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Advanced I/O Module Components

*Interlink*BT™ 3000 Campus Drive Minneapolis, MN 55441 Phone: (01) (763) 694-2300 Fax: (01) (763) 694-2399 Toll Free: 1-888-546-5880

Quick Selection Guide to AIM™ Stations and Standard Cable Lengths

DeviceNet™ Stations

Part Number		Input Parameters						Output Parameters						
FDNQ (Short) Housing, SE (page 22)	Page Numbers	Number of Inputs	Connector Wiring	Inputs per Connector	Compatible with NPN/PNP Sensors?	Short Circuit * Protection	Open Circuit Detection	Number of Outputs	Output Wiring	Outputs per Connector	Maximum Output Load	Bus or Aux. Power?	Short Circuit * Protection	Open Circuit Detection
FNDQ-S0400-T	23	4	S	1	PNP	G		-	-	-	-	-	-	
FDNQ-S0800-T	23	8	2S	2	PNP	G		-	-	-	-	-	-	
FDNQ-CSG44-T	24	4	C	1	PNP	G		4	C	1	0.5A	BUS	I	
FDNQ-S0404G-T	25	4	2S	2	PNP	G		4	2G	2	0.5A	BUS	I	
FDNQ-XSG08-T	24	8	2X	2	PNP	G		8	2X	2	0.5A	BUS	I	
FDNQ (Short) Housing, Aux Powered Outputs (page 26)														
FDNQ-S0404G-MM	26	4	2S	2	PNP	G		4	2G	2	0.5A	AUX	I	
FDNQ (Short) Housing, Analog and Counter Station (page 28)														
FDNQ-4AI-I-T	28	4	AI	1	4 16-Bit 0/4-20mA Inputs									
FDNQ-C4-T	30	4	S	1	PNP	G	4 Counter Inputs							
FDNQ (E-*connect*™) Housing (page 103)														
FDNQ-ES11-T	106	1	ES	1	PNP	G		1	ES	1	0.5A	AUX	I	
FDNQ-ES22-T	107	2	ES	1	PNP	G		2	ES	1	0.5A	AUX	I	
FDNP-ES88-T	108	8	ES	1	PNP	G		8	ES	1	0.5A	AUX	I	
FDNL (Tall) Housing, LX (page 32)														
FDNL-L0800-T	33	8	L	1	NPN/PNP	I	✓	-	-	-	-	-	-	
FDNL-L1600-T	33	16	2L	2	NPN/PNP	I	✓	-	-	-	-	-	-	
FDNL-CPG88-T	34	8	C	1	PNP	I	✓	8	C	1	0.5A	BUS	I	✓
FDNL (Tall) Housing, SE (page 35)														
FDNL-S0800-T	36	8	S	1	PNP	G		-	-	-	-	-	-	
FDNL-N0800-T	36	8	N	1	NPN	G		-	-	-	-	-	-	
FDNL-S1600-T	36	16	2S	2	PNP	G		-	-	-	-	-	-	
FDNL-N1600-T	37	16	2N	2	NPN	G		-	-	-	-	-	-	
FDNL-CSG88-T	37	8	C	1	PNP	G		8	C	1	0.5A	BUS	I	
FDNP (Tall) Housing with Aux Power, LX (page 38)														
FDNP-L0404G-TT	39	4	L	1	NPN/PNP	I	✓	4	G	1	0.5A	AUX	I	✓
FDNP-L0808G-TT	40	8	2L	2	NPN/PNP	I	✓	8	2G	2	0.5A	AUX	I	✓
FDNP-L0808H-TT	41	8	2L	2	NPN/PNP	I	✓	8	2H	2	2.0A	AUX	I	✓
FDNP-P0808H-TT	42	8	2P	2	PNP	I	✓	8	2H	2	2.0A	AUX	I	✓
FDNP-P1204G-TT	43	12	2P	2	PNP	I	✓	4	2G	2	0.5A	AUX	I	✓
FDNP-CPG88-TT	44	8	C	1	PNP	I	✓	8	C	1	0.5A	AUX	I	✓
FDNP (Tall) Housing with Aux Power, SE (page 45)														
FDNP-S0404G-TT	46	4	S	1	PNP	G		4	G	1	0.5A	AUX	I	
FDNP-S0808G-TT	46	8	2S	2	PNP	G		8	2G	2	0.5A	AUX	I	
FDNP-S1204H-TT-0149	47	12	2S	2	PNP	G		4	2H	2	1.4A	AUX	I	
FDNP-CSG88-TT	48	8	C	1	PNP	G		8	C	1	0.5 A	AUX	I	
FDNP-XSG16-TT	49	16	2X	2	PNP	G		16	2X	2	0.5A	AUX	I	
FDNP-S0008G-TT	50	-	-	-	-	-		8	G	1	0.5A	AUX	I	
FDNP-S0008H-TT	50	-	-	-	-	-		8	H	1	1.4A	AUX	I	
FDNP (Tall) Housing with Screw Terminals "ST" (page 58)														
FDNP-S0808G-ST	59	8	2S	2	PNP	G		8	2G	2	0.5A	AUX	I	
FDNP-XSG16-ST	60	16	2X	2	PNP	G		16	2X	2	0.5A	AUX	I	

* I = Individual G = Group ES = Estop

PROFIBUS®-DP Stations

Part Number		Input Parameters					Output Parameters					
FLDP (Compact Flat) Housing (page 121)	Page Numbers	Number of Inputs	Input Type	Inputs per Connector	Compatible with NPN/PNP	Short Circuit * Protection	Number of Outputs	Output Type	Outputs per Connector	Maximum Output Load	Bus or Aux. Power?	Short Circuit * Protection
FLDP-IM-8-0001	122	8	S	1	PNP	G	-	-	-	-	-	-
FLDP-IM-16-0001	122	16	2S	2	PNP	G	-	-	-	-	-	-
FLDP-IM-32-0001	127	32	2S	2	PNP	G	-	-	-	-	-	-
FLDP-IOM-84-0001	123	8	2S	2	PNP	G	4	H	1	2.0A	AUX	I
FLDP-IOM-88-0002-ST	136	8	2S	2	PNP	G	8	2G	2	0.5A	AUX	I
FLDP-IOM-88-0001	123	8	C	1	PNP	G	8	C	1	0.5A	AUX	I
FLDP-IOM-88-0002	124	8	2S	2	PNP	G	8	2G	2	0.5A	AUX	I
FLDP-IOM-88-0004**	124	8	2S	2	PNP	G	8	2G	2	0.5A	AUX	I
FLDP-IOM-1616-0001	128	16	2S	2	PNP	G	16	2G	2	0.5A	AUX	I
FLDP-IOM-2012-0001	131	20	2S	2	PNP	G	12	2G	2	0.5A	AUX	I
FLDP-IOM-248-0001	129	24	2S	2	PNP	G	8	2G	2	0.5A	AUX	I
FLDP-OM-8-0001	125	-	-	-	-	-	8	G	1	0.5A	AUX	I
FLDP-OM-8-0002	125	-	-	-	-	-	8	H	1	2.0A	AUX	I
FLDP-OM-16-0001	125	-	-	-	-	-	16	2G	2	0.5A	AUX	I

