WAGO-ETHERNET-Zubehör 852

Manual

852-1112

8-Port 1000BASE-T-Industrial-Eco-Switch

Mounting, Installation and Handling

Version 1.1.0
FW/HW-Version 01/01

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Every conceivable measure has been taken to ensure the accuracy and completeness of this documentation. However, as errors can never be fully excluded, we always appreciate any information or suggestions for improving the documentation.

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We wish to point out that the software and hardware terms as well as the trademarks of companies used and/or mentioned in the present manual are generally protected by trademark or patent.

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1 Notes about this Documentation

Note

Always retain this documentation!
This documentation is part of the product. Therefore, retain the documentation during the entire service life of the product. Pass on the documentation to any subsequent user. In addition, ensure that any supplement to this documentation is included, if necessary.

1.1 Validity of this Documentation

This documentation is only applicable to WAGO ETHERNET accessory products “8-Port 1000BASE-T-Industrial-Eco-Switch” (852-1112).

This documentation is only applicable from FW/HW-Version 01/01.

1.2 Copyright

1.3 Symbols

DANGER

Personal Injury!
Indicates a high-risk, imminently hazardous situation which, if not avoided, will result in death or serious injury.

DANGER

Personal Injury Caused by Electric Current!
Indicates a high-risk, imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Personal Injury!
Indicates a moderate-risk, potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Personal Injury!
Indicates a low-risk, potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE

Damage to Property!
Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

NOTICE

Damage to Property Caused by Electrostatic Discharge (ESD)!
Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

Note

Important Note!
Indicates a potential malfunction which, if not avoided, however, will not result in damage to property.

Information

Additional Information:
Refers to additional information which is not an integral part of this documentation (e.g., the Internet).

1.4 Number Notation

Table 1: Number Notation

Number Code	Example	Note
Decimal	100	Normal notation
Hexadecimal	0x64	C notation
Binary	'100' '0110.0100'	In quotation marks, nibble separated with dots (.)

1.5 Font Conventions

Table 2: Font Conventions

Font Type	Indicates
italic	Names of paths and data files are marked in italic-type. e.g.: *C:\Program Files\WAGO Software*
Menu	Menu items are marked in bold letters. e.g.: **Save**
>	A greater-than sign between two names means the selection of a menu item from a menu. e.g.: **File** > **New**
Input	Designation of input or optional fields are marked in bold letters, e.g.: **Start of measurement range**
“Value”	Input or selective values are marked in inverted commas. e.g.: Enter the value “4 mA” under **Start of measurement range**.
[Button]	Pushbuttons in dialog boxes are marked with bold letters in square brackets. e.g.: **[Input]**
[Key]	Keys are marked with bold letters in square brackets. e.g.: **[F5]**

2 Important Notes

This section includes an overall summary of the most important safety requirements and notes that are mentioned in each individual section. To protect your health and prevent damage to devices as well, it is imperative to read and carefully follow the safety guidelines.

2.1 Legal Bases

2.1.1 Subject to Changes

WAGO Kontakttechnik GmbH & Co. KG reserves the right to provide for any alterations or modifications that serve to increase the efficiency of technical progress. WAGO Kontakttechnik GmbH & Co. KG owns all rights arising from the granting of patents or from the legal protection of utility patents. Third-party products are always mentioned without any reference to patent rights. Thus, the existence of such rights cannot be excluded.

2.1.2 Personnel Qualification

All sequences implemented on Series 852 devices may only be carried out by electrical specialists with sufficient knowledge in automation. The specialists must be familiar with the current norms and guidelines for the devices and automated environments.

All changes to the controller should always be carried out by qualified personnel with sufficient sufficient skills in PLC programming.

2.1.3 Proper Use of the Industrial Switches

The device is designed for the IP30 protection class. It is protected against the insertion of solid items and solid impurities up to 2.5 mm in diameter, but not against water penetration. Unless otherwise specified, the device must not be operated in wet and dusty environments.

2.1.4 Technical Condition of Specified Devices

The devices to be supplied ex works are equipped with hardware and software configurations, which meet the individual application requirements. WAGO Kontakttechnik GmbH & Co. KG will be exempted from any liability in case of changes in hardware or software as well as to non-compliant usage of devices.

