Manual

WAGO-ETHERNET-Accessories 852

5 Port 100BASE-TX Industrial Eco Switch

852-111

Assembly, Installation and Handling

Version 1.0.0

General

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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.

Table of Contents

1 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.

1.1 Legal Bases

1.1.1 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.

1.1.2 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.

1.1.3 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.

1.1.4 Technical Condition of Specified Devices

The components to be supplied Ex Works, are equipped with hardware and software configurations, which meet the individual application requirements. Changes in hardware, software and firmware are permitted exclusively within the framework of the various alternatives that are documented in the specific manuals. 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 components.

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

1.2 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.

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 Safety Information

⚠ DANGER

Warning of physical injury
Industrial Eco Switches are exposed operating equipment. They may only be assembled in housings, cabinets or in electrical operation rooms. Access is only permitted via a key or tool to authorized qualified personnel.

⚠ DANGER

Warning of physical injury
All power sources to the device must always be switched off before performing any installation, repair or maintenance work.

NOTICE

Warning of damage to equipment
The components are not resistant against materials having seeping and insulating properties such as: aerosols, silicones, triglycerides (found in some hand creams). If it cannot be determined that these materials appear in the component environment, then the components must be installed in an enclosure that is resistant against the above mentioned materials. Clean tools and materials are generally required to operate the device/module.

NOTICE

Warning of damage to equipment
Soiled contacts must be cleaned using oil-free compressed air or with ethyl alcohol and leather cloths.

NOTICE

Warning of damage to equipment
Do not use contact sprays, which could possibly impair contact area functionality.

NOTICE

Warning of damage to equipment
Avoid reverse polarity of data and power lines as this may damage the devices.

NOTICE

Warning of damage to equipment by electrostatic discharge
The devices are equipped with electronic components that may be destroyed by electrostatic discharge when touched.

1.5 Font Conventions

Table 1: Font Conventions

Font typ:e	Indicates:
italic	Names of paths and data files are marked in italic-type. e.g.: *C:\Programme\WAGO-IO-CHECK*
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 markeded 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]**

1.6 Number Notation

Table 2: 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 (.)

2 General

2.1 Package Contents

- 1 Industrial Eco Switch
- Carrier rail support

2.2 Industrial Ethernet Technology

The line of switches from WAGO ensure the scalability of your network infrastructure with outstanding electrical and mechanical characteristics. These robust devices are designed for industrial use and they are fully compliant with IEEE802.3, 802.3u.
They have voltage supply with a supply voltage range of 18 … 30 V.
Characteristics such as auto negotiation and auto MDI/MDIX (crossover) on all 10/100 BaseTX ports are realized.

2.3 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.

2.4 Auto Negotiation

The Industrial Switch’s 10/100Mbps 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.

2.5 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.

2.6 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.

3 Device Description

The Industrial Switch was designed for easy installation in an industrial environment where vibration, shock, heat, and RF interference may be commonplace.

The Industrial Switch, with its small, compact size, was specifically designed for easy DIN rail mounting and can be installed where space is limited.

The Industrial Switch is ideal for deployment with multiple high-speed servers for shared bandwidth 10 Mbps or 100 Mbps workgroups. With the highest bandwidth 200 Mbps (100 Mbps full duplex mode), any port can provide workstations with a congestion-free data pipe for simultaneous access to the server.

The Industrial Switch is expandable by cascading two or more switches together in a ‘daisy-chain’ fashion. As all ports support 200 Mbps, the Industrial Switch can be cascaded from any port and to any number of switches.

The Industrial Switch combines dynamic memory allocation with store-and forward switching to ensure that the buffer is effectively allocated for each port, while controlling the data flow between the transmit and receive nodes to guarantee against all possible packet loss.

Other key features are:

- Five (5) 10/100Base-TX Ports
- Comprehensive front-panel diagnostic LEDs
- Supports Auto-MDI/MDI-X
- Full/half-duplex transfer modes for each port
- Wide supply voltage range 18 … 30 V
- Store-and-forward switching method
- Integrated address Look-Up Engine, supports 2K absolute MAC addresses
- Supports surge protection
- Power input polarity protection function
- IEEE 802.3x flow control for fullduplex
- Wide operating temperature range 0 °C … 70 °C
- Auto-Negotiation an allen Ports
- Rugged metal-IP30 case
- Vibration/Shock operational

The 852-111 has 5 ports with each port featuring Auto-negotiation and auto MDI/MDI-X detection. Existing 10Mbps networks can now be upgraded effortlessly to higher speed 100Mbps Fast Ethernet networks. The 852-111 5-port density can be used to create multiple segments to alleviate client congestion and provide dedicated bandwidth to each user node.

The 852-111 is a cost-effective solution to keep up with the constant demands for emerging IP-based industry communication needs. The switch can be easily configured and installed and is also ideally suited for small to medium-sized networks.