* I = Individual G = Group

** High Speed (0.2ms) Inputs

Ethernet Stations

Part Number		Input Parameters					Output Parameters				
	Page Numbers	Number of Inputs	Input Type	Inputs per Connector	Compatible with NPN/PNP	Short Circuit * Protection	Number of Outputs	Output Type	Outputs per Connector	Maximum Output Load	Short Circuit * Protection
FENP-S0800	161	8	S	1	PNP	G	-	-	-	-	-
FENP-S1600	161	16	2S	2	PNP	G	-	-	-	-	-
FENP-S0808G	162	8	2S	2	PNP	G	8	2G	2	0.5A	I
FENP-XSG16	163	16	2X	2	PNP	G	16	2X	2	0.5A	I
FENP-S0008G	164	-	-	-	-	-	8	G	1	0.5A	I

* I = Individual G = Group

Cordset Standard Lengths

Standard lengths of pre-molded cordsets and bulk cable are listed below.

Standard Cable Lengths			
Cordsets		Bulk Cable	
meters	feet	meters	feet
0.3	1.0	30	98
0.5	1.6		
1.0	3.3		
1.5	4.9	75	246
2.0	6.6		
2.5	8.2		
3.0	9.8	150	492
4.0	13		
5.0	16		
6.0	20	225	738
8.0	26		
10	33		
15	49	300	984
20	66		
25	82		
30	98	- - -	- - -
40	131		
50	164		

Other lengths available upon request. Contact the factory at 1-888-546-5880.

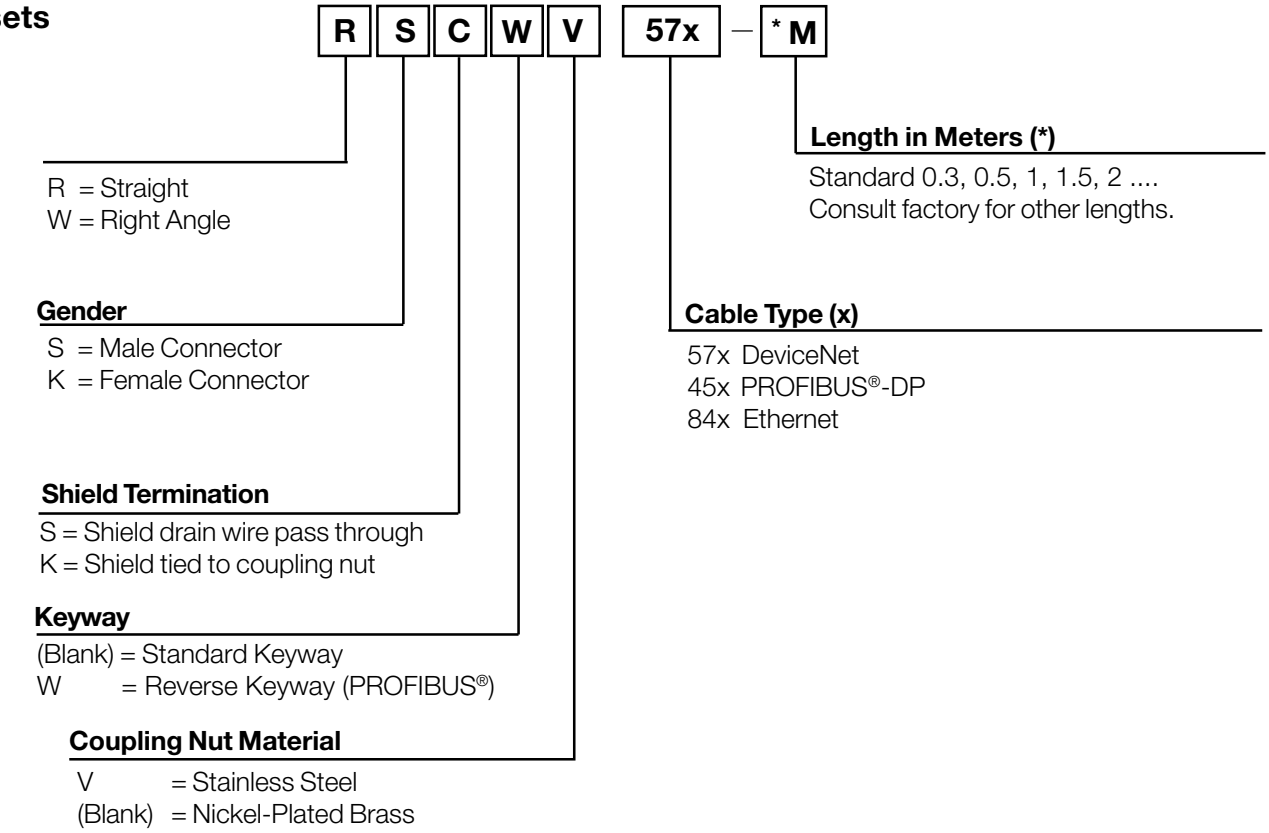
Unit Conversions:

1 meter = 3.28 feet
1 meter = 39.8 inches

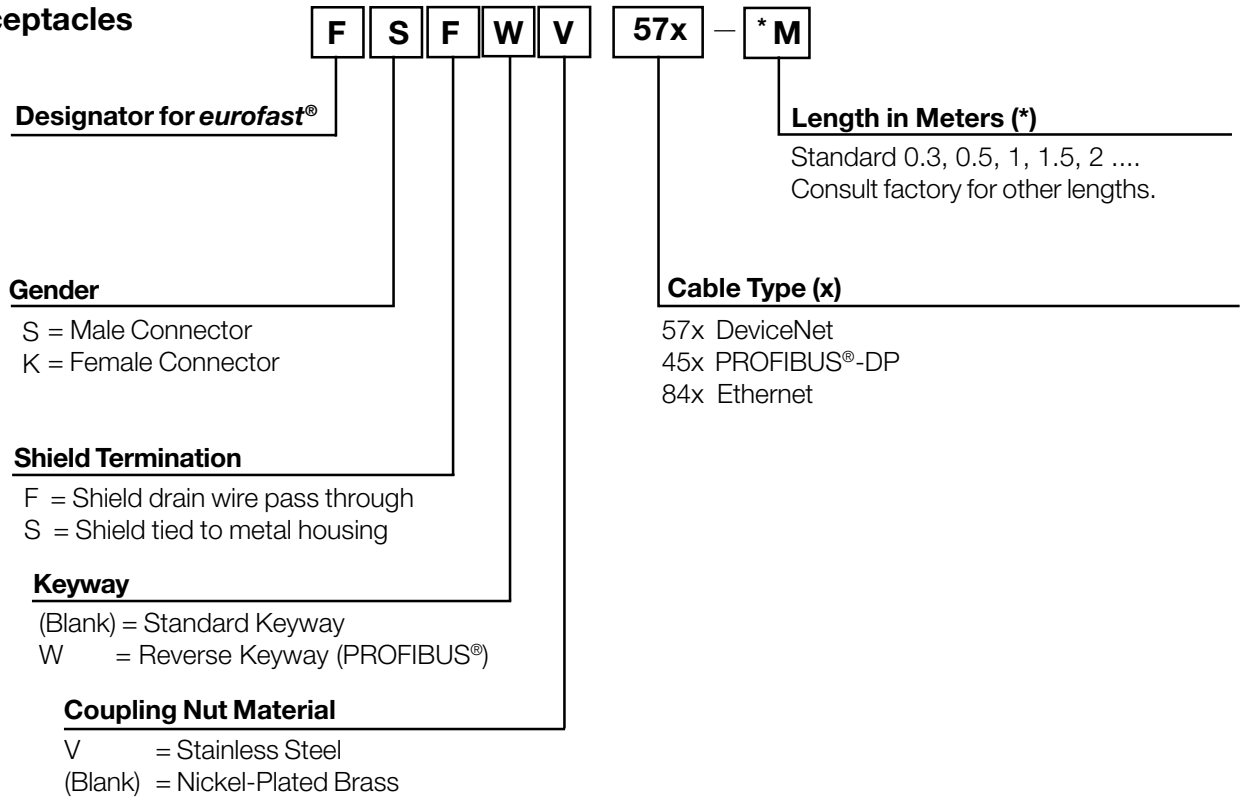
Tolerances:

0-1 meter: +35 / - 0 mm
> 1 m +85/-0 mm or +4% of length
which ever is greater

Cordsets

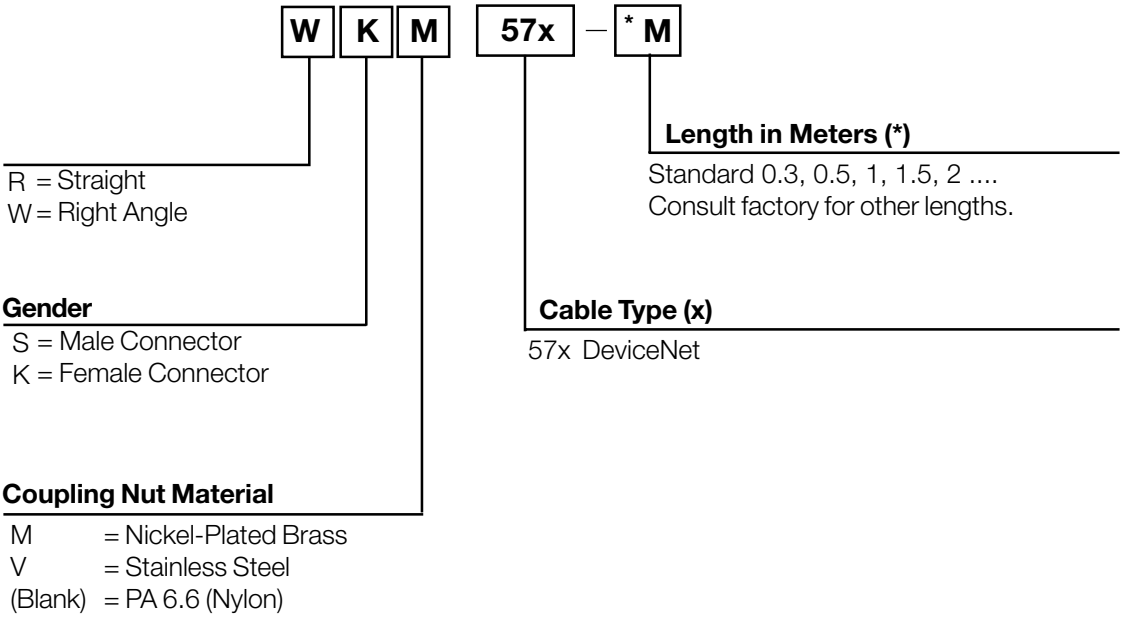


Receptacles

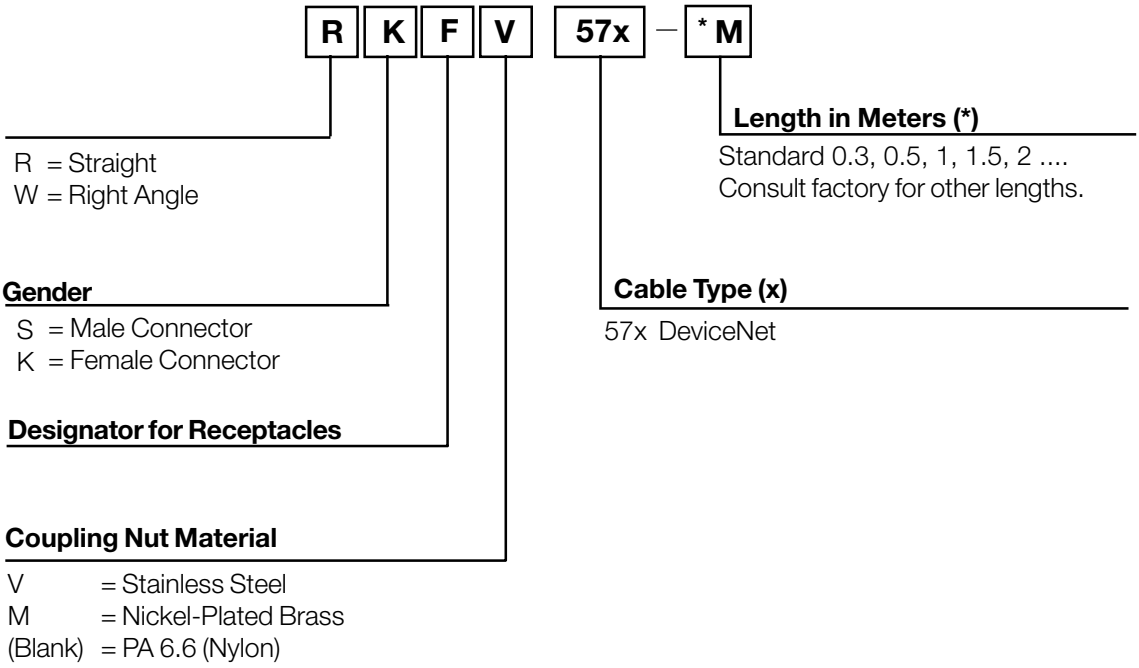


minifast® Part Number Keys

Cordsets



Receptacles



A Worldwide Fieldbus Solution

busstop® - Fieldbus Solutions for Harsh Industrial Environments

When you work with *Interlink*BT™ *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. Whether they're stations, junctions or connectors, *busstop* fieldbus components provide the connection to all popular fieldbus systems, such as:

- AS-interface®
- DeviceNet™
- FOUNDATION™ fieldbus
- HART®
- PROFIBUS®-DP
- PROFIBUS®-PA

▲ *piconet*®
▲ *sensoplex*®*2*
▲ *sensoplex*®*2Ex*
▲ *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. Our product line, ranges 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.

busstop cables and pre-molded cordsets 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.

