

## Industrial Ethernet Switch - FL SWITCH 2316 PN - 1031673

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Managed Switch 2000, 16 RJ45 ports 10/100/1000 Mbps, degree of protection: IP20, PROFINET Conformance-Class B, PROFINET mode preset, PROFINET status LEDs


The figure shows a version of the product

### Your advantages

- ✓ PROFINET mode preset
- ✓ Easy and fast startup and commissioning with the FL NETWORK MANAGER software
- ✓ Configuration memory
- ✓ RSTP
- ✓ DHCP client, DHCP server (pool-based and port-based), DHCP option 82
- ✓ VLANs
- ✓ MRP (client and manager)
- ✓ Web-based management, SNMP
- ✓ -40°C ... +70°C ambient temperature



### Key Commercial Data

Packing unit	1 pc
GTIN	 4 055626 535265
GTIN	4055626535265
Weight per Piece (excluding packing)	620.000 g
Custom tariff number	85176200
Country of origin	Germany

# Industrial Ethernet Switch - FL SWITCH 2316 PN - 1031673

## Technical data

### Note

Utilization restriction	EMC: class A product, see manufacturer's declaration in the download area
	Use in potentially explosive areas is not permitted in China.

### Dimensions

Width	85 mm
Height	130 mm
Depth	115 mm

### Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-40 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Permissible humidity (operation)	10 % ... 95 % (non-condensing)
Permissible humidity (storage/transport)	10 % ... 95 % (non-condensing)
Air pressure (operation)	79 kPa ... 108 kPa up to 2000 m above mean sea level (Without derating)
Air pressure (storage/transport)	79 kPa ... 108 kPa up to 2000 m above mean sea level (Without derating)
Degree of pollution	2

### Interfaces

Interface	Ethernet (RJ45)
No. of ports	16 (RJ45 ports)
Note on the connection method	Auto negotiation and autocrossing
Transmission physics	Copper
Transmission speed	10/100/1000 Mbps
Transmission length	100 m (per segment)
Signal LEDs	Data receive, link status

### Function

Basic functions	Store-and-forward switch, complies with IEEE 802.3
Configuration memory	max. 8 GByte (SD card)
Management	Web-based management (HTTP/HTTPS)
	Role-based user management
	SNMPv1/v2/v3
	Command-line interface (Telnet, SSH)
Diagnostic functions	RMON History
	LLDP (Link Layer Discovery Protocol)
	SNMP-Traps
	N:1-Portmirroring

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### Function

	ACD (Address Conflict Detection)
	SysLog
	CRC-Surveillance
Filter functions	Quality of Service (8 priority classes)
	Class of Service
	DiffServ/DSCP
	Port-Priorisierung
	VLAN (up to 32 VLANs)
	IGMP Snooping/Querier (v1/v2)
	Auto-Query-Port
	Extended Multicast Filtering
Redundancy	MRP (Media Redundancy Protocol)
	RSTP (Rapid Spanning Tree Protocol)
	FRD (Fast Ring Detection)
	Large Tree Support
	LACP (Link Aggregation Control Protocol)
Additional functions	Jumbo frames (Max. 9,600 bytes)
	Transmission of MMS and GOOSE (IEC 61850-8-1)
MAC address table	8k
Latency	≥ 1.9 µs (Store-and-Forward mode, 10/100/1000 Mbps, depending on the frame size)
IP parameterization	DHCP-Client
	DHCP Option 82 (Relay Agent)
	DHCP server (pool-based, port-based)
	BootP
	DCP (Discovery and Configuration Protocol)
PROFINET device function	PROFINET device
	Fast Startup
PROFINET conformance class	Conformance-Class B
Time synchronization	SNTP (Simple Network Time Protocol)
Status and diagnostic indicators	LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (link/activity and speed), PROFINET status LEDs (BF, SF)
Signal contact control voltage	typ. 24 V DC

### Security functions

Port security	MAC-based, RADIUS (IEEE 802.1X)
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### Network expansion parameters

Cascading depth	Network, linear, and star structure: any
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### Network expansion parameters

Maximum conductor length (twisted pair)	100 m
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### Supply voltage

Supply voltage	24 V DC (redundant)
Residual ripple	3.6 V <sub>PP</sub> (within the permitted voltage range)
Supply voltage range	12 V DC ... 57 V DC
Typical current consumption	455 mA (at U <sub>S</sub> = 24 V DC and 25 °C ambient temperature)
Max. current consumption	1.8 A (U <sub>S</sub> = Min, T <sub>amb</sub> = Max, DO <sub>I</sub> = Max)
Current consumption	455 mA

### General

Mounting type	DIN rail
Type AX	Book type
Net weight	445 g
Housing material	Polycarbonate fiber reinforced
Note	Support by phone or on-site (fee is charged)
Special properties	PROFINET mode preset, PROFINET status LEDs
Latency	≥ 1.9 μs (Store-and-Forward mode, 10/100/1000 Mbps, depending on the frame size)
MTTF	379.84 Years (SN 29500 standard, temperature 25°C, operating cycle 21%)
	199.41 Years (SN 29500 standard, temperature 40°C, operating cycle 34.25%)
	27.52 Years (SN 29500 standard, temperature 55°C, operating cycle 100%)

