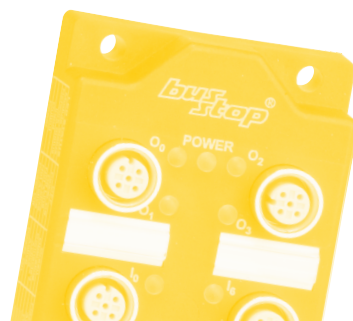
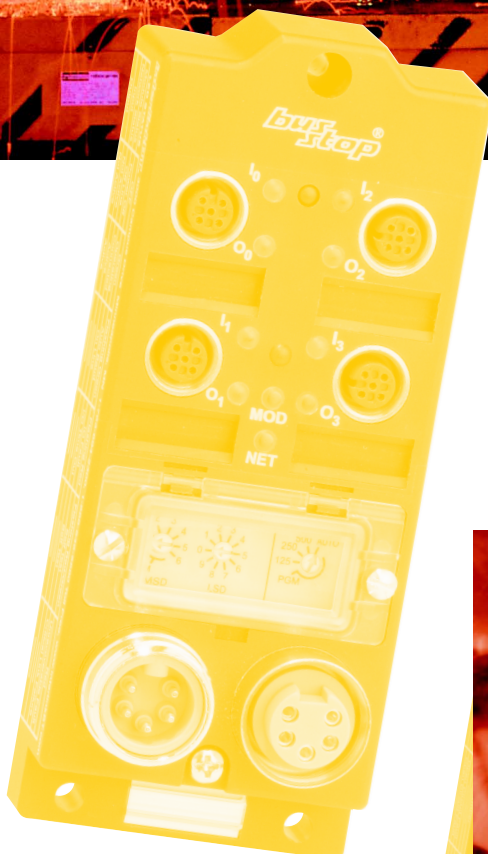
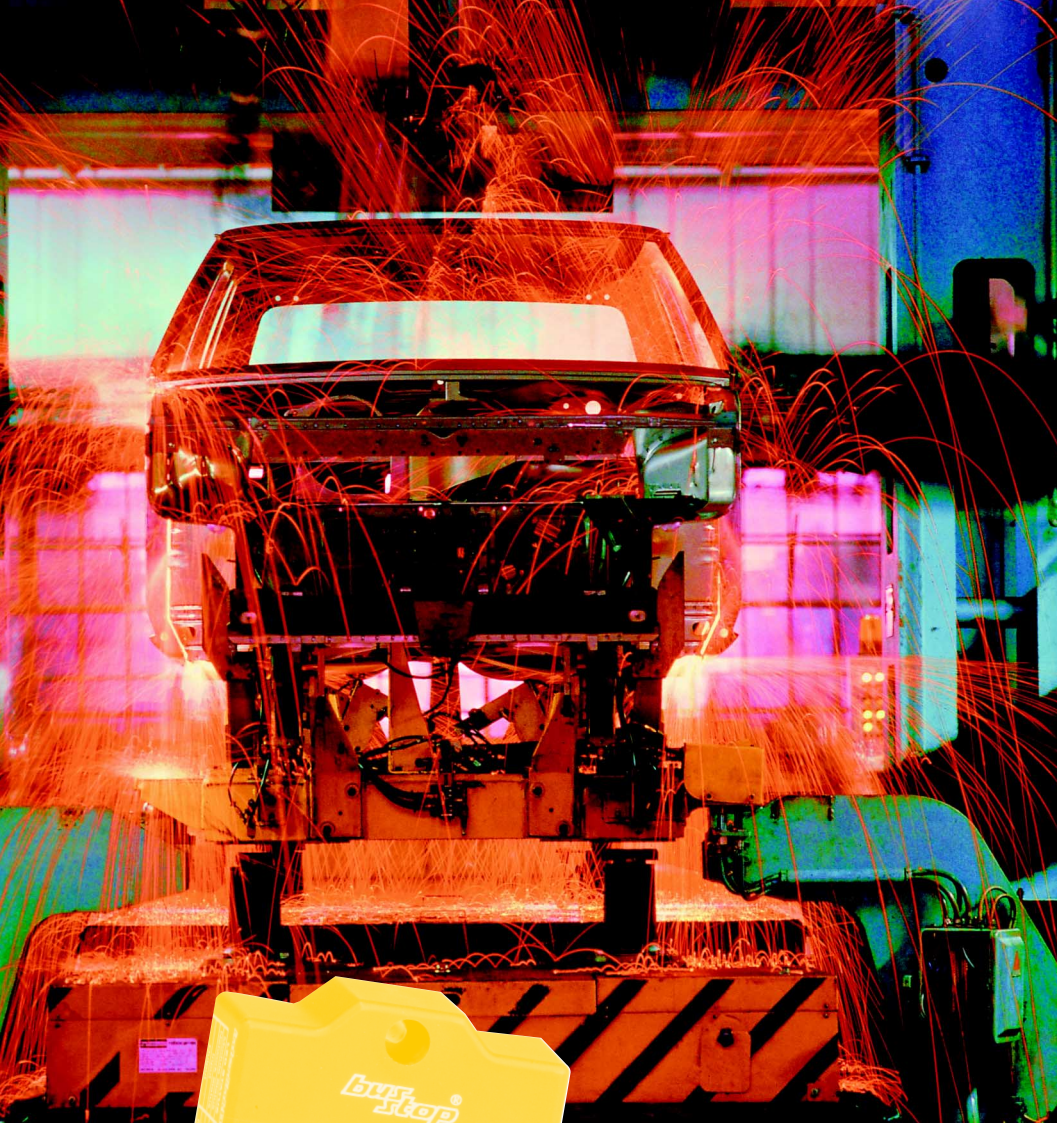


TURCK

DeviceNet™

**FIELDBUS
COMPONENTS**



**bus
stop®**
Your fieldbus connection

F 105/03

DeviceNet™ Stations and Connection Products



Components

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	Page number	Number of inputs	Inputs per connector	Compatible with npn/pnp sensor	Short-circuit protection	Input connector wiring	Open-circuit detection	Number of outputs	Outputs per connector	Maximum output load	Output connector wiring	Bus power or auxiliary power	Short-circuit protection	Open-circuit detection
Advanced I/O modules:														
FDNL-L0800-T	18	8	1	nnp/pnp	i	L	i	–	–	–	–	–	–	–
FDNL-L1600-T	18	8 x 2	2	nnp/pnp	i	2L	i	–	–	–	–	–	–	–
FDNL-CPG88-T	19	8	1	pnp	i	C	i	8	1	0.5 A	C	bus	i	–
FDNP-CPG88-TT	19	8	1	pnp	i	C	i	8	1	0.5 A	C	aux	i	–
FDNP-L0404G-TT	20	4	1	nnp/pnp	i	L	i	4	1	0.5 A	G	aux	i	i
FDNP-L0808G-TT	20	4 x 2	2	nnp/pnp	i	2L	i	4 x 2	2	0.5 A	2G	aux	i	–
FDNP-P1204G-TT	21	6 x 2	2	pnp	i	2P	i	2 x 2	2	0.5 A	2G	aux	i	i
FDNP-P0808H-TT	21	4 x 2	2	pnp	i	2P	i	4 x 2	2	2 A	2H	aux	i	–
FDNP-L0808H-TT	22	4 x 2	2	nnp/pnp	i	2L	i	4 x 2	2	2 A	2H	aux	i	–
FDNQ-S0400-T	22	4	1	pnp	g	S	–	–	–	–	–	–	–	–
FDNQ-S0800-T	23	4 x 2	2	pnp	g	2S	–	–	–	–	–	–	–	–
FDNQ-CSG44-T	23	4	1	pnp	g	C	–	4	1	0.5 A	C	bus	i	–
FDNQ-S0404G-T	24	2 x 2	2	pnp	g	2S	–	2 x 2	1	0.5 A	2G	bus	i	–
FDNQ-XSG08-T	24	4 x 2	2	pnp	g	2X	–	4 x 2	2	0.5 A	2X	bus	i	–
FDNL-S0800-T	25	8	1	pnp	g	S	–	–	–	–	–	–	–	–
FDNL-N0800-T	25	8	1	nnp	g	N	–	–	–	–	–	–	–	–
FDNL-S1600-T	26	8 x 2	2	pnp	g	2S	–	–	–	–	–	–	–	–
FDNL-N1600-T	26	8 x 2	2	nnp	g	2N	–	–	–	–	–	–	–	–
FDNL-CSG88-T	27	8	1	pnp	g	C	–	8	1	0.5 A	C	bus	i	–
FDNP-S0404G-TT	27	4	1	pnp	g	S	–	4	1	0.5 A	G	aux	i	–
FDNP-S0808G-TT	28	4 x 2	2	pnp	g	2S	–	4 x 2	2	0.5 A	2G	aux	i	–
FDNP-XSG16-TT	28	8 x 2	2	pnp	g	2X	–	8 x 2	2	0.5 A	2X	aux	i	–
FDNP-S0008G-TT	29	–	–	–	–	–	–	8	1	0.5 A	G	aux	i	–
FDNP-S0008H-TT	29	–	–	–	–	–	–	8	1	1.4 A	H	aux	i	–
CDN-IM4-0046	37	4	1	nnp/pnp	i	L	i	–	–	–	–	–	–	–
CDN-IM8-0024	37	8	1	nnp/pnp	i	L	i	–	–	–	–	–	–	–
CDN-IM8-0039	38	8	1	nnp/pnp	i	L	i	–	–	–	–	–	–	–
CDN-IM8-0043	38	8	1	nnp/pnp	i	2L	i	–	–	–	–	–	–	–
CDN-IM16-0053	39	8 x 2	2	nnp/pnp	i	2L	i	–	–	–	–	–	–	–
CDN-IOM22-0032	39	1 x 2	2	nnp/pnp	i	2L	i	2	1	1 A	H	aux	i	i
CDN-IOM42-0048	40	2 x 2	2	nnp/pnp	i	2L	i	2	1	2 A	H	aux	i	i
CDN-IOM44-0041	40	4	1	nnp/pnp	i	L	i	4	1	2 A	H	aux	i	i
CDN-IOM44-0045	41	4	1	nnp/pnp	i	L	i	4	1	2 A	H	aux	i	i
CDN-OM8-0026	41	–	–	–	–	–	–	8	1	1 A	H	aux	i	i
CDN-OM8-0042	42	–	–	–	–	–	–	8	1	1 A	H	aux	i	i
BD2DT1EP0	45	1	1	pnp	i	P	–	–	–	–	–	–	–	–
BD2DT1EX0	45	1 x 2	2	pnp	g	PBD	–	–	–	–	–	–	–	–
BD2DT2EP0	46	2	1	pnp	g	P	–	–	–	–	–	–	–	–
BD2DT2EX0	46	2 x 2	2	pnp	g	PBD	–	–	–	–	–	–	–	–
BD2DT1EP1EU	47	1	1	pnp	i	P	–	1	1	150 mA	G	bus	i	–
BD2DT1EX1EU	47	1 x 2	2	pnp	g	PBD	–	1	1	150 mA	G	bus	i	–
BD2DT2EU	48	–	–	–	–	–	–	2	1	150 mA	G	bus	i	–
BD8D4EP0	48	4	1	pnp	g	P	–	–	–	–	–	–	–	–
BD8D4EX0	49	4 x 2	2	pnp	g	PBD	–	–	–	–	–	–	–	–
BD8D8EP0	49	8	1	pnp	g	P	–	–	–	–	–	–	–	–
BD8D8EX0	50	8 x 2	2	pnp	g	PBD	–	–	–	–	–	–	–	–
BD8D2EP2ET	50	2	1	pnp	g	P	–	2	1	2 A	H	aux	i	–
BD8D2EX2ET	51	2 x 2	2	pnp	g	PBD	–	2	1	2 A	H	aux	i	–
BD8D4EP4ET	51	4	1	pnp	g	P	–	4	1	2 A	H	aux	i	–
BD8D4EX4ET	52	4 x 2	2	pnp	g	PBD	–	4	1	2 A	H	aux	i	–

i = individual, g = group, – = not available /the codes for input and output connector wiring are explained on pages 54...56.

A Worldwide Fieldbus Solution

Freedom to Make the Best Fieldbus Choice

When you work with TURCK, you are not linked to a single fieldbus technology. You have freedom of choice from a supplier who will allow you to choose from the leading bus products that best match your application and desired bus benefits.

The TURCK Catalogue

busstop® is the trade name that covers the industry's most complete and industrially hardened line of device-level stations, junctions and cabling products. Robust *busstop*® stations are high quality on-the-machine and at-the-process nodes which are designed to be installed in the worst environments while delivering maximum performance within the design parameters of the particular bus.

busstop® cables and cordsets for data and other bus-specific applications come in a variety of different connectors, cable grades and individual bus standards. These cabling products are the electrical designer's choice for secure and trouble-free communication. The gold plated pin-and-sleeve connector will transmit the lowest level data signal or carry enough power to actuate banks of solenoids.

Device-level Buses and Fieldbuses

A device-level bus connects directly to a device such as a sensor or actuator; there are no other buses between the device-level bus and the device. Only a few of the buses are strictly device-level buses. They are AS-Interface®, Seriplex, and *sensoplex*®2. These strictly device-level buses are fast and have limited data bits per node, but have minimal overhead in their messages.

A fieldbus is something more. It could be a device-level bus but it could also have a device-level bus attached to it through a gateway or bridge. Another definition of a fieldbus is that devices on the bus are complex or „smart“, while the products on the device-level buses are simple or „dumb“. Although this is a good black-and-white definition, it is full of holes when analogue or digital sensors are considered. Most digital sensors are actually analogue sensors with fixed set points; this makes the digital sensor more complex than the analogue sensor.

The buses that could qualify in some or all scenarios as fieldbuses are DeviceNet™, Smart Distributed System, PROFIBUS-DP, PA & FMS, FOUNDATION fieldbus H1 & H2, Interbus-S, Beckhoff I/O Light Bus, Sercos, Modbus+, ControlNet, GE Genius I/O and industrial versions of ARCnet and Ethernet. All are legitimate fieldbuses and vary in some form or another.

InterlinkBT – A BANNER-TURCK Company for Bus Products

InterlinkBT was founded by the companies **TURCK** und **BANNER** and combines the experience and know-how of these two pioneers in the field of industrial automation, resulting in one of the most complete and versatile lines of bus products. The range of products comprises stations, junctions and connection products for all customary industrial fieldbus systems.

InterlinkBT is the distributor for the American market.

A Fieldbus Example

The illustration below is a simple fieldbus example but it does have many of the components of an actual application. The host may be a PLC or PC.

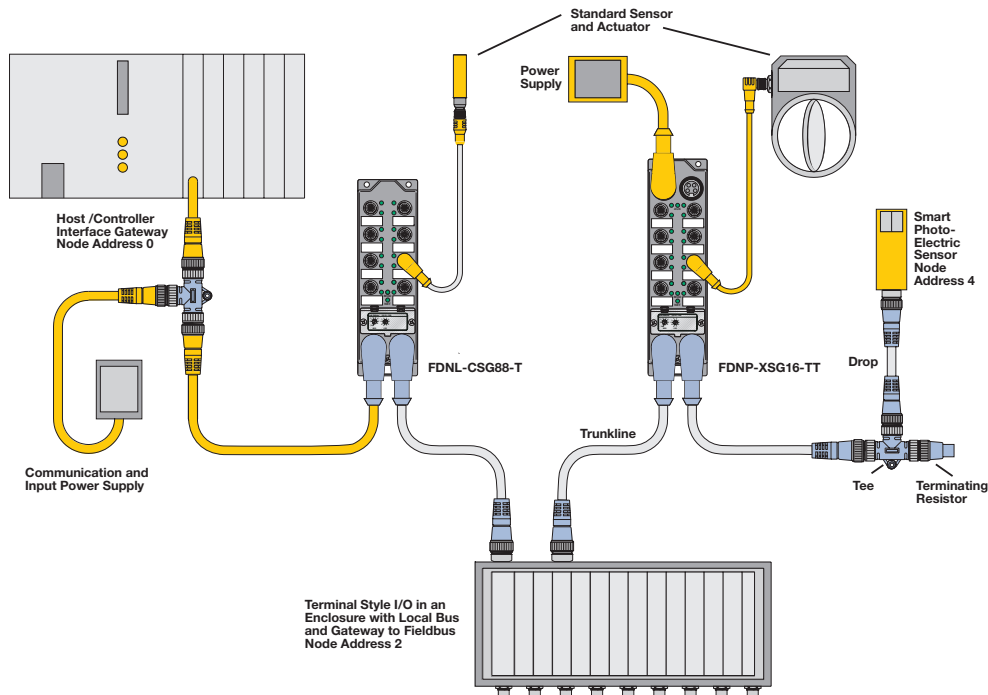


Fig. 1

The interface gateway, sometimes called a scanner module, may be a separate card or be built into the host. This card acts as the network manager and as a gateway to the bus used by the host. As a network manager the card must be able to manage reporting of information by the nodes and in some way organize the data to deliver it to the host in a fashion the host will understand. In simple buses, the network management function is just a standard master-to-slave and the organizing of the data for the host is simple mapping. By default the address of this card is often "0"; even when it is not zero many programmers set it to zero out of convention.

Next, power is required to run at least the transmitting and receiving components in each node on the network. Often the same power is used to power the inputs as well as the "smart" chipsets that handle communication. A plug-and-play tee cleans up some of the interconnect wiring to the power supply, making it easier to replace.

The first field node in this example has eight input channels. Although several different types of inputs are possible, the most common on today's buses are 24 VDC 2- and 3-wire. This eight-input station is shown connected to a standard sensor. Another node may be a terminal style node where individual slices of I/O are mounted on a DIN rail and connected to a bus coupler. This bus coupler is in essence a gateway from the local bus to the higher level bus. Most examples of this type of I/O today are IP20 or open-style construction and must be mounted in an enclosure. When done right, a node with small granularity (two or four channels per slice) offers maximum flexibility. Advanced terminal I/O systems such as Beckhoff Terminal II/O include many types of digital and analogue I/O, as well as serial, high-speed and motion control modules. Simple applications or even complex applications such as test stands can be done with these advanced terminal I/O systems.

The next node, address 3, is an output station. It is connected to another power supply. This power is often used to drive solenoids and other electromechanical devices. By separating this power from the busline the potential for noise induced in the bus signals is greatly reduced. The other advantage is that most smart nodes can recognize a short in an electromechanical device, and report the problem back to the host. This could not occur if the short were also dragging down the power to the smart device.

Until now all of the communication has gone on through the main bus cable, called a trunkline. The next item after address 3 is a tee, and from it extends a branch. In some bus nomenclature this is called a drop or spur. Some high-speed buses cannot branch beyond a few centimeters without some active device to either condition or repeat the signal. In Figure 1 this branch leads to a smart photoelectric sensor with all of the communication hardware built into the sensor. The sensor is node address 4 and is specific to the bus protocol.

The last part on this network is the terminating resistor. In some buses it is a simple resistor connected to the two data lines. The resistor conditions the signal on the rest of the network by expending energy when the signal goes from an energized state to a de-energized state.

Serial Data Communication

Serial data transmission is a conventional method of industrial data transfer. It is used to program the control system via a PC or programming device. The signal mode on both lines, defined as „ON – OFF“ or „1 – 0“ or „HIGH – LOW“, dates back to telegraphing technology, but today the speed of transmission is some million times faster.

Some terms used in the context of serial data transfer are:

Serial data transmission	– transmission of information which is divided into parts and transferred consecutively
Bit	– one part of the information, either „1“ or „0“
Byte	– 8 bits
Word	– 2 bytes

Signal

The signals that represent the bits are either electrical oscillations or pulses. Pulses are digital square wave signals and oscillations are modulated signals. The digital signal has the advantage of cost and the modulated signal is better over long distances, especially if the transmission lines are subject to electrical noise.

A simple modulated signal uses two frequencies to represent the “High - Low” bit states.

Common digital signals have two states - “ON or “OFF”. One is binary logic state. Here the “High” may mean “ON” but the “Low” is either “OFF” or no signal (nothing is being sent). Two meanings for the low state is obviously a problem, so a certain number of “High” bits must be sent to warn a receiver that a message is coming and a certain number of “High” bits are needed to end the message. In between, all the “Lows” are then considered “OFF”, not an absent signal.

Terms used to describe the signals and signal transmission are:

Bit encoding	– data bits („0“ - and „1“) are encoded within a defined time pattern
FSK – Frequency Shift Keying	– data bits are transferred via two frequencies ($0 = f_1$ and $1 = f_2$)
Manchester	– a common bit encoding method for digital signals
EIA RS485	– a standard which describes signal generators, receivers and a combination of both (transceivers). It also describes the electrical values of the signal. The cable and the signal contents are not defined.
Carrier	– the bit-encoded signal can be sent on an AC or DC carrier. The advantage of using such a carrier is that both data and power can be transferred via a 2-wire cable. Another benefit is the possibility of transfer over long distances without distortion
NRZ – Non Return to Zero	– an encoding method of differential buses such as RS485 and CAN.

Protocol

All bits need to be organised to have a meaning. A specialised program is implemented in the transmitter and receiver units to carry out the required decoding. A single bit may sometimes have a defined meaning, but usually a group of bits is needed to understand the contents of a telegram.

Start of message	– a certain number of high bits which indicate the start of a message or a telegram; consecutive bits enable the receiver to adjust to the telegram.
Address	– a unique connection point on the bus. It allows identification of the transmitter and receiver. Depending on the type of protocol, the address of the transmitter and/or receiver may be contained in the telegram.
Check sum	– with the help of defined algorithms the transmitter computes a check sum which is transferred to the receiver as part of the telegram. After receipt of the telegram, the receiver also performs the check sum calculation according to the same algorithm. The results are then compared: if they are not identical, the received data are rejected and usually a new telegram request is generated (depending on the type of bus).
End of message	– this lets other occupants of the bus know the transmission is over and other messages can be sent.

Occupants on the Bus

When analysing the different kinds of buses, it is possible to distinguish between two basic categories: active and passive components. Active components either generate a signal or receive a signal or provide both possibilities. Passive components are cables, junctions, tee-pieces etc.

Active components:

Node	– an „addressable“ device on the bus line
Bus station or bus module	– an active component - but not a master or a gateway
Gateway	– a special node connecting two different buses electrically and logically.
Amplifier	– a product that amplifies (strengthens) a signal in real time, precisely copying the old signal. This product links two portions of the same bus together when the signal is weakened by electrical losses as it travels down a wire. An amplifier is used when the signal is weak but not distorted.
Repeater	– a product that strengthens a signal, while adding typically a half bit wait state and producing a fresh signal without distortions. It also links two portions of the same bus together. A repeater is used when a signal is weak or distorted.
Bridge	– there are two types of bridges, called either „intelligent“ or „dumb“. A „dumb“ bridge connects two segments (portions) of the same bus type, but with different transmission speeds. An „intelligent“ bridge also connects two segments, but in addition to this it transfers only certain pre-programmed telegrams with special addresses from one segment to the next.
Router	– a higher level bridge which is preferably used in larger networks.
Master	– PC card or PLC card for control of the bus and for data mapping. A master typically consists of hardware and software.
Scanner module	– DeviceNet™ specification for a gateway between the fieldbus and a PLC or PC.
Interface card, interface module	– generic term for the gateway, either in a PLC or PRC that interfaces to a device-level bus.
Spanner module	– Turck's designation for a double-sided slave. This device has bi-directional data from one control area segment to another in a free form format.

Passive components:

Tee	– a T-shaped component which enables creation of a drop line from the main bus branch.
Passive hub	– the same as a tee but with the capacity of creating more branches
Terminating resistor	– a resistor which terminates the bus on both cable ends and thus avoids reflexions and disturbances.
Bus cable	– usually a shielded 2-wire cable. Electrical features such as resistance, capacitance etc. may vary depending on the type of the bus. There are various bus cables for use in different environments, e.g. oil and chemical resistant versions, trailing cables etc.
Trunk line	– the main bus line
Drop line	– a bus branch
Power tap	– a special tee which provides power to the network

Bus Topology

Topology is the term used to describe the geometrical structure of the bus. It describes how the bus line connects the individual devices:

Typical versions are:

- | | | |
|-------------|---|---|
| Bus | – | the most simple and line-shaped topology is called a bus |
| Tree | – | a simple bus can have branches and drops which quite often may be only a few centimetres long. These may also have branches so that a tree-like structure is created. |
| Star | – | a further cabling topology is the star. This method is mainly used in computer networks. The long individual bus lines are disadvantageous. |
| Ring | – | the ring is a topology which quite often is not immediately identified as such because the cables may be routed back in the same branch. When using this structure, each node performs like a repeater. The node takes its data from the telegram and adds new information. Specific hardware within the node enables distribution of the telegram. |

Bus Types

There are several different bus types utilizing the following technologies:

Media Access - this is the “right-of-way” for talking on the bus.

There are 3 main types:

- **Master Control** - one super node controls all transmission, sequence and time. Remaining nodes do not talk unless told to by the master.
- **Token Passing** - this is a message shift method that is incremented in a manner that allows each node a chance to talk each cycle.
- **CSMA** - an access method allowing each node to speak, provided that it has something to say and no other node is on the line.

Message Collision Avoidance - when two people talk simultaneously there is a verbal collision. A few humans can talk and listen to some one else at the same time but nodes can't. Both token passing and master control do not have that problem. A field node can only access the bus when it is its turn to talk or when it has been told to talk. The CSMA type buses do have this problem. Sometimes they are operated as a master-to-slave, so the problem goes away. When operating in the native CSMA access method, two nodes could start talking simultaneously.

Two major ways have been developed to handle the potential collision:

- CD – collision detection - all senders must also be receivers. If two nodes start talking at the same time, they will hear a collision. Both stop talking, wait a random length of time, then look for a clear line to start talking again.
- BA – bitwise arbitration - all senders must also be receivers. The busline must be of a specific length or less so that all nodes hear the bit at the same time (actually the first node and the last node can be approximately 1/6 bit apart).

Messaging – there are three major types in the run mode, but many more during startup and initialization:

- Solicited** – a response to another node or a response when it is the node's predetermined time to speak (token passing).
- Unsolicited** – a response to a change-of-state at that node.
- Explicit** – this is a command order. It may command an output be turned “On” or “Off”. It may command any node to report its diagnostic status or identify itself in full detail.

One last distinction must be made for the output nodes. How do they get the information so they know what to do? There is an overlap with the terms used for messaging, but there is also a difference.

Explicit Message – this is a command from another node.

Limited Peer-to-Peer – exclusive one-to-one relationship between the input node and the output node. This could also be called exclusive peer-to-peer.

Unlimited Peer-to-Peer – similar to limited peer-to-peer, but the output node may get information from several input nodes.

DeviceNet™ Housings

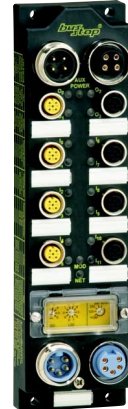
Version 1:



Version 2:



Version 3:



Version 4:



Version 5:



Version 6:



Version 7:



Version 8:



pico net

- Stand-alone modules

(for more information about *piconet*® see pages 98-101)

Version 9:



Version 10:



Please note: Detailed information and technical specifications on the individual module types can be downloaded from www.interlinkbt.com.

TURCK DeviceNet™ modules are available in ten different housing types. All modules have IP67 rating.

Version 1 - Type FDN...

Version 1 is made of glass-fibre reinforced plastic and is fully potted. It is equipped with eight M12 x 1 connectors for the inputs and outputs. The bus is connected via two 7/8" connectors. There are premoulded DeviceNet™ cables available (bus "in" and bus "out") to exclude wiring errors. The modules are powered via the bus. Addresses and the communication rate are set via software or coded rotary switches, which are located in good view under a transparent cover. The communication rate is detected automatically.

Version 2 - Type FDN...

The housing design and connection of inputs and outputs are identical to version one, but the bus is connected via a single 7/8" connector. The bus tee RSM-2RKM57-KF can be used for the bus connection. Addresses are set via software or coded rotary switches, which are located in good view under a transparent cover. The communication rate is detected automatically.

Version 3 - Type FDN...

Version 3 is made of glass-fibre reinforced plastic and is fully potted. It is equipped with eight M12 x 1 connectors for the inputs and outputs. The bus is connected via two 7/8" connectors. There are premoulded DeviceNet™ cables available (bus "in" and bus "out") to exclude wiring errors. The modules are powered via the bus. Auxiliary power is separately connected via two 7/8" connectors. Addresses and the communication rate are set via software or coded rotary switches, which are located in good view under a transparent cover. The communication rate is detected automatically.

Version 4 - Type FDN...

The housing design and connection of inputs and outputs are identical to version three, but the bus and auxiliary power are connected separately via a single 7/8" connector. The bus tee RSM-2RKM57-KF and the power tee RSM-2RKM40-KF can be used. Addresses are set via software or coded rotary switches, which are located in good view under a transparent cover. The communication rate is detected automatically.

Version 5 - FDN...

Version 5 is made of glass-fibre reinforced plastic and is fully potted. It is equipped with four M12 x 1 connectors for the inputs and outputs. The bus is connected via two 7/8" connectors. There are premoulded DeviceNet™ cables available (bus "in" and bus "out") to exclude wiring errors. The modules are powered via the bus. Addresses and the communication rate are set via software or coded rotary switches, which are located in good view under a transparent cover. The communication rate is detected automatically.

Version 6 -Type CDN...

Version 6 is made of die-cast aluminium and is fully potted. It is equipped with four or eight M12 x 1 connectors for the inputs and outputs. The bus is connected via two 7/8" connectors. There are premoulded DeviceNet™ cables available (bus "in" and bus "out") to exclude wiring errors. The modules are powered via the bus. Addresses and the communication rate are set via software or DIP-switches, which are located under the module's cover.

Version 7 - Type CDN...

Version 7 is made of die-cast aluminium and is fully potted. It is equipped with four or eight M12 x 1 connectors for the inputs and outputs. The bus is connected via two 7/8" connectors. There are premoulded DeviceNet™ cables available (bus "in" and bus "out") to exclude wiring errors. The modules are powered via the bus. Auxiliary power is separately connected via two 7/8" connectors. Addresses and the communication rate are set via software or DIP-switches which are located under the module's cover.

Version 8 - Type CDN...

Version 8 is made of glass-fibre reinforced polyethylene. It is equipped with eight M12 x 1 connectors for the inputs and outputs. The bus is connected via two 7/8" connectors. The bus tee RSM-2RKM57-KF can be used. There are premoulded DeviceNet™ cables available (bus "in" and bus "out") to exclude wiring errors. The modules are powered via the bus. Auxiliary power is separately connected via two 7/8" connectors. Addresses and the communication rate are set via software or DIP switches located under the module's cover.

Version 9 - Type BD8...

Version 9 is made of high-density Noryl. It is equipped with four or eight M12 x 1 connectors for the inputs and outputs. The bus is connected via one 7/8" connector. The bus tee RSM-2RKM57-KF can be used. There are premoulded DeviceNet™ cables available (bus "in" and bus "out") to exclude wiring errors. The modules are powered via the bus. The versions with 2 A outputs require auxiliary power which is separately connected via two 7/8" connectors. The power tee type RSM-2RKM40-KF can be used. Addresses and the communication rate are set via software.

Version 10 - Type BD2...

Version 10 is made of high-density Noryl. It is equipped with one or two M12 x 1 connectors for the inputs and outputs. The bus is connected via two 7/8" connectors. There are premoulded DeviceNet™ cables available (bus "in" and bus "out") to exclude wiring errors. The modules are powered via the bus. Addresses and the communication rate are set via software.

System Description

DeviceNet™ is a low-cost communication link to connect 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 and eliminate hard-wiring. The direct connectivity provides improved communication between devices as well as important device-level diagnostics not easily accessible or available through hard-wired I/O interfaces.

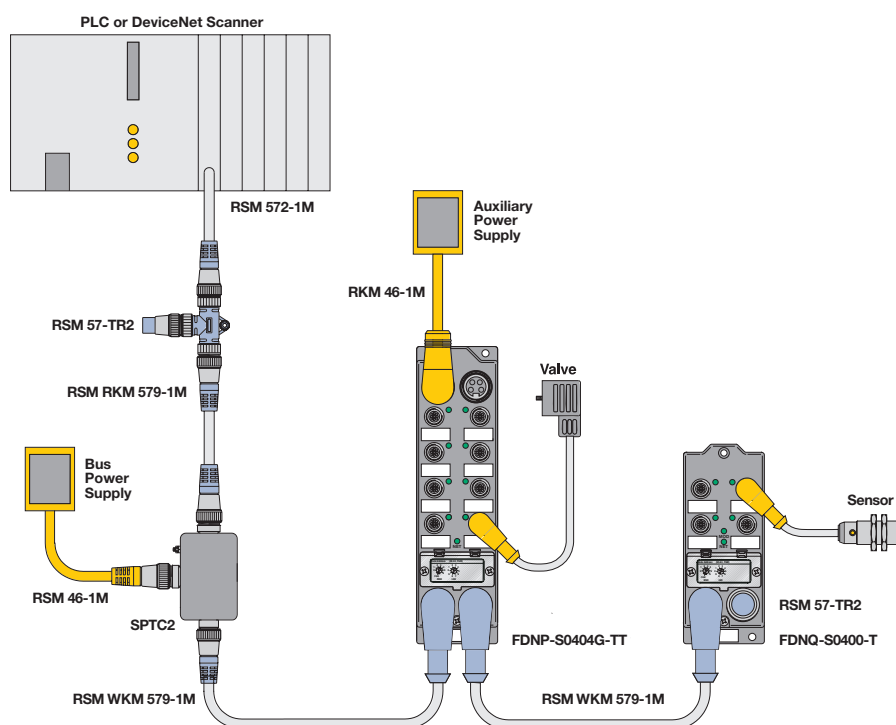
DeviceNet™ is based on a broadcast-oriented communications architecture - the Controller Area Network (CAN). CAN uses the CSMA/BA bus arbitration method. CSMA/BA assures that the highest priority message always gets transmitted. The DeviceNet™ protocol further defines message priorities such that I/O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

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

DeviceNet™ allows Peer-to-Peer data exchange (in which any DeviceNet™ product can produce and consume messages) and Master/Slave operation (called the Predefined Master/Slave Connection Set.) TURCK stations support the slave capabilities of the predefined master/slave connection set. The stations do not support peer-to-peer data exchange.