Freedom to Make the Best Fieldbus Choice

The *busstop*® Brand

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

busstop products will indicate either TURCK or *Interlink*BT as the manufacturer since TURCK bus products were introduced long before InterlinkBT was formed. Keep in mind that when you order replacement parts, the original products could have the TURCK name. However, they are all *busstop* products.

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 communications. 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, have limited data bits per node, and have minimal overhead in their messages.

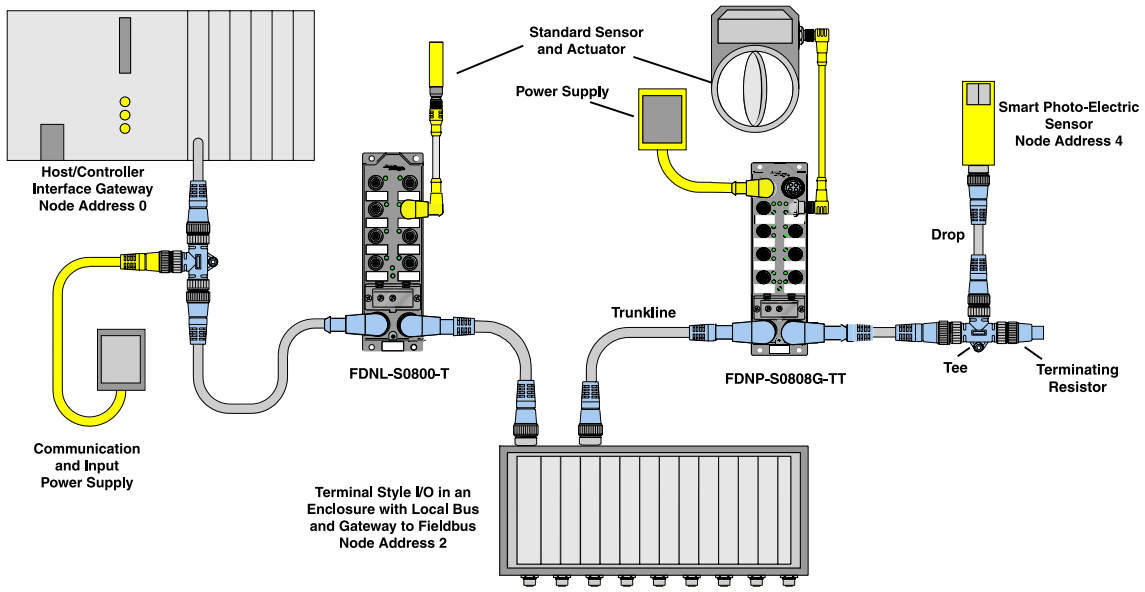
A fieldbus is something more. It could be a device-level bus but it could also have a device-level bus attached to it through a gateway or bridge. Another definition of a fieldbus is that devices on the bus are complex or "smart" in some way, while the products on the device-level buses are simple or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

The buses that could qualify in some or all scenarios as fieldbuses are DeviceNet™, PROFIBUS®-DP, PA & FMS, FOUNDATION™ fieldbus H1 & H2, INTERBUS™, Sercos™, Modbus+™, ControlNet™, GE Genius I/O™, WFIP™ and industrial versions of ARCnet™and Ethernet™. All are legitimate fieldbuses.

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.

Figure 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".

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 the communications. 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 is 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.

The next node, address 3, has outputs as well as inputs. It is connected to another power supply. This power is often used to drive solenoids and other electromechanical devices. By separating the output 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 electro-mechanical 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 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 communication has been used a long time in industrial control. We use it to program a PLC from a personal computer. The origination of “ON-OFF” or “High-Low” electrical signal on 2 wires goes back to the telegraph. Today, the speed has increased by a few million times.

Some of the terms used to describe serial data communication are:

Serial data transfer - information transmitted one piece at a time in a specific order.
Bit - one piece of data that means either “High-Low” or “ON-OFF”.
Byte - 8 bits of information
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 - puts a time reference to an electrical or light signal, so we can distinguish high and low bits.
FKS - Frequency Shift Key - a common bit encoding method for modulated signals.
Manchester - a common bit encoding method for digital signals.
EIA RS-485 - a standard that defines the number of signal generators (the components that create the signal), the receiver and a combination of the two called a transceiver. It also defines the electrical signal values. It does not define anything about the message or the connecting wire.
Carrier - the bit encoded signal carrying the data can ride on top of an AC or DC carrier. One advantage of using a carrier is that both power and data can be sent on just 2 wires. Another advantage is longer transmission capabilities without distortion.
Non Return To Zero (NRZ) - an encoding method on differential signals such as RS-485 and CANbus.

Protocol

All of these bits must be organized to have meaning. A small program is embedded in sending and listening devices to organize the meaning of the bits. A single bit may have a complete meaning or it may take a group of bits to have a meaning.

Start of message - a certain number of high bits that start a message. These consecutive bits allow the listener time to prepare to receive the data.
Address - a unique logical point on the bus. Depending upon protocol and type of message, the address of the listener and sender may be included in a message.
Checksum - the sender may calculate a check sum based upon a numerical representation of all the bits and include it in the message. The receiver performs the same calculation and compares the results. If they are not equal the data is considered bad and not used. Some buses have a message type that can be sent back saying “repeat the original message”.
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

In discussing the products used on the buses, we will break them down into two general categories, active and passive. The active products are either creating the signal, responding to the signal, manipulating the signal, or any combination of these.

Products in the active category are:

Node - an addressable device on the bus.
Bus Station - this is an *Interlink*BT™ designation for a fully connectorized field node, but not a master or gateway.
Bus Module - this is an *Interlink*BT designation for any field node, whether it uses terminal screws, connectors, or a combination of connecting means.
Gateway - a special node on two different buses that serves as a signal and data translator between the buses.
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. One is a double side node that connects two segments together that are of the same protocol but at different transmission speeds. The other is a smart repeater that only repeats the data between two bus segments when the source and destination address are in different segments. The bridge must be programmed to know what the addresses are and their respective segments. There is a several bit wait state as the bridge reads the address in the message header. The bridge may be a possible product for a device level bus, but is not common today.
Router - a higher level bridge for connection of wide area networks. This product would seldom be used on a device level bus.
Active hub- a multiple port repeater or amplifier that lengthens the branching ability of a bus.
Scanner module- Allen-Bradley designation for the gateway that plugs into their PLC and interfaces the PLC’s bus to DeviceNet™ bus.
Interface card, interface module- generic terms for the gateway, either in a PLC or PC, that interfaces to a device level bus.
Spanner- *Interlink*BT’s designation for a double-sided slave node. This unit has bi-directional data from one control area segment to another in a free form format.

