

FL SWITCH 5/8 TX

10/100 Mbps Ethernet switch with five/eight ports



AUTOMATION

Data sheet
6160_en_03

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1 Product description

The FL SWITCH 5/8TX enables quick and cost-effective Ethernet network expansion. It has five/eight twisted pair ports, which can be used to connect additional network segments or termination devices. The switch supports Ethernet with a transmission speed of 10 Mbps, as well as Fast Ethernet with a transmission speed of 100 Mbps.

The switch regenerates received data telegrams and sends them to the port to which the device is connected with the corresponding destination address.

Features and fields of application

- Increased network performance by filtering the data traffic.
 - Local data traffic remains local.
 - The data volume in the network segments is reduced.
- Easy network expansion without configuration of the switch.
- Coupling network segments with different transmission speeds.
 - Automatic detection of 10 Mbps or 100 Mbps data transmission rate.
- Auto negotiation: Every port establishes a half or full duplex connection with 10 or 100 Mbps.
- Auto crossing at 100 Mbps: It is not necessary to distinguish between 1:1 and crossover Ethernet cables.

- Floating alarm output: The alarm output can be used to monitor the redundant power supply.

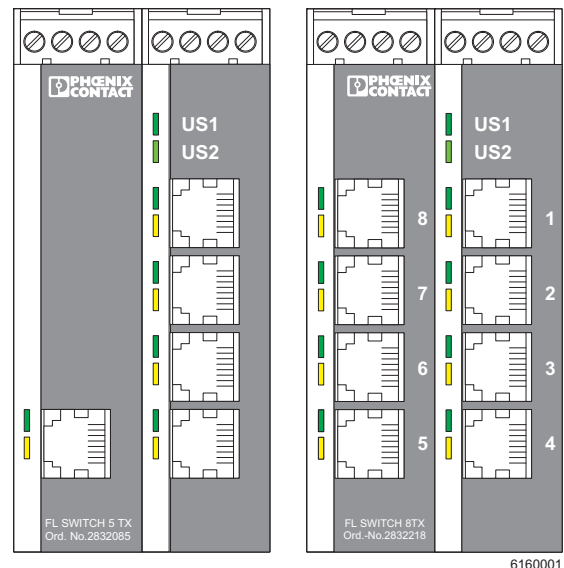


Figure 1 FL SWITCH 5/8TX



Make sure you always use the latest documentation. It can be downloaded at www.download.phoenixcontact.com.

A conversion table is available on the Internet at www.download.phoenixcontact.com/general/7000_en_00.pdf.



This data sheet is valid for all products listed on the following page:

2 Ordering data

Products

Description	Order designation	Order No.	Pcs./Pkt.
Ethernet switch with eight ports	FL SWITCH 8TX	28 32 21 8	1
Ethernet switch with five ports and screw terminal blocks	FL SWITCH 5TX	28 32 08 5	1

Accessories

Description	Order designation	Order No.	Pcs./Pkt.
Ethernet switch with five ports and spring-cage terminal blocks	FL SWITCH 5TX-ZF	28 32 89 4	1
Startup/diagnostic software	FL SWT	28 31 04 4	1
660 nm media converter	FL MC 10BASE T/FO POF	27 44 51 3	1
Universal end clamp	E/NS 35 N	0800886	50
Dust protection caps for RJ45 female connectors	FL RJ45 PROTECT CAP	2832991	10
Patch angle with two ports in CAT 5e	FL PF 2TX CAT5E	2891165	1
Patch angle with eight ports in CAT 5e	FL PF 8TX CAT5E	2891178	1
Patch angle with two ports in CAT 6	FL PF 2TX CAT6	2891068	1
Patch angle with eight ports in CAT 6	FL PF 8TX CAT6	2891071	1
Patch cable, CAT 5, pre-assembled, 0.3 m long	FL CAT5 PATCH 0,3	2832250	10
Patch cable, CAT 5, pre-assembled, 0.5 m long	FL CAT5 PATCH 0,5	2832263	10
Patch cable, CAT 5, pre-assembled, 1.0 m long	FL CAT5 PATCH 1,0	2832276	10
Patch cable, CAT 5, pre-assembled, 1.5 m long	FL CAT5 PATCH 1,5	2832221	10
Patch cable, CAT 5, pre-assembled, 2.0 m long	FL CAT5 PATCH 2,0	2832289	10
Patch cable, CAT 5, pre-assembled, 3.0 m long	FL CAT5 PATCH 3,0	2832292	10
Patch cable, CAT 5, pre-assembled, 5.0 m long	FL CAT5 PATCH 5,0	2832580	10
Patch cable, CAT 5, pre-assembled, 7.5 m long	FL CAT5 PATCH 7,5	2832616	10
Patch cable, CAT 5, pre-assembled, 10.0 m long	FL CAT5 PATCH 10	2832629	10

