DeviceNet™ System Description

DeviceNet is a low-cost communications protocol that eliminates hard wiring and connects industrial devices such as limit switches, photoelectric sensors, valve manifolds, motor starters, process sensors, bar code readers, variable frequency drives, panel displays and operator interfaces to a network. DeviceNet’s direct connection provides improved communication between devices, as well as important device-level diagnostics not easily accessible or available through hard-wired I/O interfaces.

DeviceNet is based on the Controller Area Network (CAN) broadcast-oriented communication architecture. CAN uses a bus arbitration method, CSMA/BA, that assures the highest priority message always gets use of the bus in the event of a data collision. The DeviceNet protocol further defines message priorities such that I/O messages are given top priority and configuration messages have lower priority.

A DeviceNet network supports up to 64 nodes and virtually an unlimited amount of I/O. The bus uses a trunkline/dropline topology, where bus power and communication are supplied on a single cable. Bus power is 24 VDC and supplies current to operate the nodes and (typically) power input devices. Some TURCK stations require an additional 24 VDC auxiliary power to supply current for outputs.

DeviceNet allows peer-to-peer data exchange (where a DeviceNet node can initiate communication with other nodes or peers), and a master/slave configuration in which the master node initiates all communication and all other nodes, or slaves, respond to the master node’s requests.

Typical System Configuration

A typical DeviceNet system consists of the following parts:
- A - Controller
- B - Power Supply
- C - DeviceNet Cable
- D - DeviceNet I/O Modules (or Slaves)
- E - Terminating Resistors

DeviceNet stations require a network master (also called a scanner) to interface the stations to the host controller. TURCK DeviceNet stations are designed to be fully compatible with DeviceNet equipment from other manufacturers.
Cordsets

**TURCK** offers a complete line of molded DeviceNet cordsets to facilitate network installation, resulting in a faster start-up and fewer wiring errors. The bus and drop cables are specially designed foil-shielded, high-flex cables with very low inductance and capacitance to minimize propagation delay time. DeviceNet cables consist of a shielded and twisted data pair, as well as a shielded and twisted power pair for the 24 VDC bus power, with an additional outer shield. The 24 VDC power pair provides bus power to the station’s communication electronics and (typically) to input circuits.

The data lines for CAN-High and CAN-Low differential signals conform to the CAN standard, and support network data exchange at the maximum transmission speed of 500 kbps.

In most cases, bus cable connections are made using 5-pin **minilast**® (7/8-16 UN) or **eurofast**® (M12) connectors. A variety of stations are also available that support terminal-block type connections. Stations with output circuits for DC actuators normally require 24 VDC auxiliary power fed through a separate connection from the communication bus.

**TURCK** cordsets for the DeviceNet system are available in standard lengths. Contact your local sales representative to order custom lengths.

Diagnostics

**TURCK** stations provide increased diagnostics when used with standard proximity or photoelectric sensors and discrete actuators. **TURCK** stations also serve as a buffer between I/O devices and the DeviceNet bus by detecting short-circuits without disrupting DeviceNet communication.

For deluxe style stations, each I/O point on the station provides state and status data. State data represents the real world value of the I/O device; for example, when the sensor is on or the actuator is off. Status data indicates short-circuits in the I/O device or in the wiring between the device and the station. Some models also use status data to indicate open circuits.

State and status data are transferred to the DeviceNet scanner where it is available for fault handling in the control program. Additionally, each input and output has a multicolored LED to indicate its state and status and pinpoint I/O problems quickly; for example the module status LED indicates the internal health of the station, and the network status LED indicates the station’s communication on the DeviceNet network.

Addressing

The valid range of DeviceNet node addresses is 0 to 63. The station’s default node address is 63. Each node’s address must be initially set, usually via rotary dials or switches on the node. The address can also be set with a DeviceNet configuration tool.

Changes to the address settings take effect when the station power is cycled. Care must be taken to prevent the same address from being assigned to more than one node in a system. If the same address is set on multiple nodes, one node will take control of the address and the others will go into “Critical Link Failure” state, indicated by the network status LED (solid red).

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Communication Rate/Cycle Time

DeviceNet™ specifications define three transmission speeds: 125, 250 and 500 kbps. All nodes on a network must communicate at the same rate.

Several factors must be considered when calculating the complete cycle time of a DeviceNet system, including:

• Number of nodes being scanned
• Amount of data produced and consumed by the nodes
• Type of I/O messaging (change of state, strobe, poll)
• Network communication rate
• Device time-out and explicit messaging traffic
• Cycle time of the control program

Electronic Data Sheets (EDS) Files

Electronic Data Sheets, or EDS files, are files that contain detailed information about a DeviceNet device, including I/O data size and the device’s configurable parameters. The information provided by EDS files guide a user through the steps necessary to configure a device. EDS files are available on the TURCK web site.

Maximum Ratings

The DeviceNet bus uses trunk and drop topology. The trunk is the main communication cable, and requires a 121 ohm resistor at both ends of the trunk. The length of the trunk depends on the communication rate and the cable type. Drops are branches off the trunk, and may be from zero to 6 m (20 ft) in length. The cumulative drop lengths are dependent on the communication rate. The following table shows the maximum ratings for a trunk using thick, mid and thin cable. Thick and thin DeviceNet communication cable types are defined by the DeviceNet specification; mid cable is a hybrid of the two that is offered by TURCK.

<table>
<thead>
<tr>
<th>Communication Rate</th>
<th>Thick Trunk Length (maximum)</th>
<th>Mid Trunk Length (maximum)</th>
<th>Thin Trunk Length (maximum)</th>
<th>Drop Length (maximum per drop)</th>
<th>Drop Length (cumulative)</th>
<th>Nodes (maximum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>125 kbps</td>
<td>500 m (1640 ft.)</td>
<td>300 m (984 ft.)</td>
<td>100 m (328 ft.)</td>
<td>6 m (20 ft.)</td>
<td>156 m (512 ft.)</td>
<td>64</td>
</tr>
<tr>
<td>250 kbps</td>
<td>250 m (820 ft.)</td>
<td>250 m (820 ft.)</td>
<td>100 m (328 ft.)</td>
<td>6 m (20 ft.)</td>
<td>78 m (256 ft.)</td>
<td>64</td>
</tr>
<tr>
<td>500 kbps</td>
<td>100 m (328 ft.)</td>
<td>100 m (328 ft.)</td>
<td>100 m (328 ft.)</td>
<td>6 m (20 ft.)</td>
<td>39 m (128 ft.)</td>
<td>64</td>
</tr>
</tbody>
</table>
DeviceNet™ AIM™ Stations

TURCK’s Advanced I/O Module (AIM) DeviceNet stations are extremely rugged stations designed for machine mounting. These stations allow easy connection of standard I/O devices (such as sensors, limit switches, valves and pilot lights) to a DeviceNet network, typically without a protective enclosure. This is made possible by epoxy-filled station housings, all-metal connectors and visible rotary address switches, among other things.

Specifications

Mechanical

TURCK DeviceNet AIM stations are designed for machine mounting with no separate enclosure or housing necessary. Quick-disconnect capability, combined with an epoxy-filled housing, creates an extremely durable station that can be mounted in most industrial environments. Detailed environmental specifications are as follows:

- Housing material: Glass filled nylon
- Connector material: Nickel-plated brass
- Protection level: NEMA 1,3,4,12,13; IEC IP 67
- Operating temperature: SE stations -40 to +70°C (-40 to +158°F); LX stations -25 to +70°C (-13 to +158°F)
- Vibration: 50 g @ 10-500 Hz

Other housing and connector materials available upon request.

The stations components are identified in the following figure. The figure shows a station with minilast® (7/8-16 UN) network connectors, but other connector options (such as M12 eurofast®) are available for some stations. Stations with all I/O powered from the DeviceNet power supply do not have the auxiliary power connectors at the top of the housing.
Connectors

DeviceNet™ AIM™ stations generally provide connections for the bus and I/O, in addition to auxiliary power for stations with outputs.

**Bus Connectors**

*minifast®* (7/8-16UN) is the standard bus connector for DeviceNet AIM stations. Some stations are available with *eurofast®* (M12) or M23 bus connectors.

<table>
<thead>
<tr>
<th>DeviceNet minifast Pinouts</th>
<th>DeviceNet eurofast Pinouts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male</strong></td>
<td><strong>Female</strong></td>
</tr>
<tr>
<td>1 - Shield/Drain</td>
<td>1 - Shield/Drain</td>
</tr>
<tr>
<td>2 - V+ (24 VDC)</td>
<td>2 - V+ (24 VDC)</td>
</tr>
<tr>
<td>3 - V- (0 VDC)</td>
<td>3 - V- (0 VDC)</td>
</tr>
<tr>
<td>4 - CAN High</td>
<td>4 - CAN High</td>
</tr>
<tr>
<td>5 - CAN Low</td>
<td>5 - CAN Low</td>
</tr>
</tbody>
</table>

**eurofast I/O Connectors**

Different I/O connector pinouts are used for different station types. Stations are available with one or two inputs per connector, one or two outputs per connector, or one input and one output per connector. The pin assignments for these styles are provided below.