The passive bus products are:

Tee - a product that creates a branch or drop from a bus.
Passive hub - multiple port Tee.
Bus Junction - *Interlink*BT’s designation for a connectorized passive hub.
Terminating resistor - a resistor that is usually put at the beginning and end of a bus to stabilize and tune the signal.
Busline - any group of wires that carries data from node-to-node.
Trunk line - the main busline.
Power Tap- A special tee which provides power to the network.

Bus Topology

Topology is a term that applies to buses. It describes how the data lines connect the nodes together. The first bus goes back to the original telegraph-two data lines hanging on wooden poles going from telegraph station to telegraph station.

Bus - the simple straight-line topology is called a *bus.*
Branch - a common bus can have branches, and sometimes the branches can have branches. Another term used to describe the branches is “drops”. Depending upon the bus, the branches may be restricted to just a few centimeters or a free-form topology with only the cumulative distance of all data lines being the restriction.
Star - another wiring topology is the *star*. This method was prevalent in the mainframe computer days. The big mainframe would be connected in this fashion to several peripheral devices such as tape storage, printers, and terminals. Today, the star is more of an idea than a reality. On paper, a hub (either passive or active) looks like a star, but internally it’s a common bus with many branches jammed together in a relatively small area.
Ring - the *ring* is another topology that is often conceptual, although true rings do exist. On a true ring every node is also a repeater. The information comes into a node, information that pertains to that node is read, new information is added and the message is sent on to the next node. With advanced protocol and additional hardware the nodes can re-route the message if the ring is cut or a node-repeater dies.

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 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 (carrier sense multiple access) - 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 verbal collision. A few humans can talk and listen to someone 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 it’s 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 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 start-up 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 it’s diagnostic status or identity 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.

NOTES:

DeviceNet™ Stations

System Description

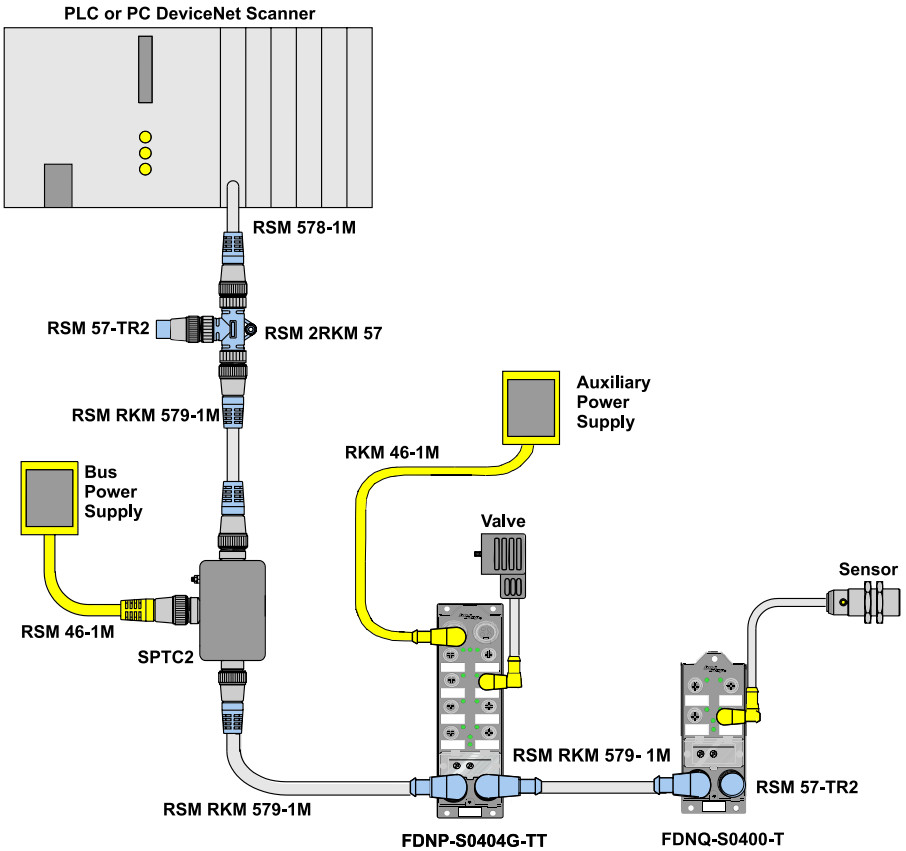
DeviceNet™ is a low-cost communications link to connect industrial devices such as limit switches, photoelectric sensors, valve manifolds, motor starters, process sensors, bar code readers, variable frequency drives, panel displays and operator interfaces to a network and eliminate hard wiring. The direct 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 communication 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. Some *Interlink*BT stations require an additional 24 VDC auxiliary power to supply current for the outputs.

DeviceNet allows for Peer-to Peer data exchange (in which a DeviceNet product can produce and consume messages) and Master/Slave operation (called the Predefined Master/Slave Connection Set).

System Configuration



Basic Parts List

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

Nodes	
(1) FDNP-S0404G-TT	Input/Output Station
(1) FDNQ-S0400-T	Input Station

Physical Media	
(1) SPTC2	Bus Power Tap
(1) RSM-2RKM 57	Bus Tee
(2) RSM 57-TR2	Terminator
(3) RSM RKM 579-1M	Bus Cordset
(1) RSM 578-1M	Drop Cordset
(1) RKM 46-1M	Auxiliary Power Cable
(1) RSM 46-1M	Bus Power Cable

*Interlink*BT™ stations require a network master (also called a scanner) to interface the stations top the host controller. Here is a partial list of PLC's and PC interface products that support DeviceNet:

DeviceNet compatible PLC's
-Allen-Bradley (MicroLogix, SLC and PLC series)
-GE Fanuc (90/30, 90/70)
-Omron (CV/CVM1, C2000HS/X/G/E series)
-Siemens (S5, TI505)
-Toshiba (T2E, T3)

DeviceNet compatible PC interfaces
-Allen-Bradley (PCI)
-Cutler Hammer (ISA, PCMCIA)
-National Instruments (ISA, PCI, PCMCIA)
-Softing (ISA,PCMCIA)
-SST (ISA, PC/104, PCMCIA,VME)
-Synergetic Micro Systems (ISA, PC/104)

Cordsets

*Interlink*BT offers a complete line of molded 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 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 500kbps.
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 made using 5-pin *minifast*® or *eurofast*® connectors.
Stations with output circuits for DC actuators require 24 VDC auxiliary power that is fed through a 4-pin *minifast*® connection. All input and output connections are made using industry standard 12 mm *eurofast*® connectors.
*Interlink*BT cordsets for the DeviceNet system are available in standard lengths. Contact factory for custom lengths and configurations.

