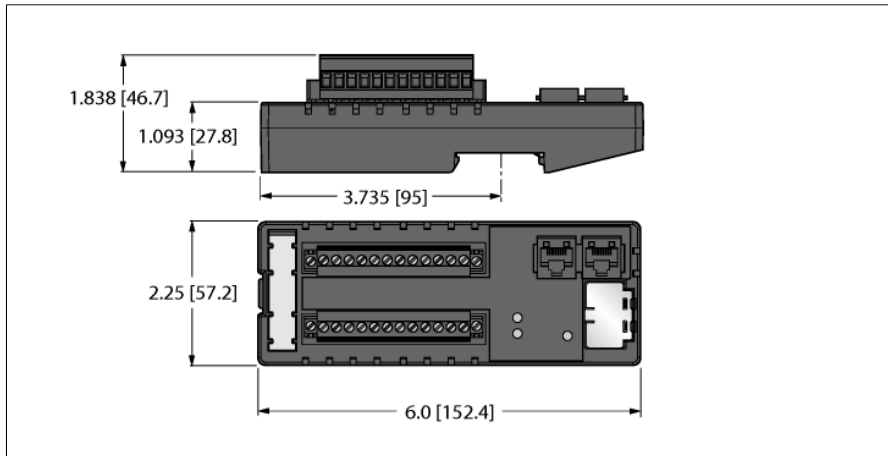


# Compact IP20 Multiprotocol Ethernet I/O Station

## 16 Configurable Digital PNP Channels

### FEN20-16DXP



- EtherNet/IP™ Slave
- Modbus TCP Slave
- PROFINET Slave
- Integrated Ethernet Switch
- 10 Mbps / 100 Mbps supported
- 2 x RJ45 Sockets for Fieldbus Connection
- DIN rail mount housing
- 3 I/O power supply groups each galvanically separated
- 16 configurable PNP channels, DI or DO
- 24 VDC
- Up to 1 A outputs
- Protection class IP20

|                                |   |
|--------------------------------|---|
| <b>Type</b>                    | FEN20-16DXP   |
| <b>ID</b>                      | 6931089   |
| <b>Number of channels</b>      |   |
| Operating / load voltage       | 12...30 VDC   |
| Operating current              | 100 mA  |
| Electrical isolation           | 500V Galvanic Zone-Zone and Zone-Ethernet   |
| Supply voltage                 | 24 VDC  |
| Power dissipation, typical     | ≤ 2.4 W   |
| Voltage supply connection      | Screw terminals   |
| <b>Inputs</b>                  |   |
| Number of channels             | 16  |
| Input voltage                  | 24 VDC  |
| Supply current                 | 700 mA  |
| Switching threshold            | 10V / 2mA   |
| Low level signal voltage       | < 9 VDC   |
| High level signal voltage      | 11...30 VDC   |
| Low level signal current       | < 1.5 mA  |
| High level signal current      | > 2.5 mA  |
| Input delay                    | 2.5 ms  |
| Max. input current             | 6 mA  |
| <b>Outputs</b>                 |   |
| Number of channels             | 16  |
| Output voltage                 | 12...30 VDC   |
| Output current per channel     | @70°C: 0.5A (8A Overall) or 0.75A (6A Overall)<br>@50°C: 0.75A (12A Overall) or 1A (8A Overall) |
| Load type                      | Resistive, Inductive, Lamp Load   |
| Short-circuit protection       | yes   |
| <b>System data</b>             |   |
| Transmission rate              | 10/100 Mbps; Full/Half Duplex; Auto Negotiation; Auto Crossing                                  |
| Addressing modes Ethernet:     | via Coded Rotary Switch   |
| Connection technology Ethernet | 2 x RJ45 female connector   |
| Protocol detection             | automatic   |
| Web server                     | 192.168.1.254 (Default)   |
| Service interface              | Ethernet  |
| Device Reset                   | via Rotary Switch   |
| <b>Modbus TCP</b>              |   |
| Addressing                     | Static IP, BOOTP, DHCP  |
| Supported function codes       | FC1, FC2, FC3, FC4, FC5, FC6, FC15, FC16, FC23  |
| Number of TCP connections      | 6   |
| Input Data Size                | max. 1 register   |
| Input register start address   | 0 (0x0000 hex)  |
| Output Data Size               | max. 1 register   |
| Output register start address  | 2048 (0x0800 hex)   |

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**Ethernet/IP**

|                           |                                   |
|---------------------------|-----------------------------------|
| Addressing                | acc. to EtherNet/IP specification |
| Quick Connect (QC)        | < 150 ms                          |
| Device Level Ring (DLR)   | supported                         |
| Class 1 connections (CIP) | 6                                 |