3 Technical data

General data	
Function	Switch/repeater; conforms to standard IEEE 802.3
Housing dimensions (width x height x depth)	45 mm x 99 mm x 112 mm
Permissible operating temperature	0°C to 55°C
Permissible storage temperature	-20°C to 70°C
Degree of protection	IP20, DIN 40050, IEC 60529
Class of protection	Class 3 VDE 0106; IEC 60536
Humidity (operation)	30% to 95%, no condensation
Humidity (storage)	30% to 95%, no condensation
Air pressure (operation)	86 kPa to 108 kPa, 1500 m above sea level
Air pressure (storage)	66 kPa to 108 kPa, 3500 m above sea level
Preferred mounting position	Perpendicular to a standard DIN rail
Connection to protective earth ground	Snapped onto a grounded DIN rail
Ambient compatibility	Free from substances which would hinder coating with paint or varnish (according to VW specification)
Resistance to solvents	Standard solvents
Resistance to gases that may endanger functions according to DIN 40 436 Parts 36 and 37	Sulfur dioxide (SO ₂) 10 ±0.3 cm ³ /m ³ , hydrogen sulfide (H ₂ S) 1 ±0.3 cm ³ /m ³ , each at 25°C and 75% humidity and an exposure time of four days
Weight	140 g, typical

Supply voltage (US)

Connection	Via COMBICON; conductor cross-section = 2.5 mm ² , maximum
Nominal value	24 V DC
Permissible ripple	3.6 V _{PP} within the permissible voltage range
Permissible voltage ranges	18.5 V DC to 30.2 V DC
Current consumption at US	250 mA, maximum
Test voltage	500 V AC/50 Hz for one minute
Protection against polarity reversal	Present
Power consumption	6.0 W, maximum

Interfaces

Ethernet interfaces	
Number	5/8
Connection format	8-pos. RJ45 female connector on the switch
Connection medium	Twisted pair cable with a conductor cross-section of 0.14 mm ² to 0.22 mm ²
Cable impedance	100 Ω
Transmission speed	10/100 Mbps
Maximum network segment expansion	100 m
Alarm contact	
Voltage	24 V DC, typical
Current carrying capacity	100 mA, typical

Mechanical tests

Shock test according to IEC 60068-2-27	Operation: 25g, 11 ms period, half-sine shock pulse Storage/transport: 50g, 11 ms period, half-sine shock pulse
Vibration resistance according to IEC 60068-2-6	Operation/storage/transport: 5g, 150 Hz, Criterion 3
Free fall according to IEC 60068-2-32	1 m

Conformance with EMC directives

Developed according to IEC 61000-6.2	
IEC 61000-4-2 (ESD)	Criterion B
IEC 61000-4-3 (radiated noise immunity)	Criterion A
IEC 61000-4-4 (burst)	Criterion B
IEC 61000-4-5 (surge)	Criterion B
IEC 61000-4-6 (conducted noise immunity)	Criterion A
IEC 61000-4-8 (noise immunity against magnetic fields)	Criterion A
EN 55022 (noise emission)	Criterion A

Differences compared to previous versions

Version 01: None - first version
Version 02: FL SWITCH 5TX added
Version 03: Current consumption adjusted, accessories updated

3.1 Local diagnostic and status indicators

Des.	Color	Meaning
US1	Green	Supply voltage US1
US2	Green	Supply voltage US2
One LED per port		
	Green	Link active
	Yellow	Receiving telegrams