Please send your request for modified and new hardware or software configurations directly to WAGO Kontakttechnik GmbH & Co. KG.

2.1.5 Standards and Regulations for Operating the Industrial Switches

Please observe the standards and regulations that are relevant to installation:

- The data and power lines must be connected and installed in compliance with the standards to avoid failures on your installation and eliminate any danger to personnel.
- For installation, startup, maintenance and repair, please observe the accident prevention regulations of your machine (e.g., BGV A 3, “Electrical Installations and Equipment”).
- Emergency stop functions and equipment must not be deactivated or otherwise made ineffective. See relevant standards (e.g., DIN EN 418).
- Your installation must be equipped in accordance to the EMC guidelines so electromagnetic interferences can be eliminated.
- Please observe the safety measures against electrostatic discharge according to DIN EN 61340-5-1/-3. When handling the modules, ensure that environmental factors (persons, workplace and packing) are well grounded.
- The relevant valid and applicable standards and guidelines regarding the installation of switch cabinets must be observed.

2.2 Safety Advice (Precautions)

For installing and operating purposes of the relevant device to your system the following safety precautions shall be observed:

DANGER

Do not work on devices while energized!
All power sources to the device shall be switched off prior to performing any installation, repair or maintenance work.

DANGER

Only install in appropriate housings, cabinets or electrical operation rooms!
WAGO's 852 Series ETHERNET Switches are considered exposed operating components. Therefore, only install these switches in lockable housings, cabinets or electrical operation rooms. Access must be limited to authorized, qualified staff having the appropriate key or tool.

NOTICE

Do not use in telecommunication circuits!
Only use devices equipped with ETHERNET or RJ-45 connectors in LANs. Never connect these devices with telecommunication networks.

NOTICE

Replace defective or damaged devices!
Replace defective or damaged device/module (e.g., in the event of deformed contacts), since the long-term functionality of device/module involved can no longer be ensured.

NOTICE

Protect the components against materials having seeping and insulating properties!
The components are not resistant to materials having seeping and insulating properties such as: aerosols, silicones and triglycerides (found in some hand creams). If you cannot exclude that such materials will appear in the component environment, then install the components in an enclosure being resistant to the above-mentioned materials. Clean tools and materials are imperative for handling devices/modules.

NOTICE

Clean only with permitted materials!
Clean soiled contacts using oil-free compressed air or with ethyl alcohol and leather cloths.

NOTICE

Do not use any contact spray!
Do not use any contact spray. The spray may impair contact area functionality in connection with contamination.

NOTICE

Do not reverse the polarity of connection lines!
Avoid reverse polarity of data and power supply lines, as this may damage the devices involved.

NOTICE

Avoid electrostatic discharge!
The devices are equipped with electronic components that may be destroyed by electrostatic discharge when touched. Please observe the safety precautions against electrostatic discharge per DIN EN 61340-5-1/-3. When handling the devices, please ensure that environmental factors (personnel, work space and packaging) are properly grounded.

2.3 Special Use Conditions for ETHERNET Devices

If not otherwise specified, ETHERNET devices are intended for use on local networks. Please note the following when using ETHERNET devices in your system:

- Do not connect control components and control networks to an open network such as the Internet or an office network. WAGO recommends putting control components and control networks behind a firewall.
- Limit physical and electronic access to all automation components to authorized personnel only.
- Change the default passwords before first use! This will reduce the risk of unauthorized access to your system.
- Regularly change the passwords used! This will reduce the risk of unauthorized access to your system.
- If remote access to control components and control networks is required, use a Virtual Private Network (VPN).
- Regularly perform threat analyses. You can check whether the measures taken meet your security requirements.
- Use “defense-in-depth” mechanisms in your system's security configuration to restrict the access to and control of individual products and networks.

3 General

3.1 Package Contents

- One Industrial Switch
- DIN rail bracket
- Protective caps for unused ports

3.2 Industrial ETHERNET Technology

The range of WAGO Switches ensures scalability of your network infrastructure with outstanding electrical and mechanical characteristics. These rugged devices are designed for industrial use and are fully compliant with the IEEE 802.3, 802.3u, 802.3ab, 802.3az, 802.3x and 802.1p standards.
They have power supply with a supply voltage range of 9 … 57 V. Characteristics such as auto-negotiation and auto MDI/MDIX (crossover) on all 10/100/1000BASE-T ports are also realized.