Electronic data sheets, or EDS files, are specifically formatted ASCII files that contain detailed information about the device, including I/O data size and the device's configurable parameters. The information in an EDS guides a user through the steps necessary to configure a device. EDS files are available on disk or from the InterlinkBT website (www.interlinkbt.com).

System Configuration – DeviceNet™



Basic Parts List

A DeviceNet™ system like the one shown on the previous page consists of the following parts:

Nodes		Physical Media	
(1) FDNL-L1600-T	input/output station	(1) SPTC2	bus power tap
(1) FDNP-L0808G-TT	input station	(2) RSM-2RKM57	bus tee
		(2) RSM 57-TR2	terminator
		(1) RSM-RKM579-1M	bus cordset
		(2) RSM 578-1M	drop cordset
		(1) RKM 46-1M	auxiliary power cable
		(1) RSM 46-1M	bus power cable

PLC / Controller Connectivity

TURCK stations require a network master (also called a scanner) to interface the stations to the host controller. Here is a partial list of PLCs and PC interface products that support DeviceNet™:

DeviceNet™ compatible PLCs	DeviceNet™ compatible PC interfaces
– Allen-Bradley (MicroLogix, SLC and PLC series)	– Allen-Bradley (PCI)
– GE Fanuc (90/30, 90/70)	– Cutler-Hammer (ISA, PCMCIA)
– Omron (CV/CVM1, C200HS/X/G/E series)	– National Instruments (ISA, PCI, PCMCIA)
– Siemens (S5, TI505)	– Softing (ISA, PCMCIA)
– Toshiba (T2E, T3)	– SST (ISA, PC/104, PCMCIA, VME)
	– Synergetic Micro Systems (ISA, PC/104)

Cordsets

TURCK offers a complete line of moulded DeviceNet™ cordsets to facilitate network installation, resulting in faster start-up and reduced 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 and a shielded and twisted power pair for the 24 VDC bus power, with an additional outer shield.

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

The two 24 VDC lines provide bus power to the stations' communication electronics and input circuits.

All connections of the bus cable to the stations are achieved with 5-pin 7/8" connectors.

Stations with output circuits for DC actuators require 24 VDC auxiliary power that is fed through a 4-pin 7/8" connection. All input and output connections are accomplished with industry standard M12 x 1 connectors.

TURCK cordsets for the DeviceNet™ system are available in standard lengths. Contact factory for custom lengths and configurations.

CAUTION: Stations, junctions and bus cables should not be mounted where there is risk of damage from moving machine parts.

A short-circuit or wire-break on the bus cable would result in a breakdown of the communication network.

Diagnostics

A key benefit of TURCK stations is increased diagnostics when using standard proximity or photoelectric sensors and digital actuators. TURCK stations also serve as a buffer between I/O devices and the DeviceNet™ bus by detecting short-circuits without disrupting DeviceNet™ communication.

Each I/O point on the station provides "state" and "status" data. State represents the real world value of the I/O device - for example, the sensor is on, or the actuator is off. Status data indicates short-circuits in the I/O device or the wiring between the device and the station. Some models also use the status to indicate open circuits. The state and status data are transferred to the DeviceNet™ scanner where they are available for fault handling in the control program.

In addition, each input and output has a multicoloured LED to indicate its state and status. These LEDs pinpoint I/O problems quickly. There is a "Module Status LED" that indicates the internal functionality of the station and a "Network Status LED" that indicates the station's communication on the DeviceNet™ network. A detailed description of module status and network status LED indications is shown on page 15.

Addressing

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

Changes to the address settings take effect when the station power is cycled or when the station receives a software reset. Care must be taken that the same address is not 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 the "Critical Link Failure" state and the Network Status LED will illuminate red.

Communication Rate / Cycle Time

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

The complete cycle time of a DeviceNet™ system is affected by several factors:

- the number of nodes being scanned
- the amount of data produced and consumed by the nodes
- type of I/O messaging (change of state, strobe, poll)
- network communication rate
- device timeout and explicit messaging traffic
- the cycle time of the control program

All of these factors must be considered when calculating the cycle time of a particular network.

Electronic Data Sheets (EDS) Files

Electronic Data Sheets, or EDS files, are specifically formatted ASCII files that contain detailed information about the device, including I/O data size and the device's configurable parameters. The information in an EDS guides a user through the steps necessary to configure a device. EDS files are available on the InterlinkBT website (www.interlinkbt.com).

Maximum Ratings

The DeviceNet™ bus uses a trunk and drop topology. The trunk is the main communication cable and requires a 121 Ω resistor at both ends of the cable. The length of the cable depends on the communication rate and the cable type. Drops are branches off the trunk and may be from 0 to 6 m (20 ft). The cumulative drop lengths are dependent on the communication rate. The table below shows the maximum ratings for a trunk using a thick, mid or thin trunk cable:

Communication rate (max.)	Thick cable length (max.)	Mid cable length (max.)	Thin cable length (max.)	Drop length (cumulative)	Drop length (max.)	Nodes
125 kbps	500 m (1640 ft)	300 m (984 ft)	100 m (328 ft)	6 m (20 ft)	156 m (512 ft)	64
250 kbps	250 m (820 ft)	250 m (820 ft)	100 m (328 ft)	6 m (20 ft)	78 m (256 ft)	64
500 kbps	100 m (328 ft)	100 m (328 ft)	100 m (328 ft)	6 m (20 ft)	39 m (128 ft)	64

LED Indications

Module Status LED

State	LED is	Indication
Power off	off	no bus power
Device operational	green	device is operating normally
Device in standby (Device needs commissioning)	flashing green	device needs commissioning due to configuration missing, incomplete, or incorrect
Minor fault	flashing red	recoverable fault
Unrecoverable fault	red	device cannot recover; it may need replacing
Device self-testing	flashing red-green	device is in self-test

Network Status LED and MOD/NET Status LED

State	LED is	Indication
Not powered / not on-line	off	- device is not on-line - device has not completed the Duplicate MAC ID test - device may not be powered
On-line, not connected	flashing green	device is on-line but is not allocated to a master
On-line, connected	green	device is allocated to a master and is operating normally
Connection time-out	flashing red	the I/O connection is in the time-out state
Critical link failure	red	device has detected an error that has rendered it incapable of network communication (Duplicate MAC ID or Bus-Off)
Device self-testing	flashing red-green	device is in self-test

Auxiliary Power LED

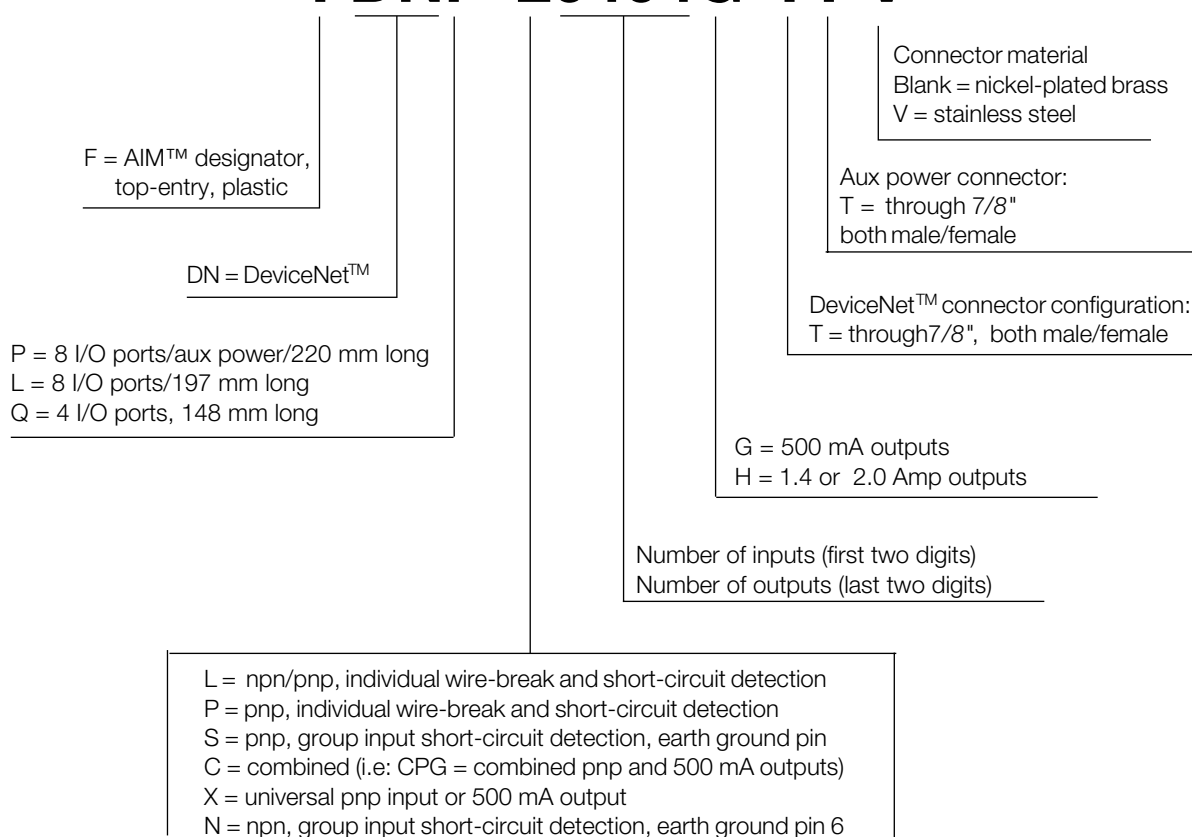
State	LED is	Indication
Power off	off	no auxiliary power
Normal operation	green	auxiliary power is present

Type codes – Advanced I/O Modules (AIM™)

The AIM™ type codes are designed to identify the features of each unit easily and quickly. Based on the alpha/numeric characters used, you can determine the size of the module, I/O type, number of I/O points and network and auxiliary connector type.

The model type code shown below will help you identify the meaning of each character.

FDNP-L0404G-TT-V



Following one sample type code and its specifications.

FDNP-L0404G-TT-V

This model is a DeviceNet™ AIM™ station with top-entry and a plastic housing. It has 8 I/O points, aux power and is 220 mm long. It has both npn and pnp with individual short-circuit and open-circuit detection. There are 4 inputs and 4 outputs, with each output supplying up to 500 mA. The connector configuration is through 7/8" connections, both male and female.

Advanced I/O Modules (AIM™) - Type FDN...

Striving for the “Cadillac” of the industrial bus network market, TURCK has developed a deluxe (LX) version of their multiport, connectorized DeviceNet™ stations. The improvements in board design and added features allow for a “flatter” housing and the handling of more applications.

The FDN...type AIM modules support all forms of DeviceNet™ messaging, including poll, strobe, cyclic, change-of-state (COS) and UCMM. Some stations even offer downloadable firmware, which allows you to install the latest DeviceNet™ specifications without having to replace stations.

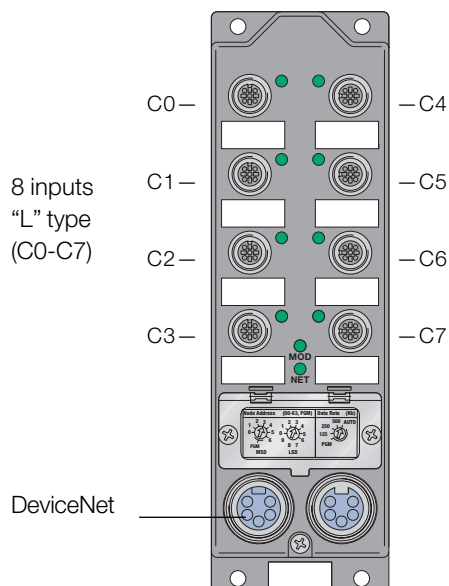
Enhanced diagnostics provide either individual or grouped open and short circuit detection, allowing for quick and easy recognition and resolution of automation problems. Stations are also available with 2 amp outputs for those applications requiring more power.

The rugged IP67 enclosures are fully connectorized and can be mounted directly on the machine. This saves you time and money from installing additional hardware to support the bus network. Three housing styles support over 20 different I/O configurations. FDN... type stations feature visible rotary switches for selection of the node address and communication rate, LED indications for I/O, module and network status, and labelling for quick identification of inputs and outputs.

Quick Selection Guide

Type code	Input parameters							Output parameters						
	Page number	Number of inputs	Inputs per connector	Compatible with npn/pnp sensor	Short-circuit protection	Connector wiring	Open-circuit detection	Number of outputs	Outputs per connector	Maximum output load	Connector wiring	Bus power or auxiliary power	Short-circuit protection	Open-circuit detection
Advanced I/O modules:														
LX Series														
Per-point diagnostics														
FDNL-L0800-T	18	8	1	nnp/pnp	i	L	i	–	–	–	–	–	–	–
FDNL-L1600-T	18	16	2	nnp/pnp	i	2L	i	–	–	–	–	–	–	–
FDNL-CPG88-T	19	8	1	pnp	i	C	i	8	1	0.5 A	C	bus	i	–
FDNP-CPG88-TT	19	8	1	pnp	i	C	i	8	1	0.5 A	C	aux	i	–
FDNP-L0404G-TT	20	4	1	nnp/pnp	i	L	i	4	1	0.5 A	G	aux	i	i
FDNP-L0808G-TT	20	8	2	nnp/pnp	i	2L	i	8	2	0.5 A	2G	aux	i	–
FDNP-P1204G-TT	21	12	2	pnp	i	2P	i	4	2	0.5 A	2G	aux	i	i
FDNP-P0808H-TT	21	8	2	pnp	i	2P	i	8	2	2 A	2H	aux	i	–
FDNP-L0808H-TT	22	8	2	nnp/pnp	i	2L	i	8	2	2 A	2H	aux	i	–
SE Series														
Group diagnostics														
FDNQ-S0400-T	22	4	1	pnp	g	S	–	–	–	–	–	–	–	–
FDNQ-S0800-T	23	8	2	pnp	g	2S	–	–	–	–	–	–	–	–
FDNQ-CSG44-T	23	4	1	pnp	g	C	–	4	1	0.5 A	C	bus	i	–
FDNQ-S0404G-T	24	4	2	pnp	g	S	–	4	1	0.5 A	G	bus	i	–
FDNQ-XSG08-T	24	8	2	pnp	g	2X	–	8	2	0.5 A	2X	bus	i	–
FDNL-S0800-T	25	8	1	pnp	g	S	–	–	–	–	–	–	–	–
FDNL-N0800-T	25	8	1	nnp	g	N	–	–	–	–	–	–	–	–
FDNL-S1600-T	26	16	2	pnp	g	2S	–	–	–	–	–	–	–	–
FDNL-N1600-T	26	16	2	nnp	g	2N	–	–	–	–	–	–	–	–
FDNL-CSG88-T	27	8	1	pnp	g	C	–	8	1	0.5 A	C	bus	i	–
FDNP-S0404G-TT	27	4	1	pnp	g	S	–	4	1	0.5 A	G	aux	i	–
FDNP-S0808G-TT	28	8	2	pnp	g	2S	–	8	2	0.5 A	2G	aux	i	–
FDNP-XSG16-TT	28	16	2	pnp	g	2X	–	16	2	0.5 A	2X	aux	i	–
FDNP-S0008G-TT	29	–	–	–	–	–	–	8	1	0.5 A	G	aux	i	–
FDNP-S0008H-TT	29	–	–	–	–	–	–	8	1	1.4 A	H	aux	i	–
i = individual, g = group – = not available														

FDNL-L0800-T, 8 npn/pnp inputs, per-point diagnostics

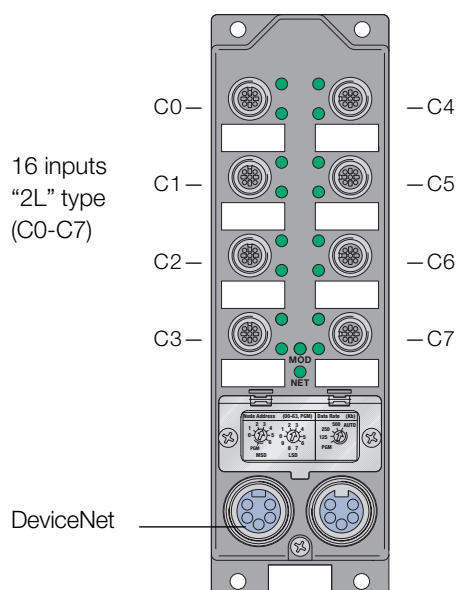


Item number/EDS file: F0075/I0075_xx.eds
Product code: 7/1201 (4B1 hex)
Ident-Nr. 66 035 35

Input Data	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	ISS-7	ISS-6	ISS-5	ISS-4	ISS-3	ISS-2	ISS-1	ISS-0
	2	IOS-7	IOS-6	IOS-5	IOS-4	IOS-3	IOS-2	IOS-1	IOS-0

Please refer to pages 30 and 31 for dimensions and specifications.

FDNL-L1600-T, 16 npn/pnp inputs, per-point diagnostics



Item number/EDS file: F0095/I0095_xx.eds
Product code: 7/1521(5F1 hex)
Ident-no. 66 023 35

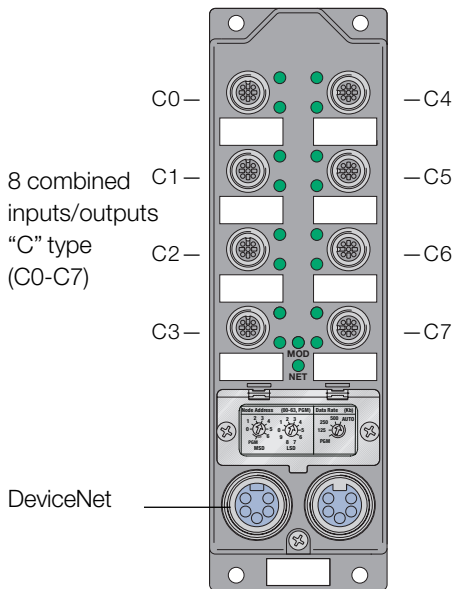
Input Data	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	I-15	I-14	I-13	I-12	I-11	I-10	I-09	I-08
	2	ISS-7	ISS-6	ISS-5	ISS-4	ISS-3	ISS-2	ISS-1	ISS-0
	3	ISS-15	ISS-14	ISS-13	ISS-12	ISS-11	ISS-10	ISS-9	ISS-8
	4	IOS-7	IOS-6	IOS-5	IOS-4	IOS-3	IOS-2	IOS-1	IOS-0
	5	IOS-15	IOS-14	IOS-13	IOS-12	IOS-11	IOS-10	IOS-9	IOS-8

Abbreviations

I = Input data (0 = OFF, 1 = ON)
ISS = Input short status (0 = working, 1 = fault)
IOS = Input open status (0 = working, 1 = fault)
IGS = Input group status (0 = working, 1 = fault)

O = Output data (0 = OFF, 1 = ON)
OS = Output status (0 = working, 1 = fault)
OGS = Output group status (0 = working, 1 = fault)
APS = Aux power status (0 = OFF, 1 = ON)

FDNL-CPG88-T, 8 combined pnp inputs and outputs, 0.5 A, per-point diagnostics

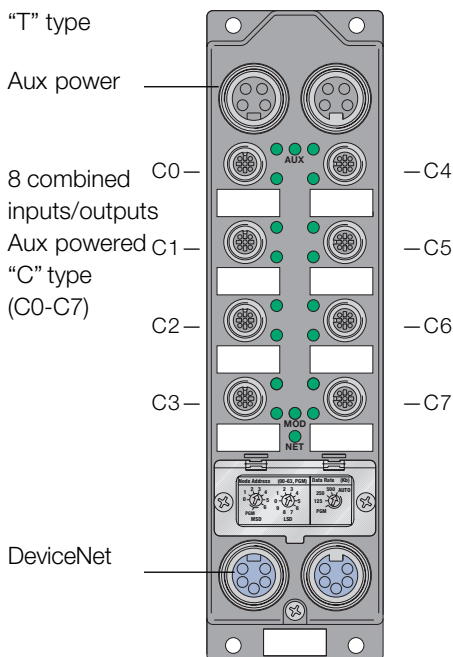


Item number/EDS file: F0083/I0083_xx.eds
Product code: 7/1329 (531 hex)
Ident-no. 66 033 33

Input Data	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	ISS-7	ISS-6	ISS-5	ISS-4	ISS-3	ISS-2	ISS-1	ISS-0
	2	IOS-7	IOS-6	IOS-5	IOS-4	IOS-3	IOS-2	IOS-1	IOS-0
	3	OS-7	OS-6	OS-5	OS-4	OS-3	OS-2	OS-1	OS-0
	4	–	APS	–	–	–	–	–	–
Output Data	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Please refer to pages 30 and 31 for dimensions and specifications.

FDNP-CPG88-TT, 8 combined pnp inputs and outputs, 0.5 A, per-point diagnostics



Item number/EDS file: F0098/I0098_xx.eds
Product code: 7/1569 (621 hex)
Ident-no. 66 033 24

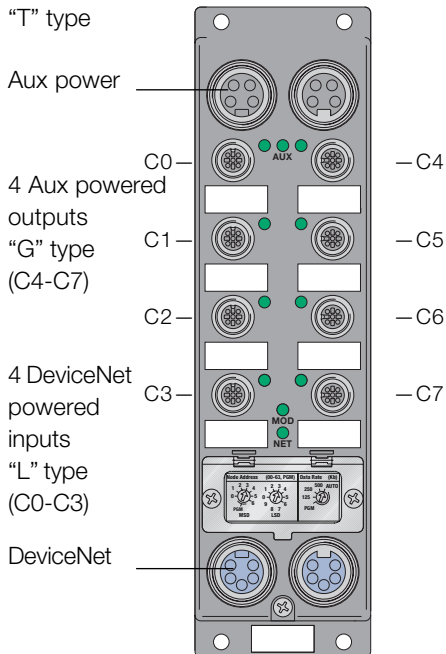
Input Data	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	ISS-7	ISS-6	ISS-5	ISS-4	ISS-3	ISS-2	ISS-1	ISS-0
	2	IOS-7	IOS-6	IOS-5	IOS-4	IOS-3	IOS-2	IOS-1	IOS-0
	3	OS-7	OS-6	OS-5	OS-4	OS-3	OS-2	OS-1	OS-0
	4	–	APS	–	–	–	–	–	–
Output Data	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Abbreviations

I = Input data (0 = OFF, 1 = ON)
ISS = Input short status (0 = working, 1 = fault)
IOS = Input open status (0 = working, 1 = fault)
IGS = Input group status (0 = working, 1 = fault)

O = Output data (0 = OFF, 1 = ON)
OS = Output status (0 = working, 1 = fault)
OGS = Output group status (0 = working, 1 = fault)
APS = Aux power status (0 = OFF, 1 = ON)

FDNP-L0404G-TT, 4 npn/pnp inputs and 4 outputs, 0.5 A, per-point diagnostics

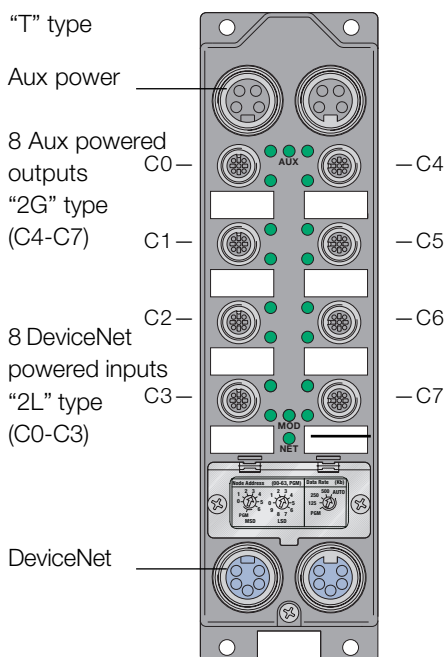


Item number/EDS file: F0072/I0072_xx.eds
Product code: 7/1153(481 hex)
Ident-no. 66 033 27

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	–	–	–	–	I-3	I-2	I-1	I-0
	1	IOS-3	IOS-2	IOS-1	IOS-0	ISS-3	ISS-2	ISS-1	ISS-0
	2	OOS-3	OOS-2	OOS-1	OOS-0	OSS-3	OSS-2	OSS-1	OSS-0
	3	–	APS	–	–	–	–	–	–
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Output Data	0	–	–	–	–	O-3	O-2	O-1	O-0

Please refer to pages 30 and 31 for dimensions and specifications.

FDNP-L0808G-TT, 8 npn/pnp inputs and 8 outputs, 0.5 A, per-point diagnostics



Item number/EDS file: F0069/I0069_xx.eds
Product code: 7/1105(451 hex)
Ident-no. 66 023 89

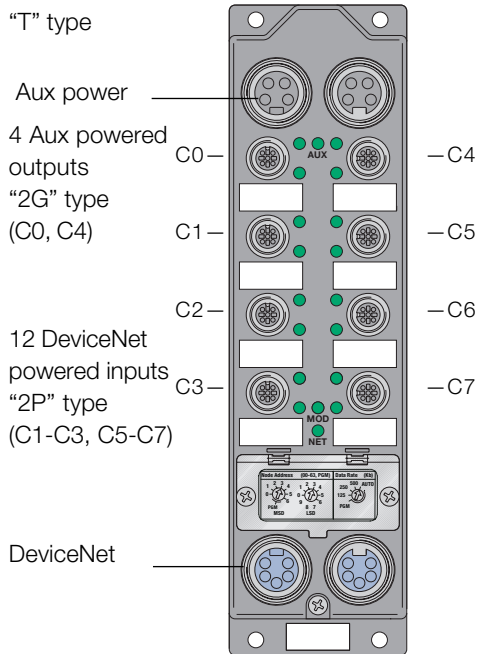
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	ISS-7	ISS-6	ISS-5	ISS-4	ISS-3	ISS-2	ISS-1	ISS-0
	2	IOS-7	IOS-6	IOS-5	IOS-4	IOS-3	IOS-2	IOS-1	IOS-0
	3	OS-7	OS-6	OS-5	OS-4	OS-3	OS-2	OS-1	OS-0
	4	–	APS	–	–	–	–	–	–
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Output Data	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Abbreviations

I = Input data (0 = OFF, 1 = ON)
ISS = Input short status (0 = working, 1 = fault)
IOS = Input open status (0 = working, 1 = fault)
IGS = Input group status (0 = working, 1 = fault)

O = Output data (0 = OFF, 1 = ON)
OS = Output status (0 = working, 1 = fault)
OGS = Output group status (0 = working, 1 = fault)
APS = Aux power status (0 = OFF, 1 = ON)

FDNP-P1204G-TT, 12 pnp inputs and 4 outputs, 0.5 A, per-point diagnostics

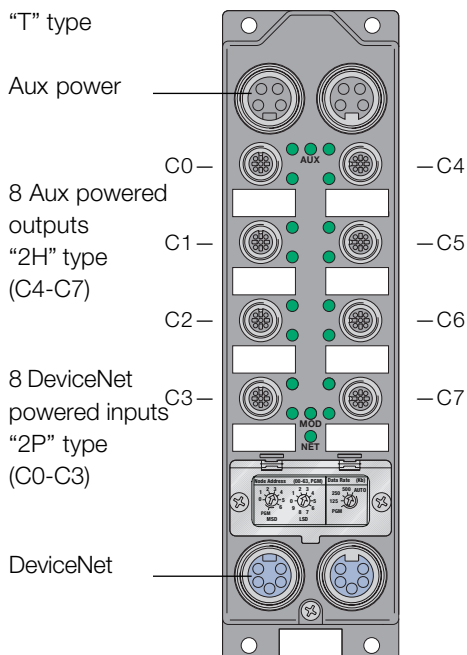


Item number/EDS file: F0062/I0062_xx.eds
Product code: 7/993 (3E1 hex)
Ident-no. 66 033 52

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	–	APS	–	–	I-11	I-10	I-9	I-8
	2	ISS-7	ISS-6	ISS-5	ISS-4	ISS-3	ISS-2	ISS-1	ISS-0
	3	OSS-4	OSS-2	OSS-1	OSS-0	ISS-11	ISS-10	ISS-9	ISS-8
	4	IOS-7	IOS-6	IOS-5	IOS-4	IOS-3	IOS-2	IOS-1	IOS-0
Output Data	5	OOS-3	OOS-2	OOS-1	OOS-0	IOS-11	IOS-10	IOS-9	IOS-8
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	0	–	–	–	–	O-3	O-2	O-1	O-0

Please refer to pages 30 and 31 for dimensions and specifications.

FDNP-P0808H-TT, 8 pnp inputs and 8 outputs, 2 A, per-point diagnostics



Item number/EDS file: F0112/I0112_xx.eds
Product code: 7/1793 (701 hex)
Ident-no. 66 033 29

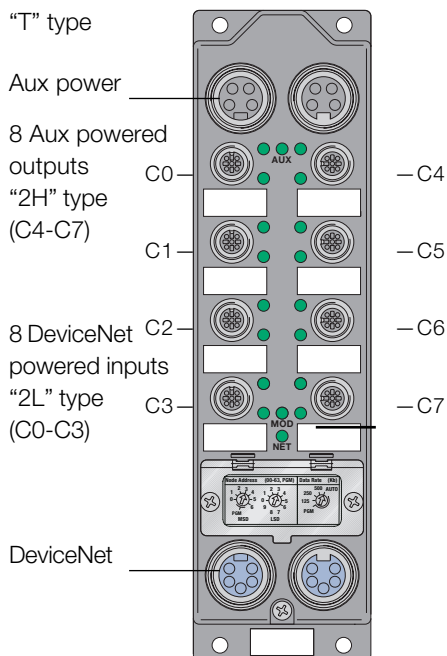
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	ISS-/	ISS-6	ISS-5	ISS-4	ISS-3	ISS-2	ISS-1	ISS-0
	2	IOS-/	IOS-6	IOS-5	IOS-4	IOS-3	IOS-2	IOS-1	IOS-0
	3	OS-7	OS-6	OS-5	OS-4	OS-3	OS-2	OS-1	OS-0
	4	–	APS	–	–	–	–	–	–
Output Data	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Abbreviations

I = Input data (0 = OFF, 1 = ON)
ISS = Input short status (0 = working, 1 = fault)
IOS = Input open status (0 = working, 1 = fault)
IGS = Input group status (0 = working, 1 = fault)

O = Output data (0 = OFF, 1 = ON)
OS = Output status (0 = working, 1 = fault)
OGS = Output group status (0 = working, 1 = fault)
APS = Aux power status (0 = OFF, 1 = ON)

FDNP-L0808H-TT, 8 npn/pnp inputs and 8 outputs, 2 A, per-point diagnostics

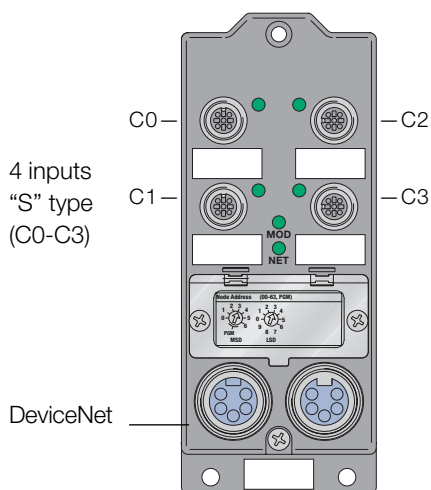


Item number/EDS file: F0096/I0096_xx.eds
Product code: 7/1537 (601 hex)
Ident-no. 66 033 28

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	ISS-/	ISS-6	ISS-5	ISS-4	ISS-3	ISS-2	ISS-1	ISS-0
	2	IOS-/	IOS-6	IOS-5	IOS-4	IOS-3	IOS-2	IOS-1	IOS-0
	3	OS-7	OS-6	OS-5	OS-4	OS-3	OS-2	OS-1	OS-0
	4	–	APS	–	–	–	–	–	–
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Output Data	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Please refer to pages 30 and 31 for dimensions and specifications.