Diagnostics

A key benefit of *Interlink*BT stations is increased diagnostics when using standard proximity or photoelectric sensors and discrete actuators. *Interlink*BT 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 it is available for fault handling in the control program.
In addition, each input and output has a multicolored LED to indicate it's state and status. These LED's pinpoint I/O problems quickly. A detailed description of input and output LED indications is shown on each product page.
There is a Module Status LED that indicates the internal health of the station and a Network Status LED that indicates the station's communication on the DeviceNet network.

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 dials or 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 be solid 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. FDN series stations can "Autobaud". They will automatically use the same transmission speed as the other devices on the network.

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 time-out 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 *Interlink*BT web site (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 ohm resistor at both ends of the trunk. The length of the trunk depends on the communication rate and the cable type. Drops are branches off the trunk and may be from 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 InterlinkBT thick, mid and thin cable:

Communication Rate	Thick Trunk Length (maximum)	Mid Trunk Length (maximum)	Thin Trunk Length (maximum)	Drop Length (maximum)	Drop Length (cumulative)	Nodes (maximum)
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 for DeviceNet™ Stations

Module Status LED		
State	**LED is**	**Indication**
Power Off	Off	No bus power.
Device Operational	Green	Device is operating normally.
Device in Standby	Flashing Green	Device needs commissioning due to configuration missing, incomplete, incorrect, or Autobaud.
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 Online Off		Device is not online. Device has not completed the Duplicate MAC ID test. Device may not be powered.
Online, Not Connected	Flashing Green	Device is online but is not allocated to a master.
Online, 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.

DeviceNet™ Stations

Part Number		Input Parameters						Output Parameters						
FDNQ (Short) Housing, SE (page 22)	Page Numbers	Number of Inputs	Connector Wiring	Inputs per Connector	Compatible with NPN/PNP Sensors?	Short Circuit * Protection	Open Circuit Detection	Number of Outputs	Output Wiring	Outputs per Connector	Maximum Output Load	Bus or Aux. Power?	Short Circuit * Protection	Open Circuit Detection
FNDQ-S0400-T	23	4	S	1	PNP	G		-	-	-	-	-	-	
FDNQ-S0800-T	23	8	2S	2	PNP	G		-	-	-	-	-	-	
FDNQ-CSG44-T	24	4	C	1	PNP	G		4	C	1	0.5A	BUS	I	
FDNQ-S0404G-T	25	4	2S	2	PNP	G		4	2G	2	0.5A	BUS	I	
FDNQ-XSG08-T	24	8	2X	2	PNP	G		8	2X	2	0.5A	BUS	I	
FDNQ (Short) Housing, Aux Powered Outputs (page 26)														
FDNQ-S0404G-MM	26	4	2S	2	PNP	G		4	2G	2	0.5A	AUX	I	
FDNQ (Short) Housing, Analog and Counter Station (page 28)														
FDNQ-4AI-I-T	28	4	AI	1	4 16-Bit 0/4-20mA Inputs									
FDNQ-C4-T	30	4	S	1	PNP	G	4 Counter Inputs							
FDNQ (E-*connect*™) Housing (page 103)														
FDNQ-ES11-T	106	1	ES	1	PNP	G		1	ES	1	0.5A	AUX	I	
FDNQ-ES22-T	107	2	ES	1	PNP	G		2	ES	1	0.5A	AUX	I	
FDNP-ES88-T	108	8	ES	1	PNP	G		8	ES	1	0.5A	AUX	I	
FDNL (Tall) Housing, LX (page 32)														
FDNL-L0800-T	33	8	L	1	NPN/PNP	I	✓	-	-	-	-	-	-	
FDNL-L1600-T	33	16	2L	2	NPN/PNP	I	✓	-	-	-	-	-	-	
FDNL-CPG88-T	34	8	C	1	PNP	I	✓	8	C	1	0.5A	BUS	I	✓
FDNL (Tall) Housing, SE (page 35)														
FDNL-S0800-T	36	8	S	1	PNP	G		-	-	-	-	-	-	
FDNL-N0800-T	36	8	N	1	NPN	G		-	-	-	-	-	-	
FDNL-S1600-T	36	16	2S	2	PNP	G		-	-	-	-	-	-	
FDNL-N1600-T	37	16	2N	2	NPN	G		-	-	-	-	-	-	
FDNL-CSG88-T	37	8	C	1	PNP	G		8	C	1	0.5A	BUS	I	
FDNP (Tall) Housing with Aux Power, LX (page 38)														
FDNP-L0404G-TT	39	4	L	1	NPN/PNP	I	✓	4	G	1	0.5A	AUX	I	✓
FDNP-L0808G-TT	40	8	2L	2	NPN/PNP	I	✓	8	2G	2	0.5A	AUX	I	✓
FDNP-L0808H-TT	41	8	2L	2	NPN/PNP	I	✓	8	2H	2	2.0A	AUX	I	✓
FDNP-P0808H-TT	42	8	2P	2	PNP	I	✓	8	2H	2	2.0A	AUX	I	✓
FDNP-P1204G-TT	43	12	2P	2	PNP	I	✓	4	2G	2	0.5A	AUX	I	✓
FDNP-CPG88-TT	44	8	C	1	PNP	I	✓	8	C	1	0.5A	AUX	I	✓
FDNP (Tall) Housing with Aux Power, SE (page 45)														
FDNP-S0404G-TT	46	4	S	1	PNP	G		4	G	1	0.5A	AUX	I	
FDNP-S0808G-TT	46	8	2S	2	PNP	G		8	2G	2	0.5A	AUX	I	
FDNP-S1204H-TT-0149	47	12	2S	2	PNP	G		4	2H	2	1.4A	AUX	I	
FDNP-CSG88-TT	48	8	C	1	PNP	G		8	C	1	0.5 A	AUX	I	
FDNP-XSG16-TT	49	16	2X	2	PNP	G		16	2X	2	0.5A	AUX	I	
FDNP-S0008G-TT	50	-	-	-	-	-		8	G	1	0.5A	AUX	I	
FDNP-S0008H-TT	50	-	-	-	-	-		8	H	1	1.4A	AUX	I	
FDNP (Tall) Housing with Screw Terminals "ST" (page 58)														
FDNP-S0808G-ST	59	8	2S	2	PNP	G		8	2G	2	0.5A	AUX	I	
FDNP-XSG16-ST	60	16	2X	2	PNP	G		16	2X	2	0.5A	AUX	I	

* I = Individual G = Group ES = Estop

Advanced I/O Modules (AIM™)

Advanced I/O Modules (AIM™) are the culmination of *Interlink*BT™'s focused dedication to the idea of connectorized I/O stations. There are two station families. The standard (SE) style stations provide diagnostic information that is simply not available using traditional PLC I/O cards. This includes group sensor power supply over current indication and individual output short circuit indication. The deluxe (LX) style stations provide an even higher level of diagnostics. These stations indicate if an individual input or output point is shorted, open, or working correctly.