3.2 General information

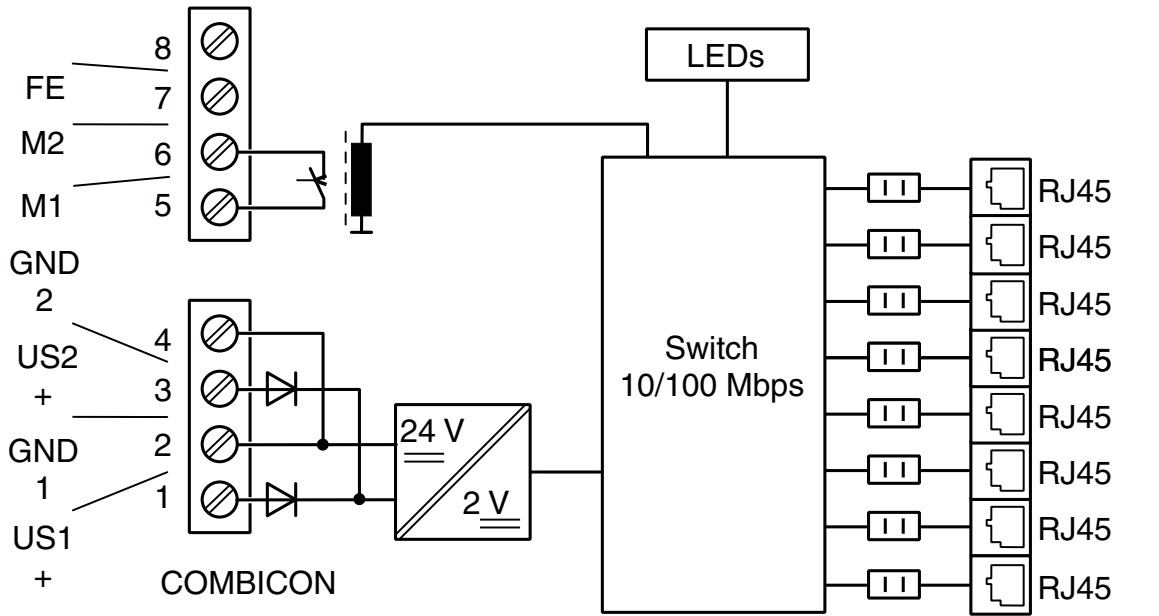


NOTE: Disregarding this warning may result in damage to equipment and/or serious personal injury. Only qualified personnel may start up and operate this device. According to the safety instructions in this text, qualified personnel are persons who are authorized to start up, to ground, and to mark devices, systems, and equipment according to the standards of safety technology. In addition, these persons must be familiar with all warning instructions and maintenance measures in this text.



NOTE: The switch is designed for SELV/PELV operation at +24 V DC according to IEC 60950-1/VDE 0805. Only SELV/PELV according to the defined standards may be used for supply purposes.

4 Internal basic circuit diagram



61601004

Figure 2 Internal basic circuit diagram of the FL SWITCH 8TX

5 Installation and mounting/removal

Install the FL SWITCH 5/8TX on a clean DIN rail. To avoid contact resistance only use clean, corrosion-free DIN rails. End clamps can be mounted on both sides of the module to stop the modules from slipping on the DIN rail.



Connect the DIN rail to protective earth ground using a grounding terminal block. The modules are grounded when they are snapped onto the DIN rail. Connect protective earth ground with low impedance.

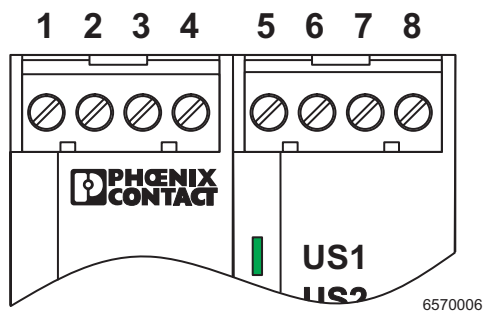
5.1 Mounting:

1. Place the module onto the DIN rail from above. The upper holding keyway must be hooked onto the top edge of the DIN rail.
2. Push the module from the front towards the mounting surface.
3. Once the module has been snapped on properly, check that it is fixed securely on the DIN rail.

5.2 Removal:

1. Insert a suitable tool (e.g., needle-nose pliers) into the arresting latch and pull it down.
2. Pull the module slightly away from the mounting surface.
3. Lift the module from the DIN rail.

5.3 Terminal assignment



Terminal	Meaning
1	Supply voltage +US1
2	GND US1
3	Supply voltage +US2
4	GND US2
5	Alarm contact 1 (M1)
6	Alarm contact 2 (M2)
7	Functional earth ground
8	n. c.

Figure 3 Terminal assignment

6 Connecting the supply voltage



The module is operated using a +24 V DC SELV/PELV. The module is fully operational even with only one supply voltage (without jumpering it to other supply voltage terminal blocks) and/or without wiring the alarm contact.