FDNQ-S0400-T, 4 pnp inputs, group diagnostics



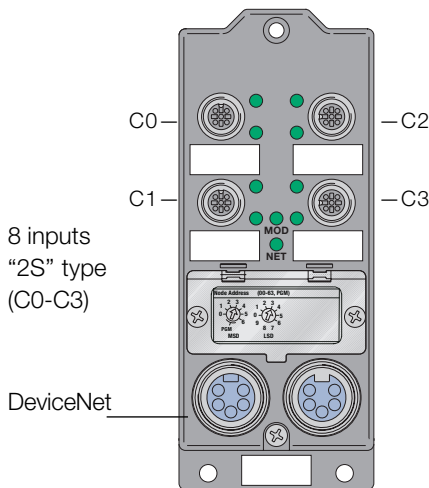
Item number/EDS file: F0080/I0080_xx.eds
Product code: 7/1281 (501 hex)
Ident-no. 66 036 66

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	IGS	–	–	–	I-3	I-2	I-1	I-0

Abbreviations

I	=	Input data (0 = OFF, 1 = ON)	O	=	Output data (0 = OFF, 1 = ON)
ISS	=	Input short-circuit status (0 = working, 1 = fault)	OS	=	Output status (0 = working, 1 = fault)
IOS	=	Input open-circuit status (0 = working, 1 = fault)	OGS	=	Output group status (0 = working, 1 = fault)
IGS	=	Input group status (0 = working, 1 = fault)	APS	=	Aux power status (0 = OFF, 1 = ON)

FDNQ-S0800-T, 8 pnp inputs, group diagnostics

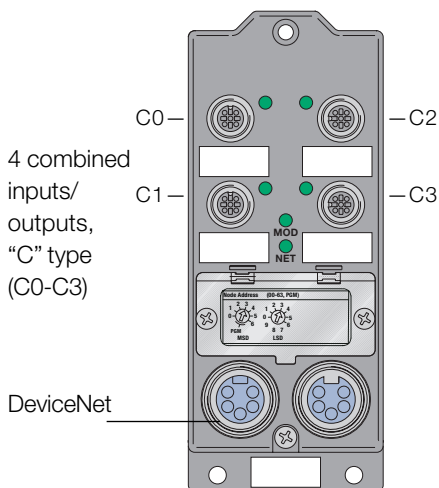


Item number/EDS file: F0079/I0079_xx.eds
 Product code: 7/1265 (4F1 hex)
 Ident-no. 66 036 67

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
Data	1	IGS	–	–	–	–	–	–	–

Please refer to pages 30 and 31 for dimensions and specifications.

FDNQ-CSG44-T, 4 combined pnp inputs and outputs, 0.5 A, group diagnostics



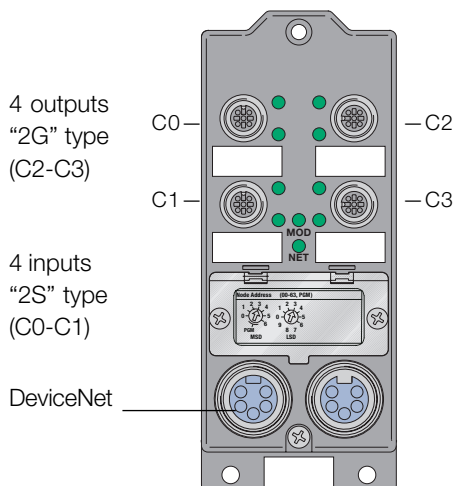
Item number/EDS file: F0120/I0120_xx.eds
 Product code: 7/1921 (781 hex)
 Ident-No. 66 036 68

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input	0	IGS	OGS	–	–	I-3	I-2	I-1	I-0
Output	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data	0	–	–	–	–	O-3	O-2	O-1	O-0

Abbreviations

I	=	Input data (0 = OFF, 1 = ON)	O	=	Output data (0 = OFF, 1 = ON)
ISS	=	Input short-circuit status (0 = working, 1= fault)	OS	=	Output status (0 = working, 1= fault)
IOS	=	Input open-circuit status (0 = working, 1= fault)	OGS	=	Output group status (0 = working, 1= fault)
IGS	=	Input group status (0 = working, 1= fault)	APS	=	Aux power status (0 = OFF, 1= ON)

FDNQ-S0404G-T, 4 pnp inputs and 4 outputs, 0.5 A, group diagnostics

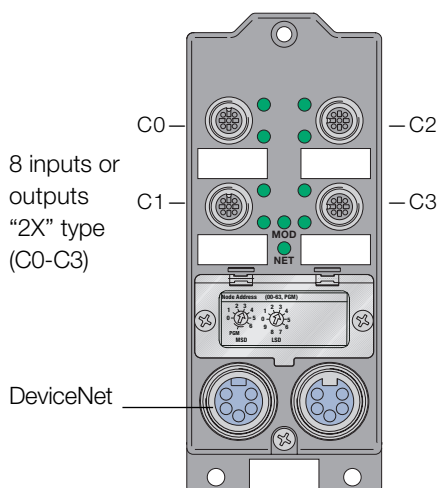


Item number/EDS file: F0133/I0133_xx.eds
Product code: 7/2129 (851 hex)
Ident-no. 66 036 69

Input	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data	0	IGS	OGS	–	–	I-3	I-2	I-1	I-0
Output	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data	0	–	–	–	–	O-3	O-2	O-1	O-0

Please refer to pages 30 and 31 for dimensions and specifications.

FDNQ-XSG08-T, 8 pnp inputs or outputs, 0.5 A, group diagnostics



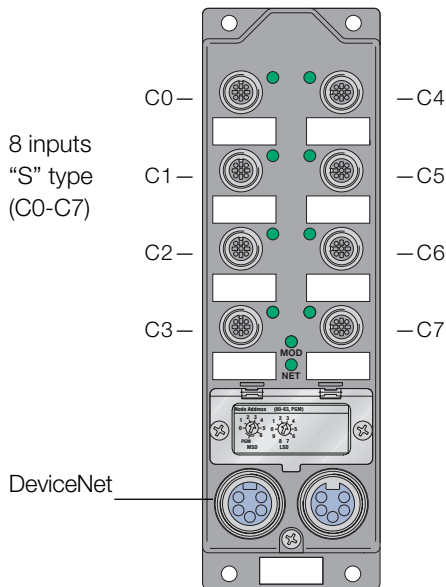
Item number/EDS file: F0134/I0134_xx.eds
Product code: 7/2145 (861 hex)
Ident-no. 66 036 70

Input	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	IGS	OGS	–	–	–	–	–	–
Output	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Abbreviations

I	=	Input data (0 = OFF, 1 = ON)	O	=	Output data (0 = OFF, 1 = ON)
ISS	=	Input short-circuit status (0 = working, 1= fault)	OS	=	Output status (0 = working, 1= fault)
IOS	=	Input open-circuit status (0 = working, 1= fault)	OGS	=	Output group status (0 = working, 1= fault)
IGS	=	Input group status (0 = working, 1= fault)	APS	=	Aux power status (0 = OFF, 1= ON)

FDNL-S0800-T, 8 pnp inputs, group diagnostics

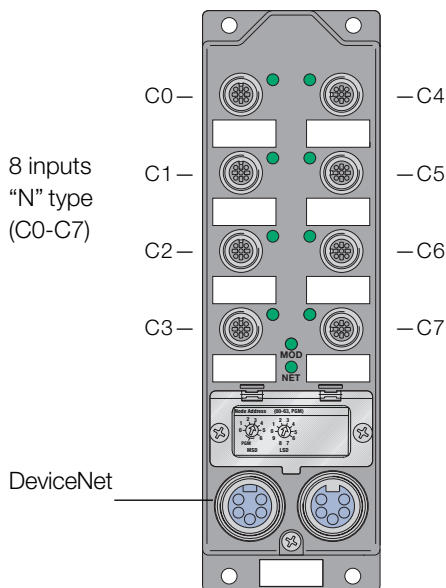


Item number/EDS file: F0076/I0076_xx.eds
Product code: 7/1217 (4C1 hex)
Ident-no. 66 033 36

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
Data	1	IGS	–	–	–	–	–	–	–

Please refer to pages 30 and 31 for dimensions and specifications.

FDNL-N0800-T, 8 npn inputs, group diagnostics



Item number/EDS file: F0138/I0138_xx.eds
Product code: 7/2209 (8A1 hex)
Ident-no. 66 036 71

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
Data	1	IGS	–	–	–	–	–	–	–

Abbreviations

I = Input data (0 = OFF, 1 = ON)

ISS = Input short-circuit status (0 = working, 1 = fault)

IOS = Input open-circuit status (0 = working, 1 = fault)

IGS = Input group status (0 = working, 1 = fault)

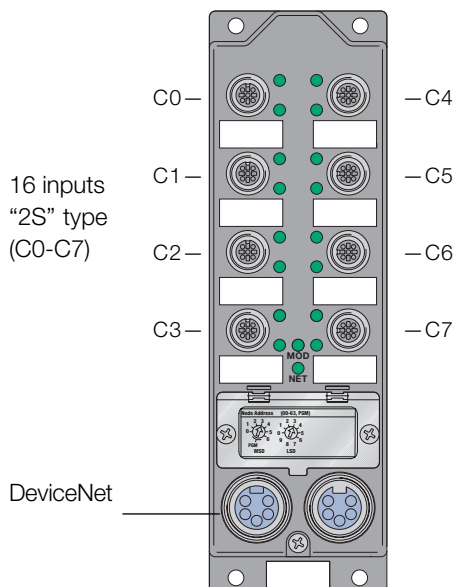
O = Output data (0 = OFF, 1 = ON)

OS = Output status (0 = working, 1 = fault)

OGS = Output group status (0 = working, 1 = fault)

APS = Aux power status (0 = OFF, 1 = ON)

FDNL-S1600-T, 16 pnp inputs, group diagnostics

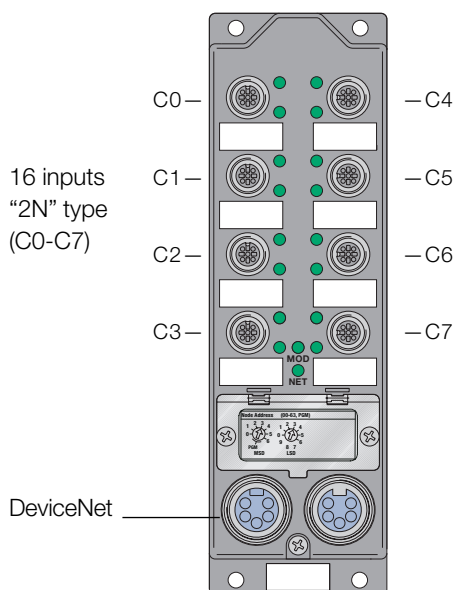


Item number/EDS file: F0077/I0077_xx.eds
Product code: 7/1233 (4D1 hex)
Ident-no. 66 033 16

Input Data	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	I-15	I-14	I-13	I-12	I-11	I-10	I-9	I-8
	2	IGS	–	–	–	–	–	–	–

Please refer to pages 30 and 31 for dimensions and specifications.

FDNL-N1600-T, 16 npn inputs, group diagnostics



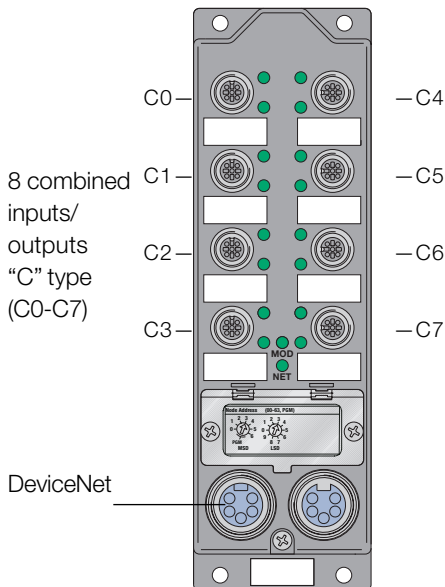
Item number/EDS file: F0139/I0139_xx.eds
Product code: 7/2225 (8B1 hex)
Ident-no. 66 036 72

Input Data	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	I-15	I-14	I-13	I-12	I-11	I-10	I-9	I-8
	2	IGS	–	–	–	–	–	–	–

Abbreviations

I	=	Input data (0 = OFF, 1 = ON)	O	=	Output data (0 = OFF, 1 = ON)
ISS	=	Input short-circuit status (0 = working, 1= fault)	OS	=	Output status (0 = working, 1= fault)
IOS	=	Input open-circuit status (0 = working, 1= fault)	OGS	=	Output group status (0 = working, 1= fault)
IGS	=	Input group status (0 = working, 1= fault)	APS	=	Aux power status (0 = OFF, 1= ON)

FDNL-CSG88-T, 8 combined pnp inputs and outputs, 0.5 A, group diagnostics

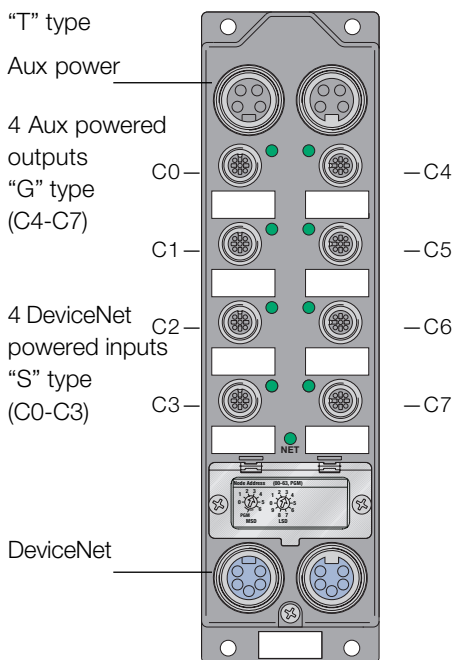


Item number/EDS file: F0130/I0130_xx.eds
Product code: 7/2081 (821 hex)
Ident-no. 66 033 51

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
Data	1	IGS	OGS	–	–	–	–	–	–
Output	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Please refer to pages 30 and 31 for dimensions and specifications.

FDNP-S0404G-TT, 4 pnp inputs and 4 outputs, 0.5. A, group diagnostics



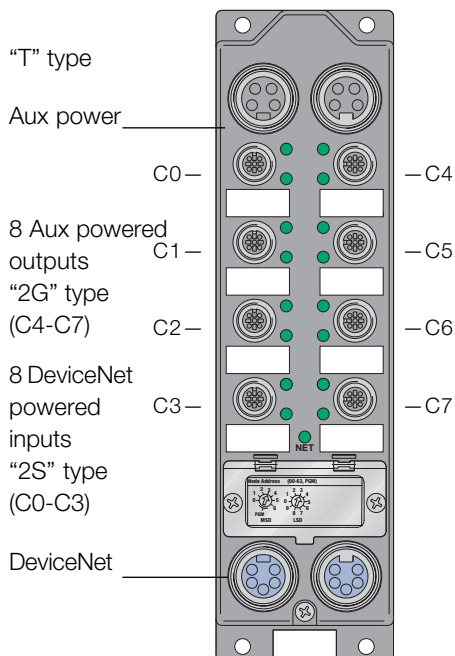
Item number/EDS file: F0074/I0074_xx.eds
Product code: 7/1185 (4A1 hex)
Ident-no. 66 033 31

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input	0	IGS	OGS	–	–	I-3	I-2	I-1	I-0
Data	0	–	–	–	–	O-3	O-2	O-1	O-0

Abbreviations

I	=	Input data (0 = OFF, 1 = ON)	O	=	Output data (0 = OFF, 1 = ON)
ISS	=	Input short-circuit status (0 = working, 1 = fault)	OS	=	Output status (0 = working, 1 = fault)
IOS	=	Input open-circuit status (0 = working, 1 = fault)	OGS	=	Output group status (0 = working, 1 = fault)
IGS	=	Input group status (0 = working, 1 = fault)	APS	=	Aux power status (0 = OFF, 1 = ON)

FDNP-S0808G-TT, 8 pnp inputs and 8 outputs, 0.5. A, group diagnostics

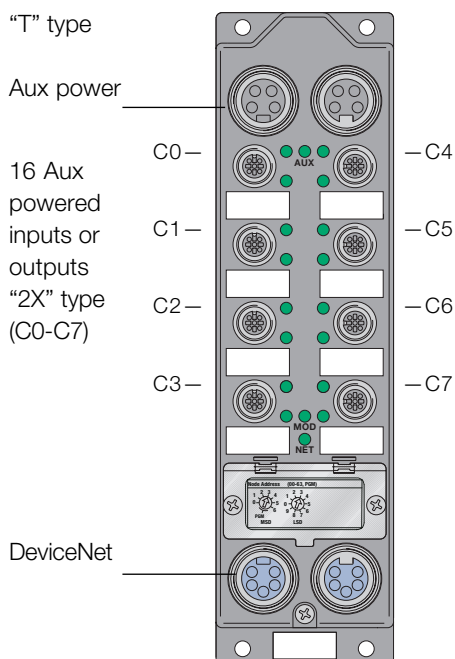


Item number/EDS file: F0073/I0073_xx.eds
Product code: 7/1169 (491 hex)
Ident-no. 66 033 48

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	IGS	OGS	–	–	–	–	–	–
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Output Data	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0
	1	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Please refer to pages 30 and 31 for dimensions and specifications.

FDNP-XSG16-TT, 16 pnp inputs or outputs, 0.5. A, group diagnostics



Item number/EDS file: F0129/I0129_xx.eds
Product code: 7/2065 (811 hex)
Ident-no. 66 033 23

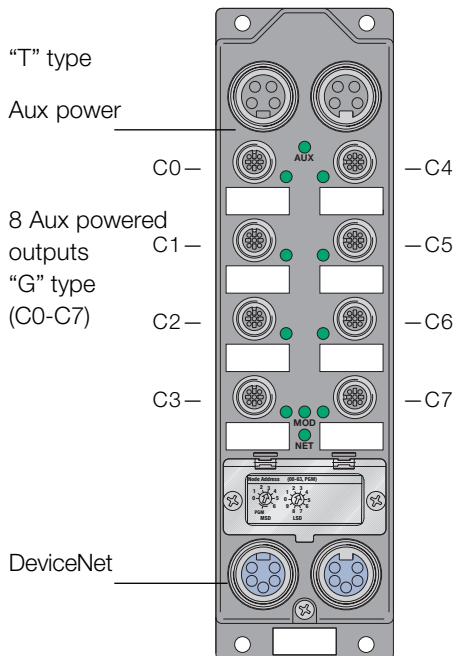
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	I-15	I-14	I-13	I-12	I-11	I-10	I-9	I-8
	2	IGS	OGS	–	–	–	–	–	–
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Output Data	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0
	1	O-15	O-14	O-13	O-12	O-11	O-10	O-9	O-8

Because the inputs and outputs are powered off the same circuit, this station is not recommended for E-Stop controlled outputs.

Abbreviations

I	=	Input data (0 = OFF, 1 = ON)	O	=	Output data (0 = OFF, 1 = ON)
ISS	=	Input short-circuit status (0 = working, 1 = fault)	OS	=	Output status (0 = working, 1 = fault)
IOS	=	Input open-circuit status (0 = working, 1 = fault)	OGS	=	Output group status (0 = working, 1 = fault)
IGS	=	Input group status (0 = working, 1 = fault)	APS	=	Aux power status (0 = OFF, 1 = ON)

FDNP-S0008G-TT, 8 outputs, 0.5 A

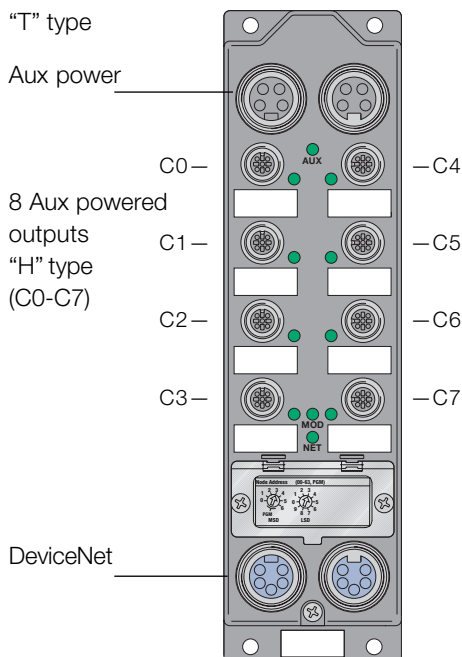


Item number/EDS file: F0135/I0135_xx.eds
Product code: 7/2161 (871 hex)
Ident-no. 66 036 73

Input	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data	0	OS-7	OS-6	OS-6	OS-4	OS-3	OS-2	OS-1	OS-0
Output	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data	0	O-7	O-6	O-6	O-4	O-3	O-2	O-1	O-0

Please refer to pages 30 and 31 for dimensions and specifications.

FDNP-S0008H-TT, 8 outputs, 1.4 A



Item number/EDS file: F0136/I0136_xx.eds
Product code: 7/2177 (881 hex)
Ident-no. 66 036 74

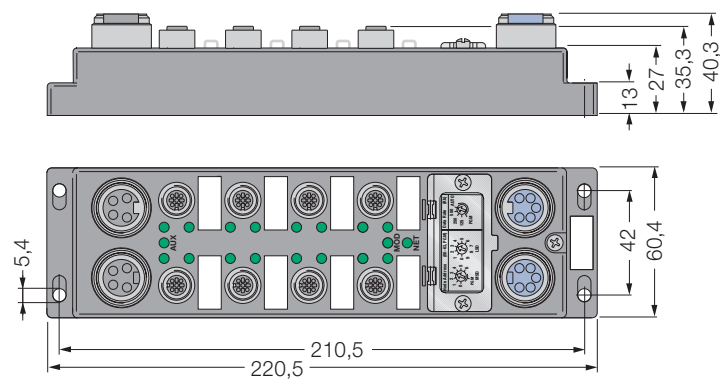
Input	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data	0	OS-7	OS-6	OS-6	OS-4	OS-3	OS-2	OS-1	OS-0
Output	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data	0	O-7	O-6	O-6	O-4	O-3	O-2	O-1	O-0

Abbreviations

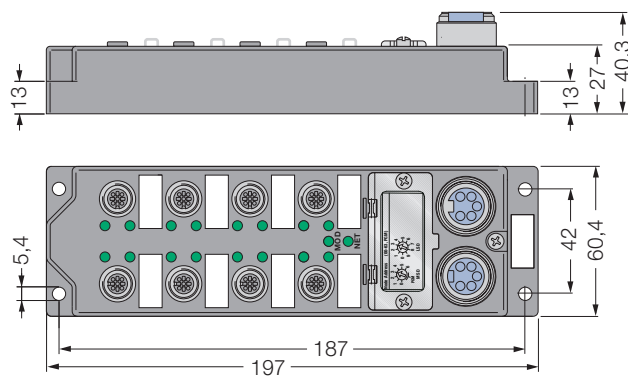
I	=	Input data (0 = OFF, 1 = ON)	O	=	Output data (0 = OFF, 1 = ON)
ISS	=	Input short-circuit status (0 = working, 1 = fault)	OS	=	Output status (0 = working, 1 = fault)
IOS	=	Input open-circuit status (0 = working, 1 = fault)	OGS	=	Output group status (0 = working, 1 = fault)
IGS	=	Input group status (0 = working, 1 = fault)	APS	=	Aux power status (0 = OFF, 1 = ON)

Types and Dimensions

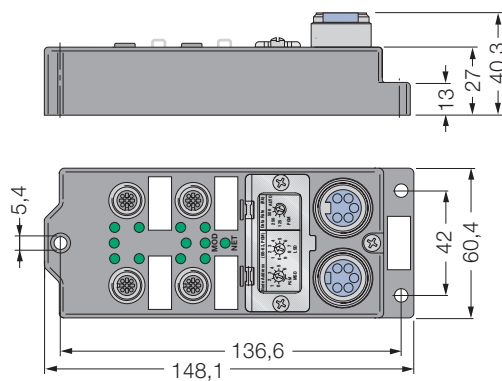
“FDNP” Style Housings



“FDNL” Style Housings



“FDNQ” Style Housings



Module Specifications, FDN... Modules

Supply voltage

Bus power	11...26 VDC
Internal current consumption	< 140 mA, L or P type inputs; <75 mA, S or X type inputs
Auxiliary power	18...26 VDC

Input circuits

Input voltage	11...26 VDC
Open circuit current	< 1 mA (L or P type inputs only)
Sensor current	< 80 mA per individual input (L or P type input)
	< 1.0 A per group of 8 input connectors (S or X type input)
	< 0.5 A per group of 4 input connectors (S or X type input)
Input signal current	OFF < 2 mA
	ON 3.0...3.4 mA at 24 VDC
Input delay	2.5 ms

Output circuits

Output voltage	18...26 VDC, optically isolated
Output load current	0.5 A per G type output; 1.4 A per for stations with type code containing S...H)
	2.0 A per each output (for stations with type code containing L...H)
Open circuit current	< 1 mA per output
Maximum switching frequency	100 HZ

I/O LED Indications

yellow = open-circuit
off = OFF
green = ON
red = short-circuit

Module Status LED

green: working properly
flashing green: detecting autobaud rate
flashing red: I/O short-circuit

Network Status LED

green: connection established
flashing green: ready for connection
flashing red: connection time-out
red: connection not possible

Adjustments

Address	0...63 via rotary switch
---------	--------------------------

Housing

Material	glass-fibre reinforced plastic with nickel plated brass connectors
Protection degree (IEC 60529/EN 60529)	IP67 (NEMA 1, 3, 4, 12, 13)
Operating temperature	-25° to 70°C (-13° to 158°F)

Please note:
Detailed information and technical specifications on the individual module types can be downloaded from www.interlinkbt.com

Bus Components for Sensors and Actuators



The FDN-DN1 "Spanner" module provides a means to route data between two PLCs 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 the 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). In the software position, the transferred size does not need to be the same in both directions.

Electrical features

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.

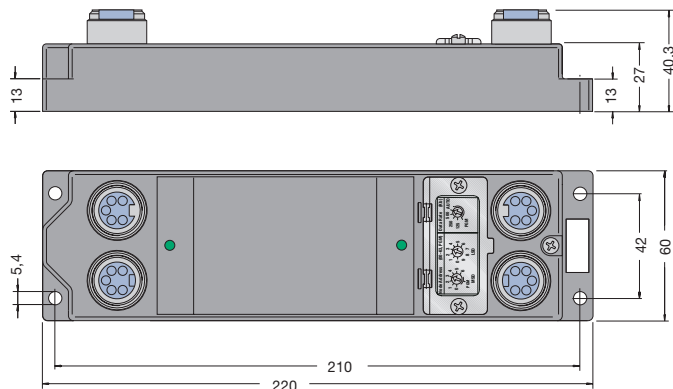
FDN-DN1

Applications

- For handoff between work cells and conveyor
- For bi-directional data transfer between PLCs

Features

- Transfer up to 128 bytes of data between any two PLC's
- Optical isolation between networks
- Rotary address switches
- Same footprint as standard AIM stations

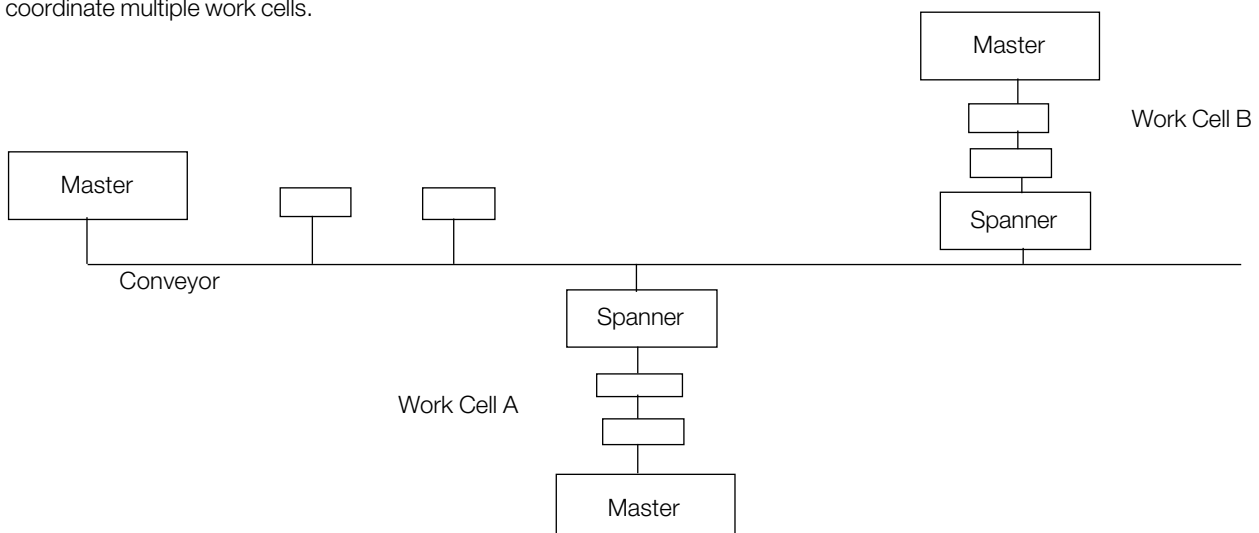


Spanner module FDN-DN1

Type	
Ident-No.	FDN-DN1 66 035 96
Item-no./EDS file name	F0132/I032_xx.eds (located at www.interlinkbt.com)
Supply Voltage	
Bus power	11...30 VDC
Node current consumption	125 mA segment A, 30 mA segment B
Network Status LED	
	yellow: determining baudrate flashing green: ready for connection green: connection established flashing red: connection time out red: connection not possible (duplicate address - faulty communication)
Adjustments	
Address A	0...63 via rotary switches
Address B	0...63 via rotary switches
Transfer size (via rotary switch)	4,16,32 or 128 bytes
Transfer size (via software)	settable to any size (0,1,2,3...128 bytes). In the software position, the transferred size does not need to be the same in both directions.
Connections	
Bus line	5-pin 7/8" connectors
Housing	
Material	glass-fibre reinforced plastic with nickel plated brass connectors
Mounting	(4) through-holes, 5.3 mm diameter
Protection degree (IEC 60529/EN 60529)	IP67 (NEMA 1, 3, 4, 12, 13)
Operating temperature	-25° to +70 °C (-13° to +158 °F)

Spanner Topology

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



Bus Components for Sensors and Actuators



The REP-DN is a potted, fully connectorized repeater. It is very rugged and can be mounted directly on the machine. It is designed for use on any Controller Area Network (CAN), including DeviceNet. Network segments attached together with a repeater are considered separate physical networks (trunk and drop lengths for each segment are determined as if the other segments are not there), but one logical network (addresses cannot be duplicated - the scanner and configuration tools work as a single network).

The repeater does not consume an address and is invisible to all the other devices on the network. The repeater does not have an EDS file.

The REP-DN can be used to extend either the trunk or the drop lines. It can also be used to isolate power supplies on networks with multiple supplies.

There is no limit to the number of repeaters that can be used on one network. When a message is repeated a 2 ms delay is introduced. This is typically insignificant compared to the overall scan time of the network when a few repeaters are used. If more than four repeaters are used in series, the interscan delay may need to be increased.

The repeater automatically determines the baudrate. The baudrate on each side of the repeater must be the same. Different rates would cause the slow side to be overloaded with messages from the fast side.

REP-DN

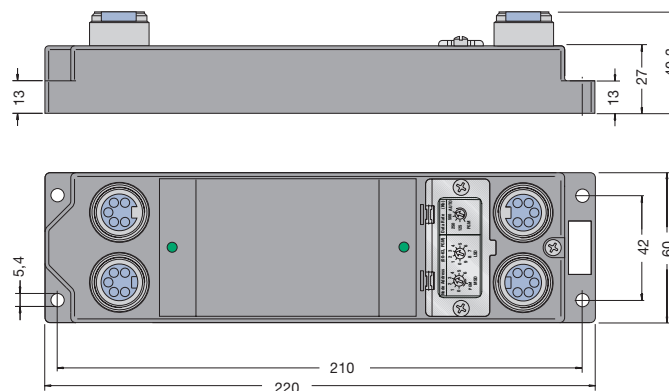
- CAN (DeviceNet™ Repeater)

Features

- Extremely rugged
- Fully connectorized

Applications

- Extending maximum trunk lengths
- Extending maximum drop lengths
- Isolating DeviceNet™ power



Repeater Module for DeviceNet™

Type	REP-DN
Ident-no.	68 25 349
Supply Voltage	
Bus power	11...30 VDC
Node current consumption	125 mA segment A, 30 mA segment B
Status LED	
	yellow: determining baud rate flashing green: ready to repeat green: repeating red: cannot repeat
Adjustments	
Baudrate	125k, 250k, 500k or autobaud via rotary switch
Connections	
Bus line	5-pin 7/8" connectors, RSM RKM 579-2M
Housing	
Material	glass-fibre reinforced plastic with nickel plated brass connectors
Mounting	(4) through-holes, 5.3 mm diameter
Protection degree (IEC 60529/EN 60529)	IP67 (NEMA 1, 3, 4, 12, 13)
Operating temperature	-25° to +70 °C (-13° to +158 °F)

Repeater Configurations

Extended trunk line

To extend the trunk line, the repeaters are connected in series. The overall delay for the network is the sum of all the individual repeater delays. The total delay is 2 ms x number of repeaters.

Extended drop line

To extend the drop line lengths, the repeaters are connected in parallel. The overall delay for the network is 2 ms total. This is because there is really only one repeater between the scanner on the trunk and any other device.

Do not create a ring

While the repeater can be used to create very large and complex networks, some configurations are not permitted. If a ring is created (both sides of a repeater are connected to the same network) then the repeater will continuously repeat to itself. This will cause the network to overload.

Bus Components for Sensors and Actuators

Advanced I/O Modules (AIM™) -Type CDN...

These heavy-duty DeviceNet™ stations are suited for the most harsh industrial environments. There are three different housing designs: two die-cast aluminium housing types (150 mm and 185 mm high) with nickel-plated brass connectors and a glass-fibre reinforced reinforced polyethylene housing (190 mm high) with stainless steel connectors for especially corrosive environments.

All three station types feature protection rating IP67, individual short-circuit and open-circuit detection. They are suited for connection of pnp or npn sensors. LEDs indicate short-circuit, overload and open-circuit conditions, the module status and missing auxiliary power.