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**PROFINET**

|                                 |                                 |
|---------------------------------|---------------------------------|
| Addressing                      | DCP                             |
| Conformance class               | B (RT)                          |
| MinCycleTime                    | 1 ms                            |
| Fast Start-Up (FSU)             | < 150 ms                        |
| Diagnostics                     | acc. to PROFINET alarm handling |
| Topology detection              | supported                       |
| Automatic addressing            | supported                       |
| Media Redundancy Protocol (MRP) | supported                       |

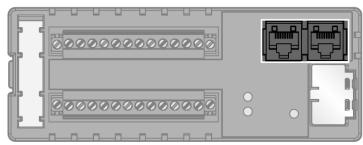
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**Dimensions (W x L x H)**

|                     |   |
|---------------------|---|
| Housing material    | 57.1 x 152.2 x 46.7 mm                      |
| Ambient temperature | Fiber-glass reinforced Polyamide (PA6-GF30) |
| Storage temperature | -40...+70 °C                                |
| Protection class    | -40...+85 °C                                |
| MTTF                | IP20  |
| Approvals           | 148 years acc. to SN 29500 (Ed. 99) 20 °C   |
|                     | CE, UL, Class I Div. 2                      |

**Compact IP20 Multiprotocol Ethernet I/O Station**  
**16 Configurable Digital PNP Channels**  
**FEN20-16DXP**

**Terminal assignment**



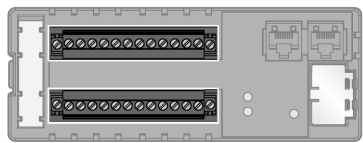
**Ethernet**

Fieldbus cable (example): RJ45S RJ45S 441-2M (Ident no. U-06842)

**RJ45 Ethernet**



- 1 = TX +
- 2 = TX -
- 3 = RX +
- 4 = n.c.
- 5 = n.c.
- 6 = RX -
- 7 = n.c.
- 8 = n.c.



**Power Supply and I/O Channels**

The internal module electronics and the I/O channels 0 to 7 are supplied via V1.

The I/O channels 8 to 13 are supplied via V2.

The I/O channels 14 to 15 are supplied via V3.

More devices can be supplied with 24 VDC, up to 0.7 A, via the terminals Vout1+ and Vout1-.

Recommended torque for screw terminals: 0.5 Nm (4.43 lb.in)

**Terminal Connection**



- 1 = V<sub>out1</sub> +
- 2 = V<sub>out1</sub> -
- 3 = V1 +
- 4 = V1 -
- 5 = I/O 0
- 6 = I/O 1
- 7 = I/O 2
- 8 = I/O 3
- 9 = I/O 4
- 10 = I/O 5
- 11 = I/O 6
- 12 = I/O 7
- 13 = V2 +
- 14 = V2 -
- 15 = I/O 8
- 16 = I/O 9
- 17 = I/O 10
- 18 = I/O 11
- 19 = I/O 12
- 20 = I/O 13
- 21 = V3 +
- 22 = V3 -
- 23 = I/O 14
- 24 = I/O 15

# Compact IP20 Multiprotocol Ethernet I/O Station

## 16 Configurable Digital PNP Channels

### FEN20-16DXP

#### Module LED Status

| LED            | Color  | Status   | Description                                  |
|----------------|--------|----------|--|
| ETH1 / ETH2    | Green  | ON       | Ethernet Link (100 Mbps)                     |
|                |        | Flashing | Ethernet communication (100 Mbps)            |
|                | yellow | ON       | Ethernet Link (10 Mbps)                      |
|                |        | Flashing | Ethernet communication (10 Mbps)             |
|                |        | OFF      | No Ethernet link                             |
| BUS            | Green  | ON       | Active connection to a master                |
|                |        | Flashing | Ready  |
|                | Red    | ON       | IP address conflict or status word is active |
|                |        | Flashing | Blink/Wink command active                    |
|                |        | OFF      | Power off                                    |
| ERR            | Green  | ON       | Diagnostics disabled                         |
|                | Red    | ON       | Short-circuit                                |
| I/O 0 – I/O 15 | Green  | ON       | Input/Output: Active                         |
|                |        | OFF      | Input/Output: Inactive                       |