3.3 Switching Technology

Another approach to pushing beyond the limits of ETHERNET technology is the development of switching technology. A switch bridge ETHERNET packets at the MAC address level of the ETHERNET protocol transmitting among connected ETHERNET or Fast ETHERNET LAN segments.

Switching is a cost-effective way of increasing the total network capacity available to users on a local area network. A switch increases capacity and decreases network loading by dividing a local area network into different segments, which don´t compete with each other for network transmission capacity.

3.4 Auto Negotiation

The Industrial Switch’s 10/100/1000Mbit/s switched RJ-45 ports auto negotiates with connected devices to determine the fastest data transmission rate supported by both devices. This helps make the Switch a plug and play device. The Switch’s RJ-45 ports support full or half duplex, depending on which transmission speed is supported by the attached device.

3.5 Autocrossing

Autocrossing (MDI/MDI-X, “Medium Dependent Interface”) allows the transmission and reception lines to be crossed automatically at twisted pair interfaces.
This allows users to use cables and cross-over cables in the same manner 1:1.

3.6 Switching, Filtering

Packets entering the Industrial Switch with source and destination addresses belonging to the same port segment will be filtered, limiting those packets to one port, and relieving the rest of the network from the need to process them. A packet with a destination address served by another port segment will be forwarded to the appropriate port, and will not be sent to the other ports where it is not needed. Packets that are used to maintain network operations (such as the occasional multi cast packet) are forwarded to all ports.

The Industrial Switch operates in the store and forward switching mode, which eliminates bad packets and enables peak performance to be achieved when there is heavy traffic on the network.

3.7 Store-and-forward switching mode

The store-and-forward-switching mode is relay and transfer principle.

With this transfer principle the data packages or messages are relayed via subsections from one network node to the next where they a buffered for a short time.
Here they are checked for correctness and validity and then discarded or relayed on to the final receiver.

3.8 Line Depth in PROFINET

Line depth (cascading) is the number of all switches in a communication path.

The maximum line depth depends on the send cycle and the switch mode used.

Note

Observe line depth!
Observe the maximum line depth for switches in Store-and-Forward mode according to the “Topology Check” section of PI-PROFINET Commissioning Guideline (PROFINET_Commissioning_8081) (www.profibus.com).

3.9 Port Speed & Duplex Mode

After a cable is plugged into a specific port, the system uses auto negotiation to determine the transmission mode for the new twisted pair connection:

If the connected device does not support auto negotiation or has auto negotiation disabled, an auto sensing process is initiated to select the speed and set the duplex mode to half duplex.

4 Device Description

The 852-1112 is an industrial ETHERNET switch with 8 10/100/1000Base-T ports, with auto-negotiation and auto-MDI-/MDI-X detection at every port.
Using the industrial ECO switch's 8 ports, several segments can be set up for reducing network load and a dedicated bandwidth assigned to each user node. The 852-1112 is a cost-effect solution to keep up with the constant demands of IP-based, industrial communication needs.
The industrial ECO switch is easy to configure and install and is best suited for small to medium-sized networks.

4.1 View

4.1.1 Front View

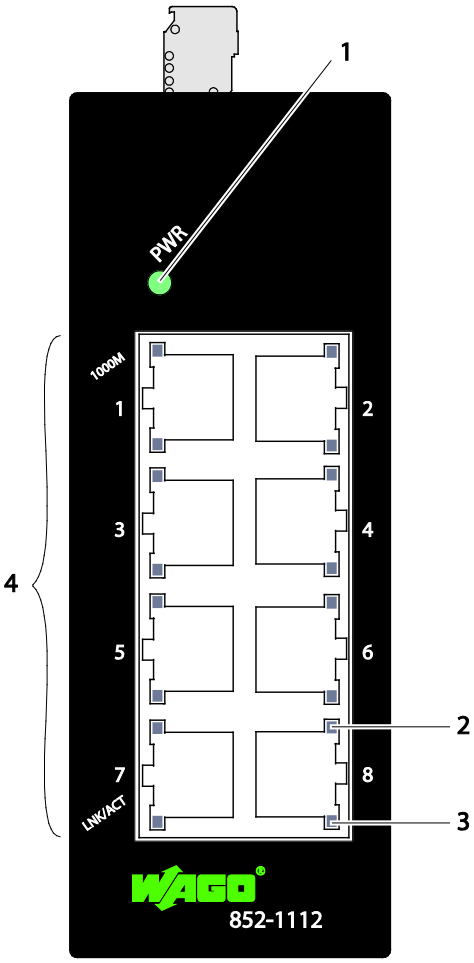

Figure 1: Front View of the Industrial ECO Switch

Table 3: Legend for Figure “Front View of the Industrial ECO Switch”