**Screw Terminal I/O Connection**

- **S**
  - Mating cordset: RK 4.4T-* RS 4.4T
  - Splitter: VBRS-4.4-2RK 4T-*/*

- **2S**
  - Mating cordset: RK 4.4T-* RS 4.4T
  - Splitter: VB2-RS 4.4T-1/2RK 4.4T-*/*5631

- **G**
  - Mating cordset: RK 4.4T-* RS 4.4T
  - Splitter: VBRS-4.4-2RK 4T-*/*

- **2G**
  - Mating cordset: RK 4.4T-* RS 4.4T
  - Splitter: VBRS-4.4-2RK 4T-*/*

- **2X**
  - Mating cordset: RK 4.4T-* RS 4.4T
  - Splitter: VBRS-4.4-2RK 4T-*/*

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AIM™ stations with part numbers ending in “ST” support screw terminal I/O and bus connections. The screw terminals for these stations are located on the back of the station. The back of the station is also fitted with a foam gasket to allow the station to be mounted to the outside of a cabinet or field I/O box (i.e. motor control center).

**Auxiliary Power Connectors**

Auxiliary Power Connectors

![Image of AUX Power Connectors](https://via.placeholder.com/150)

Stations where I/O draws a significant amount of current (2 Amp outputs, for example) receive this power from a second, or auxiliary, power supply. Some stations receive input power from the network and output power from the auxiliary supply. Generally, the connection is a male/female pair to allow cabling one power supply to multiple stations without the use of a tee (daisy chain configuration). Auxiliary power is typically supplied by a 4-pin minilast® 7/8-16 UN connector, though other auxiliary power connections are used on some stations. For further details see the individual station entries in this catalog.

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = VAUX+</td>
<td>1 = VAUX+</td>
</tr>
<tr>
<td>2 = Pass Through</td>
<td>2 = Pass Through</td>
</tr>
<tr>
<td>3 = Pass Through</td>
<td>3 = Pass Through</td>
</tr>
<tr>
<td>4 = VAUX-</td>
<td>4 = VAUX-</td>
</tr>
</tbody>
</table>

**Power**

Some AIM stations (typically those with only inputs) are completely powered from the DeviceNet power supply. When designing a network, take care to include the current draw for the station, as well as all input devices connected to the station in your power supply sizing calculations. For example, if the internal current consumption of the station is <50 mA and the total short-circuit limit for all inputs combined is <700 mA, then the maximum current draw for the station is 50 mA + 700 mA = 750 mA.

Stations with output points normally use a separate auxiliary power supply to provide current for the outputs. Several AIM stations can be powered by one auxiliary supply, or a single supply for each station can be used.

Common power ratings for AIM stations include:
- Bus (DeviceNet) Voltage: 11-26 VDC
- Aux Power Voltage: 24 VDC (nominal, supported stations)
• Input Voltage: 13-26 VDC (From DeviceNet supply)
• Input Signal Current (each input): OFF <2 mA; ON 3.0-3.4 mA (@ nominal 24 VDC)
• Input Delay: 2.5 ms

Addressing

DeviceNet™ stations must have a network address for communication. The address for AIM stations may be set via the visible rotary switches under the clear plastic cover on the front of the station.

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 station, rotate the switches with a small slotted screwdriver until the arrows on the switch point to the appropriate numbers for the chosen address.

Some stations (LX style with extended diagnostics) have a third switch. This switch is used to set the communication baud rate for the station. When set to the AUTO position, the station automatically senses the baud rate of the network. SE style stations only use the autobaud setting.

Parameters

Many DeviceNet configuration tools support the use of EDS driver files to configure nodes and set various parameters. Some of the user-settable parameters available for AIM stations are:

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Description</th>
<th>Valid Values</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baud Rate</td>
<td>Defines the baud rate for the station to use if Autobaud is disabled</td>
<td>125kB; 250kB; 500kB</td>
<td>125kB</td>
</tr>
<tr>
<td>Autobaud</td>
<td>If enabled the station automatically senses the baud rate</td>
<td>Enable; Disable</td>
<td>Enable</td>
</tr>
<tr>
<td>Connection Mode</td>
<td>Set to UCMM to use unconnected messaging</td>
<td>Predefined M/S Connection; UCMM</td>
<td>Predefined M/S Connection</td>
</tr>
<tr>
<td>Quick Connect</td>
<td>Set to enable fast-startup connection to DeviceNet (QuickConnect)</td>
<td>Enable; Disable</td>
<td>Disable</td>
</tr>
</tbody>
</table>

Consult the documentation for the DeviceNet configuration tool you are using for details on how to access device parameters via EDS files.
Diagnostics

AIM™ stations provide two LEDs for diagnosing communication problems.

Module Status

- Green: Working properly
- Flashing green: Detecting baud rate
- Flashing red: Input short-circuit

Network Status

- Green: Connection established
- Flashing green: Waiting for connection
- Flashing red: Connection timed out
- Red: Cannot connect

There is an additional LED for each I/O point on the station. This LED indicates:

- Off: Point is off
- Green: Point is on
- Amber: Point is in open circuit state (advanced diagnostic stations only)
- Red: Point is in short-circuit state (advanced diagnostic stations only)

For SE style (group diagnostic) stations there is also a single bit communicated to the controller for diagnostic purposes. This bit is on if any input on the station is in the short-circuit condition, and off if all inputs are operating normally.

LX style (extended diagnostic) stations indicate the diagnostic status of each I/O point on the station, with an extra bit to indicate if the point is short or open circuited. These diagnostic bits can be disabled via the EDS parameter settings.

### I/O Data Map 1

<table>
<thead>
<tr>
<th></th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>In</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Out</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Connecting Devices to an AIM Station

AIM stations typically provide a eurofast® (M12) connection for each I/O point. Standard TURCK I/O cordsets can be used to connect physical devices in the field to the AIM station. Some AIM stations, specifically those with I/O counts greater than eight total points, connect two signals to each connector. If the signals being connected are on the same physical device (for example a sensor with two outputs), a simple four or five-wire cordset can be used for connection (Figure 1) on the next page.

<table>
<thead>
<tr>
<th>byte</th>
<th>bit 7</th>
<th>bit 6</th>
<th>bit 5</th>
<th>bit 4</th>
<th>bit 3</th>
<th>bit 2</th>
<th>bit 1</th>
<th>bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

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If the signals are on two separate devices, a splitter can be used to separate the AIM™ I/O connector into two individual eurofast® connectors. The recommended splitter is wired such that the second signal pin on the AIM station (pin 2) is wired to the default signal pin (pin 4) on the second splitter arm - requiring no special wiring by the user. The splitter is simply plugged into the AIM I/O connector and each arm is plugged into the appropriate I/O devices, as shown (Figure 2).

Figure 1

For one input per connector use standard cordsets, for example RK 4.4T-1-RS 4.4T

AIM stations provide a wide range of connection options depending on the I/O count and type being used. The user should be aware of the I/O pinout being used.

Figure 2

For two inputs per connector use a splitter, for example VBRS 4.4-2RK 4T-1/1
Deluxe Input Stations

- Rugged, Fully Potted Stations
- IP 67 Protection
- Rotary Address Switches
- Automatic Baud Rate Sensing

**Electrical**
- Operating Current: \( \leq 100 \, \text{mA} \) (8-in) or \( 140 \, \text{mA} \) (16-in) plus sum of input currents (from DeviceNet)
- Sensor Current: \(< 80 \, \text{mA} \) per input (from DeviceNet)

**Power Distribution**
- Inputs: DeviceNet power supply

**Mechanical**
- Operating Temperature: -25 to +70°C (-13 to +158°F)
- Protection: NEMA 1,3,4,12,13 / 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 (Logical)**
- Open/short-circuit status mapped to DeviceNet I/O table, one bit each per I/O point

**Diagnostics (Physical)**
- Individual LED to indicate open/short-circuit for each channel
- LEDs to indicate status of DeviceNet communication

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**FDNL-L0800-T**
**FDNL-L0800-T-V**
**FDNL-L1600-T**
**FDNL-L0800-C**
**FDNL-L1600-C**

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**DeviceNet minifast® Pinouts**

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Shield</td>
<td>1 = Shield</td>
</tr>
<tr>
<td>2 = V+</td>
<td>2 = V+</td>
</tr>
<tr>
<td>3 = V-</td>
<td>3 = V-</td>
</tr>
<tr>
<td>4 = CAN_H</td>
<td>4 = CAN_H</td>
</tr>
<tr>
<td>5 = CAN_L</td>
<td>5 = CAN_L</td>
</tr>
</tbody>
</table>

**DeviceNet eurofast® Pinouts**

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Shield</td>
<td>1 = Shield</td>
</tr>
<tr>
<td>2 = V+</td>
<td>2 = V+</td>
</tr>
<tr>
<td>3 = V-</td>
<td>3 = V-</td>
</tr>
<tr>
<td>4 = CAN_H</td>
<td>4 = CAN_H</td>
</tr>
<tr>
<td>5 = CAN_L</td>
<td>5 = CAN_L</td>
</tr>
</tbody>
</table>

