

DeviceNet Spanner



- Rugged, Fully Potted Stations
- IP 67 Protection
- Communicate Between PLCs
- Connect Two DeviceNet Networks

Electrical

- Operating Current: 125 mA from segment A, 30 mA from segment B

Power Distribution

- Station: DeviceNet power supply for each segment (must be powered by separate supplies)

Mechanical

- Operating Temperature: -40 to +70°C (-40 to +158°F)
- Protection: NEMA 1,3,4,12,13 and IEC IP 67
- Vibration: 50 g @ 10-500 Hz

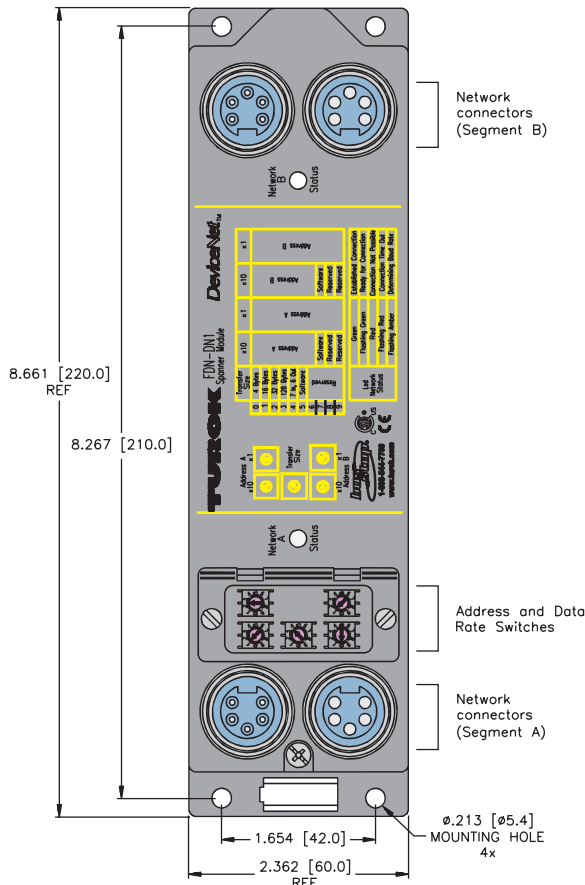
Material

- Connectors: Nickel-plated brass (stainless steel available on request)
- Housing: Nylon 6 (other materials available on request)

Diagnostics (Physical)

- One LED for each segment to indicate communication status

FDN-DN1



DeviceNet minifast Pinouts

Male	Female
5-Pin	5-Pin

- 1 = Shield
- 2 = V+
- 3 = V-
- 4 = CAN_H
- 5 = CAN_L

Note: Each segment has one male and one female connector.

DeviceNet™ Spanner

The FDN-DN1 “Spanner” module provides a means to route data between two PLC’s using DeviceNet. The spanner eliminates the need for a high level control network pyramid, by connecting the DeviceNet networks directly. This simple approach is extremely powerful and economical. It is simple because the spanner appears to each PLC as a standard rack of I/O; any DeviceNet scanner can send I/O data to the spanner without additional software or complex configuration procedures. It is powerful because it can transfer up to 128 bytes of data in one message. It is economical because it replaces the high level control network, eliminating two control cards, wiring, conduit and programming.

Theory of operation

The spanner transfers data between PLC A and PLC B by appearing as I/O to each PLC. The spanner immediately copies the output data from PLC A to the input data for PLC B. Similarly, PLC B’s output data is copied to PLC A’s input data. The size of data transferred is set by the transfer size switch. If the transfer size switch is set at 4,16, 32 or 128 bytes, then the size of the data transferred is the same in both directions. If the transfer size switch is set to software, then the transfer size is set via software and it can be any size (0,1,2,3...128 bytes). When in software mode, the data size mapped to the PLC must be equal in opposite directions on either side of the spanner. For example, if side A produces 2 input bytes and consumes 12 output bytes, then side B must be set to produce 12 input bytes and consume 2 output bytes.

Electrically

The spanner optically isolates network A from network B; the networks do not interact electrically in any way. The spanner is powered internally by network A; a power reset on the A side will reset the entire station.