The 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 changing out stations.

Enhanced diagnostics gives you individual 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 30 different I/O configurations.

The AIM stations feature visible rotary switches for selection of the node address and communication rate, LED indications for I/O, module and network status, and labeling for quick indentification of inputs and outputs.

The AIM part numbers are designed to easily identify the features of each unit. 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 sample part number below will help you indentify the meaning of each character.

FDNP-L0404G-TT- V

F = AIM Designator
Top-entry, Plastic

DN = DeviceNet™

P = 8 I/O Ports/Aux Power/220 mm Long
L = 8 I/O Ports/197 mm Long
Q = 4 I/O Ports, 148 mm Long

L = NPN/PNP, Individual Open and Short-Circuit Detection
P = PNP, Individual Open and Short-Circuit Detection
S = PNP, Group Input Short-Circuit Detection, Earth Ground Pin 5
C = Combined (ie: CPG = Combined PNP and 500 mA Outputs)
X = Universal PNP Input or 500 mA Output
N = NPN, Group Input Short-Circuit Detection, Earth Ground Pin 5

Number of Inputs (First Two Digits)
Number of Outputs (Last Two Digits)

G = 510 mA Outputs
H = 1.4 or 2.0 Amp Outputs

DeviceNet Connector Configuration
T = Through *minifast*®, Both M/F
E = *eurofast*® Drop, Single Male
M = *minifast*® drop, male only

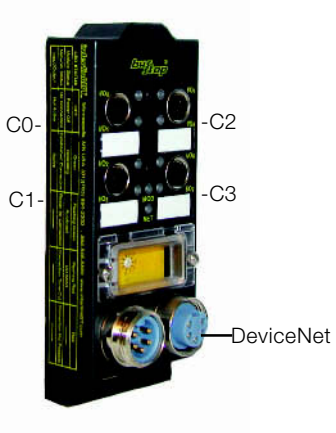
Aux Power Connector
T = Through *minifast*®
Both Male/Female

Connector Material
Blank = nickel plated brass
V = Stainless Steel

FDNQ Housing, Standard Diagnostics

The FDNQ stations are the smallest AIM™ stations available. They are designed for conveyors or other systems where the I/O points are widely distributed. There are two DeviceNet™ connectors on each station, one male and one female. No additional DeviceNet "T" is required. As with all AIM stations, the DeviceNet address is set using rotary switches on the front of the station. The station's address is clearly visible when installed, which simplifies troubleshooting.

All of these models are powered entirely from DeviceNet to reduce and simplify cabling. All inputs and outputs are also powered entirely by DeviceNet. Many I/O configurations are available. The smallest size is 4 inputs. The largest (and most popular) size is the XSG08 which handles 8 I/O points. Each of the I/O points can be either an input or an output. Diagnostic data includes one bit for input power status and one bit for output power status.



- Advanced DeviceNet station

Applications
- For wet or dry environments
- Long Conveyors with dispersed I/O
- Push button pendants-"CSG44" style

Features
- PNP short-ciruit protected inputs
- 0.5 amp short-circuit protected outputs
- All I/O powered by DeviceNet
- Compact size
- Rotary address switches

Module Specifications

Supply Voltage	
Bus power	11-26 VDC
Internal current consumption	≤75mA, plus sum of sensor and output currents (from bus power)
Input Circuits	PNP push buttons, 3-wire sensors, or dry contacts
Input voltage (V+)	13-26 VDC (from bus power)
Input short-circuit (V+)	<700mA (total, short-circuit protected)
Input signal current (Input)	OFF <2mA
	ON 3.0-3.4 mA at 24VDC
Input delay	2.5 ms
Output Circuits	DC actuators
Output voltage	18-26 VDC (from bus power)
Output load current	0.5 A per output (from bus power)
Maximum switching frequency	100 HZ
I/O LED Indications	Off=Off; Green=On
Module Status LED	Green: working properly; Flashing green: detecting autobaud rate
	Flashing red: I/O short-circuit
Network Status LED	Green: established connection; Flashing Green: ready for connection
	Flashing red: connection time-out; Red: connection not possible
Adjustments	Address 0-63 via Rotary Switch
Housing	Glass filled nylon with nickel plated brass connectors
Enclosure	NEMA 1, 3, 4, 12, 13, and IEC IP67
Operating Temperature	-40° to 70° C (-40° to 158°)

FDNQ-S0400-T, 4 PNP Input, Group Diagnostic

I/O Data Map

Product Code: 7/1281 (511hex)

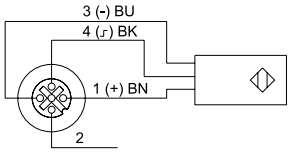
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	IGS	-	-	-	I-3	I-2	I-1	I-0

Connectors

4 Inputs "S" Type (C0-C3)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use RK 4.4T-*-RS 4.4T
Field Wireable: Single Sensor use BS 8141-0

1 = VI+
2 = N/C
3 = V-
4 = Input
5 = PE



Single Sensor

Refer to page 51 for dimensions and DeviceNet™/Aux specifications.

FDNQ-S0800-T, 8 PNP Input, Group Diagnostic

I/O Data Map

Product Code: 7/1265 (4F1hex)

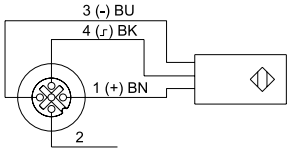
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	IGS	-	-	-	-	-	-	-

Connectors

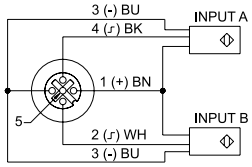
8 Inputs "2S" Type (C0-C3)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use
RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors use
VBRS 4.4-2RK 4T-*/*

1= V +
2 = Input B
3 = V -
4 = Input A
5 = PE



Single Sensor



Splitter and 2 Sensors

Refer to page 51 for dimensions and DeviceNet/Aux specifications.