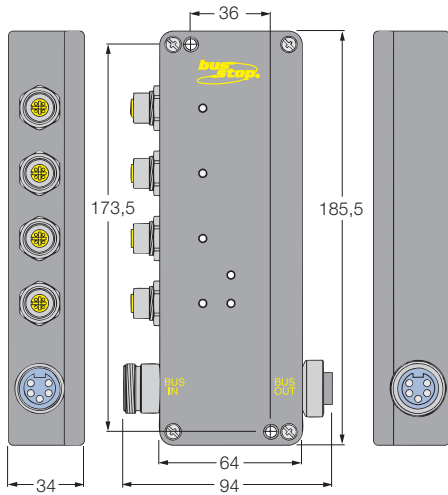
The node address and communication rate (125/250/500 kbps) are set by the DIP switches located under the device cover or through software node commissioning.

The modules support all forms of DeviceNet messaging, including poll, strobe, cyclic, change-of-state (COS) and UCMM.

Quick Selection Guide

Type code	Input parameters							Output parameters					DeviceNet™ Data				
	Page number	Number of inputs	Inputs per connector	Compatible with npn/pnp sensor	Short-circuit protection	Input type	Open-circuit detection	Number of outputs	Outputs per connector	Maximum output load	Short-circuit protection	Output type	Open-circuit detection	Product code	Input data size in bytes	Output data size in bytes	Power consumption (mA)
Advanced I/O modules:																	
CDN-IM4-0046	37	4	1	nnp/pnp	i	L	i	–	–	–	–	–	–	737	1	–	80
CDN-IM8-0024	37	8	1	nnp/pnp	i	L	i	–	–	–	–	–	–	385	2	–	85
CDN-IM8-0039	38	8	1	nnp/pnp	i	L	i	–	–	–	–	–	–	625	2	–	85
CDN-IM8-0043	38	8	2	nnp/pnp	i	2L	i	–	–	–	–	–	–	689	2	–	110
CDN-IM16-0053	39	16	2	nnp/pnp	i	2L	i	–	–	–	–	–	–	849	4	–	230
CDN-IOM22-0032	39	2	2	nnp/pnp	i	2L	i	2	1	1 A	i	H	i	517	1	1	70
CDN-IOM42-0048	40	4	2	nnp/pnp	i	2L	i	2	1	2 A	i	H	i	769	2	1	85
CDN-IOM44-0041	40	4	1	nnp/pnp	i	L	i	4	1	2 A	i	H	i	659	2	1	90
CDN-IOM44-0045	41	4	1	nnp/pnp	i	L	i	4	1	2 A	i	H	i	723	2	1	90
CDN-OM8-0026	41	–	–	–	–	–	–	8	1	1 A	i	H	i	417	1	1	60
CDN-OM8-0042	42	–	–	–	–	–	–	8	1	1 A	i	H	i	673	1	1	60
i = individual, g = group – = not available																	

**CDN-IM-4-0046, 4 npn/pnp inputs, per-point diagnostics,
185 mm die-cast aluminium housing**



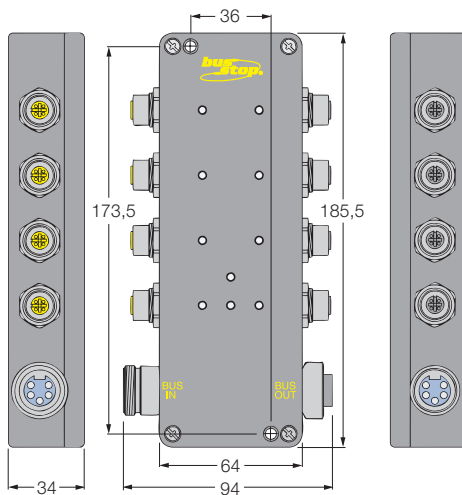
Item-no./EDS file: T0046_34.EDS
Product code: 7 / 737 /(2E1 hex)
Ident-no. 66 033 43

Input Data 1 Byte

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	IS-3	IS-2	IS-1	IS-0	I-3	I-2	I-1	I-0

Please refer to page 43 for module specifications

**CDN-IM-8-0024, 8 npn/pnp inputs, per-point diagnostics,
185 mm die-cast aluminium housing**



Item-no./EDS file: T0024_34.EDS
Product code: 7 / 385 (181 hex)
Ident-no. 69 220 19

Input data 2 bytes

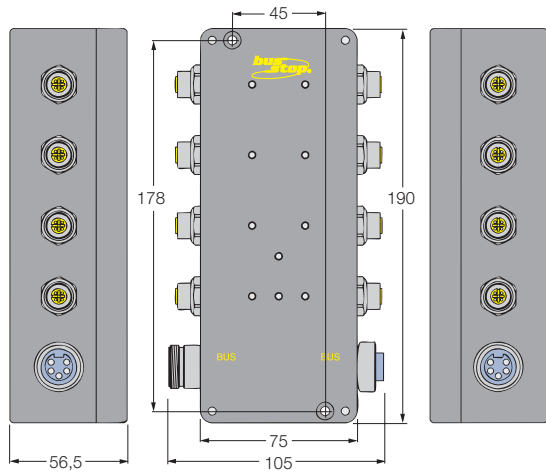
Input	Bit	07	06	05	04	03	02	01	00
Data	Meaning	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
Input	Bit	15	14	13	12	11	10	09	08
Data	Meaning	IS-7	IS-6	IS-5	IS-4	IS-3	IS-2	IS-1	IS-0

Abbreviations:

I = input data (0 = OFF, 1 = ON)
IS = input status (0 = working, 1 = fault)
O = output data (0 = OFF, 1 = ON)
OS= output status (0 = working, 1 = fault)

Bus Components for Sensors and Actuators

CDN-IM-8-0039, 8 npn/pnp inputs, per-point diagnostics, 190 mm glass-fibre reinforced polyethylene housing



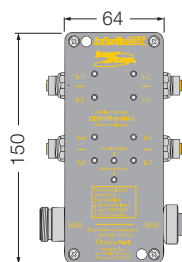
Item-no./EDS file: T0039_34.EDS
Product code: 7 / 628 (274 hex)
Ident-no. 68 220 26

Input data 2 bytes

Input Data	Bit	07	06	05	04	03	02	01	00
	Meaning	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	Bit	15	14	13	12	11	10	09	08
	Meaning	IS-7	IS-6	IS-5	IS-4	IS-3	IS-2	IS-1	IS-0

Please refer to page 43 for module specifications

CDN-IM-8-0043, 8 npn/pnp inputs, per-point diagnostics, 150 mm die-cast aluminium housing



Item-no./EDS file: T0043_35.EDS
Product code: 7 / 692 (2B4 hex)
Ident-no. 68 220 027

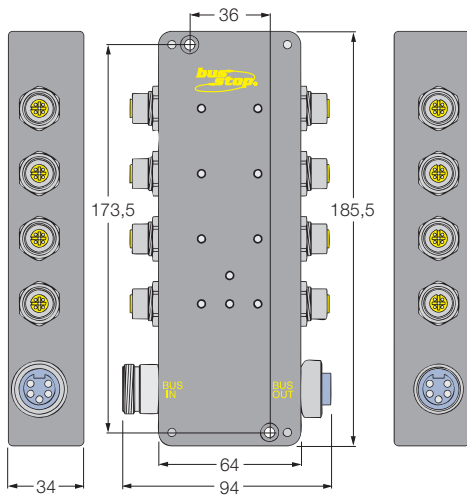
Input data 2 bytes

Input Data	Bit	07	06	05	04	03	02	01	00
	Meaning	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	Bit	15	14	13	12	11	10	09	08
	Meaning	IS-7	IS-6	IS-5	IS-4	IS-3	IS-2	IS-1	IS-0

Abbreviations:

I = input data (0 = OFF, 1 = ON)
IS = input status (0 = working, 1 = fault)
O = output data (0 = OFF, 1 = ON)
OS= output status (0 = working, 1 = fault)

**CDN-IM-16-0053, 16 npn/pnp inputs, per-point diagnostics,
185 mm die-cast aluminium housing**



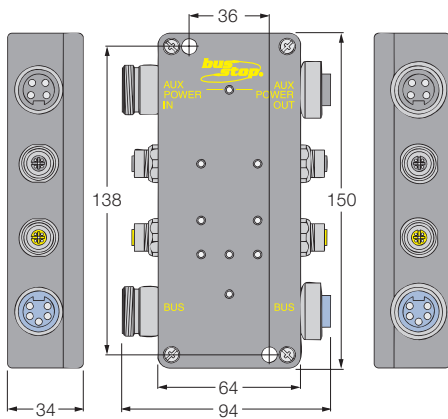
Item-no./EDS file: i0053_11.EDS
Product code: 7 / 849 (351 hex)
Ident-no. 68 220 20

Input data 4 bytes

Input Data	Bit	7	6	5	4	3	2	1	0
	Meaning	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	Bit	15	14	13	12	11	10	09	08
	Meaning	I-15	I-14	I-13	I-12	I-11	I-10	I-9	I-8
	Bit	23	22	21	20	19	18	17	16
	Meaning	IS-7	IS-6	IS-5	IS-4	IS-3	IS-2	IS-1	IS-0
	Bit	31	30	29	28	27	26	25	24
	Meaning	IS-15	IS-14	IS-13	IS-12	IS-11	IS-10	IS-9	IS-8

Please refer to page 43 for module specifications

**CDN-IOM-22-0032, 2 npn/pnp inputs and 2 outputs, 1 A,
per-point diagnostics, 150 mm die-cast aluminium housing**



Item-no./EDS file: T0032_34.EDS
Product code: 7 / 517 (205 hex)
Ident-no. 68 220 17

Input data 1 byte/Output data 1 byte

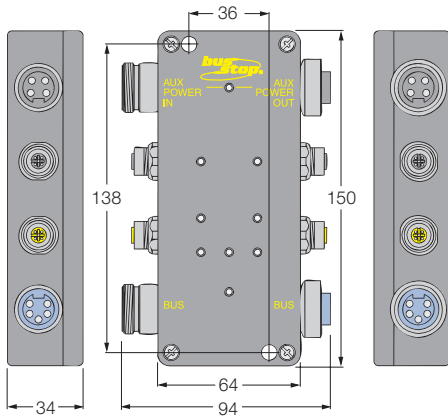
Input Data	Bit	07	06	05	04	03	02	01	00
	Meaning	OS-1	OS-0	IS-1	IS-0	A-1	A-0	I-1	I-0
Output Data	Bit	07	06	05	04	03	02	01	00
	Meaning	Reserved						O-1	O-0

Abbreviations:

A = sensor alarm data (0 = OFF, 1 = ON)
I = input data (0 = OFF, 1 = ON)
IS = input status (0 = working, 1 = fault)
O = output data (0 = OFF, 1 = ON)
OS= output status (0 = working, 1 = fault)

Bus Components for Sensors and Actuators

CDN-IOM-42-0048, 4 pnp inputs and 2 outputs, 2 A, per-point diagnostics, 150 mm die-cast aluminium housing



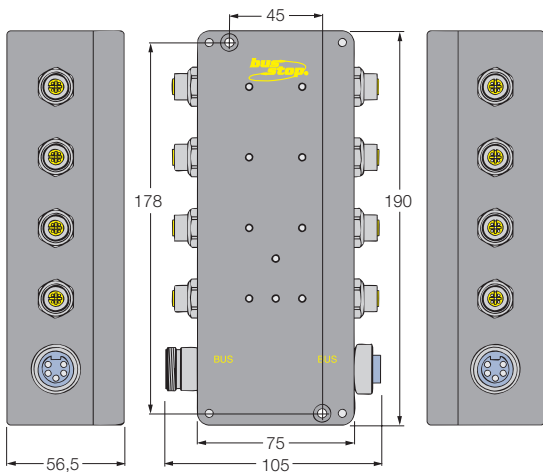
Item-no./EDS file: i0048_34.EDS
Product code: 7 / 769 (301 hex)
Ident-no. 68 220 30

Input data 2 bytes/Output data 1 byte

Input Data	Bit	07	06	05	04	03	02	01	00
	Meaning	Reserved				I-3	I-2	I-1	I-0
Input Data	Bit	15	14	13	12	11	10	09	08
	Meaning	Reserved		OS-1	OS-0	IS-3	IS-2	IS-1	IS-0
Output Data	Bit	07	06	05	04	03	02	01	00
	Meaning	Reserved						O-1	O-0

Please refer to page 43 for module specifications

CDN-IOM-44-0041, 4 pnp/npn inputs and 4 outputs, 2 A, per-point diagnostics, 190 mm glass-fibre reinforced housing



Item-no./EDS file: T0041_34.EDS
Product code: 7 / 659 (293 hex)
Ident-no. 66 220 18

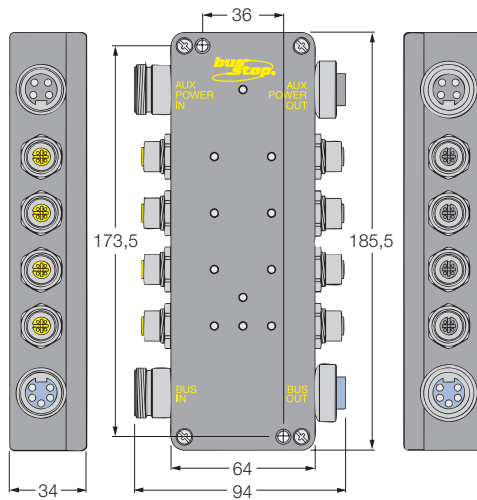
Input data 2 bytes/Output data 1 byte

Input Data	Bit	07	06	05	04	03	02	01	00
	Meaning	IS-3	IS-2	IS-1	IS-0	I-3	I-2	I-1	I-0
Input Data	Bit	15	14	13	12	11	10	09	08
	Meaning	Reserved				OS-3	OS-2	OS-1	OS-0
Output Data	Bit	07	06	05	04	03	02	01	00
	Meaning	Reserved				O-3	O-2	O-1	OS-0

Abbreviations:

I = input data (0 = OFF, 1 = ON)
IS = input status (0 = working, 1 = fault)
O = output data (0 = OFF, 1 = ON)
OS= output status (0 = working, 1 = fault)

**CDN-IOM-44-0045, 4 pnp inputs and 4 outputs, 2 A,
per-point diagnostics, 185 mm die-cast aluminium housing**



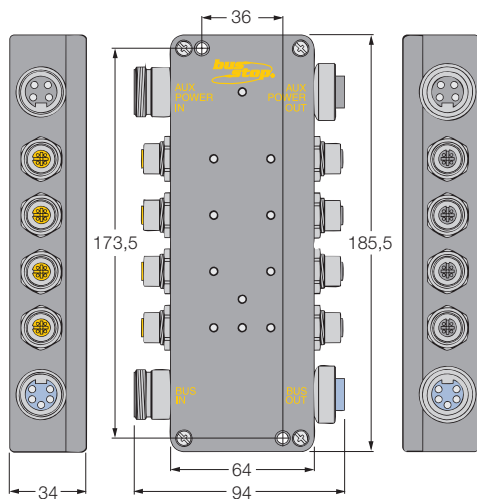
Item-no./EDS file: T0045_34.EDS
Product code: 7 / 723 (2D3 hex)
Ident-no. 66 220 18

Input data 2 bytes/Output data 1 byte

Input Data	Bit	07	06	05	04	03	02	01	00
	Meaning	IS-3	IS-2	IS-1	IS-0	I-3	I-2	I-1	I-0
Output Data	Bit	15	14	13	12	11	10	09	08
	Meaning	Reserved				OS-3	OS-2	OS-1	OS-0
Input Data	Bit	07	06	05	04	03	02	01	00
	Meaning	Reserved				O-3	O-2	O-1	O-0

Please refer to page 43 for module specifications

**CDN-OM-8-0026, 8 outputs, 1 A, per-point diagnostics,
185 mm die-cast aluminium housing**



Item-no./EDS file: T0026_42.EDS
Product code: 7 / 417 (1A1 hex)
Ident-no. 68 220 24

Input data 1 byte / Output data 1 byte

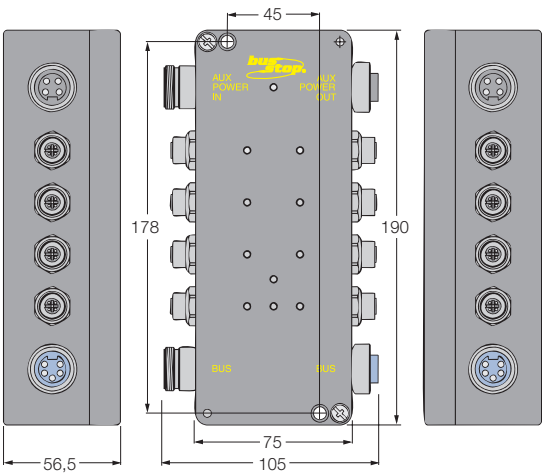
Input Data	Bit	07	06	05	04	03	02	01	00
	Meaning	OS-7	OS-6	OS-5	OS-4	OS-3	OS-2	OS-1	OS-0
Output Data	Bit	07	06	05	04	03	02	01	00
	Meaning	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Abbreviations:

I = input data (0 = OFF, 1 = ON)
IS = input status (0 = working, 1 = fault)
O = output data (0 = OFF, 1 = ON)
OS= output status (0 = working, 1 = fault)

Bus Components for Sensors and Actuators

**CDN-OM-8-0042, 8 outputs, 1 A, per-point diagnostics,
190 mm glass-fibre reinforced polyethylene housing**



Item-no. T0042_42.EDS
Product code: 7 / 673 (2A1 hex)
Ident-no. 68 220 14

Input data 1 byte / Output data 1 byte

Input	Bit	07	06	05	04	03	02	01	00
Data	Meaning	OS-7	OS-6	OS-5	OS-4	OS-3	OS-2	OS-1	OS-0
Output	Bit	07	06	05	04	03	02	01	00
Data	Meaning	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Abbreviations:

- I = input data (0 = OFF, 1 = ON)
- IS = input status (0 = working, 1 = fault)
- O = output data (0 = OFF, 1 = ON)
- OS= output status (0 = working, 1 = fault)

Module Specifications, CDN... Modules

Supply voltage

Supply voltage	11...26 VDC
Internal current consumption	80...230 mA, depending on type, see table on page 36
Auxiliary power	18...26 VDC

Input circuits

Input voltage	11...30 VDC
---------------	-------------

Output circuits

Output voltage	18...26 VDC
----------------	-------------

Connections

Bus line	5-pin 7/8" connector
Auxiliary power	4-pin 7/8" connector
Inputs and outputs	M12 x 1 connectors

I/O LED Indications

yellow = open-circuit
off = OFF
green = ON
red = short-circuit or auxiliary power missing

Adjustments

Address	via built-in 8-pole DIP-switch
Comm rate	0...63 (binary) via DIP-switch S1-S6
Internal adjustments	125/250/500 kbps via DIP-switch S7, S8
	address and comm rate from internal EEPROM (DIP-switch S7, S8 in ON position)

Housings

Type 1

Material	185.5 x 64 x 34 mm (h x w x d)
Mounting	die-cast aluminum, black powder coated, nickel-plated brass connectors
Protection degree (IEC 60529/EN 60529)	2 through-holes, 4.5 mm diameter
Operating temperature	IP67 (NEMA 1, 3, 4, 12, 13)
	-25° to 70°C (-13° to 158°F)

Type 2

Material	150.5 x 64 x 34 mm (h x w x d)
Mounting	die-cast aluminum, black powder coated, nickel-plated brass connectors
Protection degree (IEC 60529/EN 60529)	2 through-holes, 4.5 mm diameter
Operating temperature	IP67 (NEMA 1, 3, 4, 12, 13)
	-25° to 70°C (-13° to 158°F)

Type 3

Material	190. x 75 x 56 mm (h x w x d)
Protection degree (IEC 60529/EN 60529)	glass-fibre reinforced high-density polyethylene housing with stainless steel connectors
Operating temperature	IP67 (NEMA 1, 3, 4, 12, 13)
	-25° to 70°C (-13° to 158°F)

Please note:

Detailed information and technical specifications on the individual module types can be downloaded from www.interlinkbt.com

Bus Components for Sensors and Actuators

Advanced I/O Modules (AIM™) -Types BD2... and BD8...

These general duty DeviceNet™ stations are suited for harsh industrial environments. There are two different housing designs: an 8-port housing with a height of 183 mm and a 2-port housing (smart tee housing) that is 96 mm high. Both housings are made of high density Noryl and are equipped with nickel-plated brass connectors.

Both station types feature protection rating IP67 and short-circuit protected inputs and outputs. They are suited for connection of pnp sensors, mechanical contacts and 24 VDC outputs. LEDs indicate short-circuit conditions, the module and network status. The versions containing an "X" in their type code have always have two inputs on one connector and are suited for connection of 4-wire pnp sensors or mechanical contacts. The versions with a "P" in their type code have one input on one connector and are suited for connection of 3-wire pnp sensors or mechanical contacts. BD2 type output stations have a maximum output load of 150 mA, whereas BD8 type stations feature a maximum output load of 2 A for high power applications.

The node address and communication rate (125/250/500 kbps) are set via the DeviceNet™ configuration tool. The modules support all forms of DeviceNet messaging, including poll, strobe, cyclic, change-of-state (COS) and UCMM.

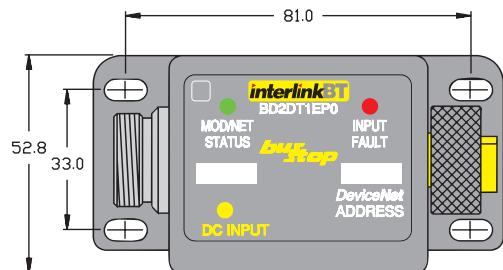
Quick Selection Guide

Type code	Input parameters						Output parameters					DeviceNet™ Data			
	Page number	Number of inputs	Inputs per connector	Compatible with npn/pnp sensor	Short-circuit protection	Input type	Number of outputs	Maximum output load	Bus or aux. power	Short-circuit protection	Output type	Product code	Input data size in bytes	Output data size in bytes	Power consumption (mA)
Advanced I/O modules:															
BD2 series, smart tee															
BD2DT1EP0	45	1	1	pnp	i	P	–	–	–	–	–	1	1	–	< 35
BD2DT1EX0	45	2	2	pnp	g	PBD	–	–	–	–	–	2	1	–	< 35
BD2DT2EP0	46	2	1	pnp	g	P	–	–	–	–	–	3	1	–	< 35
BD2DT2EX0	46	4	2	pnp	g	PBD	–	–	–	–	–	4	1	–	< 35
BD2DT1EP1EU	47	1	1	pnp	i	P	1	150 mA	bus	i	G	6	1	1	< 35
BD2DT1EX1EU	47	2	2	pnp	g	PBD	1	150 mA	bus	i	G	7	1	1	< 35
BD2DT02EU	48	–	–	–	–	–	2	150 mA	bus	i	G	5	1	1	< 35
BD8 8-port series															
BD8D4EP0	48	4	1	pnp	g	P	–	–	–	–	–	8	1	–	< 80
BD8D4EX0	49	8	2	pnp	g	PBD	–	–	–	–	–	9	2	–	< 80
BD8D8EP0	49	8	1	pnp	g	P	–	–	–	–	–	10	2	–	< 80
BD8D8EX0	50	16	2	pnp	g	PBD	–	–	–	–	–	11	3	–	< 80
BD8D2EP2ET	50	2	1	pnp	g	P	2	2 A	aux	i	H	12	1	1	< 80
BD8D2EX2ET	51	4	2	pnp	g	PBD	2	2 A	aux	i	H	13	1	1	< 80
BD8D4EP4ET	51	4	1	pnp	g	P	4	2 A	aux	i	H	14	1	1	< 80
BD8D4EX4ET	52	8	2	pnp	g	PBD	4	2 A	aux	i	H	15	2	1	< 80

i = individual, g = group

– = not available

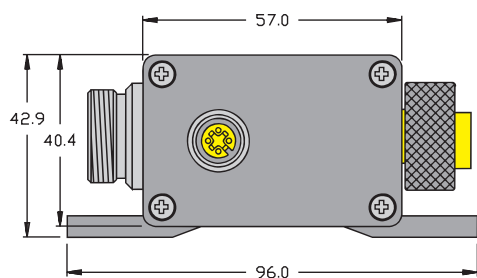
BD2DT1EP0, 1 pnp input, per-point diagnostics, for connection of one 3-wire pnp sensor or one mechanical contact



Item-no./EDS file: I1EPO_1.EDS
Product code: 7 / 1
Ident-no. 66 033 38

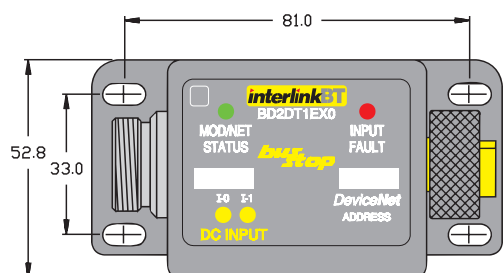
Input data 1 byte

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	IS	Reserved						I-0



Please refer to page 53 for module specifications

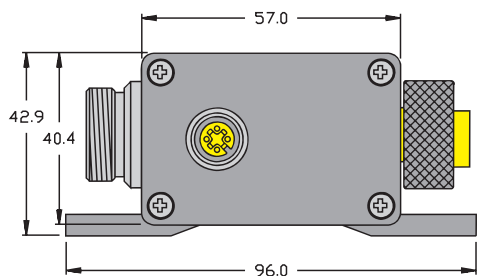
BD2DT1EX0, 1 x 2 inputs, group diagnostics, for connection of one 4-wire pnp sensor or two mechanical contacts



Item-no./EDS file: I1EXO_1.EDS
Product code: 7 / 2
Ident-no. 66 033 39

Input data 1 byte

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	IS	Reserved						I-1 I-0

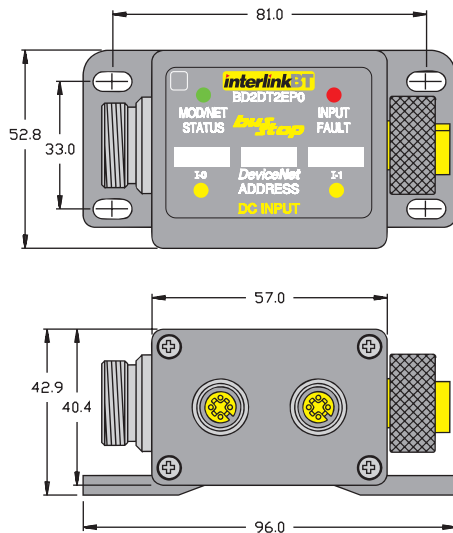


Abbreviations:

I = input data (0 = OFF, 1 = ON)
IS = input status (0 = working, 1 = fault)
O = output data (0 = OFF, 1 = ON)
OS= output status (0 = working, 1 = fault)

Bus Components for Sensors and Actuators

BD2DT2EP0, 2 pnp inputs, group diagnostics, for connection of two 3-wire pnp sensors or two mechanical contacts



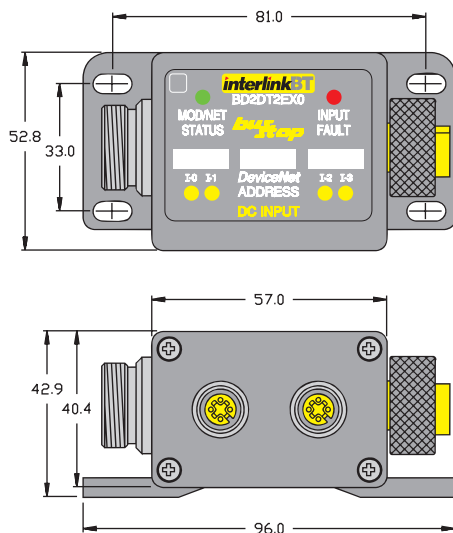
Item-no./EDS file: I2EPO_1.EDS
Product code: 7 / 3
Ident-no. 66 022 56

Input data 1 byte

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	IS	Reserved					I-1	I-0

Please refer to page 53 for module specifications

BD2DT2EX0, 2 x 2 inputs, group diagnostics, for connection of two 4-wire pnp sensors or four mechanical contacts



Item-no./EDS file: I2EXO_1.EDS
Product code: 7 / 4
Ident-no. 66 022 57

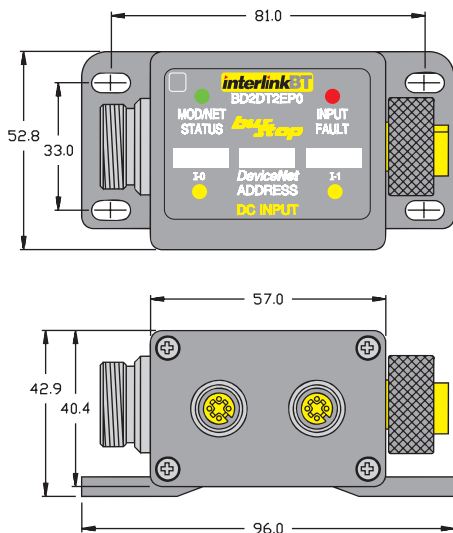
Input data 1 byte

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	IS	Reserved			I-3	I-2	I-1	I-0

Abbreviations:

I = input data (0 = OFF, 1 = ON)
IS = input status (0 = working, 1 = fault)
O = output data (0 = OFF, 1 = ON)
OS= output status (0 = working, 1 = fault)

**BD2DT1EP1EU, 1 pnp input and 1 output, 150 mA, per point diagnostics,
for connection of one 3-wire pnp sensor or one mechanical contact
and one output**



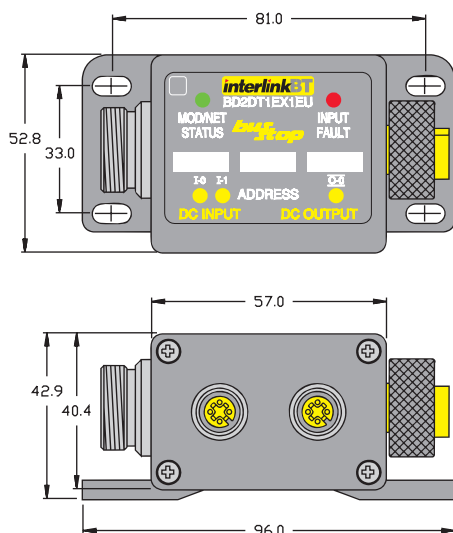
Item-no./EDS file: I1EP1EU1.EDS
Product code: 7 / 6
Ident-no. 66 022 92

Input data 1 byte/Output data 1 byte

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	IS	Reserved					OS	I-0
Output	Bit	7	6	5	4	3	2	1	0
Data	Meaning	Reserved							O-0

Please refer to page 53 for module specifications

**BD2DT1EX1EU, 1 x 2 inputs and 1 output, 150 mA, group diagnostics,
for connection of one 4-wire pnp sensor or two mechanical contacts
and one output**



Item-no./EDS file: I1EX1EU1.EDS
Product code: 7 / 7
Ident-no. 66 022 55

Input data 1 byte/Output data 1 byte

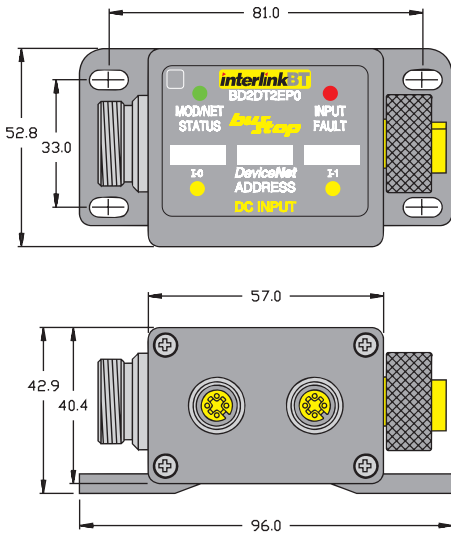
Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	IS	Reserved					OS	I-1 I-0
Output	Bit	7	6	5	4	3	2	1	0
Data	Meaning	Reserved							O-0

Abbreviations:

I = input data (0 = OFF, 1 = ON)
IS = input status (0 = working, 1 = fault)
O = output data (0 = OFF, 1 = ON)
OS= output status (0 = working, 1 = fault)

Bus Components for Sensors and Actuators

**BD2DT2EU, 2 outputs, 150 mA, per point-diagnostics,
for connection of two output devices**



Item-no./EDS file: I02EU_1.EDS

Product code: 7 / 5

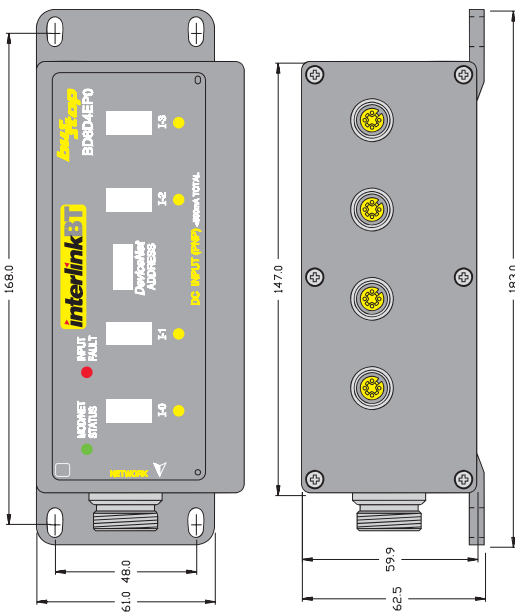
Ident-no. 66 033 40

Input data 1 byte/Output data 1 byte

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	Reserved						-	OS
Output	Bit	7	6	5	4	3	2	1	0
Data	Meaning	Reserved						O-1	O-0