---

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DeviceNet

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Input Count</th>
<th>Connectors</th>
<th>Pinout</th>
<th>Sensor Style</th>
<th>Diagnostic</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDNL-L0800-T</td>
<td>8</td>
<td>0-7</td>
<td>L</td>
<td>1</td>
<td>NPN/PNP</td>
</tr>
<tr>
<td>FDNL-L0800-T-V</td>
<td>8</td>
<td>0-7</td>
<td>L</td>
<td>1</td>
<td>NPN/PNP</td>
</tr>
<tr>
<td>FDNL-L1600-T</td>
<td>16</td>
<td>0-7</td>
<td>2L</td>
<td>2</td>
<td>NPN/PNP</td>
</tr>
<tr>
<td>FDNL-L0800-C</td>
<td>8</td>
<td>0-7</td>
<td>L</td>
<td>1</td>
<td>NPN/PNP</td>
</tr>
<tr>
<td>FDNL-L1600-C</td>
<td>16</td>
<td>0-7</td>
<td>2L</td>
<td>2</td>
<td>NPN/PNP</td>
</tr>
</tbody>
</table>

Inputs Data

<table>
<thead>
<tr>
<th>In</th>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1-7</td>
<td>I-7</td>
<td>I-6</td>
<td>I-5</td>
<td>I-4</td>
<td>I-3</td>
<td>I-2</td>
<td>I-1</td>
<td>I-0</td>
</tr>
<tr>
<td>1</td>
<td>1-16</td>
<td>I-15</td>
<td>I-14</td>
<td>I-13</td>
<td>I-12</td>
<td>I-11</td>
<td>I-10</td>
<td>I-9</td>
<td>I-8</td>
</tr>
<tr>
<td>2</td>
<td>105-7</td>
<td>105-6</td>
<td>105-5</td>
<td>105-4</td>
<td>105-3</td>
<td>105-2</td>
<td>105-1</td>
<td>105-0</td>
<td></td>
</tr>
</tbody>
</table>

Input Connectors

Mating cordset: RK 4.4T-* RS 4.4T

2L

Mating cordset: Sensor with dual outputs:
RK 4.4T-* RS 4.4T
Two sensors:
RK 4.5T-* RS 4.5T
Splitter:
VBRS 4.5-2RK 4T-*/S818

I/O Data Map 1

<table>
<thead>
<tr>
<th>In</th>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1-7</td>
<td>I-7</td>
<td>I-6</td>
<td>I-5</td>
<td>I-4</td>
<td>I-3</td>
<td>I-2</td>
<td>I-1</td>
<td>I-0</td>
</tr>
<tr>
<td>1</td>
<td>1-16</td>
<td>I-15</td>
<td>I-14</td>
<td>I-13</td>
<td>I-12</td>
<td>I-11</td>
<td>I-10</td>
<td>I-9</td>
<td>I-8</td>
</tr>
<tr>
<td>2</td>
<td>105-7</td>
<td>105-6</td>
<td>105-5</td>
<td>105-4</td>
<td>105-3</td>
<td>105-2</td>
<td>105-1</td>
<td>105-0</td>
<td></td>
</tr>
</tbody>
</table>

I/O Data Map 2

<table>
<thead>
<tr>
<th>In</th>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1-7</td>
<td>I-7</td>
<td>I-6</td>
<td>I-5</td>
<td>I-4</td>
<td>I-3</td>
<td>I-2</td>
<td>I-1</td>
<td>I-0</td>
</tr>
<tr>
<td>1</td>
<td>1-16</td>
<td>I-15</td>
<td>I-14</td>
<td>I-13</td>
<td>I-12</td>
<td>I-11</td>
<td>I-10</td>
<td>I-9</td>
<td>I-8</td>
</tr>
<tr>
<td>2</td>
<td>105-7</td>
<td>105-6</td>
<td>105-5</td>
<td>105-4</td>
<td>105-3</td>
<td>105-2</td>
<td>105-1</td>
<td>105-0</td>
<td></td>
</tr>
</tbody>
</table>

Phone: 800.894.0412 - Fax: 888.723.4773 - Web: www.clrwtr.com - Email: info@clrwtr.com
Standard Input Stations

- Rugged, Fully Potted Stations
- IP 67, IP 68, IP 69K Protection
- Rotary Address Switches
- Automatic Baud Rate Sensing

**Electrical**
- Operating Current: <50 mA plus input currents (from DeviceNet)
- Sensor Current: <700 mA sum of all inputs (from DeviceNet)

**Power Distribution**
- Inputs: DeviceNet power supply

**Mechanical**
- Operating Temperature: -40 to +70°C (-40 to +158°F)
- Protection: NEMA 1,3,4,12,13 / IEC IP 67, IP 68, IP 69K
- 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 (Logical)**
- Open/short-circuit status mapped to DeviceNet I/O table, one bit indicates a fault for all inputs

**Diagnostics (Physical)**
- One LED indicates a fault for the whole station
- LEDs to indicate status of DeviceNet communication

FDNL-S0800-T
FDNL-S1600-T
FDNL-S1600-T-V
FDNL-N0800-T
FDNL-N1600-T
FDNL-S1600-E

---

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### Input Connectors

#### FDNL-S0800-T
- **In**: 8
- **Bit**: 0-7
- **Style**: PNP
- **Pin Count**: 1
- **I/O Map**: 1

#### FDNL-S1600-T
- **In**: 16
- **Bit**: 0-7
- **Style**: PNP
- **Pin Count**: 2
- **I/O Map**: 2

#### FDNL-S1600-T-V
- **In**: 16
- **Bit**: 0-7
- **Style**: PNP
- **Pin Count**: 2
- **I/O Map**: 2

#### FDNL-N0800-T
- **In**: 8
- **Bit**: 0-7
- **Style**: NPN
- **Pin Count**: 1
- **I/O Map**: 1

#### FDNL-N1600-T
- **In**: 16
- **Bit**: 0-7
- **Style**: NPN
- **Pin Count**: 2
- **I/O Map**: 2

#### FDNL-S1600-E
- **In**: 16
- **Bit**: 0-7
- **Style**: PNP
- **Pin Count**: 2
- **I/O Map**: 2

---

**Mating Cordset:**
- **FDNL-S0800-T**: RK 4.4T-* RS 4.4T

**Splitter:**
- **FDNL-S0800-T**: VBRS 4.4-2RK 4T-/*

---

**Mating Cordset:**
- **FDNL-S1600-T**: RK 4.4T-* RS 4.4T

**Splitter:**
- **FDNL-S1600-T**: VBRS 4.4-2RK 4T-/*

---

**Mating Cordset:**
- **FDNL-S1600-T-V**: RK 4.4T-* RS 4.4T

**Splitter:**
- **FDNL-S1600-T-V**: VBRS 4.4-2RK 4T-/*

---

**Mating Cordset:**
- **FDNL-N0800-T**: RK 4.4T-* RS 4.4T

**Splitter:**
- **FDNL-N0800-T**: VBRS 4.4-2RK 4T-/*

---

**Mating Cordset:**
- **FDNL-N1600-T**: RK 4.4T-* RS 4.4T

**Splitter:**
- **FDNL-N1600-T**: VBRS 4.4-2RK 4T-/*

---

**Mating Cordset:**
- **FDNL-S1600-E**: RK 4.4T-* RS 4.4T

**Splitter:**
- **FDNL-S1600-E**: VBRS 4.4-2RK 4T-/*

---

**I/O Data Map 1**

<table>
<thead>
<tr>
<th>In</th>
<th>Byte</th>
<th>Bit 1</th>
<th>Bit 2</th>
<th>Bit 3</th>
<th>Bit 4</th>
<th>Bit 5</th>
<th>Bit 6</th>
<th>Bit 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>1-7</td>
<td>1-6</td>
<td>1-5</td>
<td>1-4</td>
<td>1-3</td>
<td>1-2</td>
<td>1-1</td>
</tr>
<tr>
<td>1</td>
<td>155</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**I/O Data Map 2**

<table>
<thead>
<tr>
<th>In</th>
<th>Byte</th>
<th>Bit 1</th>
<th>Bit 2</th>
<th>Bit 3</th>
<th>Bit 4</th>
<th>Bit 5</th>
<th>Bit 6</th>
<th>Bit 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>1-7</td>
<td>1-6</td>
<td>1-5</td>
<td>1-4</td>
<td>1-3</td>
<td>1-2</td>
<td>1-1</td>
</tr>
<tr>
<td>1</td>
<td>155</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Deluxe Input/Output Station

- Rugged, Fully Potted Stations
- IP 67, IP 68, IP 69K Protection
- Input and Output on Same Connector
- Automatic Baud Rate Sensing

Electrical
- Operating Current: <100 mA plus sum of I/O currents (from DeviceNet)
- Sensor Current: <120 mA per input (from DeviceNet)
- Output Current: <500 mA per output (from DeviceNet)