# Compact IP20 Multiprotocol Ethernet I/O Station

## 16 Configurable Digital PNP Channels

### FEN20-16DXP

#### Process Data Mapping

##### Modbus TCP Register Mapping

|               | Reg    | Bit 15 | Bit 14 | Bit 13 | Bit 12 | Bit 11 | Bit 10 | Bit 9  | Bit 8 | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0     |
|---------------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-----------|
| Inputs (RO)   | 0x0000 | DI15   | DI14   | DI13   | DI12   | DI11   | DI10   | DI9    | DI8   | DI7   | DI6   | DI5   | DI4   | DI3   | DI2   | DI1   | DI0       |
| Status (RO)   | 0x0001 | -      | FCE    | -      | -      | CFG    | COM    | V1 low | -     | -     | -     | -     | -     | -     | -     | -     | Diag Warn |
| Diag (RO)     | 0x0002 | -      | -      | -      | -      | -      | -      | -      | -     | -     | -     | -     | -     | -     | -     | -     | I/O Diag  |
| Outputs (RW)  | 0x0800 | DO15   | DO14   | DO13   | DO12   | DO11   | DO10   | DO9    | DO8   | DO7   | DO6   | DO5   | DO4   | DO3   | DO2   | DO1   | DO0       |
| I/O Diag (RO) | 0xA000 | SCO7   | SCO6   | SCO5   | SCO4   | SCO3   | SCO2   | SCO1   | SCO0  | -     | -     | -     | -     | -     | -     | -     | IGS       |
| I/O Diag (RO) | 0xA001 | -      | -      | -      | -      | -      | -      | -      | -     | SCO15 | SCO14 | SCO13 | SCO12 | SCO11 | SCO10 | SCO9  | SCO8      |

##### EtherNet/IP™ Data Mapping

| INPUT  | Word | Bit 15 | Bit 14 | Bit 13     | Bit 12 | Bit 11 | Bit 10 | Bit 9  | Bit 8 | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0     |
|--------|------|--------|--------|------------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-----------|
|        | 0    | -      | FCE    | -          | -      | CFG    | COM    | V1 low | -     | -     | -     | -     | -     | -     | -     | -     | Diag Warn |
|        | 1    | DI15   | DI14   | DI13       | DI12   | DI11   | DI10   | DI9    | DI8   | DI7   | DI6   | DI5   | DI4   | DI3   | DI2   | DI1   | DI0       |
|        | 2    | -      | -      | Sched Diag | -      | -      | -      | -      | -     | -     | -     | -     | -     | -     | -     | -     | I/O Diag  |
|        | 3    | SCO7   | SCO6   | SCO5       | SCO4   | SCO3   | SCO2   | SCO1   | SCO0  | -     | -     | -     | -     | -     | -     | -     | IGS       |
|        | 4    | -      | -      | -          | -      | -      | -      | -      | -     | SCO15 | SCO14 | SCO13 | SCO12 | SCO11 | SCO10 | SCO9  | SCO8      |
| OUTPUT | Word | Bit 15 | Bit 14 | Bit 13     | Bit 12 | Bit 11 | Bit 10 | Bit 9  | Bit 8 | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0     |
|        | 0    | -      | -      | -          | -      | -      | -      | -      | -     | -     | -     | -     | -     | -     | -     | -     | -         |
|        | 1    | DO15   | DO14   | DO13       | DO12   | DO11   | DO10   | DO9    | DO8   | DO7   | DO6   | DO5   | DO4   | DO3   | DO2   | DO1   | DO0       |

##### PROFINET Process Data

|         | Byte | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|---------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Inputs  | 0    | DI7   | DI6   | DI5   | DI4   | DI3   | DI2   | DI1   | DI0   |
|         | 1    | DI15  | DI14  | DI13  | DI12  | DI11  | DI10  | DI9   | DI8   |
| Outputs | 0    | DO7   | DO6   | DO5   | DO4   | DO3   | DO2   | DO1   | DO0   |
|         | 1    | DO15  | DO14  | DO13  | DO12  | DO11  | DO10  | DO9   | DO8   |

##### Key:

|           |                                  |            |   |
|-----------|----------------------------------|------------|---|
| DIx       | Digital input x                  | COM        | Communication error on internal module bus              |
| DOx       | Digital output x                 | CFG        | I/O configuration error                                 |
| IGS       | Input group short-circuit        | FCE        | I/O-ASSISTANT Force Mode active                         |
| SCOx      | Short-circuit output x           | I/O Diag   | I/O diagnostic detected                                 |
| Diag Warn | Diagnostic at least on 1 channel | Sched Diag | Manufacturer-specific diagnostics configured and active |
| V1 low    | Undervoltage V1                  | -          | -   |