Please refer to page 53 for module specifications

**BD8D4EP0, 4 pnp inputs, group diagnostics, for connection of four
3-wire pnp sensors or four mechanical contacts**



Item-no./EDS file: I4EPO_1.EDS

Product code: 7 / 8

Ident-no. 66 022 59

Input data 1 byte

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	IS	Reserved			I-3	I-2	I-1	I-0

Abbreviations:

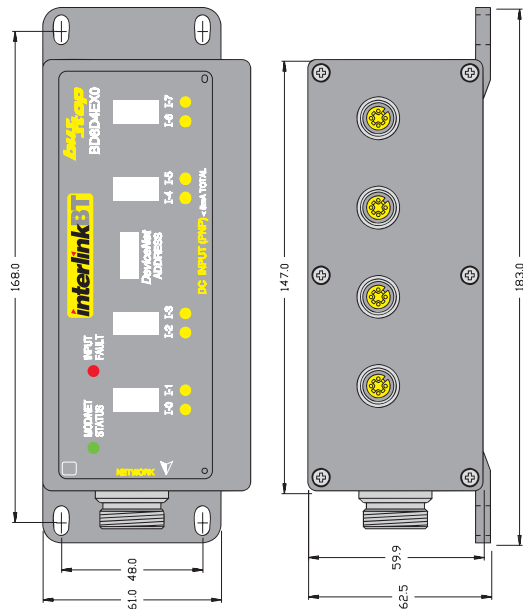
I = input data (0 = OFF, 1 = ON)

IS = input status (0 = working, 1 = fault)

O = output data (0 = OFF, 1 = ON)

OS= output status (0 = working, 1 = fault)

BD8D4EX0, 4 x 2 inputs, group diagnostics, for connection of four 4-wire pnp sensors or eight mechanical contacts



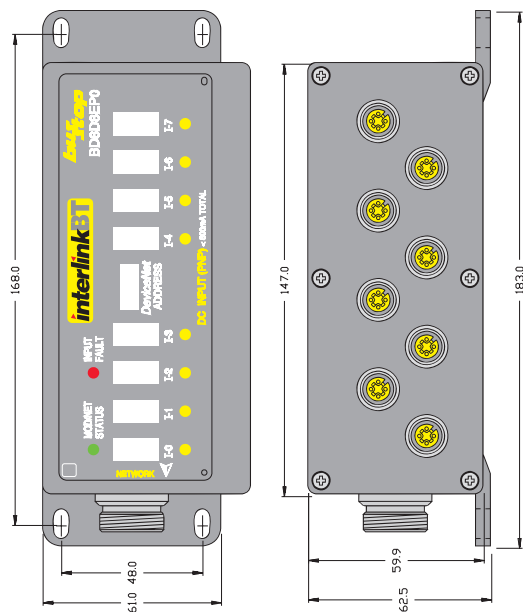
Item-no./EDS file: I4EXO_1.EDS
Product code: 7 / 9
Ident-no. 66 033 42

Input data 2 bytes

Input Data	Bit	07	06	05	04	03	02	01	00
	Meaning	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
Input Data	Bit	15	14	13	12	11	10	09	08
	Meaning	IS	Reserved						

Please refer to page 53 for module specifications

BD8D8EP0, 8 pnp inputs, group diagnostics, for connection of eight 3-wire pnp sensors or eight mechanical contacts



Item-no./EDS file: I8EPO_1.EDS
Product code: 7 / 10
Ident-no. 66 022 61

Input data 2 bytes

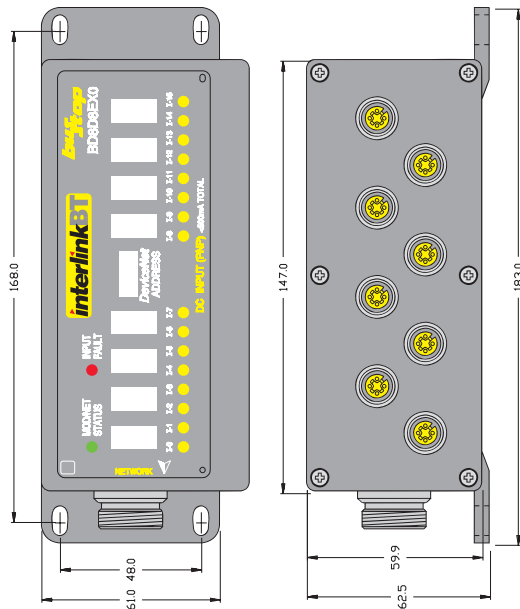
Input Data	Bit	07	06	05	04	03	02	01	00
	Meaning	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
Input Data	Bit	15	14	13	12	11	10	09	08
	Meaning	IS	Reserved						

Abbreviations:

I = input data (0 = OFF, 1 = ON)
IS = input status (0 = working, 1 = fault)
O = output data (0 = OFF, 1 = ON)
OS= output status (0 = working, 1 = fault)

Bus Components for Sensors and Actuators

BD8D8EX0, 8 x 2 inputs, group diagnostics, for connection of eight 4-wire pnp sensors or sixteen mechanical contacts



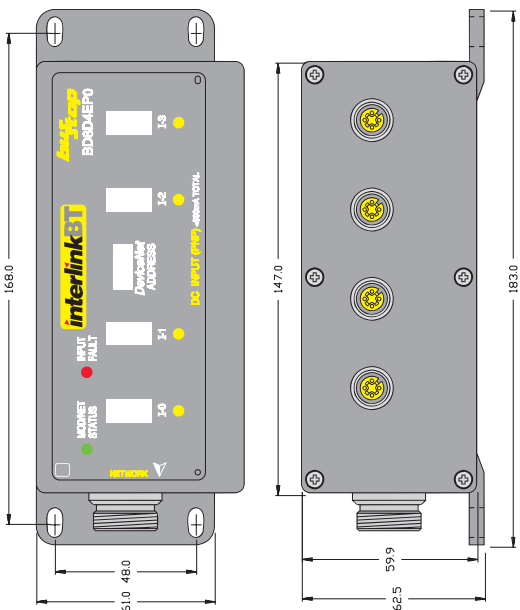
Item-no./EDS file: I8EXO_1.EDS
Product code: 7 / 11
Ident-no. 66 023 74

Input data 3 bytes

Input Data	Bit	07	06	05	04	03	02	01	00
	Meaning	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	Bit	15	14	13	12	11	10	09	08
	Meaning	I-15	I-14	I-13	I-12	I-11	I-10	I-9	I-8
	Bit	23	22	21	20	19	18	17	16
	Meaning	IS-1	Reserved						

Please refer to page 53 for module specifications

BD8D2EP2ET, 2 pnp inputs, 2 outputs, 2 A, group diagnostics, for connection of two 3-wire pnp sensors and two output devices



Item-no./EDS file: I2EP22ET1.EDS
Product code: 7 / 12
Ident-no. 66 022 58

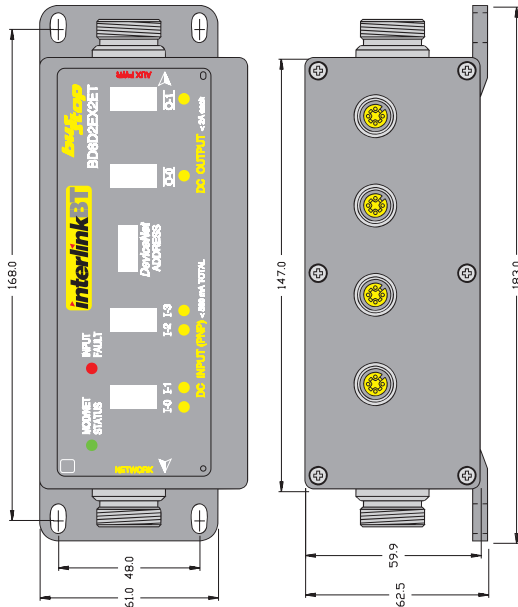
Input data 1 byte/Output data 1 byte

Input Data	Bit	07	06	05	04	03	02	01	00
	Meaning	IS	Reserved			OS-1	OS-2	I-1	I-0
Output Data	Bit	07	06	05	04	03	02	01	00
	Meaning	Reserved						O-1	O-0

Abbreviations:

I = input data (0 = OFF, 1 = ON)
IS = input status (0 = working, 1 = fault)
O = output data (0 = OFF, 1 = ON)
OS= output status (0 = working, 1 = fault)

**BD8D2EX2ET, 2 x 2 inputs, 2 outputs, 2 A, group diagnostics,
for connection of two 4-wire pnp sensors or
four mechanical contacts and two output devices**



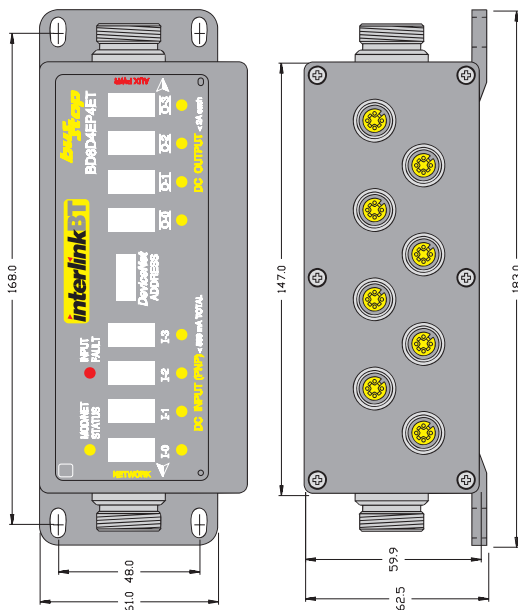
Item-no./EDS file: I2EX2ET1.EDS
Product code: 7 / 13
Ident-no. 66 033 41

Input data 1 byte/Output data 1 byte

Input	Bit	07	06	05	04	03	02	01	00
Data	Meaning	IS	Reserved	OS-1	OS-0	I-3	I-2	I-1	I-0
Output	Bit	07	06	05	04	03	02	01	00
Data	Meaning	Reserved						O-1	O-0

Please refer to page 53 for module specifications

**BD8D4EP4ET, 4 pnp inputs, 4 outputs, 2 A, group diagnostics,
for connection of four 3-wire pnp sensors
and four output devices**



Item-no./EDS file: I4EP4ET1.EDS
Product code: 7 / 14
Ident-no. 66 022 60

Input data 2 bytes/Output data 1 byte

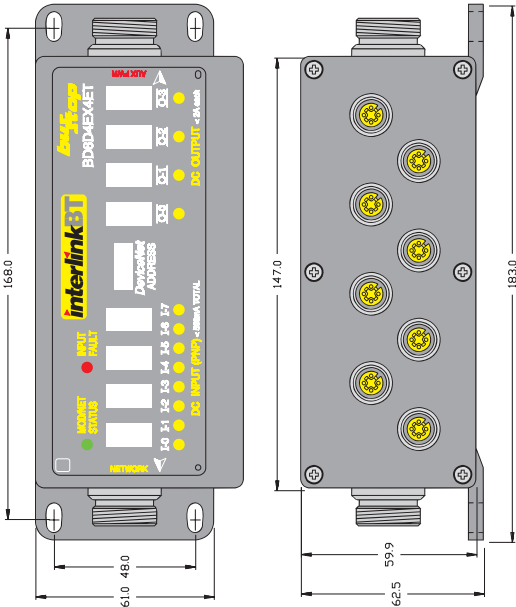
Input	Bit	07	06	05	04	03	02	01	00
Data	Meaning	OS-3	OS-2	OS-1	OS-0	I-3	I-2	I-1	I-0
	Bit	15	14	13	12	11	10	09	08
	Meaning	IS							
Output	Bit	07	06	05	04	03	02	01	00
Data	Meaning	Reserved				O-3	O-2	O-1	O-0

Abbreviations:

I = input data (0 = OFF, 1 = ON)
IS = input status (0 = working, 1 = fault)
O = output data (0 = OFF, 1 = ON)
OS= output status (0 = working, 1 = fault)

Bus Components for Sensors and Actuators

BD8D4EX4ET, 4 x 2 inputs, 4 outputs, 2 A, group diagnostics,
for connection of four 4-wire pnp sensors or eight mechanical contacts
and 4 output devices



Item-no./EDS file: I4EX4ET1.EDS
Product code: 7 / 15
Ident-no. 66 023 73

Input data 2 bytes/Output data 1 byte

Input Data	Bit	07	06	05	04	03	02	01	00
	Meaning	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	Bit	15	14	13	12	11	10	09	08
	Meaning	IS				OS-3	OS-2	OS-1	OS-0
Output Data	Bit	07	06	05	04	03	02	01	00
	Meaning	Reserved				O-3	O-2	O-1	O-0

Module Specifications, BD... Modules

Supply voltage

Supply voltage	11...26 VDC
Internal current consumption	< 80 mA (BD8... series), < 35 mA (BD2... series)

Input circuits

Input voltage	11...25 VDC
---------------	-------------

Output circuits

Output voltage	11...25 VDC
Max. output load	BD8 stations: 2 A BD2 stations: typ. 150 mA

Connections

Bus line	5-pin 7/8" connectors
Auxiliary power	4-pin 7/8" connectors
Inputs and outputs	M12 x 1 connectors

LED Indications

Module / network status	green: normal operation flashing green: station needs allocation red: communication error flashing red: polled time-out
Input/output	yellow: input on; yellow/red: output on/short-circuit
Input fault	red: input power shorted

Adjustments

	via DeviceNet™ configuration tool
Address	0...63
Communication rate	125/250/500 kbps
ON delay	0...60.000 seconds ± 1 ms (BD8 series)
OFF delay	0...60.000 seconds ± 1 ms (BD8 series)

Housings

BD2 series

	53 x 96 x 43 mm (h x w x d)
Material	black Noryl PPO, nickel-plated brass connectors
Mounting	4 through-holes, 5 mm diameter
Protection degree (IEC 60529/EN 60529)	IP67 (NEMA 1, 3, 4, 12, 13)
Operating temperature	-25° to 70°C (-13° to 158°F)

BD8 series

	61 x 183 x 62.5 mm (h x w x d)
Material	black Noryl PPO, nickel-plated brass connectors
Mounting	4 through-holes, 5 mm diameter
Protection degree (IEC 60529/EN 60529)	IP67 (NEMA 1, 3, 4, 12, 13)
Operating temperature	-25° to 70°C (-13° to 158°F)

Please note:

Detailed information and technical specifications on the individual module types can be downloaded from www.interlinkbt.com

Auxiliary Power Connectors

Please refer to the table of contents, page 3, columns "Input/output wiring", to find the connector types matching the various stations.

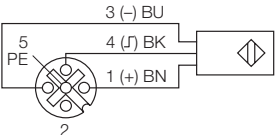
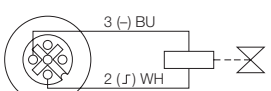
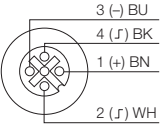
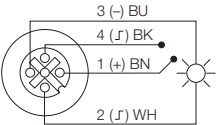
Type T	1 = Aux + 2 = E+ 3 = E- 4 = Aux -	 Male	 Female
Style: 4-pin 7/8" Cordset: Aux power use RSM RKM 46- *M Tee : Aux power use RSM 2RKM 40			

Input Connectors

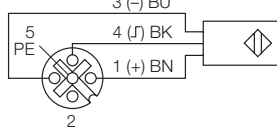
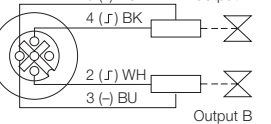
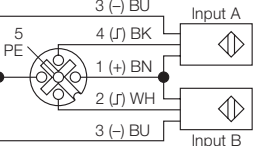
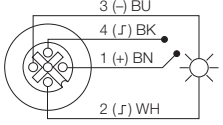
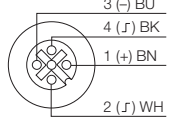
Type S or N		1 = VI+ 2 = N/C 3 = V- 4 = Input 5 = PE	
Style: 5-pin M12 x 1			
Cordset: Single sensor use RK 4.4T*-RS 4.4T			
Field wireable: Single sensor use BS 8141-0			
Type 2S or 2N	1= V + 2 = Input B 3 = V - 4 = Input A 5 = PE		
Style: 5-pin M12 x 1		Sensor with 2 signals	Splitter and 2 sensors
Cordset: Single sensor use RK 4.4T*-RS 4.4T			
Splitter: Splitter and 2 sensors use VBRS 4.4-2RK 4T-*/*			
Type L or P	1 = V+ 2 = N/C 3 = V- 4 = Input 5 = PE		
Style: 5-pin M12 x 1		Single sensor	Mechanical contact
Cordset: Single sensor or dry contact use RK 4.4T*-RS 4.4T			
Type 2L or 2P	1= V + 2 = Input B 3 = V - 4 = Input A 5 = PE		
Style: 5-pin M12 x 1		Sensor with 2 signals	Splitter and 2 sensors
Cordset: Sensor with 2 signals use RK 4.4T*-RS 4.4T			
Splitter: Splitter and 2 sensors use VBRS 4.5-2RK 4T-*/S818			
Type PBD	1= V + 2 = Input B 3 = V - 4 = Input A 5 = PE		
Style: 5-pin M12 x 1		Sensor with 2 signals	Mechanical contacts
Cordset: Single sensor or dry contact use RK 4.4T*-RS 4.4T			

Combined Input/Output Connectors

Please refer to the table of contents, page 3, columns “Input/output wiring”, to find the connector types matching the various stations.

Type C	1 = V + 2 = Output Signal 3 = GND 4 = Input Signal 5 = PE	 Single sensor	 Single output
Style: 5-pin M12 x 1 Cordsets: Single sensors, outputs or push buttons use RK 4.4T-*/*-RS 4.4T Splitter: Part verification array use VB2-RS 4.4T 1/2RK 4.4T-*/*-S651		 Part verification array	 Push button

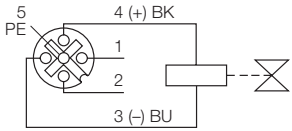
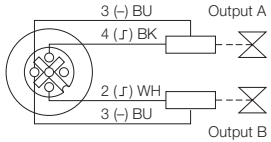
Universal Input or Output Connector

Type 2X	1 = V + 2 = Input/Output B 3 = GND 4 = Input/Output A 5 = PE	 Single sensor	 Outputs
Style: 5-pin M12 x 1 Cordsets: Single sensor, output or push button use RK 4.4T-*/*-RS 4.4T Splitter: 2 sensors or 2 outputs use VBRS 4.4-2RK 4T-*/* Parallel Splitter: Part verification array use VB2-RS 4.4T */2RK 4.4T-*/*-S651		 Splitter and 2 sensors	 Push button
			 Part verification array

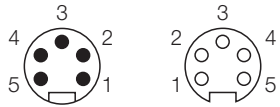
* Indicates length in meters

Output Connectors

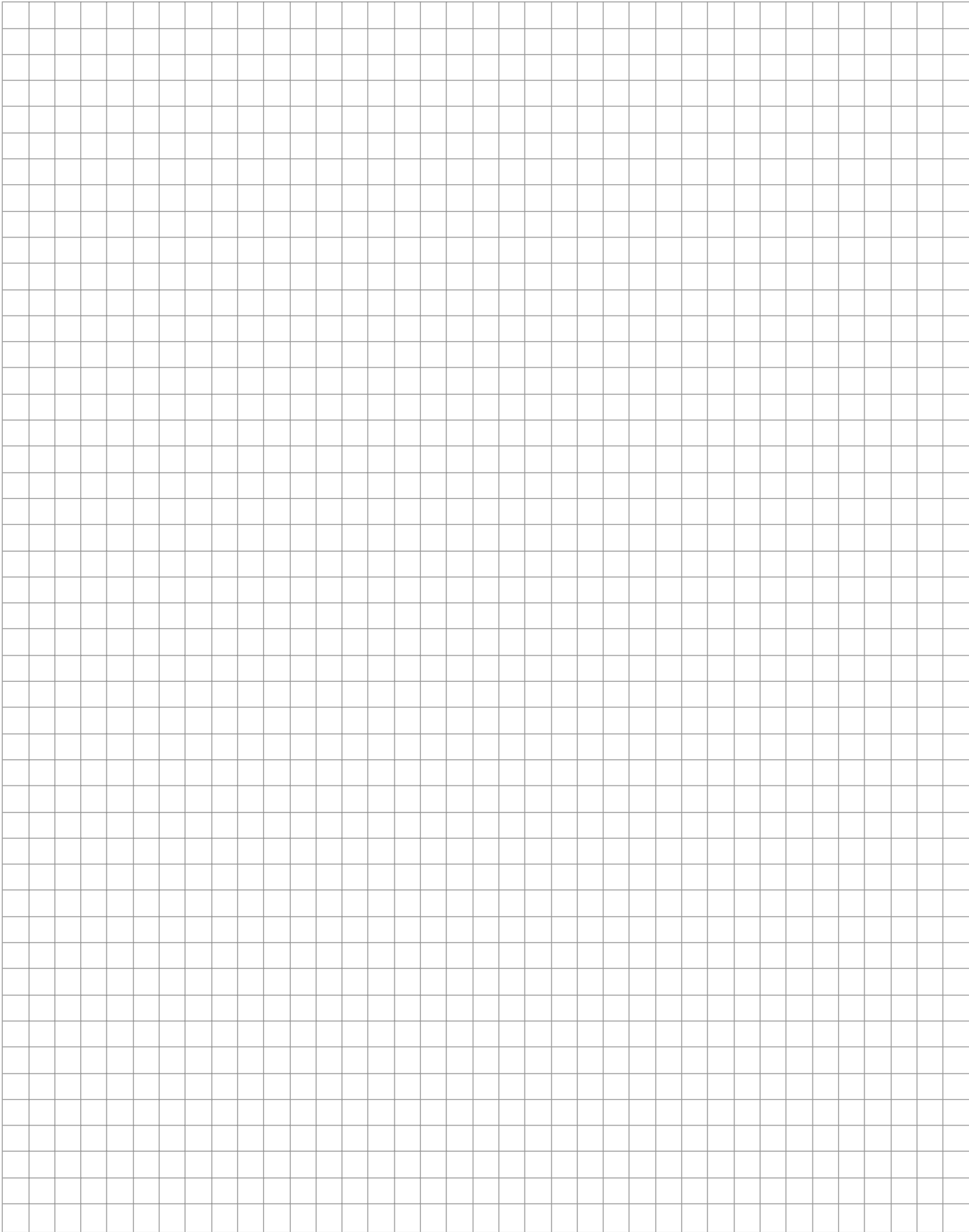
Please refer to the table of contents, page 3, columns “Input/output wiring”, to find the connector types matching the various stations.

Type G or H	1 = N/C 2 = N/C 3 = GND 4 = Output 5 = PE	 Single output
Type 2G or 2H	1 = N/C 2 = Output B (odd numbers) 3 = GND 4 = Output A (even numbers) 5 = PE	 Dual output

DeviceNet™

DeviceNet™	1 = Shield 2 = V + 3 = V - 4 = CAN_H 5 = CAN_L	 Through bus
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* Indicates length in meters



Bus Components for Sensors and Actuators

Premoulded fieldbus cables for DeviceNet™

Premoulded fieldbus cables ensure simple and secure wiring of the connected fieldbus components. Time-consuming wiring of individual components and bus communication problems due to wiring errors or incomplete shielding are eliminated.

Moulded polyurethane insulation provides IP67 protection. Standard lengths of pre-moulded cordsets and bulk cable are listed below. Consult the manufacturer for other lengths.

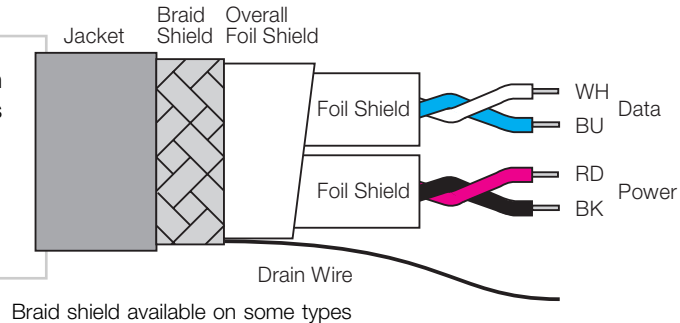
Overview Cable Lengths							
Cordsets – Standard lengths for all cables		Stock items: Cordsets with connector on both ends Bus cables: types 572, 5711, 5723 Power cable: type 42		Stock items: Cordsets with connector on one end Bus cables: types 572, 5711, 5723 Power cable: type 42		Bulk Cable	
Metres	Feet	Metres	Feet	Metres	Feet	Metres	Feet
0.3	1.0	–	–	–	–	30	98
0.5	1.6	0.5	1.6	–	–		
1.0	3.3	1.0	3.3	–	–		
1.5	4.9	–	–	–	–	75	246
2.0	6.6	2.0	6.6	–	–		
2.5	8.2	–	–	–	–		
3.0	9.8	–	–	–	–	150	492
4.0	13	4.0	13	–	–		
5.0	16	–	–	–	–		
6.0	20	6.0	20	6.0	20	225	738
8.0	26	–	–	–	–		
10	33	10	33	10	33		
15	49	15	49	15	49	300	984
20	66	–	–	–	–		
25	82	–	–	–	–		
30	98	30	98	–	–	–	–
40	131	–	–	–	–		
50	164	–	–	–	–		

Notes:

- Other lengths available upon request.
- Cable conversions:
1 metre = 3.2808 feet
1 metre = 39.37 inches
- Tolerances
0 - 1 metre: + 25 / - 0 mm
> 1 metre: + 50 / - 0 mm
or + 4 % of length / - 0 mm
whichever is greater

DeviceNet™ – Thin cable specifications

Cable that meets the requirements of ODVA thin or type 1 cable. This cable is commonly used as drop cable to a maximum length of 6 metres (20 feet) or trunk cable in networks up to a maximum length of 100 metres (328 feet).



Data rate	Max. cable length	Drop length	
		Maximum	Cumulative
125 Kbaud	100 m	6 m	156 m
280 Kbaud	100 m		78 m
500 Kbaud	100 m		39 m

Type	Approval	Power Pair		Data Pair		Outer Jacket	Shields	Bulk Cable ¹⁾ Part Number
		AWG Colour Code	DCR (/1000 ft) Insulation	AWG Colour Code	DCR (/1000ft) Insulation	Material Color Nominal O.D.	Type Drain Wire	
572	AWM 300V PLTC 300V ⁴⁾	2/22 AWG black/red	16.5 Ω PVC	2/22 AWG blue/white	16.5 Ω PE	PVC light grey 7.3 mm (.285 in)	Foil 22 AWG	Cable 572-*M
577 ²⁾	AWM 300V PLTC 300V ⁴⁾	2/22 AWG black/red	16.5 Ω SR-PVC	2/22 AWG blue/white	16.5 Ω PE	PVC light grey 8.4 mm (.330 in)	Foil/Braid 22 AWG	Cable 577-*M
578	CL2 300V PLTC 300V ⁴⁾	2/22 AWG black/red	16.5 Ω PVC	2/22 AWG blue/white	16.5 Ω PE	PVC light grey 6.0 mm (.235 in)	Foil/Braid 22 AWG	Cable 578-*M
5715	AWM 300V	2/22 AWG black/red	16.5 Ω PVC	2/22 AWG blue/white	16.5 Ω PE	PVC light grey 6.0 mm (.235 in)	Foil (data only) 22AWG	Cable 5715-*M
5717	AWM 300V	2/22 AWG black/red	16.5 Ω PVC	2/22 AWG blue/white	16.5 Ω PE	Santoprene® light grey ³⁾ 6.2 mm (.244 in)	Foil (data only) 22AWG	Cable 5717-*M

1) See page 58 for standard bulk cable lengths.

2) Flexlife cable

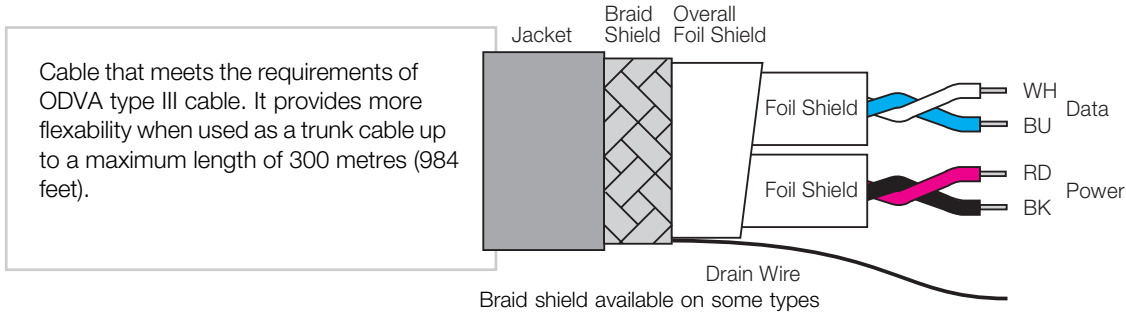
3) Santoprene is a registered trademark of Advanced Elastomer Systems.

4) Add '/C1129' to part number for PLTC 'sunlight resistant' rating.

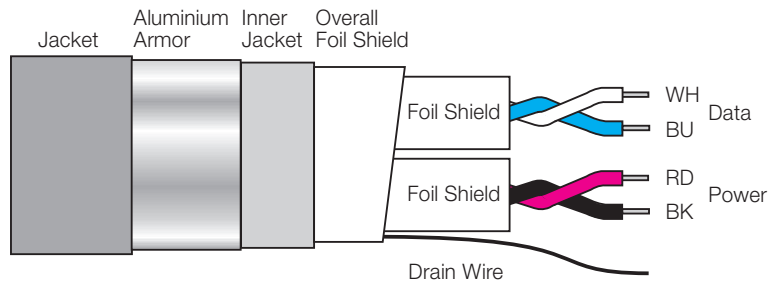
* Indicates length in metres.

Bus Components for Sensors and Actuators

DeviceNet™ – Mid cable specifications



Data rate	Max. cable length
125 Kbaud	300 m
280 Kbaud	250 m
500 Kbaud	100 m



Type	Approval	Power Pair		Data Pair		Outer Jacket	Shields	Bulk Cable ¹⁾ Part Number
		AWG Colour Code	DCR (/1000 ft) Insulation	AWG Colour code	DCR (/1000ft) Insulation			
5723 ²⁾	AWM 300V	2/17 AWG black/red	5.16 Ω PVC	2/20 AWG blue/white	10.4 Ω PE	PUR light grey 8.4 mm (.330 in)	Foil 20 AWG	Cable 5723-*M
5722 ²⁾	AWM 300V PLTC 300V	2/17 AWG black/red	5.2 Ω PVC	2/20 AWG blue/white	10.4 Ω PE	PVC light grey 8.4 mm (.330 in)	Foil 22 AWG	Cable 5722-*M
5711	AWM 300V PLTC 300V ⁴⁾	2/16 AWG black/red	4.1 Ω PVC	2/20 AWG blue/white	10.4 Ω PE	PVC light grey 8.4 mm (.330 in)	Foil/Braid 22 AWG	Cable 5711-*M
5721 ³⁾	PLTC 300V CM	2/18 AWG black/red	6.7 Ω PVC	2/20 AWG blue/white	10.4 Ω PE	Aluminum Armor/PVC light grey 13.5 mm (.530 in)	Foil/Armor 20 AWG	Cable 5721-*M

1) See page 58 for standard bulk cable lengths.

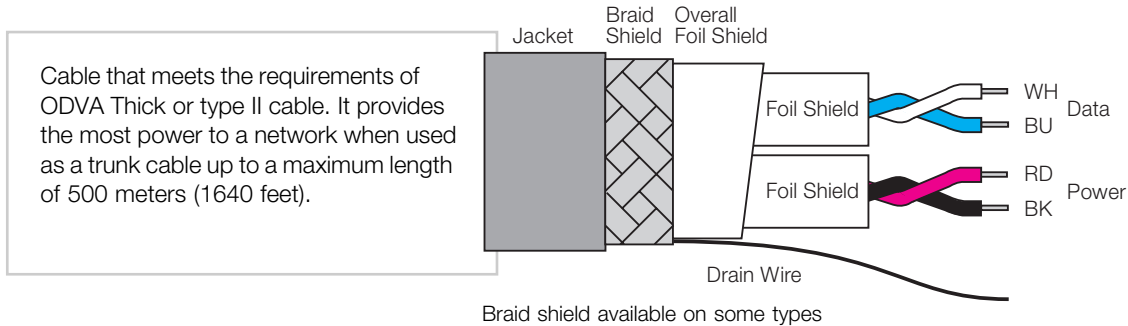
2) Flexlife cable

3) Armorfast cable

4) Add '/C1129' to part number for PLTC 'sunlight resistant' rating.

* Indicates length in metres.