### Connection data

Connection method	Push-in spring connection
Conductor cross section solid min.	0.25 mm <sup>2</sup>
Conductor cross section solid max.	1.5 mm <sup>2</sup>
Conductor cross section flexible min.	0.25 mm <sup>2</sup>
Conductor cross section flexible max.	1.5 mm <sup>2</sup>
Conductor cross section AWG min.	24
Conductor cross section AWG max.	16
Stripping length	9 mm

### Standards and Regulations

Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
Interference emission	EN 61000-6-2 EN 61000-6-3 (noise emission) Class B
Conducted noise emission	EN 61000-6-2 EN 61000-6-3 (conducted emissions) Class B
Immunity to surge	EN 61000-6-2 EN 61000-4-5 (surge) Criterion A

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### Standards and Regulations

Immunity to burst	EN 61000-6-2 EN 61000-4-4 (EFT burst) Criterion A
Immunity to EF	EN 61000-6-2 EN 61000-4-3 (electromagnetic fields) Criterion A
Immunity to ESD	EN 61000-6-2 EN 61000-4-2 (ESD) Criterion B
Immunity to conducted interference	EN 61000-6-2 EN 61000-4-6 (line noise immunity) Criterion A
Type of test	Free fall in accordance with EN 61131-2
Noise emission	EN 61000-6-4
Noise immunity	EN 61000-6-2
Vibration (storage/transport)	5g, 150 Hz, in acc. with IEC 60068-2-6
Free from substances that could impair the application of coating	Yes
Shipbuilding approval	Tested in accordance with IEC 60945 and IACS E10
Vibration (operation)	in acc. with IEC 60068-2-6: 5g, 150 Hz
Shock (operation)	30g (EN 60068-2-27)
ATEX	# II 3 G Ex ec IIC T4 Gc
IECEX	Ex ec IIC T4 Gc
UL, USA	UL 60079-0, Ed.6 / UL 60079-7, Ed.5
UL, USA/Canada	Class I, Div. 2, Groups A, B, C, D T4 Class I, Zone 2, IIC T4
UL, Canada	CSA C22.2 NO.60079-0, Ed.3 / CSA C22.2 NO.60079-7:16
Noxious gas test	ISA S71.04.2013 G3 Harsh Group A

### Environmental Product Compliance

REACH SVHC	Lead 7439-92-1
China RoHS	Environmentally Friendly Use Period = 50 years
	For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration"

## Classifications

### eCl@ss

eCl@ss 10.0.1	19170401
eCl@ss 11.0	19170401
eCl@ss 4.0	27250501
eCl@ss 4.1	27250501
eCl@ss 5.0	19030100
eCl@ss 5.1	19030100
eCl@ss 6.0	19170100
eCl@ss 7.0	19170106
eCl@ss 9.0	19170106

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## Classifications

### ETIM

ETIM 3.0	EC000734
ETIM 4.0	EC000734
ETIM 6.0	EC000734
ETIM 7.0	EC000734

### UNSPSC

UNSPSC 6.01	43172015
UNSPSC 7.0901	43201404
UNSPSC 11	43172015
UNSPSC 12.01	43201410
UNSPSC 13.2	43222612
UNSPSC 18.0	43222612
UNSPSC 19.0	43222612
UNSPSC 20.0	43222612
UNSPSC 21.0	43222612

## Approvals

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#### Approvals


UL Listed / cUL Listed / PROFINET / EAC / DNV GL / LR / RINA / ABS / NK / BV / BSH / cULus Listed

#### Ex Approvals

IECEX / UL Listed / cUL Listed / ATEX / cULus Listed

### Approval details

UL Listed		<a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a>	FILE E 238705
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cUL Listed		<a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a>	FILE E 238705
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PROFINET	Z12628
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## Approvals

EAC			RU*-DE.*.B.00741/19
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DNV GL		<a href="https://approvalfinder.dnvgl.com/">https://approvalfinder.dnvgl.com/</a>	TAA00000YV
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LR		<a href="http://www.lr.org/en">http://www.lr.org/en</a>	LR2160176TA
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RINA		<a href="http://www.rina.org/en">http://www.rina.org/en</a>	ELE130419XG
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ABS		<a href="http://www.eagle.org/eagleExternalPortalWEB/">http://www.eagle.org/eagleExternalPortalWEB/</a>	21-2066186-PDA
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NK		<a href="http://www.classnk.or.jp/hp/en/">http://www.classnk.or.jp/hp/en/</a>	TA19464M
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BV		<a href="http://www.veristar.com/portal/veristarinfo/generalinfo/approved/approvedProducts/equipmentAndMaterials">http://www.veristar.com/portal/veristarinfo/generalinfo/approved/approvedProducts/equipmentAndMaterials</a>	48146/A1 BV
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BSH			1045
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cULus Listed			
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## Accessories