Addressing

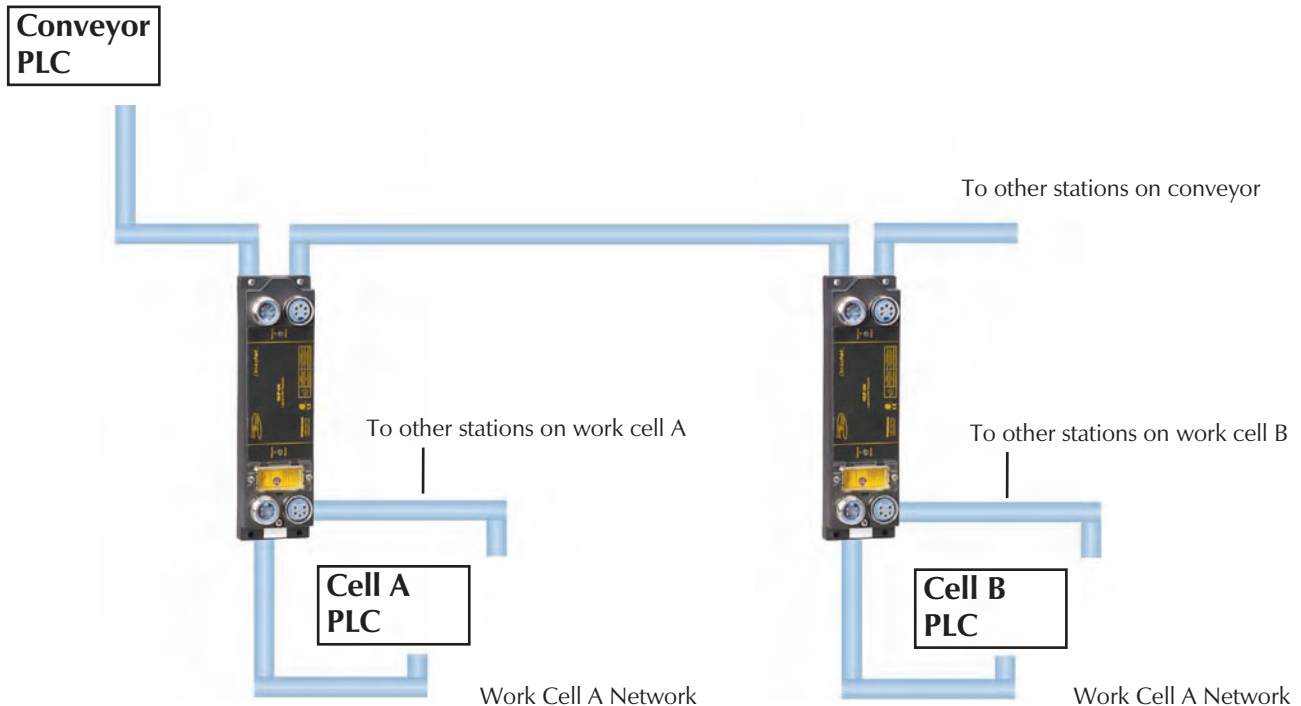
Because the spanner is essentially two DeviceNet devices, one on network A and one on network B, it has two sets of address switches. The address switches for network A are completely independent of network B.

Baudrate

The spanner automatically detects the Baudrate at startup. Network A and B may be at different baudrates.

Spanner Topology

The spanner is typically used to correct and coordinate multiple work cells.



DeviceNet

DeviceNet FDN20 Stations

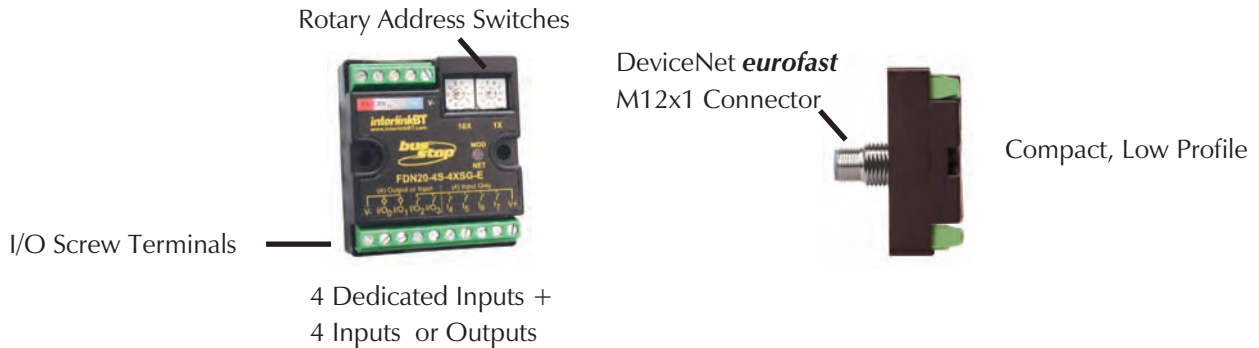
TURCK's FDN20 DeviceNet stations are low-cost screw-terminal connection stations designed for mounting in an enclosure. These stations allow you to easily connect standard I/O devices such as push buttons, pilot lights, motor starters and drives to a DeviceNet network. The FDN20 station is designed to easily upgrade existing equipment to a DeviceNet network.