Pos.	Descrip-tion	Meaning	Details see Section
1	PWR	Status LED Power Supply	“Device Description” > “Display Elements”
2	-	Status LED T-Port 1000-Mbit/s (1 LED for each port)	“Device Description” > “Display Elements”
3	-	Status LED T-Port LNK/ACT (1 LED for each port)	“Device Description” > “Display Elements”
4	-	Port 8 x RJ-45 (10/100/1000BASE-T-Ports)	“Device Description” > “Connectors”

4.1.2 Top View

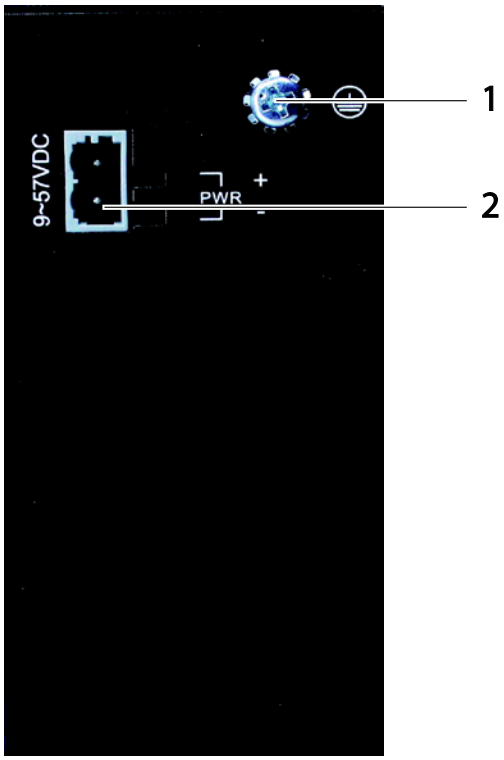

Figure 2: Top View of the Industrial ECO Switch

Table 4: Legend for Figure “Top View of the Industrial ECO Switch”

Pos.	Description	Meaning	Details see Section
1	-	Grounding screw	-
2	-	Terminal block (male connector) for power supply (PWR)	“Device Description” > “ Connectors”

4.2 Connectors

4.2.1 Power Supply (PWR/RPS)

The female connector (Order No. 2231-102/026-000) can easily be connected to the 2-pole male connector located on the top of the industrial ECO switch.

The male connector shows the following pin assignment:

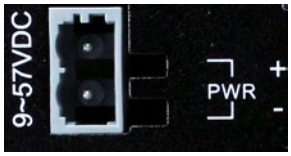

Figure 3: Power Supply (PWR) Port

Table 5: Legend fort Figure “Power Supply (PWR) Port “

Pin	Description	Meaning
+	PWR	Primary DC input
-	PWR	Primary DC input

NOTICE

Damage to Property Caused by Electrostatic Discharge (ESD)!
Industrial switch for DC operation: Power supply is provided via an external direct-current power source. As the industrial switch is not equipped with a power switch, it switches on immediately when you apply the direct-current power supply.

4.2.2 Network Connections

The industrial Eco switch uses ports with with copper connectors that can be used with ETHERNET and/or Fast ETHERNET protocols.

