

FL SWITCH 2216 PN - Industrial Ethernet Switch



1044029

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Managed Switch 2000, 16 RJ45 ports 10/100 Mbps, PROFINET Conformance-Class B, Extended temperature range, PROFINET mode preset, PROFINET status LEDs

Your advantages

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

Commercial data

Item number	1044029
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	DN17
Product key	DNN121
Catalog page	Page 307 (C-6-2019)
GTIN	4055626619538
Weight per piece (including packing)	633.9 g
Weight per piece (excluding packing)	445 g
Customs tariff number	85176200
Country of origin	DE

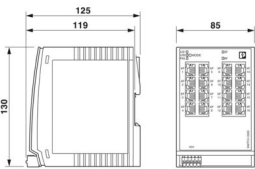
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Technical data

Dimensions

Dimensional drawing		
Width		85 mm
Height		130 mm
Depth		119 mm

Notes

General	Support by phone or on-site (fee is charged)
Note on application	
Note on application	Only for industrial use

Material specifications

Housing material	Polycarbonate fiber reinforced
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Mounting

Mounting type	DIN rail mounting
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Interfaces

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

Output data

Digital:	
Output name	Alarm output

Product properties

Product type	Switch
Product family	Managed Switch 2000
Type	Book type

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MTTF	365.63 Years (SN 29500 standard, temperature 25°C, operating cycle 21%)
	218.22 Years (SN 29500 standard, temperature 40°C, operating cycle 34.25%)
	31.7 Years (SN 29500 standard, temperature 55°C, operating cycle 100%)
Special properties	Extended temperature range
	PROFINET mode preset, PROFINET status LEDs
Signal delay	≥ 6.5 µs (Store and Forward mode, 10/100 Mbps, depending on the frame size)

Data management status

Article revision	04
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Insulation characteristics

Protection class	III (VDE 0106)
Degree of pollution	2

Switch functions

Diagnostic functions	RMON History
	LLDP (Link Layer Discovery Protocol)
	SNMP-Traps
	N:1-Portmirroring
	ACD (Address Conflict Detection)
	SysLog
	CRC-Surveillance
Basic functions	Store-and-forward switch, complies with IEEE 802.3
Signal contact control voltage	typ. 24 V DC
PROFINET conformance class	Conformance-Class B
PROFINET device function	PROFINET device
	Fast Startup
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
IP parameterization	Extended Multicast Filtering
	DHCP-Client
	DHCP Option 82 (Relay Agent)
	DHCP server (pool-based, port-based)
	BootP
MAC address table	DCP (Discovery and Configuration Protocol)
	8k
Web-based management (HTTP/HTTPS)	

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Management	Role-based user management (LDAP, RADIUS)
	SNMPv1/v2/v3
	Command Line Interface (Telnet, SSH)
Redundancy	MRP (Media Redundancy Protocol)
	RSTP (Rapid Spanning Tree Protocol)
	FRD (Fast Ring Detection)
	Large Tree Support
	LACP (Link Aggregation Control Protocol)
Status and diagnostic indicators	PROFINET S2 system redundancy
	LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (link/activity and speed), PROFINET status LEDs (BF, SF)
Additional functions	Transmission of MMS and GOOSE (IEC 61850-8-1)
	Transmission of Modbus/TCP
Time synchronization	SNTP (Simple Network Time Protocol)

Security functions

Port security	MAC-based, RADIUS (IEEE 802.1X), MAC Authentication Bypass
Basic functions	Store-and-forward switch, complies with IEEE 802.3

Electrical properties

Local diagnostics	US1/2 Supply voltage US1, US2 Green LED
	FAIL Div. LED red
	LINK Link status Green LED
	BF Bus errors LED red
	SF Group error LED red
Maximum power dissipation for nominal condition	8.4 W ($U_S = \text{Min}$, $T_{\text{amb}} = \text{Max}$, $DO_I = \text{Max}$)
Test voltage	500 V DC
Test section	for one minute 500 V DC
Transmission medium	Copper