DeviceNet™ – Thick cable specifications



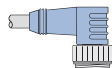
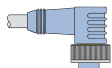
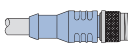
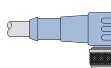
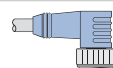
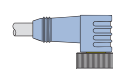
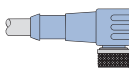
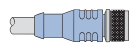
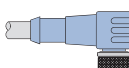
Data rate	Max. cable length
125 Kbaud	500 m
280 Kbaud	250 m
500 Kbaud	100 m

Type	Approval	Power Pair		Data Pair		Outer Jacket	Shields	Bulk Cable ¹⁾ Part Number
		AWG Colour Code	DCR (/1000 ft) Insulation	AWG Colour Code	DCR (/1000ft) Insulation	Material Color Nominal O.D.	Type Drain Wire	
575	AWM 300V	2/15 AWG black/red	3.6 Ω PVC	2/18 AWG blue/white	6.9 Ω PE	PUR light grey 10.4 mm (.409 in)	Foil/Braid 18 AWG	Cable 575-*M
579	CL2 300V PLTC 300V ⁴⁾	2/15 AWG black/red	3.6 Ω SR-PVC	2/18 AWG blue/white	6.9 Ω PE	PVC light grey 11 mm (.435 in)	Foil/Braid 18 AWG	Cable 579-*M
5720 ³⁾	TC 600V	2/16 AWG black/red	3.6 Ω PVC	2/18 AWG blue/white	6.9 Ω PE	PVC light grey 13 mm (.515)	Foil/Braid 18 AWG	Cable 5720-*M

- 1) See page 58 for standard bulk cable lengths.
- 2) Flat profile is 19.3 mm (0.760 in) x 5.3 mm (0.210 in)
- 3) Max. network length 380 m (1247 ft) at 125 kbaud; 220 m (722 ft) at 240 kbaud; 85 m (279 ft) at 500 kbaud
- 4) Add '/C1129' to part number for PLTC 'sunlight resistant' rating.

* Indicates length in metres.

DeviceNet™ – Thin, mid and thick cables and cordsets

		Connector and cable types	7/8" (thin, mid and thick cables) 572, 575, 577,578, 579, 5715, 5711, 5717, 5720, 5721, 5722				M12 x 1 (thin and mid cables) 572, 577, 578, 5711, 5715, 5717, 5721, 5722	
			Pin (male)		Socket (female)		Pin (male)	
			 RSM	 WSM	 RKM	 WKM	 RSC	 WSC
		 57 ^X -*M	RSM-57 ^X -*M	WSM-57 ^X -*M	RKM-57 ^X -*M	WKM-57 ^X -*M	RSC-57 ^X -*M	WSC-57 ^X -*M
7/8" (thin, mid and thick cables)	Pin (male)	 RSM	RSM RSM-57 ^X -*M	RSM WSM-57 ^X -*M	RSM RKM-57 ^X -*M	RSM WKM-57 ^X -*M	RSM RSC-57 ^X -*M	RSM WSC-57 ^X -*M
	WSM	 WSM		WSM WSM-57 ^X -*M	WSM RKM-57 ^X -*M	WSM WKM-57 ^X -*M	WSM RSC-57 ^X -*M	WSM WSC-57 ^X -*M
	Socket (female)	 RKM			RKM RKM-57 ^X -*M	RKM WKM-57 ^X -*M	RKM RSC-57 ^X -*M	RKM WSC-57 ^X -*M
	WKM	 WKM				WKM WKM-57 ^X -*M	WKM RSC-57 ^X -*M	WKM WSC-57 ^X -*M
	Pin (male)	 RSC					RSC RSC-57 ^X -*M	RSC WSC-57 ^X -*M
	WSC	 WSC						WSC WSC-57 ^X -*M
M12 x 1 (thin and mid cables)	Pin (male)	 RKC						
	Socket (female)	 WKC						

× Indicates cable type - see pages 58 to 61 for exact cable specifications.

Please distinguish between thin, mid and thick cables (see ordering example below).

Thin cables: types 572, 577, 578, 5715, 5717; mid cables: types 5711, 5721, 5722;

thick cables: types 575, 579, 5720

* Indicates length in metres.



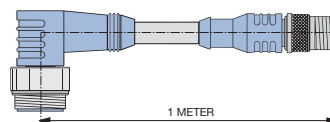
Example

WSM RSC 572-1M (cable type 572, 1 m long)

For stainless steel coupling nut

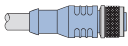
change part number: RSM... to RSV...

RSC... to RSCV...

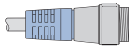
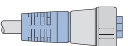
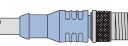
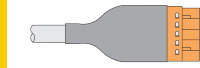


Bulk cable, see page 58 for standard lengths

DeviceNet™ – Thin, mid and thick cables and cordsets

M12 x 1 (thin and mid cables) 572, 577, 578, 5711, 5715, 5717, 5721, 5722		7/8" bulkhead (thin, mid, thick cables) 572, 575, 577, 578, 579, 5711, 5715, 5717, 5720, 5721, 5722		M12 x 1 bulkhead (thin cables) 572, 577, 578, 5715, 5717	
Socket (female)		Pin (male)	Socket (female)	Pin (male)	Socket (female)
					
RKC	WKC	RSFP	RKFP	FSFD	FKFD
RKC-57X-M	WKC-57X-M	RSFP-57X-M	RKFP-57X-M	FSFD-57X-M	FKFD-57X-M
RSMRKC-57X-M	RSMWKC-57X-M	RSMRSFP-57X-M	RSMRKFP-57X-M	RSMFSFD-57X-M	RSMFKFD-57X-M
WSMRKC-57X-M	WSMWKC-57X-M	WSMRSFP-57X-M	WSMRKFP-57X-M	WSMFSFD-57X-M	WSMFKFD-57X-M
RKMRKC-57X-M	RKMWKC-57X-M	RKMRSFP-57X-M	RKMRKFP-57X-M	RKMFSFD-57X-M	RKMFKFD-57X-M
WKMRKC-57X-M	WKMWKC-57X-M	WKMRSFP-57X-M	WKMRKFP-57X-M	WKMFSFD-57X-M	WKMFKFD-57X-M
RSC RKC-57X-M	RSC WKC-57X-M	RSC RSFP-57X-M	RSC RKFP-57X-M	RSC FSFD-57X-M	RSC FKFD-57X-M
WSC RKC-57X-M	WSC WKC-57X-M	WSC RSFP-57X-M	WSC RKFP-57X-M	WSC FSFD-57X-M	WSC FKFD-57X-M
RKC RKC-57X-M	RKC WKC-57X-M	RKC RSFP-57X-M	RKC RKFP-57X-M	RKC FSFD-57X-M	RKC FKFD-57X-M
	WKC WKC-57X-M	WKC RSFP-57X-M	WKC RKFP-57X-M	WKC FSFD-57X-M	WKC FKFD-57X-M

DeviceNet™ – Open connector cordsets

	Connector and cable types	7/8" (thin, mid and thick cables) 572, 575, 577, 578, 579, 5711, 5715, 5717, 5720, 5721, 5722					M12 x 1 (thin and mid cables)
		Pin (male)		Socket (female)			Pin (male)
		 Bare	 RSM	 WSM	 RKM	 WKM	 RSC
Device	 CBC5	CBC5-57 ^x -*M	RSM CBC5-57 ^x -*M	WSM CBC5-57 ^x -*M	RKM CBC5-57 ^x -*M	WKM CBC5-57 ^x -*M	RSC CBC5-57 ^x -*M
Beckhoff	 BK52C	BK52C-57 ^x -*M	RSM BK52C-57 ^x -*M	WSM BK52C-57 ^x -*M	RKM BK52C-57 ^x -*M	WKM BK52C-57 ^x -*M	RSC BK52C-57 ^x -*M

^x Indicates cable type.

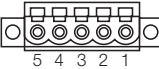
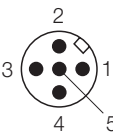
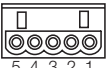
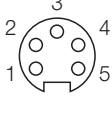
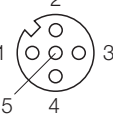
Please distinguish between thin, mid and thick cables (see ordering example below).

Thin cables: types 572, 577, 578, 5715, 5717; mid cables: types 5711, 5721, 5722;

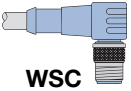
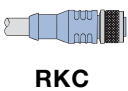
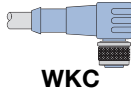
thick cables: types 575, 579, 5720

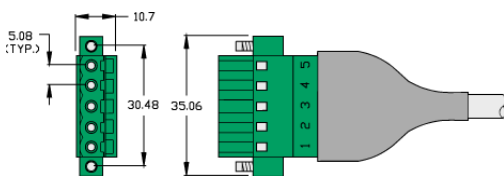
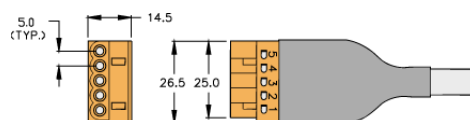
* Indicates length in metres.

For stainless steel coupling nut change part number: RSM... to RSV...; RSC... to RSCV...

Part Number	Application	Pinouts		
		CBC5	7/8"	M12 x 1
CBC5-57^x-*M	Open connector	1 = black (– voltage) 2 = blue (CAN_L) 3 = bare (shield drain) 4 = white (CAN_H) 5 = red (+ voltage) 	male 	male 
BK52C-57^x-*M	Open connector for Beckhoff bus terminals	BK52C 1 = black (– voltage) 2 = blue (CAN_L) 3 = bare (shield drain) 4 = white (CAN_H) 5 = red (+ voltage) 	female 	female 

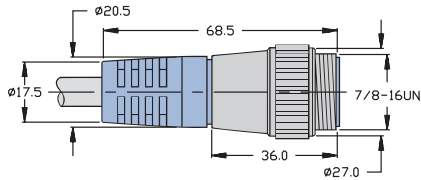
DeviceNet™ – Open connector cordsets

M12 x 1 (thin and mid cables)• 572, 577, 578, 5711, 5715, 5717, 5721, 5722			7/8" bulkhead (thin, mid, thick cables) 572, 575, 577, 578, 579, 5711, 5715, 5717, 5720, 5721, 5722		M 12 x 1 bulkhead (thin cables) 572, 577, 578, 5715, 5717	
Pin (male)	Socket (female)		Pin (male)	Socket (female)	Pin (male)	Socket (female)
						
WSC	RKC	WKC	RSFP	RKFP	FSFD	FKFD
WSC CBC5-57X-*M	RKC CBC5-57X-*M	WKC CBC5-57X-*M	RSFP CBC5-57X-*M	RKFP CBC5-57X-*M	FSFD CBC5-57X-*M	FKFD CBC5-57X-*M
WSC BK52C-57X-*M	RKC BK52C-57X-*M	WKC BK52C-57X-*M	RSFP BK52C-57X-*M	RKFP BK52C-57X-*M	FSFD BK52C-57X-*M	FKFD BK52C-57X-*M

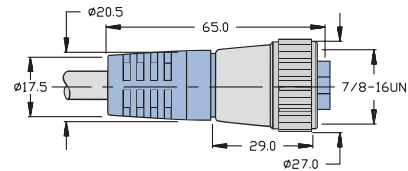
CBC5-57X-

BK52C-57X-*M


7/8" – Cordset and receptacle connector dimensions and pinouts

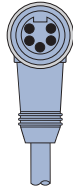
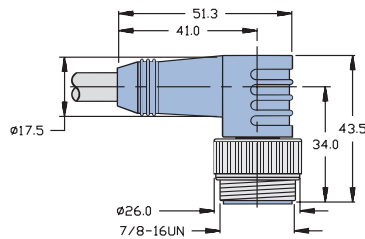
RSM-*



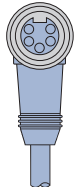
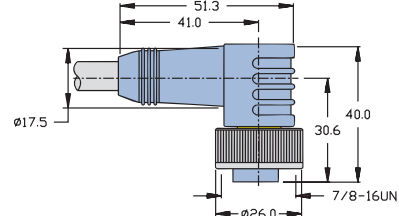
RKM-*



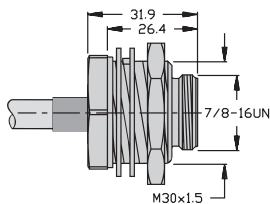
WSM-*



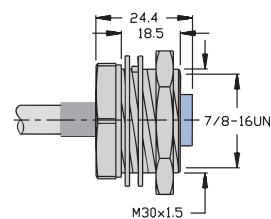
WKM-*



RSFP-*



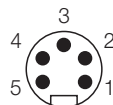
RKFP-*



Pinouts

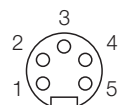
1. bare (shield drain wire)
2. red (+ voltage)
3. black (- voltage)
4. white (CAN_H)
5. blue (CAN_L)

Male



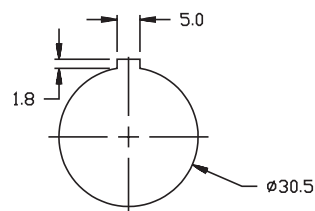
Female

1. bare (shield drain wire)
2. red (+ voltage)
3. black (- voltage)
4. white (CAN_H)
5. blue (CAN_L)

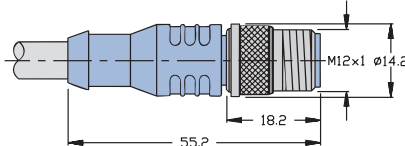
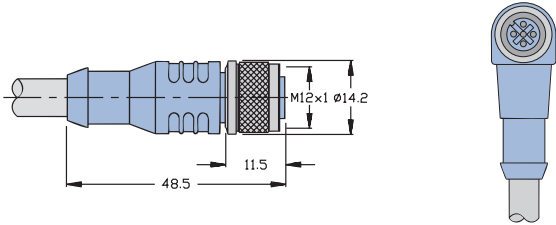
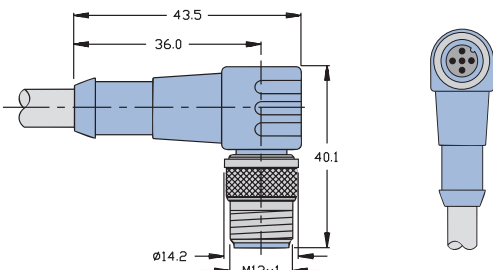
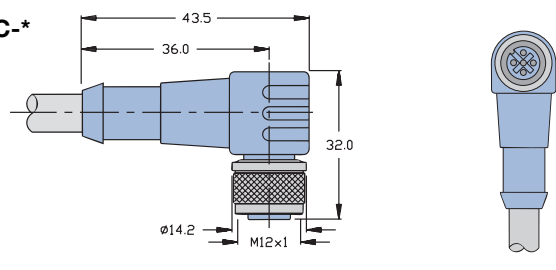
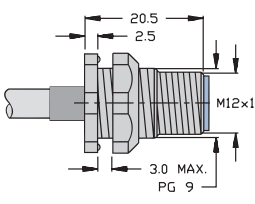
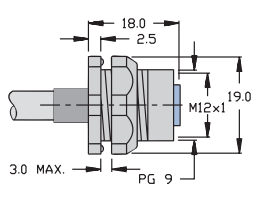
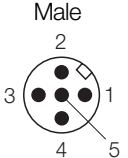
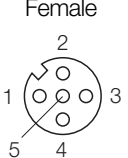
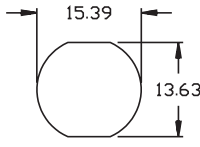


* CENELEC EN 50044 numbering standard
Note: All dimensions in millimetres.

Mounting installation



M12 x 1 – Cordset and receptacle connector dimensions and pinouts

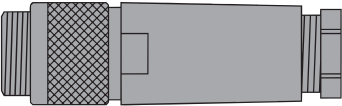
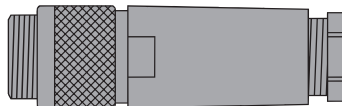
RSC-* 	RKC-* 
WSC-* 	WKC-* 
FSFD-* 	FKFD-* 
Pinouts 1. bare (shield drain wire) 2. red (+ voltage) 3. black (- voltage) 4. white (CAN_H) 5. blue (CAN_L) Male 	Female 
* CENELEC EN 50044 numbering standard Note: All dimensions in millimetres.	Mounting installation 

DeviceNet™ – 7/8" Field wireable connectors



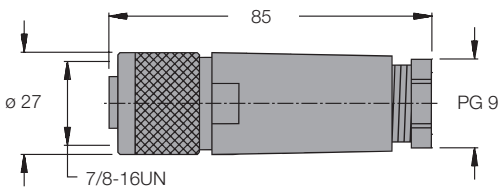
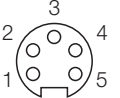
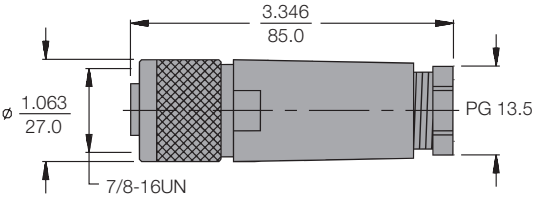
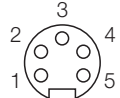
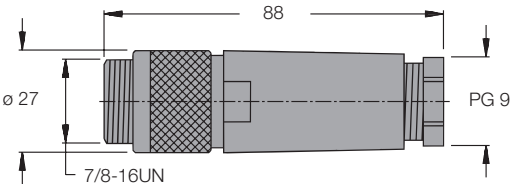
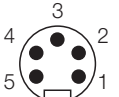
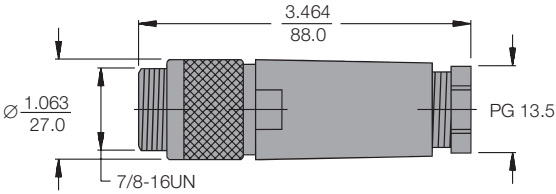
Field wireable connectors for bus lines and drops
Convert hardwiring to 7/8" connectors
Facilitate field replacement

Selection guide

Part number	Applications	Schematic
B4151-0/9 	7/8" field wireable • straight female connector • for use with DeviceNet™ thin cables	1 > _____ Bare 2 > _____ Red 3 > _____ Black 4 > _____ White 5 > _____ Blue
B4151-0/13.5 	7/8" field wireable • straight female connector • for use with DeviceNet™ thick cables	1 > _____ Bare 2 > _____ Red 3 > _____ Black 4 > _____ White 5 > _____ Blue
BS4151-0/9 	7/8" field wireable • straight male connector • for use with DeviceNet™ thin cables	1 < _____ Bare 2 < _____ Red 3 < _____ Black 4 < _____ White 5 < _____ Blue
BS4151-0/13.5 	7/8" field wireable • straight male connector • for use with DeviceNet™ thick cables	1 < _____ Bare 2 < _____ Red 3 < _____ Black 4 < _____ White 5 < _____ Blue

Specifications

Housing:	plastic, type PA 6.6 GV
Connector insert:	Polyurethane; V2 acc. UL 94
Contact materials:	CuZn-plated copper alloy
Coupling nuts:	anodized aluminum
Temperature:	-40 °C to +85 °C (-40 °F to +185 °F)
Protection:	IP67 (IEC 60529/EN 60529), NEMA 1, 3, 4, 6, 13

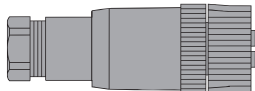
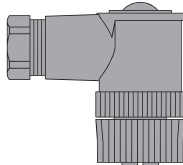
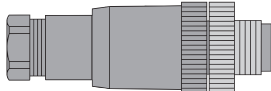
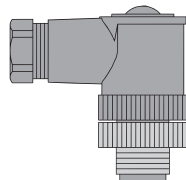
Dimensions	Pinouts	Cable range (inch/mm)
	female 7/8"  rating: 9 A, 300 VDC	• 0.236 - 0.330 / 6 - 8.5 • for use with DeviceNet™ thin cables
	female 7/8"  rating: 9 A, 300 VDC	• 0.236 - 0.330 / 6 - 8.5 • for use with DeviceNet™ thick cables
	male 7/8"  rating: 9 A, 300 VDC	• 0.236 - 0.330 / 6 - 8.5 • for use with DeviceNet™ thin cables
	male 7/8"  rating: 9 A, 300 VDC	• 0.236 - 0.330 / 6 - 8.5 • for use with DeviceNet™ thick cables

DeviceNet™ – M12 x 1 Field wireable connectors



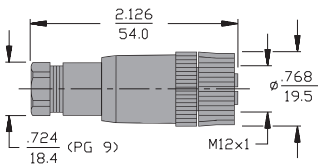
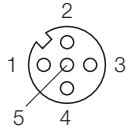
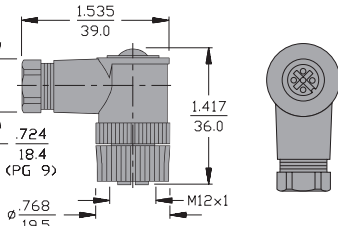
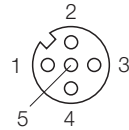
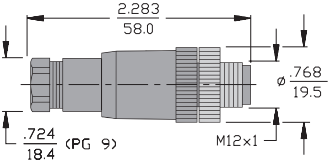
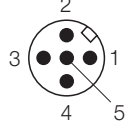
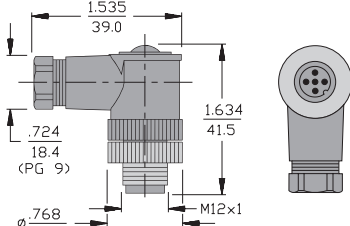
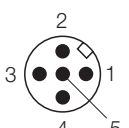
Field wireable connectors for bus lines and drops
Convert hardwiring to M12 x 1 connectors
Facilitate field replacement

Selection guide

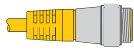
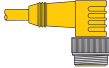
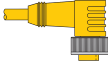
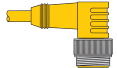
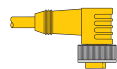
Part number	Applications	Schematic
B8151-0/9 	M12 x 1 field wireable • straight female connector • for use with DeviceNet™ thin/mid cables	Bare —————< 1 Red —————< 2 Black —————< 3 White —————< 4 Blue —————< 5
B8251-0/9 	M12 x 1 field wireable • right angle female connector • for use with DeviceNet™ thin/mid cables	Bare —————> 1 Red —————> 2 Black —————> 3 White —————> 4 Blue —————> 5
BS8151-0/9 	M12 x 1 field wireable • straight male connector • for use with DeviceNet™ thin/mid cables	Bare —————< 1 Red —————< 2 Black —————< 3 White —————< 4 Blue —————< 5
BS8251-0/9 	M12 x 1 field wireable • right angle male connector • for use with DeviceNet™ thin/mid cables	Bare —————> 1 Red —————> 2 Black —————> 3 White —————> 4 Blue —————> 5

Specifications

Housing:	Polyester, PBT black
Connector insert:	PBT; spacings to VDE 0110 Group C
Contact materials:	nickel-plated copper alloy
Coupling nuts:	female - PBT; male - nickel-plated brass
Temperature:	-40 °C to +85 °C (-40 °F to +185 °F)
Protection:	IP67 (IEC 60529/EN 60529), NEMA 1, 3, 4, 6p

Dimensions	Pinouts	Cable range (inch/mm)
 2.126 54.0 1.417 36.0 1.535 39.0 1.724 43.7 1.768 44.8 1.724 18.4 (PG 9) M12x1	female M12 x 1  rating: 3 A, 36 VDC	• 0.236 - 0.330 / 6 - 8.5 • for use with DeviceNet™ thin/mid cables
 1.535 39.0 1.417 36.0 1.724 43.7 1.768 44.8 1.724 18.4 (PG 9) M12x1	female M12 x 1  rating: 3 A, 36 VDC	• 0.236 - 0.330 / 6 - 8.5 • for use with DeviceNet™ thin/mid cables
 2.283 58.0 1.417 36.0 1.535 39.0 1.724 43.7 1.768 44.8 1.724 18.4 (PG 9) M12x1	male M12 x 1  rating: 3 A, 36 VDC	• 0.236 - 0.330 / 6 - 8.5 • for use with DeviceNet™ thin/mid cables
 1.535 39.0 1.417 36.0 1.634 41.5 1.724 43.7 1.768 44.8 1.724 18.4 (PG 9) M12x1	male M12 x 1  rating: 3 A, 36 VDC	• 0.236 - 0.330 / 6 - 8.5 • for use with DeviceNet™ thin/mid cables

DeviceNet™ – Power cordsets with 7/8" connectors

		7/8"			
		Pin (male)		Socket (female)	
		 RSM	 WSM	 RKM	 WKM
		RSM 4^x-*M	WSM 4^x-*M	RKM 4^x-*M	WKM 4^x-*M
7/8"	 RSM	RSM RSM 4^x-*M	RSM WSM 4^x-*M	RSM RKM 4^x-*M	RSM WKM 4^x-*M
	 WSM		WSM WSM 4^x-*M	WSM RKM 4^x-*M	WSM WKM 4^x-*M
	 RKM			RKM RKM 4^x-*M	RKM WKM 4^x-*M
	 WKM				WKM WKM 4^x-*M

X = indicates cable type

type ...42 = conductor cross section:

Ø 4 x 1.5 mm²

type...46 = conductor cross section

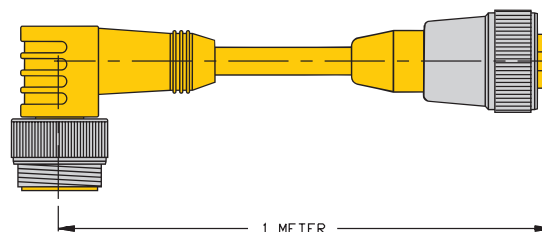
Ø 4 x 1.31 mm²

* indicates length in metres



Example

WSM RKM 4^x-1M



Specifications

Connector:	Oil resistant polyurethane body material and contact carrier, 600 V rating
Contacts:	gold-plated brass, machined from solid stock
Coupling nuts:	nickel-plated brass (CuZn) or optional stainless steel
Cable:	16 AWG oil-resistant yellow PVC jacket, 600 V, 105 °C, STOW-A, 11.0 mm diameter non-wicking, non-hygroscopic, UL recognized, CSA certified, cable end is stripped and tinned
Temperature:	-40 °C to +105 °C (-40 °F to +221 °F)
Protection:	IP67 (IEC 60529/EN 60529), NEMA 1, 3, 4, 6P

Dimensions	Cordset pinouts (per SAE-J-1738 A)	Station pinouts (per EN 50044)
	RSM male 7/8"	RSM male 7/8"
	WSM male 7/8"	WSM male 7/8"
	RKM female 7/8"	RKM female 7/8"
	WKM female 7/8"	WKM female 7/8"
Colour codes		
1. black (– voltage) 2. white (E –) 3. red (+ voltage) 4. green (E +)		1. red (+ voltage) 2. green (E +) 3. white (E –) 4. green (– voltage)

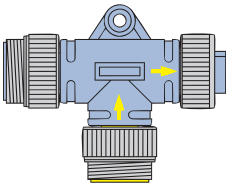
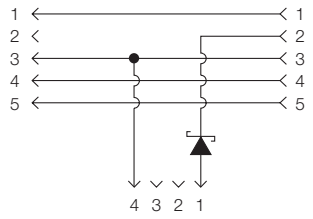
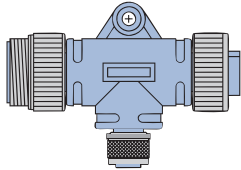
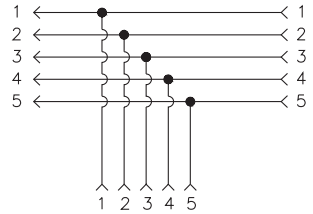
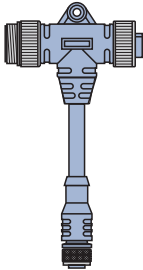
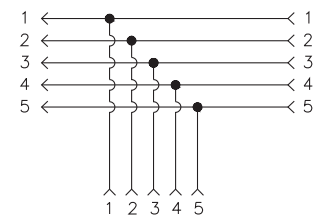
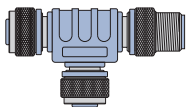
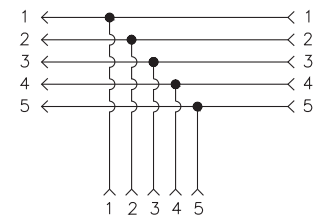
DeviceNet™ – Bus, power and diagnostic tees



Keyed for DeviceNet™ systems
Tough moulded polyurethane body
Heavy duty internal wiring

Selection guide

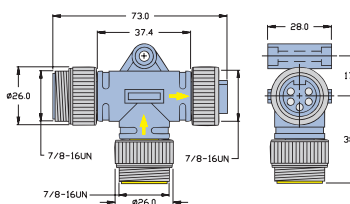
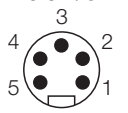
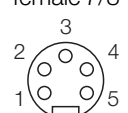
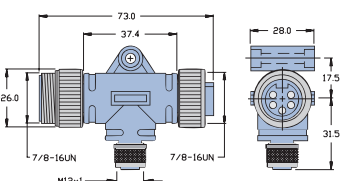
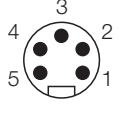
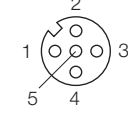
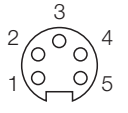
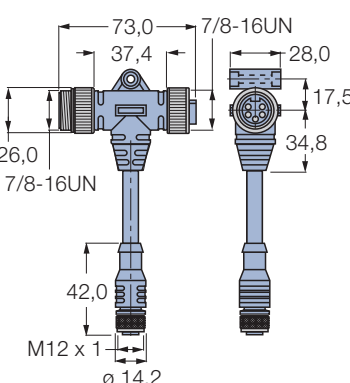
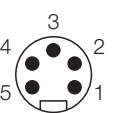
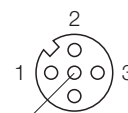
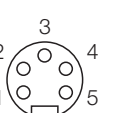
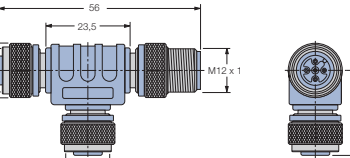
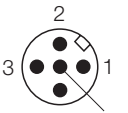
For stainless steel coupling nuts:
change part number (RSM 2RKM .. to RSV 2RKV..)

Part number	Applications	Schematic
RSM RKM 57 WSM 40-PST 	<i>busstop®</i> power tee - provides segment power - includes reverse current protection	
RSM FKM RKM 57 	M12 x 1 drop off bus line 7/8 to M12 x 1 - bus power and data branch	
RSM RKC 57*-M RKM 57 	M12x 1 cordset drop 7/8" to M12 x 1 extension cable - available with all thin cables - maximum 6 metre branch - for right angle connector change RKC to WKC	
RSC 2RKC 57 	M12 x 1 tee M12 x 1 trunk and drop	

Specifications

Connector:	moulded polyurethane construction, spacings to VDE 0110 group C (250 VAC / 300 VDC)
Contact materials:	gold-plated brass
Coupling nuts:	nickel-plated brass
Temperature:	-40 °C to +80 °C (-40 °F to +170 °F)
Protection:	IP67 (IEC 60529/EN 60529), NEMA 1, 3, 4, 6, 13

* CENELEC EN 50044 numbering convention

Dimensions	Pinouts		
 73.0, 37.4, 28.0, 17.5, 38.3, 26.0, 7/8-16UN, 7/8-16UN, 7/8-16UN, 26.0	RSM male 7/8"  rating: 9 A, 600 V	RKM female 7/8"  rating: 9 A, 600 V	WSM 40* male 7/8"  rating: 9 A, 600 V
 73.0, 37.4, 28.0, 17.5, 31.5, 26.0, 7/8-16UN, 7/8-16UN, M12 x 1	RSM male 7/8"  rating: 9 A, 600 V	FKM female M12 x 1  rating: 4 A, 300 V	RKM female 7/8"  rating: 9 A, 600 V
 73.0, 37.4, 28.0, 17.5, 34.8, 26.0, 7/8-16UN, 7/8-16UN, M12 x 1, 42.0, 14.2	RSM male 7/8"  rating: 9 A, 600 V	RKC female M12 x 1  rating: 4 A, 250 V	RKM female 7/8"  rating: 9 A, 600 V
 56, 23.5, 15, M12 x 1, M12 x 1, M12 x 1, 23.5	RSC male M12 x 1  rating: 4 A, 250 V	RKC female M12 x 1  rating: 4 A, 250 V	

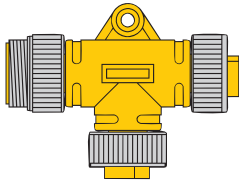
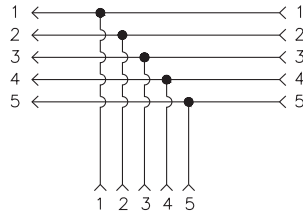
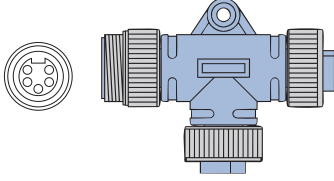
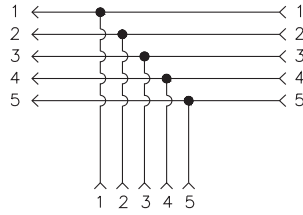
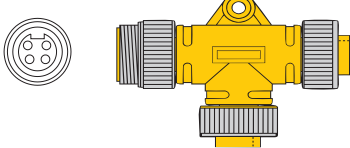
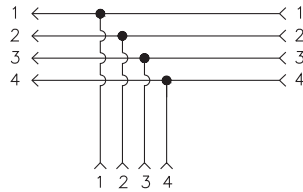
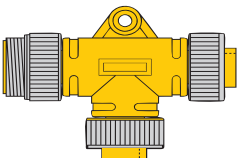
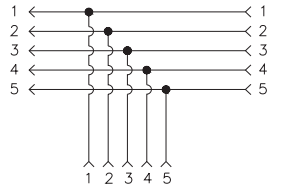
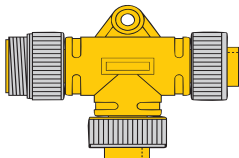
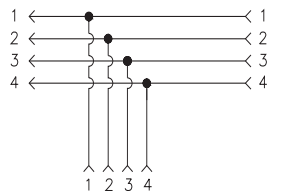
DeviceNet™ – Bus, power and diagnostic tees



Keyed for DeviceNet™ systems
Tough moulded polyurethane body
Heavy duty internal wiring

Selection guide

For stainless steel coupling nuts:
change part number (RSM 2RKM .. to RSV 2RKV..)