Power Distribution
- Inputs: DeviceNet power supply
- Outputs: DeviceNet power supply

Mechanical
- Operating Temperature: -25 to +70°C (-13 to +158°F)
- Protection: NEMA 1,3,4,12,13 / IEC IP 67, IP 68, IP 69K
- 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 (Logical)
- Open/short-circuit status mapped to DeviceNet I/O table, one bit each per I/O point

Diagnostics (Physical)
- Individual LED to indicate open/short-circuit for each channel
- LEDs to indicate status of DeviceNet communication

DeviceNet minifast Pinout

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### DeviceNet

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Input Count</th>
<th>Connectors</th>
<th>Pinout</th>
<th>Outputs per Connector</th>
<th>Sensor Style</th>
<th>Group</th>
<th>Diagnostics Individual</th>
<th>Wire-Break Detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDNL-CPG88-T</td>
<td>8</td>
<td>0-7 C</td>
<td>1 PNP</td>
<td>X X</td>
<td>X</td>
<td>X</td>
<td>0.5 A</td>
<td>X X</td>
</tr>
</tbody>
</table>

#### Input/Output Connectors

```
<table>
<thead>
<tr>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1-7</td>
<td>1-6</td>
<td>1-5</td>
<td>1-4</td>
<td>1-3</td>
<td>1-2</td>
<td>1-1</td>
<td>1-0</td>
</tr>
<tr>
<td>1</td>
<td>1S1-7</td>
<td>1S6-6</td>
<td>1S5-5</td>
<td>1S4-4</td>
<td>1S3-3</td>
<td>1S2-2</td>
<td>1S1-1</td>
<td>1S0-0</td>
</tr>
<tr>
<td>2</td>
<td>10S-7</td>
<td>10S-6</td>
<td>10S-5</td>
<td>10S-4</td>
<td>10S-3</td>
<td>10S-2</td>
<td>10S-1</td>
<td>10S-0</td>
</tr>
<tr>
<td>3</td>
<td>0S-7</td>
<td>0S-6</td>
<td>0S-5</td>
<td>0S-4</td>
<td>0S-3</td>
<td>0S-2</td>
<td>0S-1</td>
<td>0S-0</td>
</tr>
<tr>
<td>4</td>
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<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Out</td>
<td>0</td>
<td>0-7</td>
<td>0-6</td>
<td>0-5</td>
<td>0-4</td>
<td>0-3</td>
<td>0-2</td>
<td>0-1</td>
</tr>
</tbody>
</table>
```

**Mating cordset:**

RK 4.4T-*RS 4.4T

**Splitter:**

VB2-RS 4.4T-1/2RK 4.4T-*/*5651

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Rugged, Fully Potted Stations
IP 67, IP 68, IP 69K Protection
Input and Output on Same Connector
Automatic Baud Rate Sensing

Electrical
- Operating Current: <100 mA plus sum of I/O currents (from DeviceNet)
- Sensor Current: <700 mA sum of all inputs (from DeviceNet)
- Output Current: <500 mA per output (from DeviceNet)

Power Distribution
- Inputs: DeviceNet power supply
- Outputs: DeviceNet power supply

Mechanical
- Operating Temperature: -40 to +70°C (-40 to +158°F)
- Protection: NEMA 1,3,4,12,13 / IEC IP 67, IP 68, IP 69K
- 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 (Logical)
- Open/short-circuit status mapped to DeviceNet I/O table, one bit indicates a fault for all inputs, one bit for all outputs

Diagnostics (Physical)
- One LED indicates I/O fault for entire station
- LEDs to indicate status of DeviceNet communication

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<table>
<thead>
<tr>
<th>Part Number</th>
<th>DeviceNet</th>
<th>Input Count</th>
<th>Connectors</th>
<th>Input Style</th>
<th>Cables</th>
<th>Internal Diagnostics</th>
<th>Remote Diagnostics</th>
<th>No Remote</th>
<th>Individual Diagnostics</th>
<th>Wire-Break Detection</th>
<th>Output Count</th>
<th>Connectors</th>
<th>Outputs per Connector</th>
<th>Control</th>
<th>Individual Diagnostic</th>
<th>Remote Diagnostics</th>
<th>No Remote</th>
<th>Individual Diagnostics</th>
<th>Wire-Break Detection</th>
<th>I/O Map</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDNL-CSG88-T</td>
<td>8 0-7 C 1</td>
<td>PNP X</td>
<td>0 0-7 C 1 0.5 A</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FDNL-CSG88-T-V</td>
<td>8 0-7 C 1</td>
<td>PNP X</td>
<td>0 0-7 C 1 0.5 A</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Input/Output Connectors

![Input/Output Connectors Diagram]

Mating cordset:
- RK 4.4T-* RS 4.4T

Splitter:
- VB2-RS 4.4T-1/2RK 4.4T-*/S651

### I/O Data Map 1

<table>
<thead>
<tr>
<th></th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>In</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>105</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Out</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

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Input/Output Station

- Rugged, Fully Potted Stations
- IP 67, IP 68, IP 69K Protection
- DeviceNet Powered I/O
- Sinking Outputs

**Electrical**
- Operating Current: <75 mA (from DeviceNet)
- Sensor Current: <700 mA sum of all inputs (from DeviceNet)
- Output Current: <500 mA per output (from DeviceNet)

**Power Distribution**
- Inputs: DeviceNet power supply
- Outputs: DeviceNet power supply

**Mechanical**
- Operating Temperature: -40 to +70 °C (-40 to +158 °F)
- Protection: NEMA 1,3,4,12,13 / IEC IP 67, IP 68, IP 69K
- 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 indicates a fault for the entire station
- LEDs to indicate status of DeviceNet communication

---

FDNL-SN0808N-C

---

DeviceNet eurofast Pinout

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Shield</td>
<td>5</td>
</tr>
<tr>
<td>2 = V+</td>
<td>4</td>
</tr>
<tr>
<td>3 = V-</td>
<td>3</td>
</tr>
<tr>
<td>4 = CAN_H</td>
<td>1</td>
</tr>
<tr>
<td>5 = CAN_L</td>
<td>2</td>
</tr>
</tbody>
</table>

---

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### Part Number Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Inputs</th>
<th>Connectors</th>
<th>Inputs per Connector</th>
<th>Input Style</th>
<th>Output Count</th>
<th>Connectors</th>
<th>Outputs per Connector</th>
<th>Output Style</th>
<th>Individual Diagnostics</th>
<th>Wire-Break Detection</th>
<th>I/O Map</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDNL-SN0808N-C</td>
<td>8</td>
<td>0-1</td>
<td>200</td>
<td>2</td>
<td>PNP/NPN</td>
<td>8</td>
<td>4</td>
<td>2NO</td>
<td>2</td>
<td>0.5 A</td>
<td>1</td>
</tr>
</tbody>
</table>

### Input/Output Connectors

- **2SN**
  - Mating cordset: RK 4.4T-* RS 4.4T
  - In Bit 7: 0, Bit 6: 1, Bit 5: 0, Bit 4: 0, Bit 3: 1, Bit 2: 1, Bit 1: 1, Bit 0: 1
  - Out Bit 7: 0, Bit 6: 1, Bit 5: 1, Bit 4: 1, Bit 3: 1, Bit 2: 0, Bit 1: 1, Bit 0: 0

- **2NO**
  - Mating cordset: RK 4.4T-* RS 4.4T
  - In Bit 7: 0, Bit 6: 1, Bit 5: 0, Bit 4: 0, Bit 3: 1, Bit 2: 1, Bit 1: 1, Bit 0: 1
  - Out Bit 7: 0, Bit 6: 1, Bit 5: 1, Bit 4: 1, Bit 3: 1, Bit 2: 0, Bit 1: 1, Bit 0: 0

### I/O Data Map 1

<table>
<thead>
<tr>
<th>In</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

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Input/Output Station

- Rugged, Fully Potted Stations
- IP 67, IP 68, IP 69K Protection
- DeviceNet Powered I/O
- Sinking Outputs

Electrical
- Operating Current: <75 mA (from DeviceNet)
- Sensor Current: <700 mA sum of all inputs (from DeviceNet)
- Output Current: <500 mA per output (from DeviceNet)

Power Distribution
- Inputs: DeviceNet power supply
- Outputs: DeviceNet power supply

Mechanical
- Operating Temperature: -40 to +70 °C (-40 to +158 °F)
- Protection: NEMA 1,3,4,12,13 / IEC IP 67, IP 68, IP 69K
- 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 indicates a fault for the entire station
- LEDs to indicate status of DeviceNet communication

* Rear removable terminal present on FDNL-S1204H-0142 only.