Specifications

TURCK FDN20 stations are designed to be mounted in standard equipment enclosures (operator stations, motor control centers, etc.). Most FDN20 stations use only screw terminal connections for all I/O and network wiring. FDN20-4S-4XSG-E has a DeviceNet **eurofast**® (M12) connector on the back of the housing that enables mounting the station to an enclosure wall with the (DeviceNet) connection on the outside of the box; greatly simplifying network wiring. Detailed environmental specifications are as follows:

- Housing material: Glass filled nylon
- Protection level: IP 20
- Operating temperature: -40 to +70°C (-40 to +158°F)

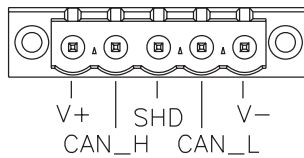
The station's components are identified in the figure below.



Connectors

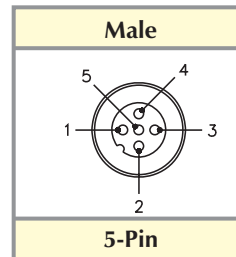
Bus connectors:

FDN20 screw terminal and **eurofast** bus connectors pinouts:



- 1 = Shield
- 2 = V+
- 3 = V-
- 4 = CAN_H
- 5 = CAN_L

DeviceNet Pinout



I/O connectors:

Each FDN20 version uses a different screw terminal connector. Detailed pinout information is given in the product information on the following pages.

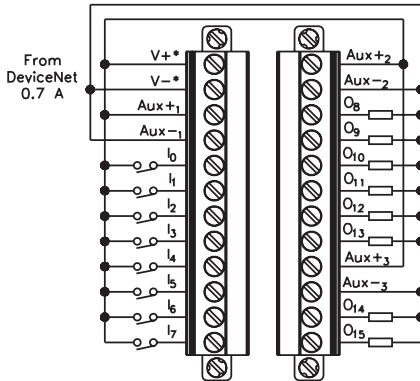
Power

The short FDN20 stations provide all the power to the I/O devices from the DeviceNet™ power supply. In this case there is no auxiliary power connection.

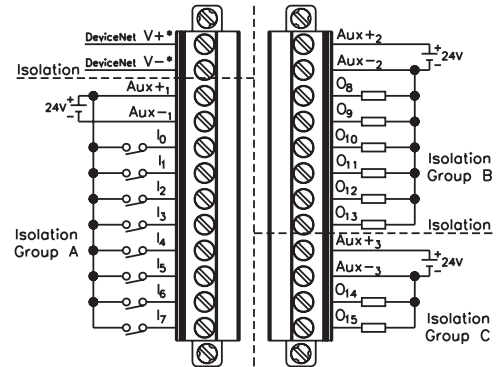
The remaining long FDN20 stations (FDN20-16XSG, for example) provide an auxiliary power connection. I/O devices can be powered from the DeviceNet or auxiliary power supply, depending on how the user chooses to wire the station. The different wiring options are illustrated in the following diagram.

***WARNING NOTE:** (V+) and (V-) PROVIDE POWER FROM DeviceNet . DO NOT CONNECT TO SUPPLY OR GROUND.

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CONNECT AS SHOWN TO USE DeviceNet to POWER I/O



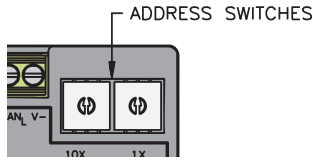
TO USE EXTERNAL POWER SUPPLY

Power ratings for FDN20 stations:

- Bus (DeviceNet) Voltage: 11-26 VDC
- Aux Power Voltage: 24 VDC (nominal)
- Internal Current Consumption: <75 mA (@ nominal 24 VDC) plus sum of I/O currents if auxiliary power is not used
- Input Voltage: 13-26 VDC (From DeviceNet supply)
- Input Short-Circuit Current: <700 mA (total for entire station)
- Input Signal Current (each input): OFF <2 mA; ON 3.0-3.4 mA (@ nominal 24 VDC)
- Input Delay: 2.5 ms
- Output Current: 0.5 A max per output

Addressing

DeviceNet stations must have a network address for communication. The address for FDN20 stations may be set via the visible rotary switches on the front of the station.



$$\text{Address} = 6 \times 10 + 3 \times 1 = 63$$

The pair of switches represents the address as a decimal number; the left switch being the 10's multiplier and the right switch the 1's multiplier. To program the stations, rotate the switches with a small slotted screwdriver until the arrows are pointing at the appropriate numbers for the chosen address.

Diagnostics

FDN20 stations provide a single Network Status LED for diagnosing communication problems.

- Green: Connection established
- Flashing green: Waiting for connection
- Flashing red: Connection timed out
- Red: Cannot connect
- Flashing Amber: Finding baud rate (autobaud setting)

The long housing stations (i.e. FDN20-16XSG) have an additional LED for each I/O point on the station indicating:

- Off: Point is off
- Green: Point is on

Additionally, most FDN20 stations provide diagnostic bits in the I/O table for diagnostics. One bit indicates a short-circuit fault for outputs or inputs. See product pages in this catalog for detailed I/O information.