Part number	Applications	Schematic
RSM 2RKM 57 DGT 	<i>busstop®</i> diagnostic tee - provides easy connection for diagnostic tools - tap protected with cover when not in use (not shown)	
RSM 2RKM 57 	7/8" drop off bus line - full power and data drop - maximum 6 metre branch - standard keyway	
RSM 2RKM 40 	7/8" power tee - power tee for DeviceNet™ stations - standard keyway	
RSM 2RKM 57 KF/KM  KF  KM 	7/8" drop off bus line - full power and data drop - maximum 6 meter branch - KF= keyway facing female - KM= keyway facing male	
RSM 2RKM 40 KF/KM  KF  KM 	7/8" power tee - power tee for DeviceNet™ stations - KF = keyway facing female - KM= keyway facing male	

Specifications

Connector:	moulded polyurethane construction, spacings to VDE 0110 group C (250 VAC / 300 VDC)
Contact materials:	gold-plated brass
Coupling nuts:	nickel-plated brass
Temperature:	-40 °C to +80 °C (-40 °F to +170 °F)
Protection:	IP67 (IEC 60529/EN 60529), NEMA 1, 3, 4, 6, 13

* CENELEC EN 50044 numbering convention

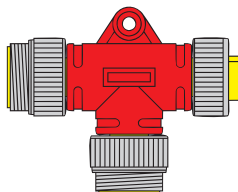
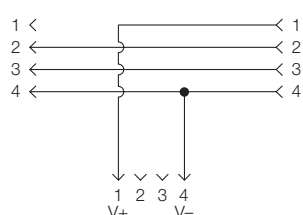
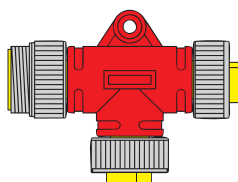
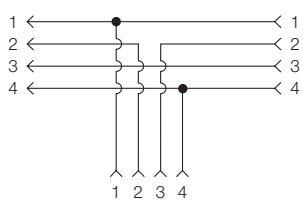
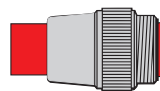
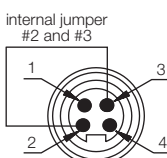
Dimensions	Pinouts	
	RSM male 7/8" rating: 9 A, 600 V	RKM female 7/8" rating: 9 A, 600 V
	RSM male 7/8" rating: 9 A, 600 V	RKM female 7/8" rating: 9 A, 600 V
	RSM male 7/8" rating: 9 A, 600 V	RKM female 7/8" rating: 9 A, 600 V
	RSM male 7/8" rating: 9 A, 600 V	RKM female 7/8" rating: 9 A, 600 V
	RSM male 7/8" rating: 9 A, 600 V	RKM female 7/8" rating: 9 A, 600 V

Device-Net™ – E & M stop tees



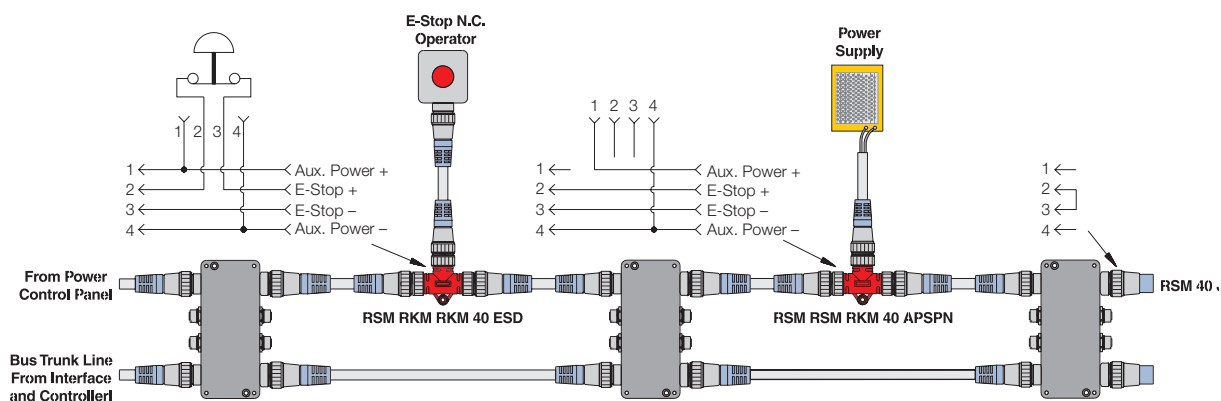
Keyed for DeviceNet™ systems
Provide emergency & machine (E & M) stop interface
Tough moulded polyurethane body

Selection guide

Part number	Applications	Schematic
RSM RSM RKM 40 APSPN 	Auxiliary power tee - provides input power for auxiliary system - uninterrupted E & M stop signals	
RSM RKM RKM 40 ESD 	E & M stop drop tee - provides interruption to auxiliary power - terminate with 7/8" internal jumper	
RSM 40 J32R 	7/8" with internal jumper internally jumpered to complete E & M stop circuit	

For stainless steel coupling nuts: change part number (RSM RKM ... to RSV RKV...)

Typical Application



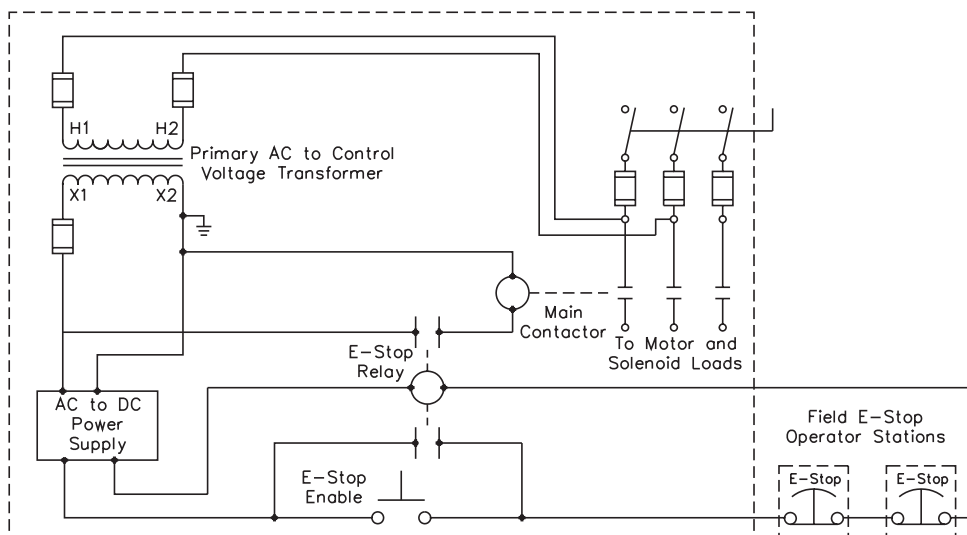
Specifications

Connector:	moulded polyurethane construction, spacings to VDE 0110 group C (250 VAC / 300 VDC).
Contact materials:	gold-plated brass
Coupling nuts:	nickel-plated brass
Temperature:	-40 °C to +80 °C (-40 °F to +170 °F)
Protection:	IP67 (IEC 60529/EN 60529), NEMA 1, 3, 4, 6, 13

Dimensions	Pinouts	
	RSM* male 7/8" rating: 9 A, 600 V	RKM* female 7/8" rating: 9 A, 600 V
	RSM* male 7/8" rating: 9 A, 600 V	RKM* female 7/8" rating: 9 A, 600 V
	RSM* male 7/8" rating: 9 A, 600 V	

System schematic

* CENELEC EN 50044 numbering standard

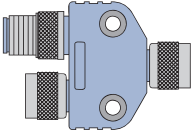
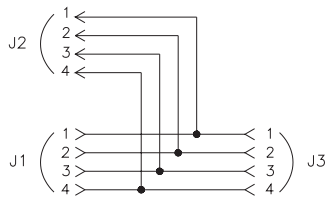
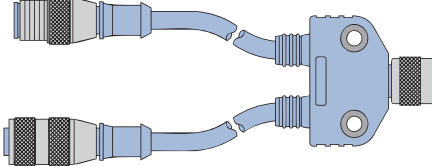
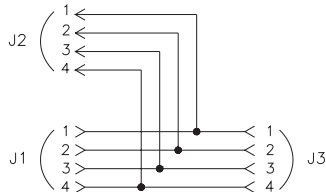
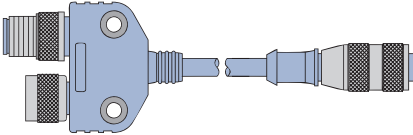
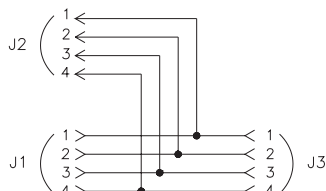
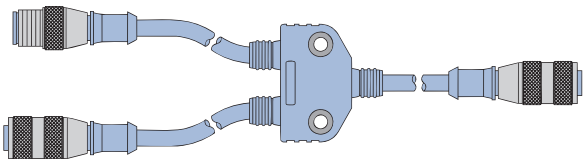
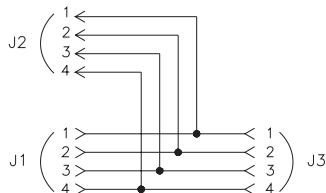


Device-Net™ – VB2 M12 x 1 drop junctions



M12 x 1 branch from M12 x 1 bus line
Keyed for DeviceNet™ systems
Tough moulded polyurethane body
Heavy duty internal wiring

Selection guide

Part number	Applications	Schematic
VB2-FKM/FSM/FKM 57 	VB2 junction • ready for M12 x 1 cordsets branch and bus • maximum 6 metre branch	
VB2-FKM/RKC RSC 57^x-*M *M 	VB2 junction with bus line • reduced power and data drop • maximum 6 metre branch	
VB2-RKC 57^x-*M/FKM FSM 	VB2 junction with bus line • ready for M12 x 1 bus line • maximum 6 metre branch	
VB2-RKC 57^x-*M/RKC RSC 57^x-*M *M 	VB2 junction with bus line and branch • maximum 6 metre branch	

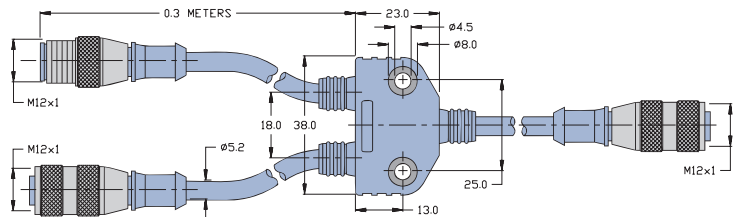
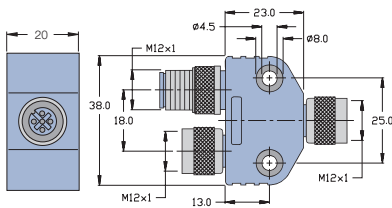
For stainless steel coupling nuts change part numbers RKC to RKC.V.

Specifications

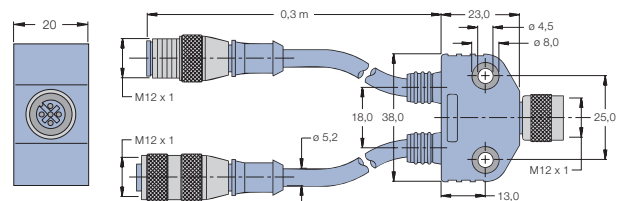
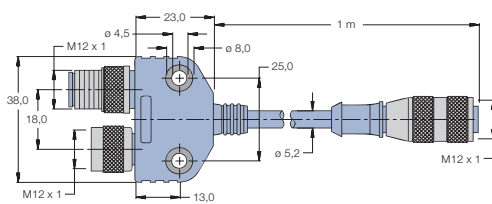
Connector:	moulded polyurethane construction, spacings to VDE 0110 Group C (250 VAC / 300 VDC).
Contact materials:	gold-plated brass
Coupling nuts:	nickel-plated brass
Temperature:	-40 °C to +80 °C (-40 °F to +170 °F)
Protection:	IP67 (IEC 60529/EN 60529), NEMA 1, 3, 4, 6, 13

Cable specification	Pinouts	
DeviceNet™ thin cable	FSM or RSC male M12 x 1  rating: 4 A, 250 V	FKM or RKC female M12 x 1  rating: 4 A, 250 V

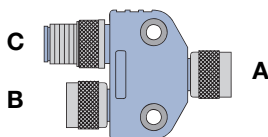
Dimensional drawings



Dimensional drawings



Part number definition



Connector* VB2 FKM ____ / FKM FSV 57 ____
 Cordset* VB2 RKC 57x *M / RKC RSC 57x *M *M

Family type _____ Length C
 Connector / cordset A _____ Length B
 Cable type A _____ Cable type B and C
 Length A _____ Connector / cordset C
 _____ Connector / cordset B

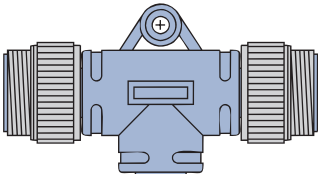
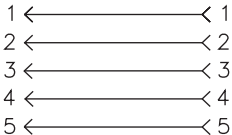
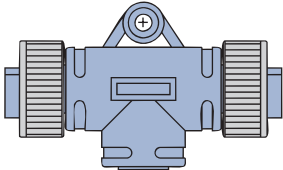
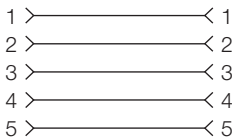
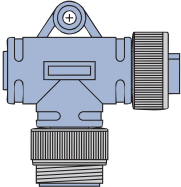
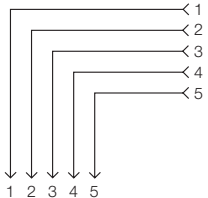
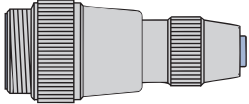
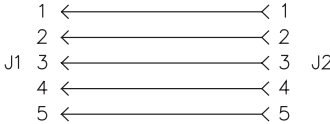
* Example: FKM in position A is an M12 x 1 connector; RKC in position A is an M12 x 1 cordset.
FKM - female M12 x 1 connector, FSM - male M12 x 1 connector, RKC - female M12 x 1 cordset, RSC - male M12 x 1 cordset.

Device-Net™ – Gender changers and elbow connectors



Keyed for DeviceNet™ systems
Tough moulded polyurethane body
Heavy duty internal wiring

Selection guide

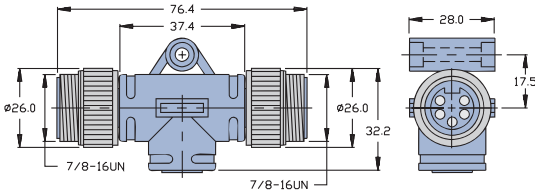
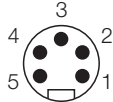
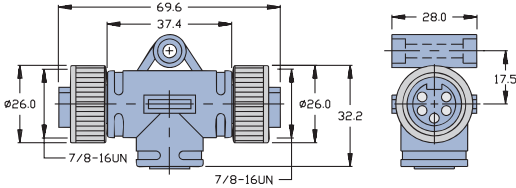
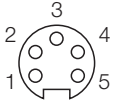
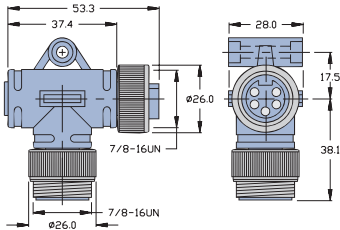
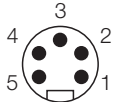
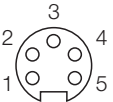
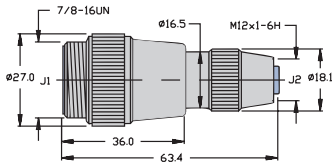
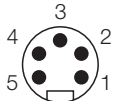
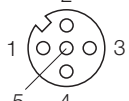
Part number	Applications	Schematic
RSM RSM 57 	7/8" male gender changer • changes female cordset to male receptacle	
RKM RKM 57 	7/8" female gender changer • changes male cordset to female receptacle	
WSM RKM 57 	7/8" elbow • right angle male to female connector	
RSM 57-FK 4.5* 	7/8" to M12 x 1 adapter • 7/8" male to M12 x 1 female connector	

For stainless steel coupling nuts:
change part number (RKM RKM .. to RKV RKV..).

* = Not available in stainless steel.

Specifications

Connector:	moulded polyurethane construction, spacings to VDE 0110 Group C (250 VAC / 300 VDC).
Contact materials:	gold-plated brass
Coupling nuts:	nickel-plated brass
Temperature:	-40 °C to +80 °C (-40 °F to +170 °F)
Protection:	IP67 (IEC 60529/EN 60529), NEMA 1, 3, 4, 6, 13

Dimensions		Pinouts	
 Dimensions for RSM male 7/8" connector: Overall length: 76.4 mm Mounting hole diameter: 37.4 mm Thread: 7/8-16UN Body diameter: 26.0 mm Mounting hole diameter: 28.0 mm Mounting hole offset: 17.5 mm Total height: 32.2 mm		RSM male 7/8"  Pinout diagram for RSM male 7/8" connector: Pins: 1, 2, 3, 4, 5 Rating: 9 A, 600 V	
 Dimensions for RKM female 7/8" connector: Overall length: 69.6 mm Mounting hole diameter: 37.4 mm Thread: 7/8-16UN Body diameter: 26.0 mm Mounting hole diameter: 28.0 mm Mounting hole offset: 17.5 mm Total height: 32.2 mm		RKM female 7/8"  Pinout diagram for RKM female 7/8" connector: Pins: 1, 2, 3, 4, 5 Rating: 9 A, 600 V	
 Dimensions for RSM male 7/8" connector with RKM female 7/8" connector: Overall length: 53.3 mm Mounting hole diameter: 37.4 mm Thread: 7/8-16UN Body diameter: 26.0 mm Mounting hole diameter: 28.0 mm Mounting hole offset: 17.5 mm Total height: 38.1 mm		RSM male 7/8"  Pinout diagram for RSM male 7/8" connector: Pins: 1, 2, 3, 4, 5 Rating: 9 A, 600 V	RKM female 7/8"  Pinout diagram for RKM female 7/8" connector: Pins: 1, 2, 3, 4, 5 Rating: 9 A, 600 V
 Dimensions for RSM male 7/8" connector with FKM female M12 x 1 connector: Overall length: 63.4 mm Thread: 7/8-16UN Body diameter: 27.0 mm Mounting hole diameter: 16.5 mm Thread: M12x1-6H Mounting hole offset: 18.1 mm Total height: 36.0 mm		RSM male 7/8"  Pinout diagram for RSM male 7/8" connector: Pins: 1, 2, 3, 4, 5 Rating: 9 A, 600 V	FKM female M12 x 1  Pinout diagram for FKM female M12 x 1 connector: Pins: 1, 2, 3, 4, 5 Rating: 9 A, 600 V

Device-Net™ – Terminating resistors



Terminating resistors with 7/8" and M12 x 1 connectors
Tough moulded polyurethane body
Heavy duty internal wiring

Selection guide

Part number	Applications	Schematic and pinout
RSM 57-TR2 	7/8" terminating resistor • internal resistor • male 7/8" connector	rating: 24 VDC internal resistor: 120 Ω, 1/4 W
RSE 57-TR2 	M12 x 1 terminating resistor • internal resistor • male M12 x 1 connector	rating: 24 VDC internal resistor: 120 Ω, 1/4 W
RKM 57-TR2 	7/8" terminating resistor • internal resistor • female 7/8" connector	rating: 24 VDC internal resistor: 120 Ω, 1/4 W
RKE 57-TR2 	M12 x 1 terminating resistor • internal resistor • female M12 x 1 connector	rating: 24 VDC internal resistor: 120 Ω, 1/4 W

Specifications

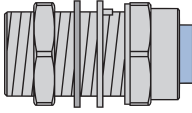
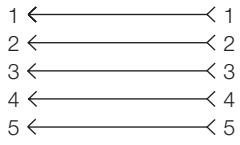
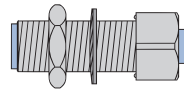
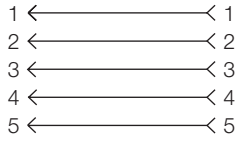
Connector:	oil resistant grey polyurethane body material and contact carrier, 300 V rating
Contact materials:	gold-plated copper alloy
Coupling nuts:	nickel-plated brass or stainless steel
Temperature:	-40 °C to +80 °C (-40 °F to +170 °F)
Protection:	IP67 (IEC 60529/EN 60529), NEMA 1, 3, 4, 6P

Device-Net™ – 7/8" and M12 x 1 – Feed-through receptacles



Keyed for DeviceNet™ systems
 Easy panel or enclosure mounting
 7/8" - standard push button panel cutout size (22.5 millimetres)
 M12 x 1 - standard cutout size (Ø 0.5 inches)
 Rugged IP67 (IEC 60529/EN 60529), NEMA 6

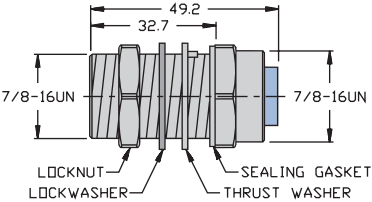
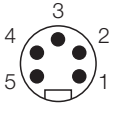
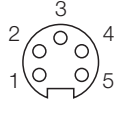
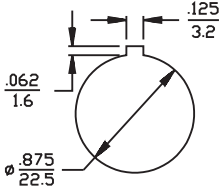
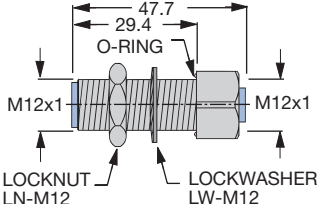
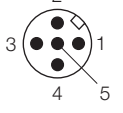
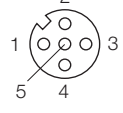
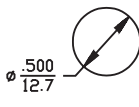
Selection guide

Part number	Applications	Schematic
RSF RKF 57/22 	7/8" bulkhead receptacle - straight male/female feed-thru - for use with DeviceNet™ 7/8" cordsets	
FKM FS 57/M12 	M12 x 1 bulkhead receptacle - straight male/female feed-thru - for use with DeviceNet™ M12 x 1 cordsets	

Consult manufacturer for availability of stainless steel housings.

Specifications

Connector housing:	nickel-plated brass (CuZn)
Contact carrier:	spacings to VDE 0110 Group C (250 VAC / 300 VDC)
Contact materials:	7/8": Polyurethane (PUR); M12 x 1: PA 6 (plastic)
Temperature:	gold-plated brass
Protection:	-40 °C to +105 °C (-40 °F to +221 °F)
	IP67 (IEC 60529/EN 60529), NEMA 1, 3, 4, 6

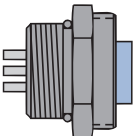
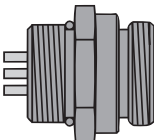
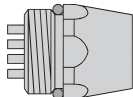
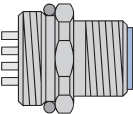
Dimensions	Pinouts	Recommended panel cutout
 LOCKNUT LOCKWASHER SEALING GASKET THRUST WASHER	male 7/8"  female 7/8"  rating: 9 A, 600 V	
 LOCKNUT LN-M12 LOCKWASHER LW-M12	male M12 x 1  female M12 x 1  rating: 4 A, 250 V	

Device-Net™ – 7/8" and M12 x 1 – field solderable receptacles



Field solderable receptacles for bus cables
Easy panel or enclosure mountings
Facilitate field installation

Selection guide

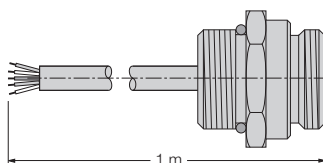
Part number	Applications	Schematic
RKF 57 	7/8" field solderable receptacle • straight female connector • for use with DeviceNet™ thin and mid cables	Bare —————< 1 Red —————< 2 Black —————< 3 White —————< 4 Blue —————< 5
RSF 57 	7/8" field solderable receptacle • straight male connector • for use with DeviceNet™ thin and mid cables	Bare —————> 1 Red —————> 2 Black —————> 3 White —————> 4 Blue —————> 5
FK 57 	M12 x 1 field solderable receptacle • straight female connector • for use with DeviceNet™ thin cables	Bare —————< 1 Red —————< 2 Black —————< 3 White —————< 4 Blue —————< 5
FS 57 	M12 x 1 field solderable receptacle • straight male connector • for use with DeviceNet™ thin cables	Bare —————> 1 Red —————> 2 Black —————> 3 White —————> 4 Blue —————> 5

For stainless housing change part number: RKF 57 to RKFV 57

Panel locknuts: LN 1/2-14/10 (10 pieces) for RSF and RKF styles

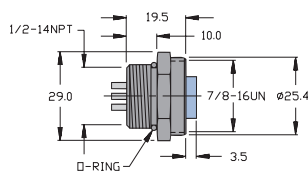
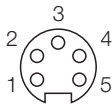
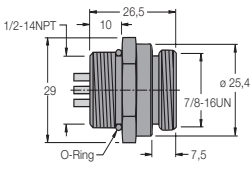
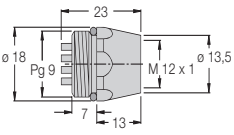
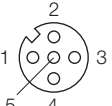
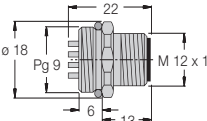
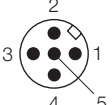
Receptacles also available with DeviceNet™ cable; see cable types on pages 59-61 for cable specifications

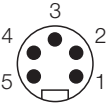
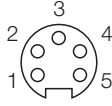
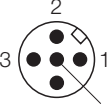
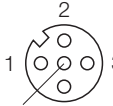
Example: RSF 572-1M



Specifications

Contact carrier:	7/8": Polyurethane, 300 V rating; M12 x 1: PA 6 (plastic), 250 V rating
Housing materials:	7/8": anodized aluminum, black; M12 x 1: nickel-plated brass, machined from solid stock
Contact materials:	gold-plated brass, machined from solid stock
Solder lugs:	7/8": 16 AWG capacity; M12 x 1: 22 AWG capacity
Temperature:	7/8": -40 °C to +90 °C (-40 °F to +194 °F); M12 x 1: -40 °C to +90 °C (-40 °F to +194 °F)
Protection:	7/8": IP67 (IEC 60529/EN 60529), NEMA 1, 3, 4, 6P M12 x 1: IP67 (IEC 60529/EN 60529), NEMA 1, 3, 4, 6P

Dimensions	Pinouts	Wire capacity
 Mounting: 13/16" (21 mm) hole	female 7/8"  rating: 9 A, 600 V	16 AWG DeviceNet™ cable
 Mounting: 13/16" (21 mm) hole	male 7/8"  rating: 9 A, 600 V	16 AWG DeviceNet™ cable
 Mounting: 5/8" (16 mm) hole	female M12 x 1  rating: 4 A, 300 V	22 AWG DeviceNet™ cable
 Mounting: 5/8" (16 mm) hole	male M12 x 1  rating: 4 A, 300 V	22 AWG DeviceNet™ cable

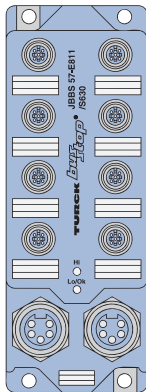
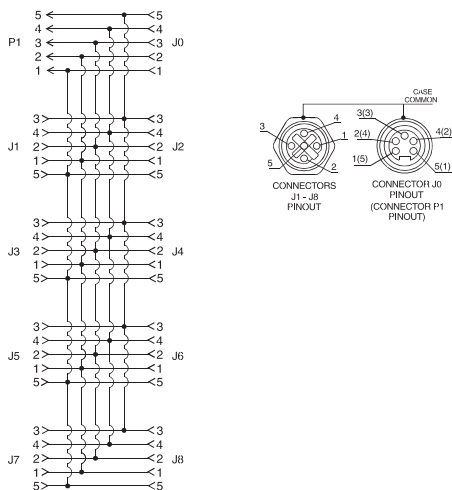
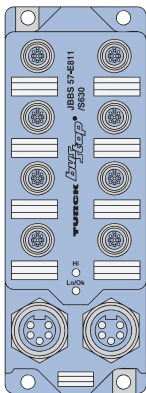
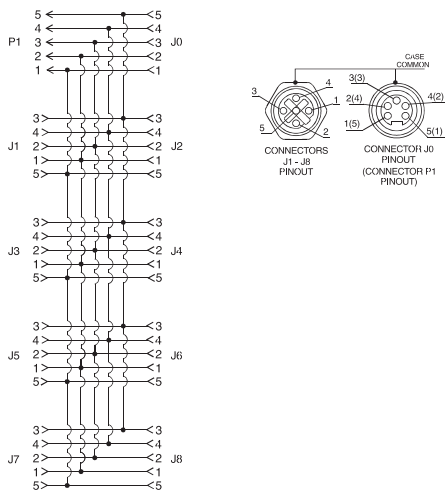
Pinouts 7/8"			M12 x 1	
male	female		male	female
		1. bare (shield drain wire) 2. red (+ voltage) 3. black (- voltage) 4. white (CAN_H) 5. blue (CAN_L)		

DeviceNet™ – M12 x 1 junctions, standard and with voltage monitoring



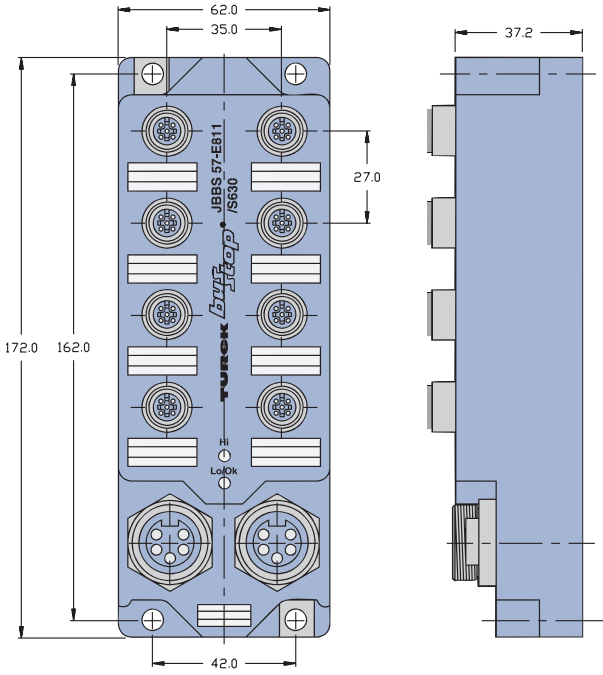
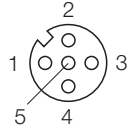
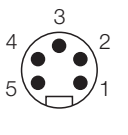
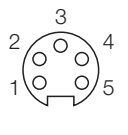
Keyed for DeviceNet™ systems
Rugged, fully encapsulated plastic enclosures
Bus-in / bus-out eliminate need for splitter tee
Ideal with right-angle connectors

Selection guide

Part number	Applications	Schematic
JBBS-57-E811-VM 	8-port <i>busstop®</i> junction with voltage monitoring - bus-in / bus-out 7/8" connectors - eight M12 x 1 connectors for field devices - voltage monitoring for low voltage (12.9 V) and high voltage (25.6 V) indications LED indications: low < 12.9 V = yellow ok = 12.9 V...25.6 V = green high > 25.6 V = yellow	
JBBS-57-E812 	8-port <i>busstop®</i> junction - bus-in / bus-out 7/8" connectors - eight M12 x 1 connectors for field devices	

Specifications

Housing:	plastic, 30 % glass reinforced; nickel-plated brass connectors
Mounting:	no. 8 screw, 4 places on centers per dimensional drawing
Temperature:	-25 °C to +70 °C (-13 °F to +158 °F)
Protection:	IP67 (IEC 60529/EN 60529), NEMA 1, 3, 4, 12, 13

Dimensions	Pinouts		
	female M12 x 1 drop  rating: 4 A, 300 V	male 7/8" bus-in  rating: 9 A, 300 V	female 7/8" bus-out  rating: 9 A, 300 V

Note: closure caps available for all receptacles

DeviceNet™ – M12 x 1 junction tee

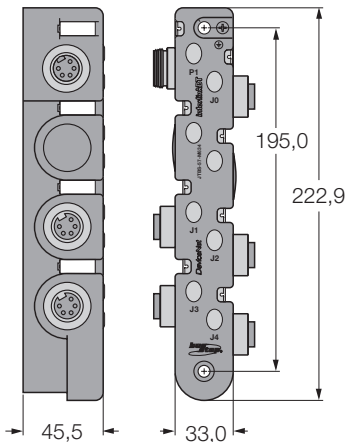
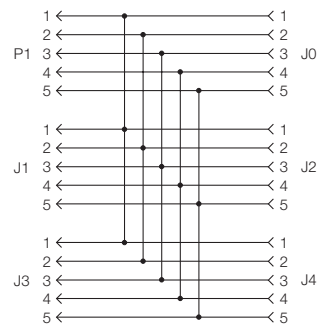
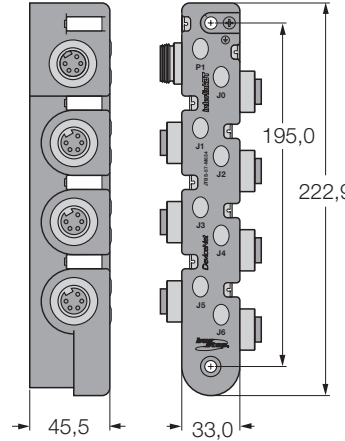
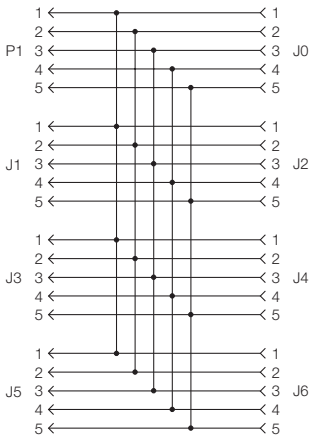