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### Input/Output Connectors

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Pinout</th>
<th>Inputs per Connector</th>
<th>Sensor Style</th>
<th>Input Count</th>
<th>Connectors</th>
<th>Pinout</th>
<th>Outputs per Connector</th>
<th>Output Count</th>
<th>Connectors</th>
<th>Pinout</th>
<th>Diagnostics</th>
<th>Individual Diagnostics</th>
<th>Wire-Break Detection</th>
<th>I/O Map</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDNL-S1204H-0142</td>
<td>12 0-2</td>
<td>2</td>
<td>PNP</td>
<td>X</td>
<td>4</td>
<td>3+7</td>
<td>2</td>
<td>20 A</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FDNL-S1204H-0153</td>
<td>12 0-2</td>
<td>2</td>
<td>PNP</td>
<td>X</td>
<td>4</td>
<td>3+7</td>
<td>2</td>
<td>20 A</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Mating cordset:
- RS 4.4T-* • RS 4.4T
- Splitter: VBRS 4.4-2RK 4T-*

#### I/O Data Map 1

<table>
<thead>
<tr>
<th>In</th>
<th>Bit 0</th>
<th>Bit 1</th>
<th>Bit 2</th>
<th>Bit 3</th>
<th>Bit 4</th>
<th>Bit 5</th>
<th>Bit 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0-3</td>
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<td>0-1</td>
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<td>1</td>
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<td>-</td>
<td>-</td>
<td>1-11</td>
<td>1-10</td>
<td>1-9</td>
</tr>
</tbody>
</table>

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### Electrical
- **Operating Current:** <100 mA (all except L0404G... is <140 mA) plus sensor currents (from DeviceNet power)
- **Sensor Current:** <80 mA per input (from DeviceNet)
- **Output Current:** See table on facing page

### Power Distribution
- **Inputs:** DeviceNet power supply
- **Outputs:** Auxiliary power supply

### Mechanical
- **Operating Temperature:** -25 to +70°C (-13 to +158°F)
- **Protection:** NEMA 1,3,4,12,13 / IEC IP 67, IP 68, IP 69K
- **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 (Logical)
- Open/short-circuit status mapped to DeviceNet I/O table, one bit per I/O point

### Diagnostics (Physical)
- Individual LED to indicate open/short-circuit for each channel
- LEDs to indicate status of DeviceNet communication

### FDNP-L0404G-TT
- **Male Female**
  - **4-Pin**
    - 1 = V_{aux}+
    - 2 = Pass thru
    - 3 = Pass thru
    - 4 = V_{aux}–

### FDNP-L0808G-TT
- **Male Female**
  - **5-Pin**
    - 1 = Shield
    - 2 = {V}+
    - 3 = {V}–
    - 4 = CAN_H
    - 5 = CAN_L

---

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Deluxe Input/Output Station

FDNP-CPG88-TT

Electrical
- Operating Current: <30 mA (from DeviceNet)
- Sensor Current: <120 mA per input (from Auxiliary power)
- Output Current: <0.5 A per output (from Auxiliary power)

Power Distribution
- Inputs: Auxiliary power supply
- Outputs: Auxiliary power supply

Mechanical
- Operating Temperature: -25 to +70°C (-13 to +158°F)
- Protection: NEMA 1,3,4,12,13 / IEC IP 67, IP 68, IP 69K
- 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 (Logical)
- Open/short-circuit status mapped to DeviceNet I/O table, one bit each per I/O point

Diagnostics (Physical)
- Individual LED to indicate open/short-circuit for each channel
- LEDs to indicate status of DeviceNet communication

Rugged, Fully Potted Stations
- Auxiliary Powered I/O
- IP 67, IP 68, IP 69K Protection
- Automatic Baud Rate Sensing

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<table>
<thead>
<tr>
<th>Part Number</th>
<th>FDNP-CPG88-TT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inputs</td>
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<td>DeviceNet</td>
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<td>C</td>
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<td>C</td>
<td>X</td>
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</tr>
<tr>
<td>Pinout</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>X</td>
</tr>
</tbody>
</table>
Standard Output Stations

- Rugged, Fully Potted Stations
- IP 67, IP 68, IP 69K Protection
- Auxiliary Powered Outputs
- Automatic Baud Rate Sensing

Electrical

- Operating Current: <140 mA (FDNP...G-TT), <50 mA (FDNP...H-TT), <75 mA (FDNP...0200) (from DeviceNet)
- Output Current: see table on facing page (from aux. power)

Power Distribution

- Outputs: Auxiliary power supply

Mechanical

- Operating Temperature: -40 to +70°C (-40 to +158°F)
- Protection: NEMA 1,3,4,12,13 / IEC IP 67, IP 68, IP 69K
- 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 (Logical)

- short-circuit status mapped to DeviceNet I/O table, one bit per each I/O point (except FDNP...0200 has no diagnostic data)

Diagnostics (Physical)

- Individual LED to indicate open/short-circuit for each channel (except FDNP...0200 has one LED indicating a short for all I/O points)

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Part Number | Output Count | Connectors | Flavor | Output Connectors | Current | Individual Diagnostics | Non-Functional Diagnostics | I/O Map
---|---|---|---|---|---|---|---|---
FDNP-S0008G-TT | 8 | G | 1 | 0.5 A | X | 1
FDNP-S0008G-TT-V | 8 | G | 1 | 0.5 A | X | 1
FDNP-S0008H-TT | 8 | H | 1 | 1.4 A | X | 1
FDNP-S0016N-TT-0200 | 16 | 2GN | 2 | 0.5 A | | 2

**Output Connectors**

- **G**
  - Mating cordset: RK 4.4T-* RS 4.4T
  - Splitter: VBRS 4.4-2RK 4T-*

- **H**
  - Mating cordset: RK 4.4T-* RS 4.4T

- **2GN**
  - Mating cordset: RK 4.4T-* RS 4.4T
  - Splitter: VBRS 4.4-2RK 4T-*

**I/O Data Map 1**

<table>
<thead>
<tr>
<th>In</th>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0-7</td>
<td>0-6</td>
<td>0-5</td>
<td>0-4</td>
<td>0-3</td>
<td>0-2</td>
<td>0-1</td>
<td>0-0</td>
<td></td>
</tr>
<tr>
<td>Out</td>
<td>0</td>
<td>0-7</td>
<td>0-6</td>
<td>0-5</td>
<td>0-4</td>
<td>0-3</td>
<td>0-2</td>
<td>0-1</td>
<td>0-0</td>
</tr>
</tbody>
</table>

**I/O Data Map 2**

<table>
<thead>
<tr>
<th>Out</th>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0-7</td>
<td>0-6</td>
<td>0-5</td>
<td>0-4</td>
<td>0-3</td>
<td>0-2</td>
<td>0-1</td>
<td>0-0</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0-15</td>
<td>0-14</td>
<td>0-13</td>
<td>0-12</td>
<td>0-11</td>
<td>0-10</td>
<td>0-9</td>
<td>0-8</td>
<td></td>
</tr>
</tbody>
</table>
Standard Input Station

- Rugged, Fully Potted Stations
- IP 67, IP 68, IP 69K Protection
- Auxiliary Powered Inputs
- Automatic Baud Rate Sensing

Electrical
- Operating Current: <20 mA (from DeviceNet)
- Sensor Current: <700 mA total of all inputs (from V_in power)

Power Distribution
- Inputs: Auxiliary (V_in) power supply

Mechanical
- Operating Temperature: -40 to +70°C (-40 to +158°F)
- Protection: NEMA 1,3,4,12,13 / IEC IP 67, IP 68, IP 69K
- 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 (Logical)
- No diagnostic data

Diagnostics (Physical)
- One LED indicates a fault for the entire station
- LEDs to indicate status of DeviceNet communication
<table>
<thead>
<tr>
<th>DeviceNet</th>
<th>Part Number Input Count</th>
<th>Connectors Pinout</th>
<th>Inputs per Connector</th>
<th>Sensor Style Group</th>
<th>Diagnostics</th>
<th>I/O Map</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDNP-N1600-TT-0197</td>
<td>16 0-7 25 2 NPN</td>
<td>1</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**Input Connectors**

```
  2S

Mating cordset:
RX 4.4T-* RS 4.4T
Splitter:
VBRS 4.4-2RK 4T-*/*
```

**I/O Data Map 1**

<table>
<thead>
<tr>
<th>In</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1-7</td>
<td>1-6</td>
<td>1-5</td>
<td>1-4</td>
<td>1-3</td>
<td>1-2</td>
<td>1-1</td>
<td>1-0</td>
</tr>
<tr>
<td>1</td>
<td>1-15</td>
<td>1-14</td>
<td>1-13</td>
<td>1-12</td>
<td>1-11</td>
<td>1-10</td>
<td>1-9</td>
<td>1-8</td>
</tr>
</tbody>
</table>

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Standard Input/Output Stations

- Rugged, Fully Potted Stations
- IP 67, IP 68, IP 69K Protection
- Auxiliary Powered
- Automatic Baud Rate Sensing

Electrical
- Operating Current: <75 mA plus applicable input currents (from DeviceNet)
- Sensor Current: <700 mA total (from DeviceNet except FDNP-C5G... and FDNP-XSG...) per input
- Output Current: See table on facing page