Supply

Supply voltage (DC)	24 V DC (redundant)
Supply voltage range	12 V DC ... 57 V DC
Power supply connection	via COMBICON, max. conductor cross section 1.5 mm ²
Residual ripple	3.6 V _{PP} (within the permitted voltage range)
Max. current consumption	1.4 A ($U_S = \text{Min}$, $T_{\text{amb}} = \text{Max}$, $DO_I = \text{Max}$)
Typical current consumption	315 mA (at $U_S = 24 \text{ V DC}$ and 25 °C ambient temperature)
Current consumption	315 mA

Function

Signal contact control voltage	typ. 24 V DC
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Connection data

Connection method	Push-in spring connection
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Note on the connection method	Use only copper connecting cables providing the permitted temperature range (-40 °C ... 75 °C).
Conductor cross section, rigid	0.25 mm ² ... 1.5 mm ²
Conductor cross section, flexible	0.25 mm ² ... 1.5 mm ²
Conductor cross section AWG	24 ... 16
Stripping length	9 mm

Environmental and real-life conditions

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)
Shock (operation)	30g (EN 60068-2-27)
Vibration (operation)	in acc. with IEC 60068-2-6: 5g, 150 Hz
Air pressure (operation)	80 kPa ... 110 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)

Standards and regulations

Free from substances that could impair the application of coating	Yes
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Approvals

Shipbuilding approval	Tested in accordance with IEC 60945 and IACS E10
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ATEX

Identification	Ex II 3 G Ex ec IIC T4 Gc
Certificate	DEMKO 16 ATEX 1709X
References to standards	EN 60079-0
	EN 60079-7

IECEX

Identification	Ex ec IIC T4 Gc
Certificate	IECEX ULD 16.0018 X
References to standards	IEC 60079-0
	IEC 60079-7

UL, USA/Canada

Identification	cULus
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UL Ex, USA / Canada

Identification	Class I, Division 2, Groups A, B, C, and D, T4
	Class I, Zone 2, AEx ec IIC T4
	Ex ec IIC T4 Gc X
Certificate	E366272

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Note	UL 60079-0 Ed. 6 / UL 60079-7 Ed. 5, CSA 22.2 No. 60079-0 Ed. 3 / CSA C22.2 No. 60079-7 Ed. 2
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EAC Ex

Identification	2Ex e IIC T4 Gc X
Certificate	RU C-DE.HB49.B.00118/21

The following continue to apply for EAC Ex:

Identification	При монтаже использовать подходящий допущенный корпус со степенью защиты не ниже IP66. На корпусе/шкафу управления должна быть размещена предупреждающая надпись, запрещающая открывать корпус или шкаф во взрывоопасной зоне. Эксплуатация устройства допускается только при условии, что все оптические порты заняты подключенными устройствами или закрыты прилагаемыми заглушками.
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CCC / China-Ex

Identification	Ex ec IIC T4 Gc
Certificate	2022122310115629

Corrosive gas test

Identification	ISA S71.04.2013 G3 Harsh Group A
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UKCA Ex (UKEX)

Identification	⚡ II 3 G Ex ec IIC T4 Gc
Certificate	PxCIMA22UKEX2702910X

DNV GL data

Temperature	B
Humidity	B
Vibration	A
EMC	B
Enclosure	Required protection according to the Rules shall be provided upon installation on board

EMC data

Conformance with EMC directives	EN 61000-6-2 EN 61000-4-2 (ESD) Criterion B EN 61000-6-2 EN 61000-4-3 (electromagnetic fields) Criterion A EN 61000-6-2 EN 61000-4-4 (EFT burst) Criterion A EN 61000-6-2 EN 61000-4-5 (surge) Criterion B EN 61000-6-2 EN 61000-4-6 (line noise immunity) Criterion A EN 61000-6-2 EN 61000-6-3 (noise emission) Class B EN 61000-6-2 EN 61000-6-3 (conducted emissions) Class B
Noise immunity	EN 61000-6-2
Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
Noise emission	EN 61000-6-3

System properties

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Functionality

Basic functions	Store-and-forward switch, complies with IEEE 802.3
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Signaling