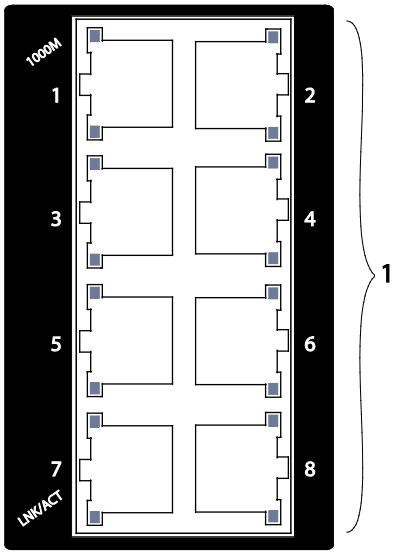

Figure 4: Network Connections

Table 6: Legend fort the Figure “Network Connections“

No.	Descrip-tion	Meaning	Details see Section
1	-	Connection 8 x RJ-45 (10/100/1000BASE-T ports)	“Device Description” > … “10/100/1000BASE-T ports“

4.2.2.1 10/100/1000Base-T

The 10/100/1000Base-T ports support network speeds of 10 Mbit/s, 100 Mbit/s and 1000 Mbit/s and can be operated in half and full-duplex transmission modes. These ports also provide automatic crossover detection (Auto-MDI/MDI-X), with plug&play capabilities. Simply plug the network cables into the ports; they then adapt to the end node devices. We recommend the following cable for the RJ-45 ports:

- 100 m – Cat 5e or higher

4.3 Display Elements

The industrial switch is equipped device LEDs and port LEDs.
You can see the status of the industrial switch at a quick glance of the device LEDs, while the port LEDs provide information about connection actions.

4.3.1 Device LED

Figure 5: Device LED

Table 7: Legend for Figure “Device LED”

LED	Name	Status	Description
PWR	Primary Power LED	Green	The primary supply voltage is connected to the industrial switch.
		OFF	The primary power supply is off or has an error.

4.3.2 Port LEDs

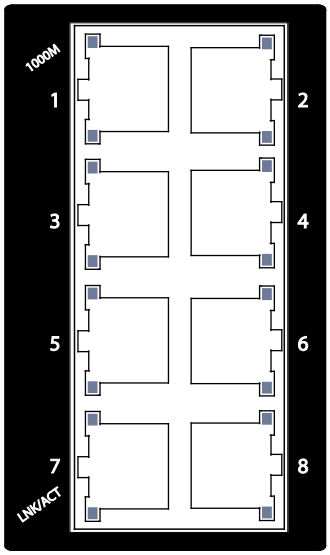

Figure 6: Port LEDs

Table 8: Legend for Figure “Port LEDs”

LED	Name	Status	Description
1000	10/100/1000BASE T-Ports-LED (1 LED for each port)	Green	Port in operation at 1000 Mbit/s.
		OFF	Connection in operation at less than 1000 Mbit/s.
LNK/ ACT	LNK/ACT-LED (1 LED for each port)	Green	Lights when ports are connected.
		Green flashing	Data traffic being routed over the port.
		OFF	No proper link established at the port.

4.4 Label

4.4.1 Hardware and Software Version

There is a label with the serial no “SN” on the back of the industrial switch.

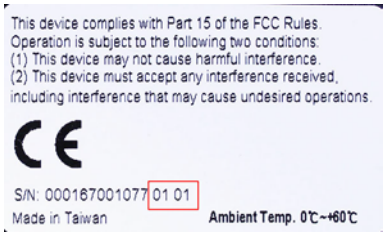

Figure 7: Label (Example)

Table 9: Legend for Figure “Label (Example)“

No.	“SN” Description
01	Firmware version
01	Hardware version

4.5 Technical Data

4.5.1 Device Data

Table 10: Technical Data - Device Data

Width	Carrier rail mounting	50 mm
Height	Carrier rail mounting	99.6 mm (from the top edge of the carrier rail)
Length	Carrier rail mounting	116 mm
Weight		472 g
Degree of protection		IP30

4.5.2 Power Supply

Table 11: Technical Data – Power Supply

Supply voltage	9 … 57 VDC
Power consumption, max.	6 W

4.5.3 Communication

Table 12: Technical Data - Communication

Ports	8 x 10/100/1000BASE-T (RJ-45)
Standards	IEEE 802.3 10BASE-T; IEEE 802.3u 100BASE-TX/FX; IEEE 802.3ab 1000BASE-T; IEEE 802.3x Flow Control; IEEE 802.3az Energy Efficient ETHERNET; IEEE 802.1p CoS Prioritization
PROFINET	Conformance Class A (CC-A)
Topology	Star, Tree, Line