Power Distribution
- Inputs: DeviceNet power supply (except FDNP-C5G... and FDNP-XSG... from Auxiliary supply)
- Outputs: Auxiliary power supply

Mechanical
- Operating Temperature: -40°C to +70°C (-40°F to +158°F)
- Protection: NEMA 1, 3, 4, 12, 13 / IEC IP 67, IP 68, IP 69K
- 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 (Logical)
- One LED indicates fault for entire station
- LEDs to indicate status of DeviceNet communication

Diagnostics (Physical)
- One LED indicates fault for entire station
- LEDs to indicate status of DeviceNet communication

Aux. Power Pinout

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vaux+</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Pass thru</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Pass thru</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Vaux-</td>
<td></td>
</tr>
</tbody>
</table>

DeviceNet minifast Pinout

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Shield</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>V+</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>V-</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>CAN_H</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>CAN_L</td>
<td></td>
</tr>
</tbody>
</table>

FDNP-S0404G-TT
FDNP-S0808G-TT
FDNP-C5G88-TT
FDNP-X5G16-TT
FDNP-S1204H-TT-0149*
* Not FM Approved

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DeviceNet

Inputs

Outputs

Data

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Inputs</th>
<th>Connectors</th>
<th>Pinout</th>
<th>Outputs</th>
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</thead>
<tbody>
<tr>
<td>FDNP-S0404G-TT</td>
<td>4</td>
<td>0-3</td>
<td>S</td>
<td>PNP</td>
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<tr>
<td>FDNP-S0808G-TT</td>
<td>8</td>
<td>0-3</td>
<td>2S</td>
<td>PNP</td>
</tr>
<tr>
<td>FDNP-CSG88TT-01</td>
<td>8</td>
<td>0-7</td>
<td>C</td>
<td>PNP</td>
</tr>
<tr>
<td>FDNP-XSG16-TT</td>
<td>16</td>
<td>0-7</td>
<td>2X</td>
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</tr>
<tr>
<td>FDNP-S1204H-TT-01</td>
<td>12</td>
<td>0-2</td>
<td>4-6</td>
<td>PNP</td>
</tr>
</tbody>
</table>

Input/Output Connectors

Mating cordset: RK 4.4T-*-RS 4.4T
Splitter: VBRS 4.4-2RK 4T-*/*

<table>
<thead>
<tr>
<th>I/O Data Map 1</th>
<th>In</th>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>D4PV-04</td>
<td>0</td>
<td>165</td>
<td>075</td>
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<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>D4PV-08</td>
<td>0</td>
<td>165</td>
<td>075</td>
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<table>
<thead>
<tr>
<th>I/O Data Map 2</th>
<th>In</th>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>D4PV-04</td>
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<td>165</td>
<td>075</td>
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<tr>
<td>D4PV-08</td>
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<td>165</td>
<td>075</td>
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</tbody>
</table>

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Deluxe Input/Output Station

- Rugged, Fully Potted Stations
- IP 67, IP 68, IP 69K Protection
- Auxiliary Powered Outputs
- Automatic Baud Rate Sensing

Electrical
- Operating Current: \(<100\, \text{mA plus sum of input currents (from DeviceNet)}\)
- Sensor Current: \(<80\, \text{mA per input (from DeviceNet)}\)
- Output Current: \(<0.5\, \text{A per output (from Auxiliary power)}\)

Power Distribution
- Inputs: DeviceNet power supply
- Outputs: Auxiliary power supply

Mechanical
- Operating Temperature: \(-25\, \text{to} +70^\circ\text{C} (-13\, \text{to} +158^\circ\text{F})\)
- Protection: NEMA 1,3,4,12,13 / IEC IP 67, IP 68, IP 69K
- Vibration: \(50\, \text{g} @ 10-500\, \text{Hz}\)

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

Diagnostics (Logical)
- Open/short-circuit status mapped to DeviceNet I/O table, one bit for each I/O point

Diagnostics (Physical)
- Individual LED to indicate open/short-circuit for each channel
- LEDs to indicate status of DeviceNet communication

DeviceNet minifast Pinout
- Male:
  - 1 = Shield
  - 2 = V+
  - 3 = V-
  - 4 = CAN_H
  - 5 = CAN_L

- Female:
  - 1 = Vaux+
  - 2 = pass thru
  - 3 = pass thru
  - 4 = Vaux−

Aux. Power Pinout
- Male:
  - 1 = VAUX+
  - 2 = pass thru
  - 3 = pass thru
  - 4 = VAUX−

- Female:
  - 1 = Vaux+
  - 2 = pass thru
  - 3 = pass thru
  - 4 = VAUX−

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### DeviceNet

#### Inputs

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Input Count</th>
<th>Connectors</th>
<th>Pinout</th>
<th>Outputs per Connector</th>
<th>Diagnostics</th>
<th>Wire-Break Detection</th>
<th>Output Connectors</th>
<th>Pinout</th>
<th>Outputs per Connector</th>
<th>Diagnostics</th>
<th>Wire-Break Detection</th>
<th>I/O Map</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDNP-P1204G-TT</td>
<td>12</td>
<td>4-6</td>
<td>2P</td>
<td>PNP</td>
<td>X</td>
<td>X</td>
<td>3, 7</td>
<td>2G</td>
<td>0.5 A</td>
<td>X</td>
<td>X</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Input/Output Connectors

**2P**

```
2P
<table>
<thead>
<tr>
<th>Bit</th>
<th>Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1-7</td>
</tr>
<tr>
<td>1</td>
<td>1-6</td>
</tr>
<tr>
<td>2</td>
<td>1-5</td>
</tr>
<tr>
<td>3</td>
<td>1-4</td>
</tr>
<tr>
<td>4</td>
<td>1-3</td>
</tr>
<tr>
<td>5</td>
<td>1-2</td>
</tr>
<tr>
<td>6</td>
<td>1-1</td>
</tr>
<tr>
<td>7</td>
<td>1-0</td>
</tr>
</tbody>
</table>
```

**2G**

```
2G
<table>
<thead>
<tr>
<th>Bit</th>
<th>Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1-7</td>
</tr>
<tr>
<td>1</td>
<td>1-6</td>
</tr>
<tr>
<td>2</td>
<td>1-5</td>
</tr>
<tr>
<td>3</td>
<td>1-4</td>
</tr>
<tr>
<td>4</td>
<td>1-3</td>
</tr>
<tr>
<td>5</td>
<td>1-2</td>
</tr>
<tr>
<td>6</td>
<td>1-1</td>
</tr>
<tr>
<td>7</td>
<td>1-0</td>
</tr>
</tbody>
</table>
```

**Mating cordset:**

Sensor with dual outputs:
- RK 4.4T-* RS 4.4T

Two sensors:
- RK 4.5T-* RS 4.5T

**Splitter:**
- VBRS 4.5-2RK 4T-*

**2P**

```
<table>
<thead>
<tr>
<th>Byte</th>
<th>Bit 1</th>
<th>Bit 2</th>
<th>Bit 3</th>
<th>Bit 4</th>
<th>Bit 5</th>
<th>Bit 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1-7</td>
<td>1-6</td>
<td>1-5</td>
<td>1-4</td>
<td>1-3</td>
<td>1-2</td>
</tr>
<tr>
<td>1</td>
<td>1-1</td>
<td>1-0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

**2G**

```
<table>
<thead>
<tr>
<th>Byte</th>
<th>Bit 1</th>
<th>Bit 2</th>
<th>Bit 3</th>
<th>Bit 4</th>
<th>Bit 5</th>
<th>Bit 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1-7</td>
<td>1-6</td>
<td>1-5</td>
<td>1-4</td>
<td>1-3</td>
<td>1-2</td>
</tr>
<tr>
<td>1</td>
<td>1-1</td>
<td>1-0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

Phone: 800.894.0412 - Fax: 888.723.4773 - Web: www.clrwtr.com - Email: info@clrwtr.com
Standard Input/Output Stations

- **Rugged, Fully Potted Stations**
- **IP 67, IP 68, IP 69K Protection**
- **Screw Terminal Connections**
- **Automatic Baud Rate Sensing**

**Electrical**

- Operating Current: <75 mA from DeviceNet (for ...S0808G... add input currents)
- Sensor Current: <700 mA total of all inputs (...S0808G... From DeviceNet, ...XSG16... from aux. Power)
- Output Current: <500 mA per output (from aux. power)

**Power Distribution**

- Inputs: ...S0808G... from DeviceNet power supply, ...XSG16... From Auxiliary power supply
- Outputs: Auxiliary power supply

**Mechanical**

- Operating Temperature: -40 to +70°C (-40 to +158°F)
- Protection: NEMA 1,3,4,12,13 / IEC IP 67, IP 68, IP 69K
- 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 (Logical)**

- Open/short-circuit status mapped to DeviceNet I/O table, one bit indicates a fault for the entire station

**Diagnostics (Physical)**

- One LED indicates an I/O fault for the entire station
- LEDs to indicate status of DeviceNet communication