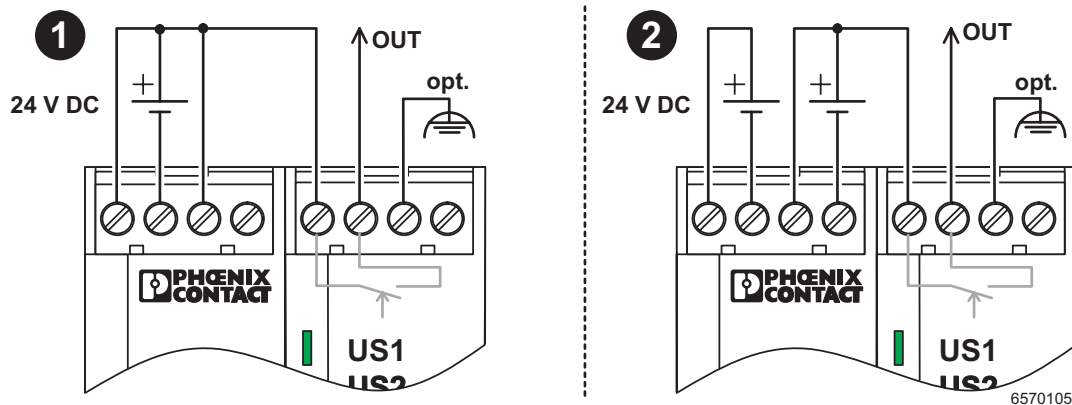


Figure 4 Typical supply of the module from one or two voltage sources

6.1 Supplying the module from one voltage source



The alarm contact is closed if voltage is present at both supply voltage terminal blocks US1 and US2. In the event of an error at one of the two voltage sources, the contact is opened. If the voltage is not supplied redundantly, terminal blocks US1 and US2 must be jumpered (see Figure 4, version 1), so that the voltage can be monitored via the alarm contact.



Option: In addition, noise immunity can be increased in environments subject to high EMI by a low-impedance connection to functional earth ground via terminal block 7.

7 Ethernet interface

The FL SWITCH 5/8TX has five/eight Ethernet ports on the front in RJ45 format, to which only twisted pair cables with an impedance of $100\ \Omega$ can be connected. The data transmission rate is 10 Mbps or 100 Mbps. In addition, each port has an auto crossing function at 100 Mbps: It is not necessary to distinguish between 1:1 and crossover Ethernet cables.

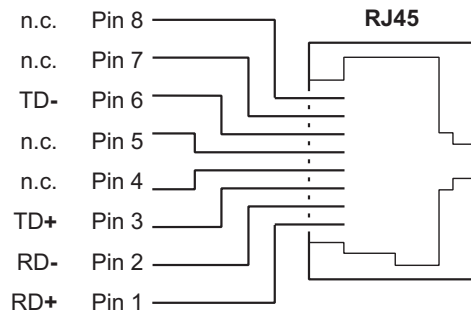


Figure 5 Pin assignment of the Ethernet ports in RJ45 format

8 Switching properties of the FL SWITCH 5/8TX

– Store-and-forward

All data telegrams received by the switch are saved and their validity checked. Invalid or faulty data packets (> 1522 bytes or CRC errors) and fragments (< 64 bytes) are rejected. Valid data telegrams are forwarded by the switch. The switch always forwards the data using the data transmission rate that is used in the destination network segment.

– Multi-address function

The switch independently learns the addresses of termination devices, which are connected via a port, by evaluating the source addresses in the data telegrams. Only packets with unknown addresses, with a source address of this port or with a multicast/broadcast address in the destination address field are forwarded via the corresponding port. The switch can store up to 4096 addresses in its address table with an aging time of 5 minutes. This is important when more than one termination device is connected to one or more ports. In this way, several independent subnetworks can be connected to one switch.



A restart deletes the entire address table.

8.1 Housing dimensions

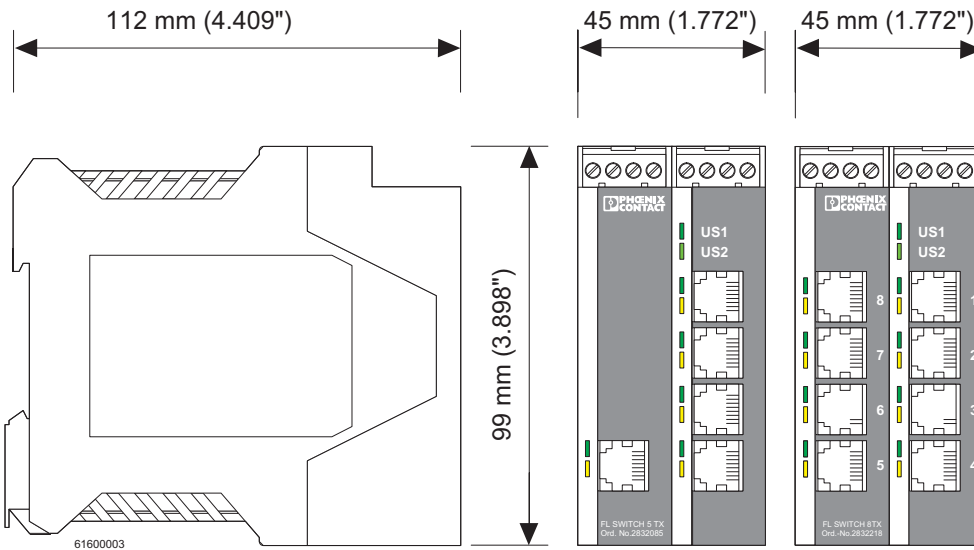


Figure 6 Housing dimensions for the FL SWITCH 5/8TX