4.5.4 Environmental Conditions

Table 13: Technical Data - Environmental Conditions

Operating temperature	0 °C … +60 °C
Storage temperature	-40 °C … +80 °C
Relative humidity (without condensation)	95 %
Vibration resistance	Acc. to IEC 60068-2-6
Shock resistance	Acc. to IEC 60068-2-27
EMC-1 immunity to interference	Acc. to EN 61000-6-2
EMC-1 Emission of interference	Acc. to EN 61000-6-4

4.6 Approvals

The following approvals have been granted for the WAGO ETHERNET accessory product “8-Port 1000BASE-T-Industrial-Eco-Switch” (852-1112):

CE Conformity Marking

The following approvals are pending for WAGO ETHERNET accessory products “8-Port 1000BASE-T-Industrial-Eco-Switch” (852-1112):

cULus cULus UL508

5 Mounting

5.1 Installation site

The location selected to install the industrial ECO switch may greatly affect its performance. When selecting a site, we recommend considering the following rules:

- Install the industrial ECO switch at an appropriate place. See section “Device Description” > … > “Technical Data” for the acceptable temperature and humidity operating ranges.

Make sure that the heat output from the industrial ECO switch and ventilation around it is adequate. Do not place any objects on the industrial ECO switch.

5.2 Installation on a Carrier Rail

The carrier rail must optimally support the EMC measures integrated into the system and the shielding of the internal data bus connections.

Place the industrial ECO switch onto the carrier rail from the top and snap it into position.

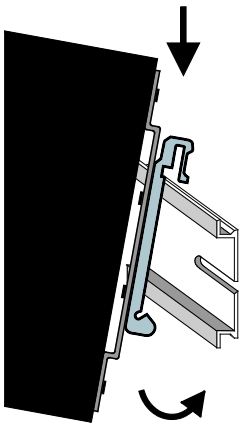

Figure 8: Snapping onto the Carrier Rail

5.3 Removal from Carrier Rail

To remove the device from the carrier rail, press down on the industrial ECO switch and pull it out of the carrier rail.

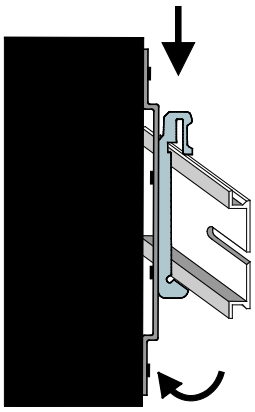

Figure 9: Removing the Device from the Carrier Rail

6 Connect Devices

6.1 Power Supply

The industrial ECO switch uses direct-current power supply for 9 … 57 V.

The primary network link is established via a 2-pin plug-in connection located on the top of the industrial ECO switch.

The female connector (order-no. 2231-102/026-000) is composed of two connecting terminals and can be inserted and removed easily by hand to connect to the 2-pin plug connector located on the top of the switch.

1. PWR +/- conductors:
   To connect or disconnect the conductors, actuate the spring directly in the female connector using a screwdriver or an operating tool and insert or remove the conductor.

2. Plug the female connector into the male connector of the switch if it has not already been plugged in.

3. Connect a suitable grounding conductor to the grounding lug on the top of the industrial ECO switch.

Note

Important note!

The ground for the industrial ECO switch prevents electromagnetic interference from electromagnetic radiation.
Observe the corresponding standards for EMC-compatible installations as well.

4. Check whether the power LED on the top of the device lights up when power is supplied to the device. If not, check to ensure that the power cable is plugged in correctly and fits securely.

7 Appendix

7.1 RJ-45 Cable

Always use category 5e cables to connect your network devices. The pin assignment is given below:

Table 14: RJ-45 Cable

Contact	Description		Pair	Color (acc. EIA/TIA 568B)
	4-wire	8-wire		
1	TD	D1+	2	White/Orange
2	TD-	D1-	2	Orange
3	RX+	D2+	3	White/Green
4	Not assigned	D3+	1	Blue
5	Not assigned	D3-	1	White/Blue
6	RX-	D2-	3	Green
7	Not assigned	D4+	4	White/Brown
8	Not assigned	D4-	4	Brown

Note

Functions on the RJ45 connector
The industrial ECO switch offers the functions autocrossing und autonegotiation to the RJ-45 connection.

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