Accessories

Data cable preassembled

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### Accessories

Patch cable - NBC-R4AC-R4AC-IE8A/.../... - 1411854



Patch cable, degree of protection: IP20, number of positions: 8, 10 Gbps, CAT6<sub>A</sub>, cable outlet: straight, Ethernet

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Patch cable - NBC-R4AC/10G-R4AC/10G-94F/2,0 - 1408360



Patch cable, CAT6<sub>A</sub>, 4-pair, shielded, connection not crossed (line), assembled at both ends with RJ45/IP20 connectors, outer sheath material: PUR, length: 2.0 m

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Patch cable - NBC-R4AC/10G-R4AC/10G-94F/3,0 - 1408365



Patch cable, CAT6<sub>A</sub>, 4-pair, shielded, connection not crossed (line), assembled at both ends with RJ45/IP20 connectors, outer sheath material: PUR, length: 3.0 m

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Patch cable - NBC-R4AC/1,0-93B/R4AC - 1408968



Patch cable, degree of protection: IP20, cable length: 1 m, number of positions: 4, 100 Mbps, CAT5, material: PA 6.6, PROFINET

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Patch cable - NBC-R4AC/2,0-93B/R4AC - 1408969



Patch cable, degree of protection: IP20, cable length: 2 m, number of positions: 4, 100 Mbps, CAT5, material: PA 6.6, PROFINET

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## Industrial Ethernet Switch - FL SWITCH 2316 PN - 1031673

### Accessories

Patch cable - NBC-R4AC/5,0-93B/R4AC - 1408970



Patch cable, degree of protection: IP20, cable length: 5 m, number of positions: 4, 100 Mbps, CAT5, material: PA 6.6, PROFINET

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### Drivers and interfaces

Software - FL SNMP OPC SERVER V3 - 2701139



SNMP-OPC server, German and English, for monitoring and configuration of SNMP-capable equipment in HMI and SCADA systems

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### End block

End clamp - E/NS 35 N - 0800886



End clamp, width: 9.5 mm, color: gray

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### Mounting rail adapter

DIN rail adapter - FL DIN RA - 2891053



The FL DIN RA is installed in a standard, 19-inch rack (EIA-310-D, IEC 60297-3-100) to allow DIN rail mounted equipment to be rack mounted.

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### Network management software

## Industrial Ethernet Switch - FL SWITCH 2316 PN - 1031673

### Accessories

Software - FL NETWORK MANAGER BASIC - 2702889



FL Network Manager, SNMP-based configuration and firmware update software, for easy startup of Managed Switches

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### Parameterization memory

Memory - SD FLASH 512MB - 2988146



Program and configuration memory, plug-in, 512 Mbyte.

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Program / configuration memory - SD FLASH 2GB - 2988162



Program and configuration memory, for extending the internal flash memory, pluggable, 2 GB.

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### Patch cable

Patch cable - FL CAT5 PATCH 0,5 - 2832263



Patch cable, CAT5, assembled, 0.5 m

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Patch cable - FL CAT5 PATCH 1,0 - 2832276



Patch cable, CAT5, assembled, 1 m

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### Accessories

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Patch cable - FL CAT5 PATCH 2,0 - 2832289



Patch cable, CAT5, assembled, 2 m

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### PCB plug

Printed-circuit board connector - FK-MCP 1,5/ 5-ST-3,81GY35BD1-5 - 1015782



PCB connector, nominal cross section: 1.5 mm<sup>2</sup>, color: light gray, nominal current: 8 A, rated voltage (III/2): 160 V, contact surface: Tin, type of contact: Female connector, number of potentials: 5, Number of rows: 1, Number of positions per row: 5, number of connections: 5, product range: FK-MCP 1,5/..-ST, pitch: 3.81 mm, connection method: Push-in spring connection, conductor/PCB connection direction: 0 °, plug-in system: MINI COMBICON, Locking: without, mounting: without, type of packaging: packed in cardboard

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PCB connector - MCVW 1,5/ 5-ST-3,81GY7035BD2DO - 1034096



PCB connector, nominal cross section: 1.5 mm<sup>2</sup>, color: light gray, nominal current: 8 A, rated voltage (III/2): 160 V, contact surface: Tin, type of contact: Female connector, number of potentials: 5, Number of rows: 1, Number of positions per row: 5, number of connections: 5, product range: MCVW 1,5/..-ST, pitch: 3.81 mm, connection method: Screw connection with tension sleeve, screw head form: L Slotted, conductor/PCB connection direction: -90 °, plug-in system: MINI COMBICON, Locking: without, mounting: without, type of packaging: packed in cardboard

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### Protective cap

Dust protection - FL RJ45 PROTECT CAP - 2832991



Dust protection caps for RJ45 socket

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