Status display	LEDs: US1, US2 (power supply), Fail (alarm contact), 2 LEDs per Ethernet port (link/activity and speed), PROFINET status LEDs (BF, SF)
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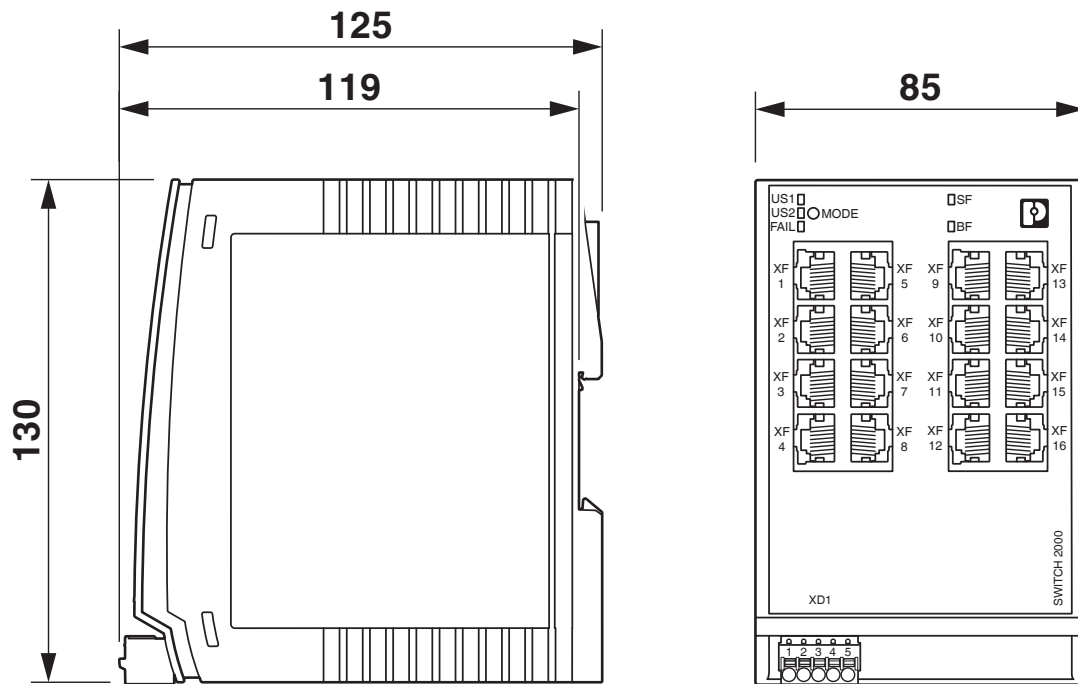


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Drawings

Dimensional drawing



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Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/1044029>



EAC

Approval ID: RU*-DE.*.B.00741/19



DNV GL

Approval ID: TAA00000YV



LR

Approval ID: LR22250919TA



NK

Approval ID: TA24215M



BV

Approval ID: 48146_B0 BV

BSH

Approval ID: 1045



RINA

Approval ID: ELE014724XG001

ABS

Approval ID: 21_2066186_1_PDA

PROFINET

Approval ID: Z13094

UAE-RoHS

Approval ID: 23-02-63229



cULus Listed

Approval ID: E238705

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IECEx

Approval ID: IECEx ULD 16.0018X



cUL Listed

Approval ID: E366272



ATEX

Approval ID: DEMKO 16 ATEX 1709X



CCC

Approval ID: 2022122310115629

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Classifications

ECLASS

ECLASS-11.0	19170401
ECLASS-12.0	19170401
ECLASS-13.0	19170401

ETIM

ETIM 9.0	EC000734
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UNSPSC

UNSPSC 21.0	43222600
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Environmental product compliance

EU RoHS	
Fulfills EU RoHS substance requirements	Yes
Exemption	7(a), 7(c)-I
China RoHS	
Environment friendly use period (EFUP)	EFUP-50
	An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required.
EU REACH SVHC	
REACH candidate substance (CAS No.)	Lead(CAS: 7439-92-1)
SCIP	d2523b57-54e8-4989-b2c4-e9eb0191eeb1
EF3.0 Climate Change	
CO2e kg	18.77 kg CO2e

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Accessories

SD FLASH 2GB - Program/configuration memory

2988162

<https://www.phoenixcontact.com/us/products/2988162>



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

FL NETWORK MANAGER BASIC - Network management software

2702889

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SNMP-based software for easy commissioning and monitoring of network components such as switches, routers, and WLAN access points

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FL DIN RA - DIN rail adapter

2891053

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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.

