

# FL SWITCH 2116 - Industrial Ethernet Switch



2702908

<https://www.phoenixcontact.com/us/products/2702908>

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Managed Switch 2000, 16 RJ45 ports 10/100/1000 Mbps, PROFINET Conformance-Class A

## Your advantages

- DHCP client, DHCP server (port-based)
- Unmanaged Mode
- MRP client
- RSTP
- VLANs
- Web-based management, SNMP
- Configuration memory
- Easy and fast startup and commissioning with the FL NETWORK MANAGER software
- Suitable for PROFINET and EtherNet/IP™ networks

## Commercial data

|                                      |                     |
|--------------------------------------|---------------------|
| Item number                          | 2702908             |
| Packing unit                         | 1 pc                |
| Minimum order quantity               | 1 pc                |
| Sales key                            | DN17                |
| Product key                          | DNN121              |
| Catalog page                         | Page 305 (C-6-2019) |
| GTIN                                 | 4055626398716       |
| Weight per piece (including packing) | 576 g               |
| Weight per piece (excluding packing) | 377 g               |
| Customs tariff number                | 85176200            |
| Country of origin                    | DE                  |

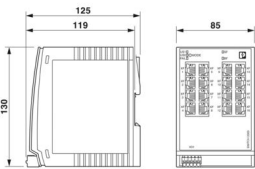
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## Technical data

### 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 |
|------------------|--------------------------------|

### Mounting

|               |                   |
|---------------|-------------------|
| Mounting type | DIN rail mounting |
|---------------|-------------------|

### Interfaces

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

### Product properties

|                |                                                                            |
|----------------|----------------------------------------------------------------------------|
| Product type   | Switch                                                                     |
| Product family | Managed Switch 2000                                                        |
| Type           | Book type                                                                  |
| 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%) |

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|                                  |                                                                                  |
|----------------------------------|----------------------------------------------------------------------------------|
|                                  | 40.42 Years (SN 29500 standard, temperature 55°C, operating cycle 100%)          |
| Signal delay                     | ≥ 1.9 µs (Store-and-Forward mode, 10/100/1000 Mbps, depending on the frame size) |
| Data management status           |                                                                                  |
| Article revision                 | 03                                                                               |
| 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                               |
| PROFINET conformance class       | Conformance-Class A                                                              |
| Filter functions                 | Quality of Service (8 priority classes)                                          |
|                                  | Class of Service                                                                 |
|                                  | DiffServ/DSCP                                                                    |
|                                  | Port-Priorisierung                                                               |
|                                  | VLAN (up to 8 VLANs)                                                             |
|                                  | IGMP Snooping/Querier (v1/v2)                                                    |
|                                  | Auto-Query-Port                                                                  |
| IP parameterization              | Extended Multicast Filtering                                                     |
|                                  | DHCP-Client                                                                      |
|                                  | DHCP server (port based)                                                         |
| MAC address table                | BootP                                                                            |
|                                  | 8k                                                                               |
|                                  |                                                                                  |
| Management                       | Web-based management (HTTP/HTTPS)                                                |
|                                  | Role-based user management (LDAP)                                                |
|                                  | SNMPv1/v2/v3                                                                     |
|                                  | Command Line Interface (Telnet, SSH)                                             |
| Redundancy                       | MRP (Media Redundancy Protocol)                                                  |
|                                  | RSTP (Rapid Spanning Tree Protocol)                                              |
| Status and diagnostic indicators | LEDs: US (power supply), 2 LEDs per Ethernet port (Link/Activity and Speed)      |
| Additional functions             | Jumbo frames (max. 9,600 bytes)                                                  |
|                                  | Transmission of MMS and GOOSE (IEC 61850-8-1)                                    |
|                                  | Transmission of Modbus/TCP                                                       |
| Time synchronization             | SNTP (Simple Network Time Protocol)                                              |

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## Security functions

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

## Electrical properties

|                                                 |                                                          |
|-------------------------------------------------|----------------------------------------------------------|
| Local diagnostics                               | US Supply voltage Green LED                              |
|                                                 | LINK Link status Green LED                               |
|                                                 | SPD Data transmission speed Green/orange LED             |
| Maximum power dissipation for nominal condition | 12.6 W (At $U_S = 18$ V DC and 60°C ambient temperature) |
| Test voltage                                    | 500 V DC                                                 |
| Test section                                    | for one minute 500 V DC                                  |
| Transmission medium                             | Copper                                                   |