3.1 View

3.1.1 Front view

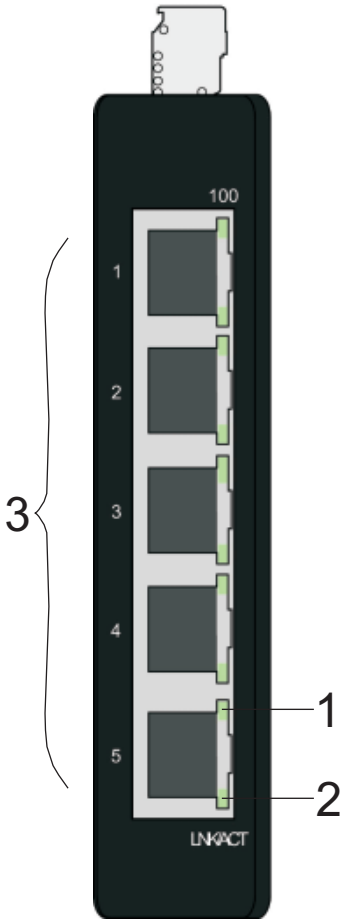


Figure 1: Front view of Industrial Eco Switch

Position	Description
1	TX port 100 Mbps LED
2	TX port LNK/ACT LED
3	TX ports (5)

3.1.2 TOP View

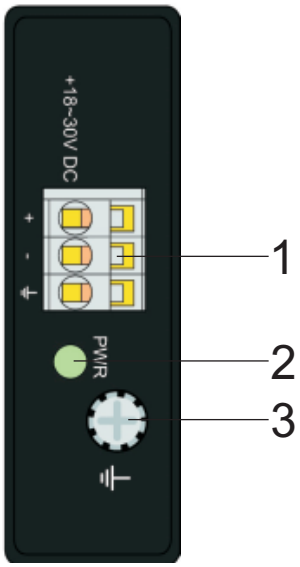


Figure 2: Top view of Industrial Eco Switch

Position	Description
1	Terminal block (male connector) for power input (PWR/RPS) and alarm dry contact
2	Primary power LED
3	Grounding Scew

3.2 Connectors

3.2.1 10/100BASE-TX Ports

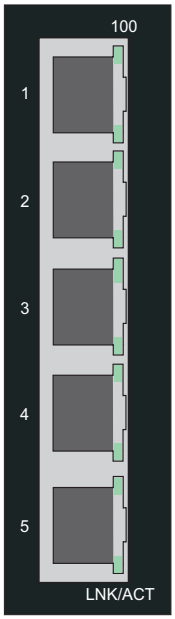


Figure 3: 10/100BASE-TX

The 10/100BASE-TX ports support network speeds of either 10 Mbps or 100 Mbps, and can operate in half- and full-duplex transfer modes. The ports also offer automatic MDI/MDI-X crossover detection that gives true “plug and play” capability – just plug the network cables into the ports and the ports will adjust according to the end-node devices. The following are the recommended cables for the RJ-45 connectors:

- 100 m – Cat 5 or better

3.2.2 Power Input (PWR)

The female connector can easily be connected to the 3-pole male connector located on the top of the switch.

The male connector shows the following pin assignment:

Table 3: Power Input (PWR)

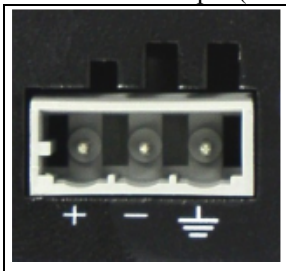


Figure 4: Power input

	Name	Designation
+	PWR	Primary DC input
-	PWR	Primary DC input
	GND	Ground

NOTICE

Warning of damage to equipment by electrostatic discharge
DC Powered Industrial Eco Switch: Power is supplied through an external DC power source. Check the technical specification section for information about the DC power input voltage. Since the Industrial Eco Switch does not include a power switch, plugging its power adapter into a power outlet will immediately power it on.

3.3 Display Elements

This Industrial Switch is equipped with Unit LEDs to enable you to quickly determine the status of the Switch, as well as Port LEDs to see what is happening across your connection.

They are as follows:

3.3.1 Unit LED

Table 4: Unit LED

Figure 5: Unit LED

LED	Desig-nation	Status	Description
PWR	Primary Power LED	Green	Industrial Eco Switch uses primary power.
		Aus	Primary power off.