**Aux. Power Pinout**

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = VAUX+</td>
<td>1 = VAUX+</td>
</tr>
<tr>
<td>2 = pass thru</td>
<td>2 = pass thru</td>
</tr>
<tr>
<td>3 = pass thru</td>
<td>3 = pass thru</td>
</tr>
<tr>
<td>4 = VAUX-</td>
<td>4 = VAUX-</td>
</tr>
</tbody>
</table>

**DeviceNet minifast Pinout**

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Shield</td>
<td>1 = Shield</td>
</tr>
<tr>
<td>2 = V+</td>
<td>2 = V+</td>
</tr>
<tr>
<td>3 = V-</td>
<td>3 = V-</td>
</tr>
<tr>
<td>4 = CAN_H</td>
<td>4 = CAN_H</td>
</tr>
<tr>
<td>5 = CAN_L</td>
<td>5 = CAN_L</td>
</tr>
</tbody>
</table>
### DeviceNet

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Input Count</th>
<th>Connectors</th>
<th>Pinout</th>
<th>Outputs per Connector</th>
<th>Current</th>
<th>Individual Diagnostics</th>
<th>Wire-Break Detection</th>
<th>I/O Map</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDNP-S0808G-ST</td>
<td>8</td>
<td>0-3 2X ST1</td>
<td>2 PNP</td>
<td>X</td>
<td>8-7 2X ST1</td>
<td>2 0.5 A</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>FDNP-XSG16-ST</td>
<td>16</td>
<td>0-7 2X ST2</td>
<td>2 PNP</td>
<td>X</td>
<td>16 0-7 2X ST2</td>
<td>2 0.5 A</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

### Input/Output Connectors

#### Mating cordset:
RK 4.4T-* RS 4.4T

#### Splitter:
VBRS 4.4-2RK 4T-**

#### I/O Data Map 1

<table>
<thead>
<tr>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>In</td>
<td>0</td>
<td>1-7</td>
<td>1-6</td>
<td>1-5</td>
<td>1-4</td>
<td>1-3</td>
<td>1-2</td>
<td>1-1</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>10S</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Out</td>
<td>0</td>
<td>0-7</td>
<td>0-6</td>
<td>0-5</td>
<td>0-4</td>
<td>0-3</td>
<td>0-2</td>
<td>0-1</td>
</tr>
</tbody>
</table>

#### I/O Data Map 2

<table>
<thead>
<tr>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>In</td>
<td>0</td>
<td>1-7</td>
<td>1-6</td>
<td>1-5</td>
<td>1-4</td>
<td>1-3</td>
<td>1-2</td>
<td>1-1</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>10S</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Out</td>
<td>0</td>
<td>0-7</td>
<td>0-6</td>
<td>0-5</td>
<td>0-4</td>
<td>0-3</td>
<td>0-2</td>
<td>0-1</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>10S</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0-7</td>
<td>0-6</td>
<td>0-5</td>
<td>0-4</td>
<td>0-3</td>
<td>0-2</td>
<td>0-1</td>
</tr>
</tbody>
</table>

Phone: 800.894.0412 - Fax: 888.723.4773 - Web: www.clrwtr.com - Email: info@clrwtr.com
**Standard Input Stations**

- Rugged, Fully Potted Stations
- IP 67, IP 68, IP 69K Protection
- Compact Housing
- Automatic Baud Rate Sensing

**Electrical**

- **Operating Current**: <75 mA plus total of input currents (from DeviceNet)
- **Sensor Current**: <700 mA sum of all inputs (from DeviceNet)

**Power Distribution**

- **Inputs**: DeviceNet power supply

**Mechanical**

- **Operating Temperature**: -40 to +70°C (-40 to +158°F)
- **Protection**: NEMA 1,3,4,12,13 / IEC IP 67, IP 68, IP 69K
- **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 (Logical)**

- Open/short-circuit status mapped to DeviceNet I/O table, one bit indicates fault for entire station

**Diagnostics (Physical)**

- One LED indicates fault for entire station
- LEDs to indicate status of DeviceNet communication

---

**FDNQ-S0200-T**
**FDNQ-S0400-T**
**FDNQ-S0800-T**
**FDNQ-S0400-C**

* Not FM Approved

---

**Male**

**Female**

- **5-Pin**

**DeviceNet minifast Pinout**

- Name: Shield
- **1**: 46.4 [46.4]
- **2**: 46.4 [46.4]
- **3**: 46.4 [46.4]
- **4**: 46.4 [46.4]
- **5**: 46.4 [46.4]

**DeviceNet eurofast Pinout**

- Name: Shield
- **1**: 46.4 [46.4]
- **2**: 46.4 [46.4]
- **3**: 46.4 [46.4]
- **4**: 46.4 [46.4]
- **5**: 46.4 [46.4]

---

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### DeviceNet

#### Part Number Input Count Connectors Pinout Inputs per Connector Sensor Style Group Diagnostics Individual Diagnostics Wire-Break Detection

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Input Count</th>
<th>Connector 1</th>
<th>Pin 1</th>
<th>Connector 2</th>
<th>Pin 2</th>
<th>Sensor Style</th>
<th>Group</th>
<th>Diagnostics</th>
<th>Individual</th>
<th>Wire-Break Detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDNQ-S0200-T</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>1</td>
<td>PNP</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FDNQ-S0400-T</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>PNP</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FDNQ-S0800-T</td>
<td>8</td>
<td>3</td>
<td>25</td>
<td>2</td>
<td>PNP</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FDNQ-S0400-C</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>PNP</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Input Connectors

- **S**
  - BU: V-
  - PE: V+
  - RM: I/G

- **2S**
  - BU: V- (2G)
  - PE: V+
  - RM: I/G

**Mating cordset:**
- RK 4.4T-*-RS 4.4T

**Splitter:**
- VBR 4.4-2RK 4T-*/*

### I/O Data Maps

#### I/O Data Map 1

<table>
<thead>
<tr>
<th>In</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>165</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>I-2</td>
<td>I-1</td>
<td>I-0</td>
</tr>
</tbody>
</table>

#### I/O Data Map 2

<table>
<thead>
<tr>
<th>In</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I-7</td>
<td>I-6</td>
<td>I-5</td>
<td>I-4</td>
<td>I-3</td>
<td>I-2</td>
<td>I-1</td>
<td>I-0</td>
</tr>
<tr>
<td>1</td>
<td>165</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

#### I/O Data Map 3

<table>
<thead>
<tr>
<th>In</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>165</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>I-1</td>
<td>I-0</td>
<td></td>
</tr>
</tbody>
</table>

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Rugged, Fully Potted Stations
- IP 67, IP 68, IP 69K Protection
- Compact Housing
- Automatic Baud Rate Sensing

Electrical
- Operating Current: <75 mA plus total of all output currents (from DeviceNet)
- Output Current: <500 mA per output (from DeviceNet)

Power Distribution
- Outputs: DeviceNet power supply

Mechanical
- Operating Temperature: -40 to +70°C (-40 to +158°F)
- Protection: NEMA 1, 3, 4, 12, 13 / IEC IP 67, IP 68, IP 69K
- 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 (Logical)
- Open/short-circuit status mapped to DeviceNet I/O table, one bit each per I/O point

Diagnostics (Physical)
- Individual LED to indicate open/short-circuit for each channel
- LEDs to indicate status of DeviceNet communication

---

Standard Output Station

FDNQ-S0002G-T

---

Electrical
- Operating Current: <75 mA plus total of all output currents (from DeviceNet)
- Output Current: <500 mA per output (from DeviceNet)

Power Distribution
- Outputs: DeviceNet power supply

Mechanical
- Operating Temperature: -40 to +70°C (-40 to +158°F)
- Protection: NEMA 1, 3, 4, 12, 13 / IEC IP 67, IP 68, IP 69K
- 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 (Logical)
- Open/short-circuit status mapped to DeviceNet I/O table, one bit each per I/O point

Diagnostics (Physical)
- Individual LED to indicate open/short-circuit for each channel
- LEDs to indicate status of DeviceNet communication

---

DeviceNet minifast Pinout

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Shield</td>
<td>1 = Shield</td>
</tr>
<tr>
<td>2 = V+</td>
<td>3 = V-</td>
</tr>
<tr>
<td>3 = V-</td>
<td>4 = CAN_H</td>
</tr>
<tr>
<td>4 = CAN_H</td>
<td>5 = CAN_L</td>
</tr>
<tr>
<td>5-Pin</td>
<td>5-Pin</td>
</tr>
</tbody>
</table>

---

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### Outputs

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Output Count</th>
<th>Connectors</th>
<th>Panel</th>
<th>Outputs per Connector</th>
<th>Current</th>
<th>Individual Diagnostics</th>
<th>Wired/Unwired Disconnect</th>
<th>E/O Map</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDNQ-S0002G-T</td>
<td>2</td>
<td>G</td>
<td>0, 2</td>
<td>1</td>
<td>0.5 A</td>
<td>S</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

#### Output Connectors

![Output Connectors Diagram]