## Supply

|                             |                                                                |
|-----------------------------|----------------------------------------------------------------|
| Supply voltage (DC)         | 24 V DC (single)                                               |
| Supply voltage range        | 18 V DC ... 32 V DC                                            |
| Power supply connection     | via COMBICON, max. conductor cross section 1.5 mm <sup>2</sup> |
| Residual ripple             | 3.6 V <sub>pp</sub> (within the permitted voltage range)       |
| Max. current consumption    | 0.7 A (At $U_S = 18$ V DC and 60°C ambient temperature)        |
| Typical current consumption | 315 mA (at $U_S = 24$ V DC and 25 °C ambient temperature)      |
| Current consumption         | 455 mA                                                         |

## Connection data

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

## Environmental and real-life conditions

### Ambient conditions

|                                          |                                             |
|------------------------------------------|---------------------------------------------|
| Degree of protection                     | IP20                                        |
| Ambient temperature (operation)          | 0 °C ... 60 °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)                    | 2g, according to IEC 60068-2-6              |
| Air pressure (operation)                 | 86 kPa ... 108 kPa (1500 m above sea level) |
| Air pressure (storage/transport)         | 86 kPa ... 108 kPa (1500 m above sea level) |

## Standards and regulations

|                                                                   |     |
|-------------------------------------------------------------------|-----|
| Free from substances that could impair the application of coating | Yes |
|-------------------------------------------------------------------|-----|

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## Approvals

|                |                                                                                                                 |
|----------------|-----------------------------------------------------------------------------------------------------------------|
| UL, USA/Canada |                                                                                                                 |
| Identification | cULus                                                                                                           |
| Note           | UL 61010-1, Ed. 3 / UL 61010-2-201, Ed. 1, CSA C22.2 NO. 61010-2-201:14, Ed. 1 / CSA C22.2 NO.61010-1-12, Ed. 3 |

## 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 61000-6-4                                                   |

## System properties

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

## Signaling

|                |                                                                             |
|----------------|-----------------------------------------------------------------------------|
| Status display | LEDs: US (power supply), 2 LEDs per Ethernet port (Link/Activity and Speed) |
|----------------|-----------------------------------------------------------------------------|

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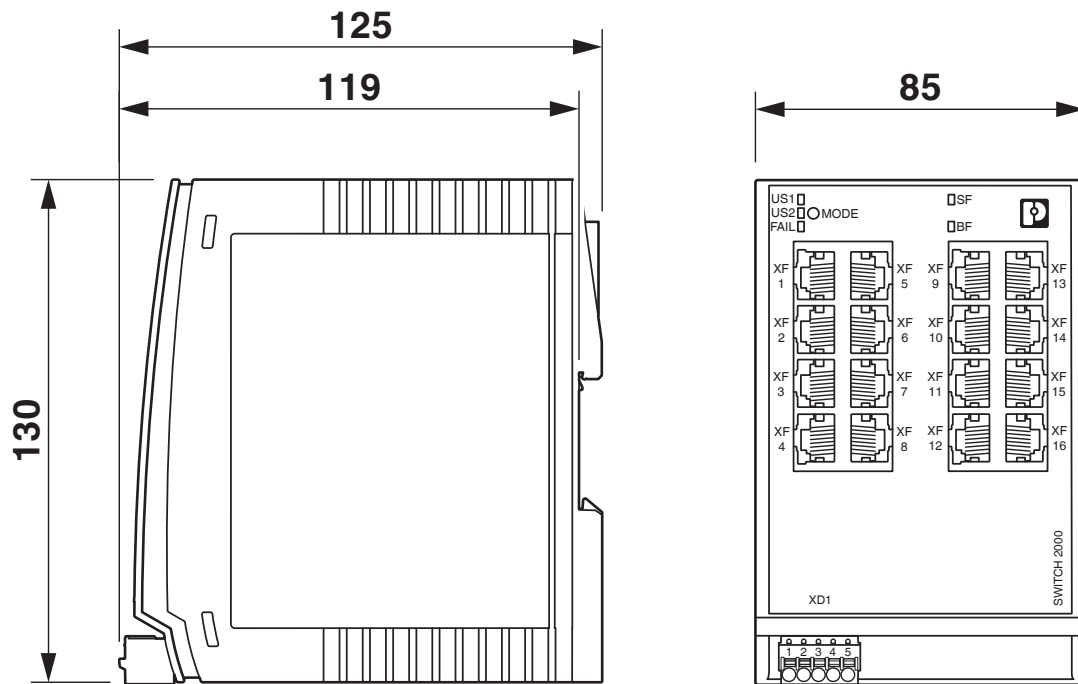
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## Drawings