Selection guide

Type	Applications	Wiring diagram / Pin configuration
JTBS 57-E434	4-port <i>bustop</i>® junction tee • 7/8" bus in/bus out connections • four M12 x 1 device ports • for stainless steel connectors change part number to JTBS 57-E433	
JTBS 57-E634	6-port <i>bustop</i>® junction tee • 7/8" bus in/bus out connections • six M12 x 1 device ports • for stainless steel connectors change part number to JTBS 57-E633	

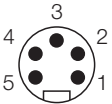
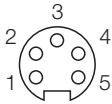
Pinouts		7/8"			M12 x 1	
male	female				male	female
		1. bare	(shield drain wire)			
		2. red	(+ voltage)			
		3. black	(– voltage)			
		4. white	(CAN_H)			
		5. blue	(CAN_L)			

DeviceNet™ – 7/8“ junction tee

Type	Applications	Wiring diagram / Pin configuration
JTBS 57-M434 	4-port <i>bustop</i>® junction tee • 7/8" bus in/bus out connections • four 7/8" device ports • for stainless steel connectors change part number to JTBS 57-M433	
JTBS 57-M634 	6-port <i>bustop</i>® junction tee • 7/8" bus in/bus out connections • six 7/8" device ports • for stainless steel connectors change part number to JTBS 57-M633	

Pinouts

7/8"

male	female			
		1. bare (shield drain wire) 2. red (+ voltage) 3. black (- voltage) 4. white (CAN_H) 5. blue (CAN_L)		

DeviceNet™ – M12 x 1 junction tee with voltage monitoring

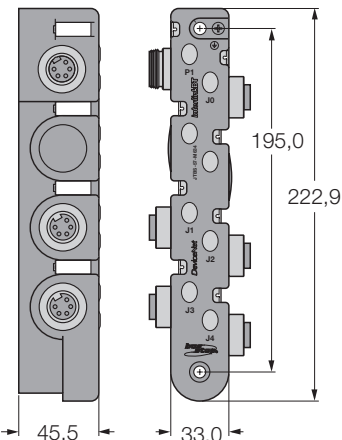
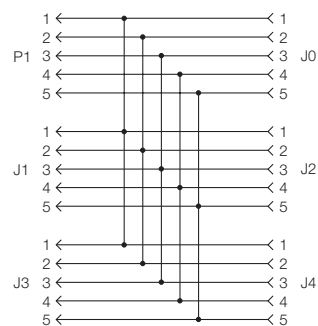
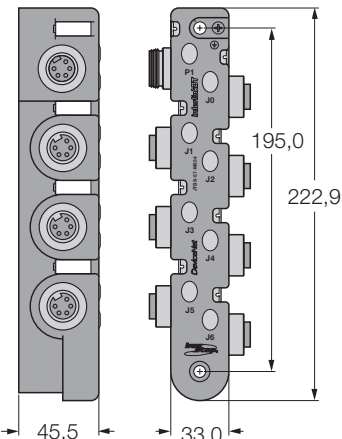
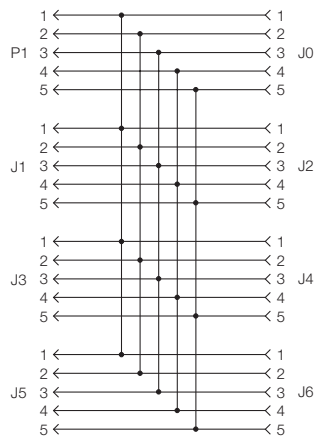


Selection guide

Type	Applications	Wiring diagram / Pin configuration
JTBS 57-E434-VM	4-port <i>bustop</i>® junction tee with voltage monitoring - bus-in / bus-out 7/8" connectors - four M12 x 1 connectors for field devices - for stainless steel connectors change part-no. to JTBS 57-E433 - voltage monitoring for low voltage (12.9 V) and high voltage (25.6 V) indications LED indications: low < 12.9 V = yellow ok = 12.9 V...25.6 V = green high > 25.6 V = yellow	
JTBS 57-E634-VM	6-port <i>bustop</i>® junction tee with voltage monitoring - bus in/bus out 7/8" connectors - six M12 x 1 device ports - for stainless steel connectors change part number to JTBS 57-E633 - voltage monitoring for low voltage (12.9 V) and high voltage (25.6 V) indications LED indications: low < 12.9 V = yellow ok = 12.9 V...25.6 V = green high > 25.6 V = yellow	

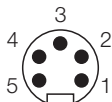
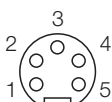
Pinouts		7/8"			M12 x 1	
male	female				male	female
		1. bare	(shield drain wire)			
		2. red	(+ voltage)			
		3. black	(- voltage)			
		4. white	(CAN_H)			
		5. blue	(CAN_L)			

DeviceNet™ – 7/8" junction tee with voltage monitoring

Type	Applications	Wiring diagram / Pin configuration
JTBS 57-M434-VM 	4-port <i>bustop</i>® junction tee with voltage monitoring - bus in/bus out 7/8" connectors - four 7/8" device ports - for stainless steel connectors change part number to JTBS 57-M433 - voltage monitoring for low voltage (12.9 V) and high voltage (25.6 V) indications LED indications: low < 12.9 V = yellow ok = 12.9 V...25.6 V = green high > 25.6 V = yellow	
JTBS 57-M634-VM 	6-port <i>bustop</i>® junction tee with voltage monitoring - bus in/bus out 7/8" connectors - six 7/8" device ports - for stainless steel connectors change part number to JTBS 57-M633 - voltage monitoring for low voltage (12.9 V) and high voltage (25.6 V) indications LED indications: low < 12.9 V = yellow ok = 12.9 V...25.6 V = green high > 25.6 V = yellow	

Pinouts

7/8"

male	female			
		1. bare (shield drain wire) 2. red (+ voltage) 3. black (- voltage) 4. white (CAN_H) 5. blue (CAN_L)		

DeviceNet™ – M12 x 1 – system module junctions



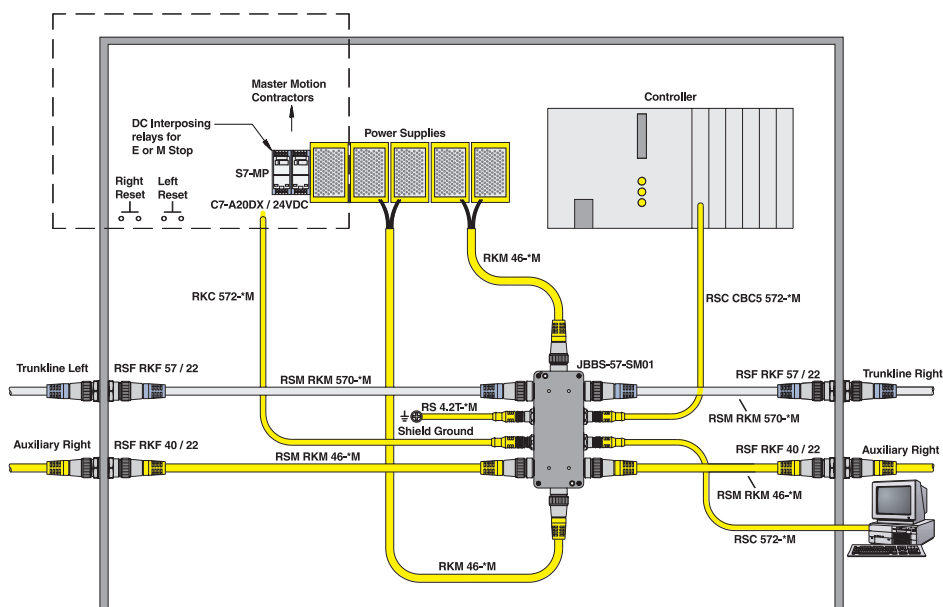
Multifunction junctions combine all system connections
Keyed for DeviceNet™ Systems
Rugged, fully encapsulated die-cast aluminum enclosures

Selection guide

[illegible]

Typical Application

Note:
See facing page for
descriptions of part
numbers.



Specifications

Housing:	die-cast aluminum, black powder coated
Mounting:	1/4-20 UNC or M 6 X 1 screw, 2 places on centers per dimensional drawing
Temperature:	-40 °C to +70 °C (-40 °F to +158 °F)
Protection:	NEMA 1, 3, 4, 12, 13 and IEC IP67

Dimensions	Pinouts		
	1 = shield 2 = V + 3 = V - 4 = CAN_H 5 = CAN_L female 7/8" trunk left & right 1 = shield 2 = shield 3 = shield 4 = shield 5 = shield female M12 x 1 shield	1 = V + 2 = E-Stop + 3 = V - 4 = E-Stop - female 7/8" aux power left & right 1 = E-Stop - left 2 = E-Stop + left 3 = E-Stop - right 4 = E-Stop + right male M12 x 1* E-Stop	1 = V + right 2 = V + left 3 = V - left 4 = V - right male 7/8" bus power in aux power in 1 = shield 2 = V + 3 = V - 4 = CAN_H 5 = CAN_L female M12 x 1* drop line, local

* CENELEC EN 50044 numbering convention

TURCK products

RSC CBC5 572-xM	x-metre, DeviceNet™ 5-pin M12 x 1 connector to 5 combicon connectors
RSM RKM 570-xM	x-metre, full trunk line (bus line) DeviceNet™ cable, male / female moulded ends
RSF RKF 57/22	male / female, 5-pin 7/8" through-wall connector
RKC 572-xM	x-metre, 5-wire DeviceNet™ thin cable, female / tinned ends
RSC 572-xM	x-metre, 5-wire DeviceNet™ thin cable, male / tinned ends
JBBS-57-SM01	system module
RS 4.5T-xM	x-metre, 5-wire M12 x 1 cable, male / tinned ends, 20 AWG, grey PVC, ground all
RSF RKF 40/22	male / female, 4-pin 7/8" through-wall connector
RSM RKM 46-xM	x-metre, 4-wire, male / female moulded 7/8" cable, 16 AWG, yellow PVC jacket
RKM 46-xM	x-metre, 4-wire, female / tinned ends 7/8" cable, 16 AWG, yellow PVC jacket
S7-M	relay base, DIN and panel mount, with relay locking tab
C7-A20DX/24VDC w/S9-N	relay, 24 VDC, with free-wheeling diode, 10 A, DPDT
	Caution: Install S9-N blanking plug to disable push-to-test/pull-to-lock functions

DeviceNet™ – Power taps



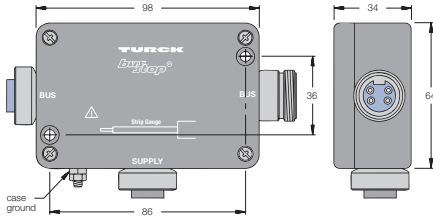
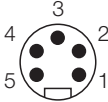
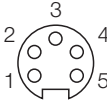
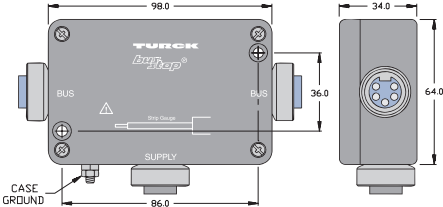
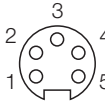
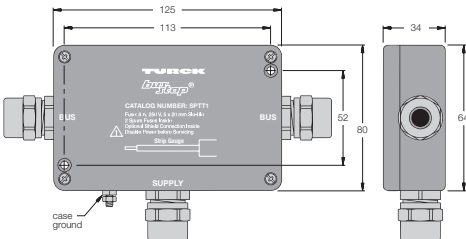
Connection of power supply to the DeviceNet™ bus line
Schottky diode reverse-current protected
Fused to protect the bus from excess current
Continuous connection for signal, drain and V -

Selection guide

Part number	Applications	Schematic
SPTC1 	<i>busstop®</i> power tap with 7/8" connectors • 7/8" male to female bus connector • 7/8" female power connector	
SPTC2 	<i>busstop®</i> power tap with 7/8" connectors • 7/8" female to female bus connector • 7/8" female power connector	
SPTT1 	<i>busstop®</i> power tap with terminal connectors • terminal strip bus connectors • terminal strip power connector	

Specifications

Housing:	die-cast aluminum, black powder coated
Mounting:	M4 or 0.138-32 socket head screw, 2 places on 36.0 x 86.0 mm center
Temperature:	-40 °C to +70 °C (-40 °F to +158 °F)
Protection:	IP67 (IEC 60529/EN 60529), NEMA 1, 3, 4, 12, 13

Dimensions	Pinouts																												
	RSM male 7/8"	RKM female 7/8"	RKM* female 7/8"																										
																													
	rating: 8 A, 45 V	rating: 8 A, 45 V	rating: 8 A, 45 V																										
	RKM female 7/8"		RKM* female 7/8"																										
																													
	rating: 8 A, 45 V		rating: 8 A, 45 V																										
		<table><tr><th></th><th></th><th>Reference</th></tr><tr><td>5</td><td>CAN_L</td><td>blue</td></tr><tr><td>4</td><td>CAN_H</td><td>white</td></tr><tr><td>3</td><td>V -</td><td>black</td></tr><tr><td>2</td><td>V +</td><td>red</td></tr><tr><td>1</td><td>shield</td><td>bare</td></tr></table>			Reference	5	CAN_L	blue	4	CAN_H	white	3	V -	black	2	V +	red	1	shield	bare	<table><tr><td>4</td><td>V -</td></tr><tr><td>3</td><td>V +</td></tr><tr><td>2</td><td>V -</td></tr><tr><td>1</td><td>V +</td></tr></table>	4	V -	3	V +	2	V -	1	V +
		Reference																											
5	CAN_L	blue																											
4	CAN_H	white																											
3	V -	black																											
2	V +	red																											
1	shield	bare																											
4	V -																												
3	V +																												
2	V -																												
1	V +																												

* CENELEC EN 50044 numbering convention

Bus Line	Auxiliary Power
1. shield	1. + voltage
2. + voltage	2. - voltage
3. - voltage	3. + voltage
4. CAN_H	4. - voltage
5. CAN_L	

busstop® - fieldbus solutions for harsh industrial environments

If you work with TURCK's *busstop®* products you are not tied down to company-specific fieldbus technologies. Within our versatile product range you will find exactly the products you need to match your application. No matter whether stations, junctions or connection products, *busstop®* fieldbus components provide the connection to all customary fieldbus systems such as:

- bus system *sensoplex®2*
- bus system *sensoplex®2Ex*
- bus system *sensoplex®MC*
- bus system AS-Interface®
- bus system DeviceNet™
- bus system FOUNDATION™ fieldbus
- bus system PROFIBUS-DP
- bus system PROFIBUS-PA
- bus system *piconet®*
- bus system *excom*

busstop® fieldbus components are manufactured to the highest quality standards and are suited for direct use on the machine and at the process.

busstop® fieldbus components enable plug & play connection of binary sensors and actuators to the bus system. A product line, ranging from miniature modules incorporated in plastic housings with M8 connectors (a design which is especially suited for the tooling industry) to robust metal versions with 7/8" connectors for harsh industrial environments, caters for all requirements.

busstop® cables and premoulded cables for data transfer and power supply are available in various different materials and with different connector types. They match various fieldbus standards and ensure secure and error-free communication. The gold-plated plug-in connections guarantee data-integrity and provide sufficient power to different kinds of actuators.

piconet® – miniature bus stations

piconet®, the new miniature bus system, comprises modules sized 175 x 30 x 27 mm only, making it the ideal solution for serial machine engineering.

- stand-alone modules for direct connection to the fieldbus
- the coupler module as the interface between the fieldbus and the *piconet®* fibre-optic network
- the extension modules

The matching plug-in or screw connectors feature IP67 rating. Our *piconet®* modules adapt perfectly to all kinds of applications by a flexible design, e.g. our programmable combined I/O stations (8 inputs, 8 outputs – any combination is possible). The stand-alone and coupler modules are connected directly to PROFIBUS-DP (12 Mbit/s) or DeviceNet™. Further interfaces are in preparation. Analogue I/O modules for standard signals such as 0...10 V or 0/4...20 mA as well as function groups and fast counters supplement this new product line.

A detailed *piconet®* system description is contained in our *piconet®* catalogue D300131.

Type	Ident-no.	Description	Connector ¹⁾
SDNB-0800D-0007	68 240 43	8 digital inputs, 24 VDC, filter 3.0 ms	M 8 x 1
SDNB-0800D-0007S	68 240 92	8 digital inputs, 24 VDC, filter 3.0 ms,	Ø 8 mm
SDNB-0800D-0004	68 240 91	8 digital inputs, 24 VDC, filter 3.0 ms,	M 12 x 1
SDNB-0800D-0008	68 240 44	8 digital inputs, 24 VDC, filter 0.2 ms,	M 8 x 1
SDNB-0800D-0008S	68 240 93	8 digital inputs, 24 VDC, filter 0.2 ms,	Ø 8 mm
SDNB-0800D-0002	68 240 90	8 digital inputs, 24 VDC, filter 0.2 ms,	M 12 x 1
SDNB-0008D-0006	68 240 41	8 digital outputs, 24 VDC, 0.5 A	M 8 x 1
SDNB-0008D-0006S	68 240 87	8 digital outputs, 24 VDC, 0.5 A	Ø 8 mm
SDNB-0008D-0001	68 240 81	8 digital outputs, 24 VDC, 0.5 A	M 12 x 1
SDNB-0008D-0002	68 240 53	8 digital outputs, 24 VDC, 2 A ($I_{\Sigma} = 4$ A)	M 8 x 1
SDNB-0008D-0002S	68 240 82	8 digital outputs, 24 VDC, 2 A ($I_{\Sigma} = 4$ A)	Ø 8 mm
SDNB-0008D-0003	68 240 83	8 digital outputs, 24 VDC, 2 A ($I_{\Sigma} = 4$ A)	M 12 x 1
SDNB-0008D-0004	68 240 84	8 digital outputs, 24 VDC, 2 A ($I_{\Sigma} = 12$ A)	M 8 x 1
SDNB-0008D-0004S	68 240 85	8 digital outputs, 24 VDC, 2 A ($I_{\Sigma} = 12$ A)	Ø 8 mm
SDNB-0008D-0005	68 240 86	8 digital outputs, 24 VDC, 2 A ($I_{\Sigma} = 12$ A)	M 12 x 1
SDNB-0404D-0003	68 241 03	4 digital inputs and outputs, 24 VDC, 0.5A, filter 3.0 ms	M 8 x 1
SDNB-0404D-0003S	68 241 04	4 digital inputs and outputs, 24 VDC, 0.5A, filter 3.0 ms	Ø 8
SDNB-0404D-0004	68 241 05	4 digital inputs and outputs, 24 VDC, 0.5A, filter 3.0 ms	M 12 x 1
SDNB-0404D-0001	68 240 45	4 digital inputs and outputs, 24 VDC, 0.5A, filter 0.2 ms	M 8 x 1
SDNB-0404D-0001S	68 241 01	4 digital inputs and outputs, 24 VDC, 0.5A, filter 0.2 ms	Ø 8 mm
SDNB-0404D-0002	68 241 02	4 digital inputs and outputs, 24 VDC, 0.5A, filter 0.2 ms	M 12 x 1
SDNB-0404D-0007	68 241 09	4 digital inputs and outputs, 24 VDC, 2 A ($I_{\Sigma} = 4$ A), filter 3.0 ms	M 8 x 1
SDNB-0404D-0007S	68 241 10	4 digital inputs and outputs, 24 VDC, 2 A ($I_{\Sigma} = 4$ A), filter 3.0 ms	Ø 8 mm
SDNB-0404D-0008	68 241 00	4 digital inputs and outputs, 24 VDC, 2 A ($I_{\Sigma} = 4$ A), filter 3.0 ms	M 12 x 1
SDNB-0404D-0005	68 241 06	4 digital inputs and outputs, 24 VDC, 2 A ($I_{\Sigma} = 4$ A), filter 0.2 ms	M 8 x 1
SDNB-0404D-0005S	68 241 07	4 digital inputs and outputs, 24 VDC, 2 A ($I_{\Sigma} = 4$ A), filter 0.2 ms	Ø 8 mm
SDNB-0404D-0006	68 241 08	4 digital inputs and outputs, 24 VDC, 2 A ($I_{\Sigma} = 4$ A), filter 0.2 ms	M 12 x 1
SDNB-0808D-0001	68 241 69	8 digital inputs/outputs, 24 VDC, 0.5 A, filter 3.0 ms	M 8 x 1 ²⁾
SDNB-0808D-0001S	68 241 68	8 digital inputs/outputs, 24 VDC, 0.5 A, filter 3.0 ms	Ø 8 mm ²⁾
SDNB-0002D-0001	68 240 99	2-channel pulse-width output, 24 VDC, 0.1 A	M 12 x 1
SDNB-0002D-0002	68 240 80	2-channel pulse-width output, 24 VDC, 2.5 A	M 12 x 1
SDNB-40A-0005	68 240 47	4 analogue differential inputs, ± 10 V, 16 bit	M 12 x 1
SDNB-40A-0007	68 241 72	4 analogue differential inputs, 0(4)...20 mA, 16 bit	M 12 x 1
SDNB-40A-0009	68 240 54	4 analogue inputs for resistance temperature detectors, preset for PT100, 16 bit	M 12 x 1
SDNB-40A-0004	68 240 46	4 analogue inputs for thermoelements, present for type K, with wire-break indication, 16 bit	M 12 x 1
SDNB-04A-0009	68 240 42	4 analogue outputs, 0...20 mA, 16 bit	M 12 x 1
SDNB-04A-0007	68 240 89	4 analogue outputs, ± 10 V, 16 bit	M 12 x 1
SDNB-0202D-0003	68 240 88	Up/down counter, 24 VDC, 100 kHz,	M 12 x 1
SDNB-10S-0001	68 240 94	Incremental encoder interface with complementary inputs, 1 MHz	M 23 x 1
SDNB-10S-0005	68 240 98	SSI input interface	M 23 x 1
SDNB-10S-0002	68 240 95	serial interface RS232C	M 12 x 1
SDNB-10S-0003	68 240 96	serial interface 0...20 mA (TTY)	M 12 x 1
SDNB-10S-0004	68 240 97	serial interface RS485	M 12 x 1

1) Ø 8 mm: I/O connection with connector Ø 8 mm, 3-pole, snap-on type
M 8 x 1: I/O connection with connector M 8 x 1, 3-pole, screw-type
M 12 x 1: I/O connection with connector M 12 x 1, 5-pole, screw-type
M 23 x 1: connection via connector M 23 x 1, 12-pole, screw-type

2) Ø 8 mm: I/O connection with connector Ø 8 mm, 4-pole, snap-on type
M 8 x 1: I/O connection with connector M 8 x 1, 4-pole, screw-type

piconet® - Stand-alone modules

In the stand-alone mode, each *piconet*® I/O module is connected directly to the fieldbus to ensure fully transparent data transfer. This is especially useful if event-controlled transmission is concerned (e. g. CANopen).

The module range comprises standard digital signals, analogue I/O modules and special function devices, such as incremental encoder interfaces, fast counter and communication modules.

For temperature detection there are thermocouple modules and resistance temperature detectors (Pt100...) available.

The compact robust housing with fully encapsulated electronics enables direct installation on the machine.

To provide the extra flexibility needed, we have developed digital, bidirectional combined modules which feature 8-channels for optional use as inputs or outputs. The separate circuitry design ensures separate supply of the inputs and outputs. Thus, secure operation also during an emergency stop is guaranteed. The combined stations enable installation of a complex system structure. Voltage is supplied to the modules via an M8 connector. The next module is connected via another M8 connector, so that a ring-like topology is created. The high-current output modules (12 A) require two M8 connectors.

Electronics and inputs have a common supply. The outputs are powered via a separate pin. This concept enables simple grouping or using different isolation types. All that needs to be considered is the total current capacity of the M8 connector which may not exceed 4 A for each the bus and load supply.



piconet® – Coupler modules and extensions

Alongside the stand-alone modules, the coupler stations plus the extensions are the second important product group within the *piconet*® family.

The coupler module (as shown on the left) is equipped with two bus connections:

- the fieldbus connection to the next hierarchical level, e.g. PROFIBUS-DP
- and the *piconet*® fibre optic subnet for connection of the extensions (as shown on the right).

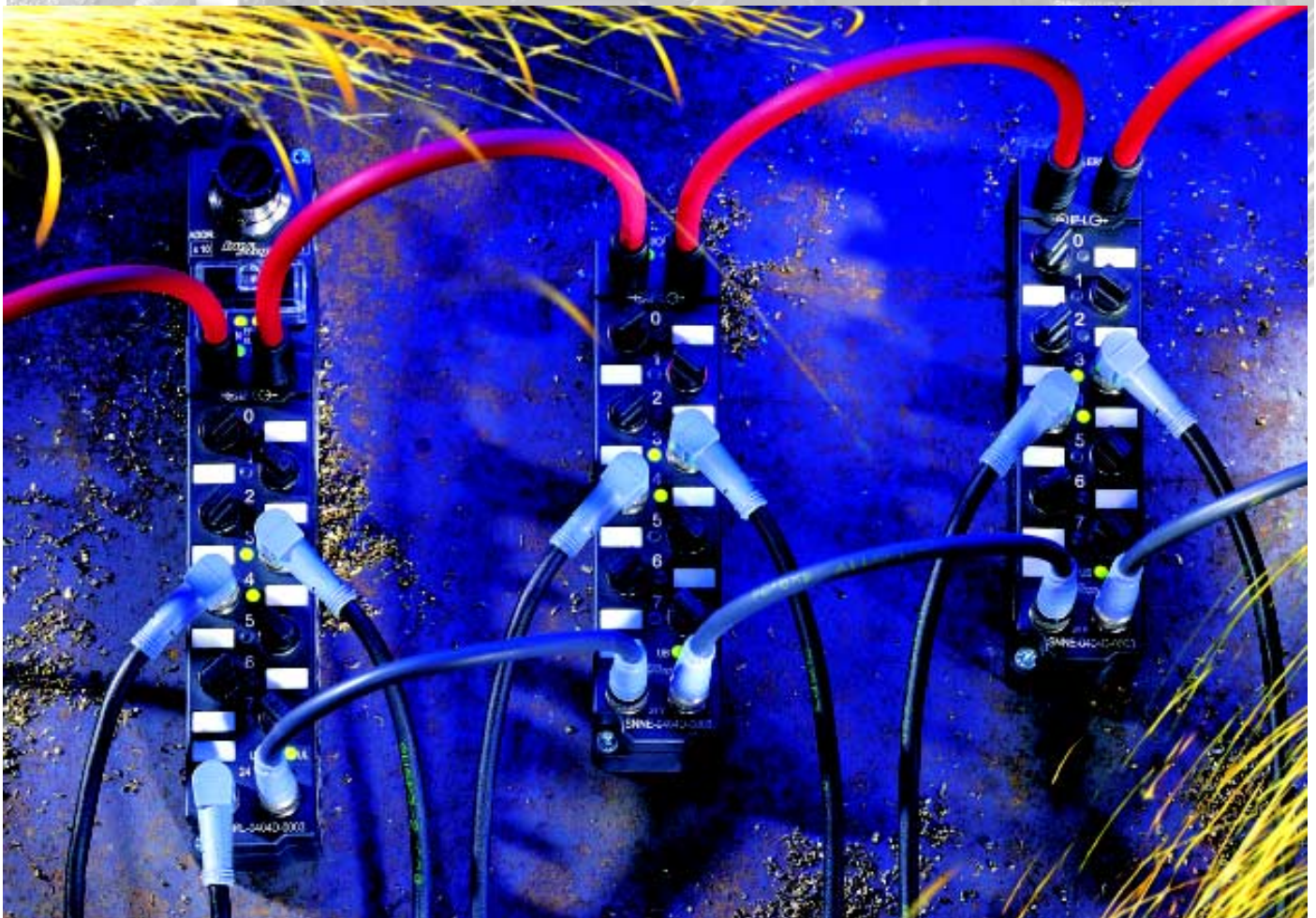
The coupler modules use the extremely fast and interference-immune IP-Link fibre-optic network to collect the input/output data from the connected extensions.

The transmission rate is 2 Mbit/s, or approx. 1 ms for 1000 I/O points. The less data are transmitted, the less time is needed. The a.m. specification clearly shows that the data transfer speed is not reduced when using our IP-Link fibre optic connection.

During start-up the coupler modules automatically generate a process image of the connected extensions. These data are then transferred to the higher-level fieldbus as if from a single bus participant together with the according number of I/O points.

Up to 120 extensions may be connected to one coupler module. The distance between two modules may not exceed 5 metres. The fibre-optics are connected directly in the field via new and inexpensive IP67 connectors. Alternatively, it is possible to use premoulded cables and pre-wired connectors.

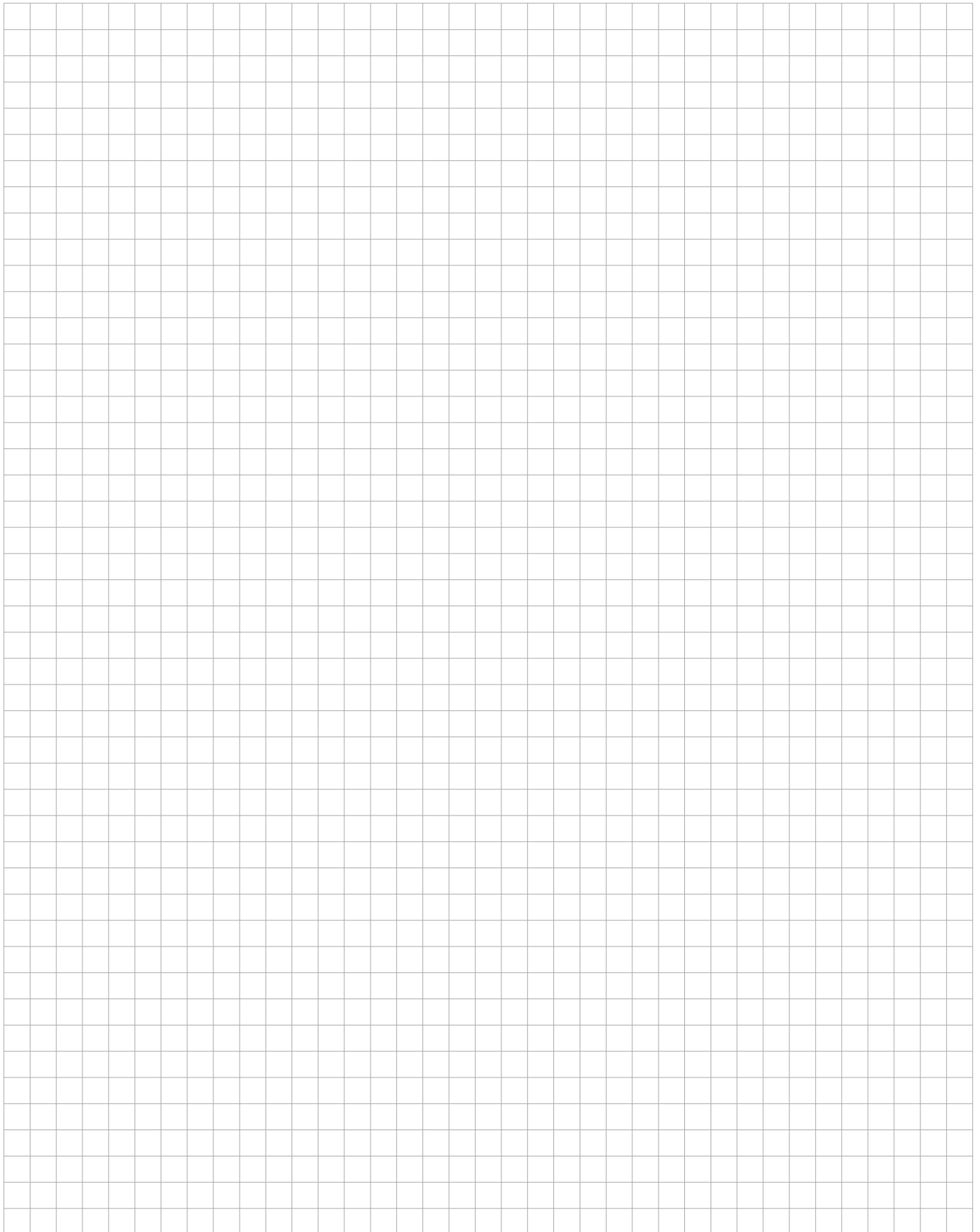
4 inputs and 4 outputs can be connected directly to the coupler module. Just like with all other digital *piconet*® modules, it is possible to select the connection type, e.g. $\varnothing$ 8 mm, M8 or M12 connectors. Further signal types, e.g. digital and analogue signals or special functions are integrated into the system via the extensions.



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