Mating cordset:
RK 4.4T-*RS 4.4T

### I/O Data Map 1

<table>
<thead>
<tr>
<th>In</th>
<th>Byte Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0-1</td>
<td>0-1</td>
<td>0-0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Out</th>
<th>Byte Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0-1</td>
<td>0-1</td>
<td>0-0</td>
</tr>
</tbody>
</table>

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**Standard Input/Output Stations**

- Rugged, Fully Potted Stations
- IP 67, IP 68, IP 69K Protection
- Compact Housing
- DeviceNet Powered I/O

**Electrical**
- Operating Current: <75 mA plus total of all I/O current (from DeviceNet)
- Sensor Current: <700 mA total of all inputs (from DeviceNet)

**Power Distribution**
- Inputs: DeviceNet power supply
- Outputs: DeviceNet power supply

**Mechanical**
- Operating Temperature: -40 to +70 °C (-40 to +158 °F)
- Protection: NEMA 1,3,4,12,13 / IEC IP 67, IP 68, IP 69K
- 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 (Logical)**
- Open/short-circuit status mapped to DeviceNet I/O table, one bit indicates fault for entire station (...S0201G-T has one dedicated bit to indicate a fault for the output point as well)

**Diagnostics (Physical)**
- One LED indicates fault for entire station
- LEDs to indicate status of DeviceNet communication

---

**DeviceNet minifast Pinout**

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Shield</td>
<td>1 = Shield</td>
</tr>
<tr>
<td>2 = V+</td>
<td>2 = V+</td>
</tr>
<tr>
<td>3 = V-</td>
<td>3 = V-</td>
</tr>
<tr>
<td>4 = CAN_H</td>
<td>4 = CAN_H</td>
</tr>
<tr>
<td>5 = CAN_L</td>
<td>5 = CAN_L</td>
</tr>
</tbody>
</table>

**DeviceNet Pinout**

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Shield</td>
<td>1 = Shield</td>
</tr>
<tr>
<td>2 = V+</td>
<td>2 = V+</td>
</tr>
<tr>
<td>3 = V-</td>
<td>3 = V-</td>
</tr>
<tr>
<td>4 = CAN_H</td>
<td>4 = CAN_H</td>
</tr>
<tr>
<td>5 = CAN_L</td>
<td>5 = CAN_L</td>
</tr>
</tbody>
</table>

---

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<table>
<thead>
<tr>
<th>Part Number</th>
<th>I/O Map</th>
<th>Inputs</th>
<th>Outputs</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDNQ-S0201G-T</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>155</td>
</tr>
<tr>
<td>FDNQ-C5G44-T</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>FDNQ-S0404G-T</td>
<td>3</td>
<td>4</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>FDNQ-XSG08-T</td>
<td>4</td>
<td>8</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>FDNQ-CSG44-E</td>
<td>5</td>
<td>4</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

**Input/Output Connectors**

<table>
<thead>
<tr>
<th>Mating cordset:</th>
<th>RK 4.4T-* RS 4.4T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Splitter:</td>
<td>VB2-RS 4.4T-1/2RK 4.4T-*/*S651</td>
</tr>
</tbody>
</table>

**I/O Data Map 1**

<table>
<thead>
<tr>
<th>In Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>165</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0-3</td>
<td>1-1</td>
<td>1-0</td>
</tr>
<tr>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**I/O Data Map 2**

<table>
<thead>
<tr>
<th>In Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>165</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1-3</td>
<td>1-2</td>
<td>1-1</td>
</tr>
<tr>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0-3</td>
<td>0-2</td>
<td>0-1</td>
</tr>
</tbody>
</table>

**I/O Data Map 3**

<table>
<thead>
<tr>
<th>In Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>165</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>0</td>
<td>0-7</td>
<td>0-6</td>
<td>0-5</td>
<td>0-4</td>
<td>0-3</td>
<td>0-2</td>
<td>0-1</td>
<td>0-0</td>
</tr>
</tbody>
</table>
• Rugged, Fully Potted Stations
• IP 67, IP 68, IP 69K Protection
• Auxiliary Powered Outputs
• Automatic Baud Rate Sensing

Electrical
- Operating Current: <75 mA plus total of input currents (from DeviceNet)
- Sensor Current: <700 mA total of all inputs (from DeviceNet)
- Output Current: <500 mA per output (from Auxiliary power)

Power Distribution
- Inputs: DeviceNet power supply
- Outputs: Auxiliary power supply

Mechanical
- Operating Temperature: -25 to +70°C (-13 to +158°F)
- Protection: NEMA 1,3,4,12,13 / IEC IP 67, IP 68, IP 69K
- 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 (Logical)
- Open/short-circuit status mapped to DeviceNet I/O table, one bit indicates fault for entire station

Diagnostics (Physical)
- One LED indicates a fault for the entire station
- LEDs to indicate status of DeviceNet communication

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### DeviceNet

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Inputs</th>
<th>Outputs</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDNQ-S0404G-MF</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

#### Inputs

- **Inputs/Outputs Data**
- **DeviceNet**

#### Outputs

- **DeviceNet**

#### Input/Output Connectors

**In**

<table>
<thead>
<tr>
<th>Byte</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>165</td>
<td>066</td>
<td>-</td>
<td>-</td>
<td>1-3</td>
<td>1-2</td>
<td>1-1</td>
<td>1-0</td>
</tr>
<tr>
<td>Out</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>0-0</td>
<td>0-2</td>
<td>0-1</td>
<td>0-0</td>
</tr>
</tbody>
</table>

**Out**

- **Mating cordset:** RK 4.4T-* RS 4.4T
- **Splitter:** VBRS 4.4-2RK 4T-***/
Analog Input Station

- Rugged, Fully Potted Stations
- IP 67, IP 68, IP 69K Protection
- Compact Housing
- Automatic Baud Rate Sensing

Electrical
- Operating Current: <100 mA plus sum of input currents (from DeviceNet)
- Sensor Current: 0-20 mA or 4-20 mA analog signal (16-bit signed integer).
  The 0-20 mA or 4-20 mA range can be adjusted via rotary switch on front of station.

Power Distribution
- Inputs: DeviceNet power supply

Mechanical
- Operating Temperature: -40 to +70°C (-40 to +158°F)
- Protection: NEMA 1,3,4,12,13 / IEC IP 67, IP 68, IP 69K
- 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)
- LEDs to indicate status of DeviceNet communication

FDNQ-4AI-I-T

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### DeviceNet

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Connector</th>
<th>Inputs</th>
<th>Data</th>
<th>I/O Map</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDNQ-4AI-I-T</td>
<td>4-3 AI-I</td>
<td>1</td>
<td>0-20 mA or 4-20 mA</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Input Connectors

- **AI-I**

  - **Mating cordset:**
    - Isolated Loop: RK 4.5T-*-*RS 4.5T/S653
  - **Loop Powered:** RK 4.5T-*-*RS 4.5T/LPS/S653

  *Note: The “LPS” in the part number indicates that the cord jumpers pin 3 to pin 4 on the male side to the signal-to the station common. Pin 3 is not connected at the female end.*

#### Applications:

- **TURCK Sensors:**
  - LU, RK 4.4T-*-*RS 4.4T/S1118
  - LI, RK 4.4T-*-*RS 4.4T/S1120

#### I/O Data Map 1

<table>
<thead>
<tr>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Channel 0, LSB</td>
<td>Channel 1, LSB</td>
<td>Channel 2, MSB</td>
<td>Channel 3, LSB</td>
<td>Channel 4, LSB</td>
<td>Channel 5, LSB</td>
<td>Channel 6, LSB</td>
</tr>
</tbody>
</table>
Analog Input Station

- Rugged, Fully Potted Stations
- IP 67, IP 68, IP 69K Protection
- Compact Housing
- Automatic Baud Rate Sensing

Electrical
- Operating Current: <100 mA plus sum of input currents (from DeviceNet)
- Sensor Current: 0-20 mA or 4-20 mA analog signal (16-bit signed integer)
- Sensor Voltage: 0 to 10 V or -10 to +10 V Analog signal
  (16 bit signed integer)

The voltage/current ranges can be adjusted via rotary switch on front of station.

Power Distribution
- Inputs: DeviceNet power supply

Mechanical
- Operating Temperature: -40 to +70°C (-40 to +158°F)
- Protection: NEMA 1,3,4,12,13 / IEC IP 67, IP 68, IP 69K
- 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)
- LEDs to indicate status of DeviceNet communication

FDNQ-4AI-V/I-T

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### Part Number: FDNQ-44I-V/I-T

<table>
<thead>
<tr>
<th>Input Group</th>
<th>Connectors</th>
<th>Phase</th>
<th>Input Style</th>
<th>Pinout</th>
<th>Inputs per Connector</th>
<th>Sensor Style</th>
<th>Group</th>
<th>Diagnostics</th>
<th>Individual Diagnostics</th>
<th>Prevent-Related Diagnostics</th>
<th>I/O Map</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0-3</td>
<td>AI-I</td>
<td>1</td>
<td>0-20 mA, 4-20 mA, 0-10 V, -10 to +10 V</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>