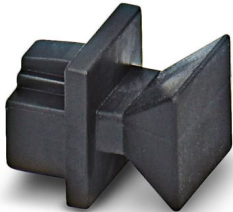


FL RJ45 PROTECT CAP - Dust protection

2832991

<https://www.phoenixcontact.com/us/products/2832991>

Dust protection caps for RJ45 socket



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E/NS 35 N - End bracket

0800886

<https://www.phoenixcontact.com/us/products/0800886>

End clamp, width: 9.5 mm, color: gray



FK-MCP 1,5/ 5-ST-3,81GY35BD1-5 - PCB connector

1015782

<https://www.phoenixcontact.com/us/products/1015782>



PCB connector, nominal cross section: 1.5 mm², color: light gray, nominal current: 8 A, rated voltage (III/2): 160 V, contact surface: Sn, contact connection type: Socket, number of potentials: 5, number of rows: 1, number of positions: 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: COMBICON MC 1,5, locking: without, mounting: without, type of packaging: packed in cardboard

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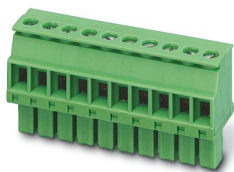
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MCVW 1,5/ 5-ST-3,81GY7035BD2DO - PCB connector

1034096

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PCB connector, nominal cross section: 1.5 mm², color: light gray, nominal current: 8 A, rated voltage (III/2): 160 V, contact surface: Sn, contact connection type: Socket, number of potentials: 5, number of rows: 1, number of positions: 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: COMBICON MC 1,5, locking: without, mounting: without, type of packaging: packed in cardboard

FL CAT5 PATCH 0,5 - Patch cable

2832263

<https://www.phoenixcontact.com/us/products/2832263>



Patch cable, CAT5, assembled, 0.5 m

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FL CAT5 PATCH 1,0 - Patch cable

2832276

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Patch cable, CAT5, assembled, 1 m



FL CAT5 PATCH 2,0 - Patch cable

2832289

<https://www.phoenixcontact.com/us/products/2832289>

Patch cable, CAT5, assembled, 2 m



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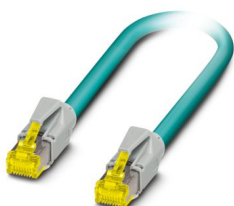
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NBC-R4AC-R4AC-IE8A/.../... - Patch cable

1411854

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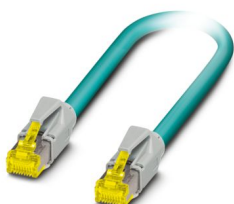


Patch cable, degree of protection: IP20, number of positions: 8, 10 Gbps, CAT6_A, cable outlet: straight, Ethernet

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

1408360

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Patch cable, CAT6_A, 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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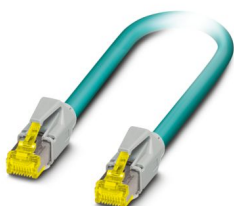
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NBC-R4AC/10G-R4AC/10G-94F/3,0 - Patch cable

1408365

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Patch cable, CAT6_A, 4-pair, shielded, connection not crossed (line), assembled at both ends with RJ45/IP20 connectors, outer sheath material: PUR, length: 3.0 m

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

1408968

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

1408969

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

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

1408970

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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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VS-08-RJ45-5-Q/IP20 - RJ45 connector

1656725

<https://www.phoenixcontact.com/us/products/1656725>



RJ45 connector, design: RJ45, degree of protection: IP20, number of positions: 8, 1 Gbps, CAT5, material: Plastic, connection method: Insulation displacement connection, connection cross section: AWG 26- 23, cable outlet: straight, color: traffic grey A RAL 7042, Ethernet

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