Dimensional drawing



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2702908>



**EAC**

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

**BSH**

Approval ID: 1045

**CC-Link IE Field**

**CC-Link IE Field**

Approval ID: Ref. No. 184

**UAE-RoHS**

Approval ID: 23-02-63229



**cULus Listed**

Approval ID: E238705

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## Classifications

### ECLASS

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

### ETIM

|          |          |
|----------|----------|
| ETIM 9.0 | EC000734 |
|----------|----------|

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 43222600 |
|-------------|----------|

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                                    | 92a105f8-0da1-4802-8962-cc4c6857b6ec                                                                                                                                                                                              |
| EF3.0 Climate Change                    |                                                                                                                                                                                                                                   |
| CO2e kg                                 | 17.22 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.

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### FL NETWORK MANAGER BASIC - Network management software

2702889

<https://www.phoenixcontact.com/us/products/2702889>



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

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



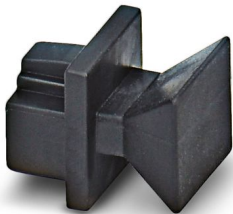
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## FL RJ45 PROTECT CAP - Dust protection

2832991

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

Dust protection caps for RJ45 socket



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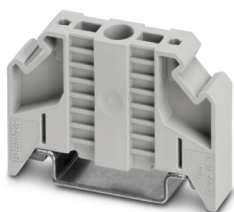
<https://www.phoenixcontact.com/us/products/2702908>

## 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 mm<sup>2</sup>, 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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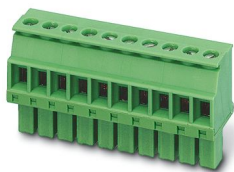
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## MCVW 1,5/ 5-ST-3,81GY7035BD2US - PCB connector

1034103

<https://www.phoenixcontact.com/us/products/1034103>



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: 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

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## 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

<https://www.phoenixcontact.com/us/products/2832276>



Patch cable, CAT5, assembled, 1 m

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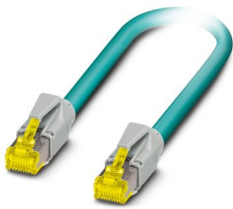
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## NBC-R4AC-R4AC-IE8A/.../... - Patch cable

1411854

<https://www.phoenixcontact.com/us/products/1411854>



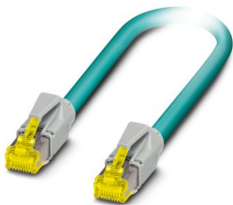
Patch cable, degree of protection: IP20, number of positions: 8, 10 Gbps, CAT6<sub>A</sub>, cable outlet: straight, Ethernet

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

1408360

<https://www.phoenixcontact.com/us/products/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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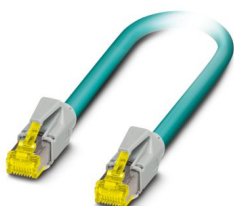
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## NBC-R4AC/10G-R4AC/10G-94F/3,0 - Patch cable

1408365

<https://www.phoenixcontact.com/us/products/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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## NBC-R4AC/1,0-93B/R4AC - Patch cable

1408968

<https://www.phoenixcontact.com/us/products/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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## NBC-R4AC/2,0-93B/R4AC - Patch cable

1408969

<https://www.phoenixcontact.com/us/products/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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## 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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