3.3.2 Port LED´s

Table 5: Port LED´s

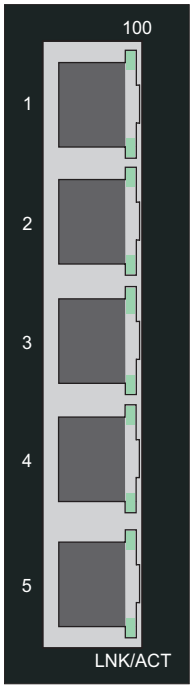


Figure 6: Port LEDs

LED	Desig-nation	Status	Description
100	TX-port 100 Mbps LED	Green	Port operating at 100 Mps (1 LED for each port).
		Off	Port operating at below 100 Mps.
LNK/ACT	TX port LNK/ ACT LED	Green	Illuminated when connectors are attached (1 LED for each port).
		Flash-ing	Data traffic passing through port.
		Off	No valid link established on port.

4 Assembly

4.1 Installation site

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

- Install the Industrial Switch at an appropriate place. See chapter “Technical Data“ for the acceptable temperature and humidity operating ranges.
- Fix the provided brackets at the back of the Industrial Switch to a DIN rail to protect the switch from falling.

4.2 Carrier rail mounting

1 Remove the screws on the back of the Industrial Eco Switch.

2 Screw the carrier rail mounting to the back of the Eco Switch.

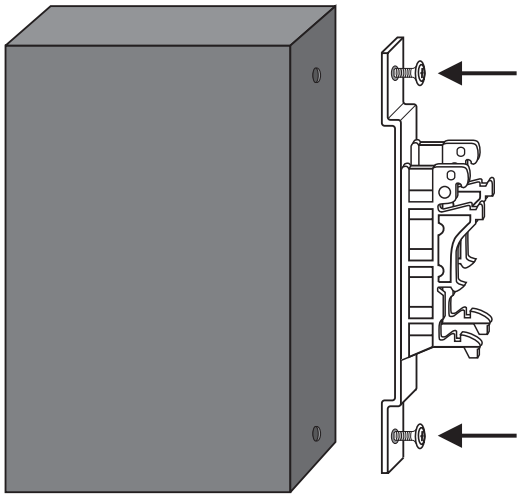


Figure 7: Mounting the carrier rail mounting

3 Rest the Industrial Eco Switch on the carrier rail.
Parallel and perpendicular mounting is possible.

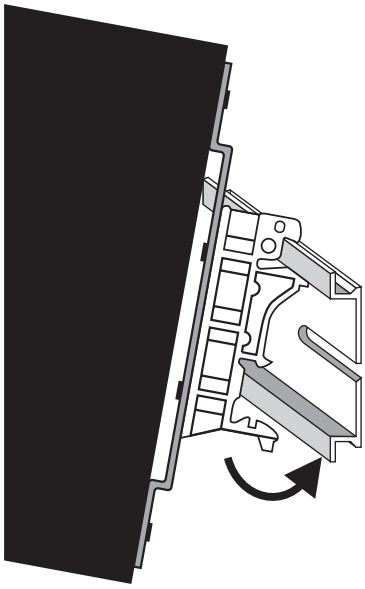


Figure 8: Assembly on carrier rail 1

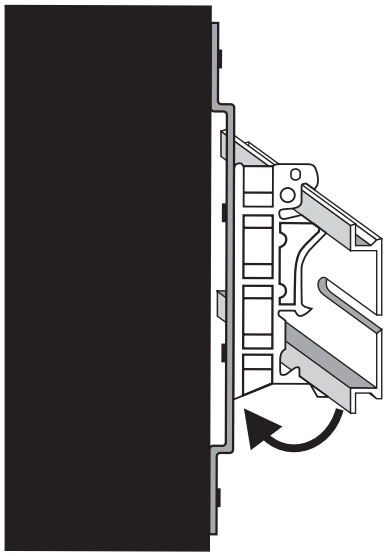


Figure 9: Assembly on carrier rail 2

4.3 Screw fixing

The Industrial Eco Switch can be mounted in the boreholes on the side directly.

Use the drilling template to mark the boreholes.

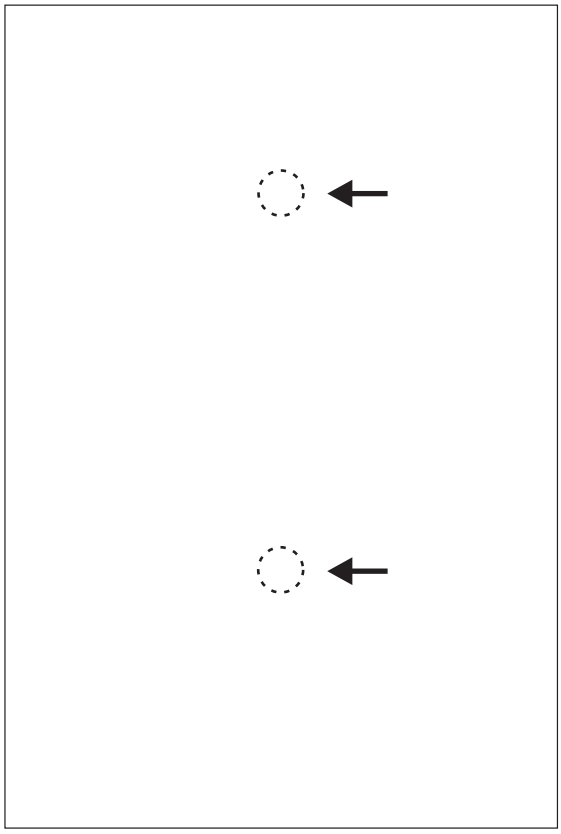


Figure 10: Drilling template

The setup of the Industrial Switch can be performed using the following steps:

- The surface must support at least 1.5 kg for the Industrial Eco Switch.
- Visually inspect the DC power jack and make sure that it is fully secured to the power adapter.
- Make sure that there is proper heat dissipation from and adequate ventilation around the Industrial Switch. Do not place heavy objects on the Industrial Switch.
- The carrier rail must optimally support the EMC measures integrated into the system and the shielding of the internal data bus connections.

Note

Important note
Grounding Industrial Eco Switch will help eliminate the effects of noise due to electromagnetic interference (EMI). Always run the ground connection from the ground screw to the grounding surface prior to connecting DC power.

4.4 Connect devices

4.4.1 Supply voltage

The Industrial Eco Switch uses a DC power supply of 18 … 30 V DC.

The primary power connection is provided via a terminal block located at the top of the Industrial Eco Switch.

The terminal block is composed of three contact pins and can be inserted and removed easily by hand to connect to the three pin terminal block (male contacts located on the body of the Switch).

1 Check the front panel LEDs as the device is powered on to verify that the Power LED is lit. If not, check that the power cable is correctly and securely plugged in.

2 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.

3 If the terminal block is not already inserted into the block receptor of the Switch, do so now.

5 Technical Data

Table 6: Technical Data

Technical Data	
Ports	5 x 10/100Base-TX (RJ-45)
Standards	IEEE 802.3 10Base-T; IEEE 802.3u 100Base-TX/FX ; IEEE 802.3x Flow Control
Topology	Star
LED	Each device: 1 x Power (PWR), green Each port: 1 x Link/Activity (LNK/ACT), green 1 x Speed (100 Mbps), green
Supply voltage	DC 18 V … 30 V
Energy consumption max.	3 W
Operating temperature	0 °C ... +60 °C
Storage temperature	-20 °C ... +80 °C
Relative air humidity (no condensation)	95 %
Dimensions (mm) W x H x L	23,4* x 73,8 x 109,2
	* Height from upper-edge of DIN 35 rail
Mounting	DIN 35 rail
Weight	145 g
Vibration resistance	acc. IEC 60068-2-6
Shock resistance	acc. IEC 60068-2-27
Degree of protection	IP 30
EMV 1-Immunity to Interference	acc. EN 61000-6-2: 2005
EMV 1-Emission to Interference	acc. EN 61000-6-4: 2001

6 Appendix

6.1 Appendix A

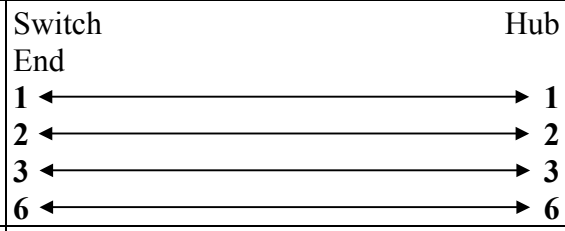
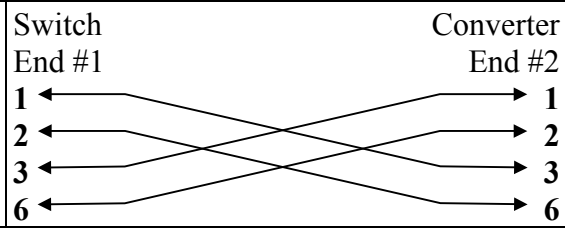
6.1.1 RJ-45 Cables

When connecting your network devices, use a standard Category 5 cable for a 10Base-T configuration for 100Base-TX. The pin assignments are as follows:

Table 7: RJ-45 Cables

Pin		Pair	Colours
1	TD+	Pair 2	White/Orange
2	TD-	Pair 2	Orange/White
3	RX+	Pair 3	White/Green
4	N/A	Pair 1	Blue/White
5	N/A	Pair 1	White/Blue
6	RX-	Pair 3	Green/White
7	N/A	Pair 4	Brown/White
8	N/A	Pair 4	Brown/White

Table 8: Configuration

Application	Cable Type	Application
Switch to Switch or Network Adapter	Straight through Cable	
Converter to Switch	Cross Over Cable	

Remark

The Switch features automatic MDI/MDI-X and NWay on RJ-45 port.

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