Abbreviations

I = Input Data (0=OFF, 1=ON) IGS = Input Group Status (0=Working, 1=Fault)
O = Output Data (0=OFF, 1=ON) OGS = Output Group Status (0=Working, 1=Fault)

FDNQ-Housing, Standard Diagnostics

FDNQ-CSG44-T, 4 Combined PNP Input and 0.5A Output, Group Diagnostic

I/O Data Map

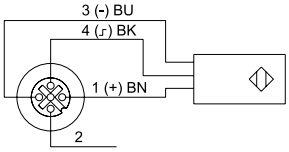
Product Code: 7/1921 (781hex)

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

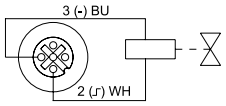
Connectors

4 Combined Inputs/Outputs, "C" Type (C0-C3)

Style: 5-Pin *eurofast*®
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

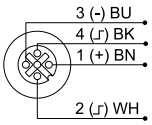


Single Sensor

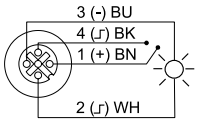


Single Output

1 = V +
2 = Output Signal
3 = GND
4 = Input Signal
5 = PE



Part Verification Array



Push Button

Refer to page 51 for dimensions and DeviceNet™/Aux specifications.

FDNQ-XSG08-T, 8 PNP Input or 0.5A Output, Group Diagnostic

I/O Data Map

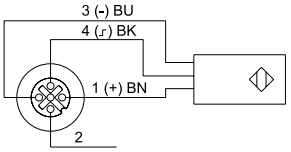
Product Code: 7/2145 (861 hex)

	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	-	-	-	-	-	-
Output Data	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

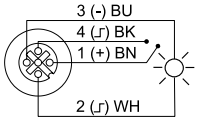
Connectors

8 Inputs or Outputs "2X" Type (C0-C3)

Style: 5-Pin *eurofast*®
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

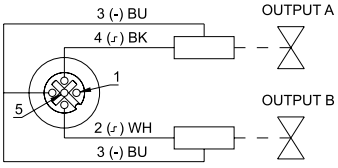


Single Sensor

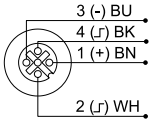


Push Button

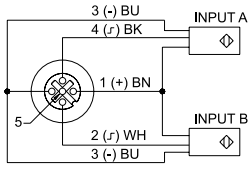
1= V +
2 = Input/Output B
3 = GND
4 = Input/Output A
5 = PE



Outputs



Part Verification Array



Splitter and 2 Sensors

Refer to page 51 for dimensions and DeviceNet/Aux specifications.

Abbreviations

I = Input Data (0=OFF, 1=ON) IGS = Input Group Status (0=Working, 1=Fault)
O = Output Data (0=OFF, 1=ON) OGS = Output Group Status (0=Working, 1=Fault)

FDNQ-S0404G-T, 4 PNP Input and 4 0.5A Output, Group Diagnostic

Product Code: 7/2129 (851hex)

I/O Data Map

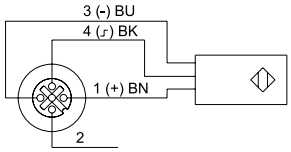
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	IGS	OGS	-	-	I-3	I-2	I-1	I-0
Output Data	0	-	-	-	-	O-3	O-2	O-1	O-0

Connectors

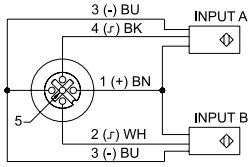
4 Inputs "2S" Type (C0-C1)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use
RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors use
VBRS 4.4-2RK 4T-*/*

1= V +
2 = Input B
3 = V -
4 = Input A
5 = PE



Single Sensor

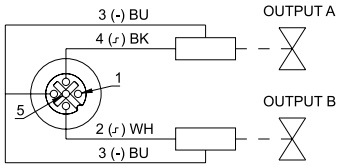


Splitter and 2 Sensors

4 Outputs "2G" Type (C2-C3)

Style: 5-Pin *eurofast*®
Cordset: Dual Output use RK 4.4T-*-RS 4.4T
Splitter: Dual Output or Dual Valve use VB2-RS 4.5T-*/2VAS 22-A528-*/*
("A"Style valve plug, other's available)
Field Wireable: Dual Output use BS 8141-0

1 = N/C
2 = Output B (odd numbers)
3 = GND
4 = Output A (even numbers)
5 = PE



Dual Output

Refer to page 51 for dimensions and DeviceNet™/Aux specifications.

Abbreviations

I = Input Data (0=OFF, 1=ON) IGS = Input Group Status (0=Working, 1=Fault)
O = Output Data (0=OFF, 1=ON) OGS = Output Group Status (0=Working, 1=Fault)

FDNQ-Housing, Standard Diagnostics

The FDNQ-S0404G-MM station is the smallest AIM™ station with isolated outputs. It is designed for the end of robotic arm systems where weight and size need to be minimized. There is one DeviceNet™ connector and one 4 pin Auxiliary power connector at the base of the station. As with all AIM stations, the DeviceNet address is set using rotary switches on the front of the station. The station's address is clearly visible when installed, which simplifies troubleshooting.

The inputs are powered from DeviceNet; the outputs are powered from Auxiliary power. Diagnostic data includes one bit for input power status and one bit for output power status.

FDNQ-S0404G-MM

- Advanced DeviceNet station

Applications
- For wet or dry environments
- "End of Arm" on robotic tools
- Drops from cable tray

Features
- PNP short-ciruit protected inputs
- 0.5 amp short-circuit protected outputs
- Isolated auxiliary power to drive outputs
- Rotary address switches

Module Specifications

Supply Voltage	
Bus power	11-26 VDC
Internal current consumption	≤100mA plus sum of sensor and output currents
Auxiliary power	18-26 VDC
Input Circuits	PNP 3-wire sensors or dry contacts
Input voltage (V+)	13-26 VDC
Input short-circuit (V+)	700mA-2A (total)
Input signal current (Input)	OFF <2mA
	ON 3.0-3.4 mA at 24VDC
Input delay	2.5 ms
Output Circuits	DC actuators
Output voltage	18-26 VDC (from aux power)
Output load current	0.5 A per output (from aux power)
Maximum switching frequency	100 HZ
I/O LED Indications	Off=Off
	Green=On
Module Status LED	Green: working properly; Flashing green: detecting autobaud rate
	Flashing red: I/O short-circuit
Network Status LED	Green: established connection; Flashing Green: ready for connection
	Flashing red: connection time-out; Red: connection not possible
Adjustments	Address 0-63 via Rotary Switch
Housing	Glass filled nylon with nickel plated brass connectors
Enclosure	NEMA 1, 3, 4, 12, 13, and IEC IP67
Operating Temperature	-40° to 70° C (-40° to 158°)

FDNQ-S0404G-MM, 4 PNP Inputs and 4 0.5A Aux Powered Outputs, Group Diagnostics

Product Code: 7/2481(9B1 hex)

I/O Data Map

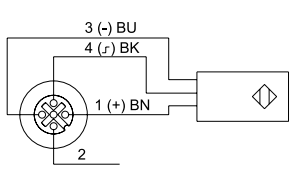
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	IGS	OGS	-	-	I-3	I-2	I-1	I-0
Output Data	0	-	-	-	-	O-3	O-2	O-1	O-0

Connectors

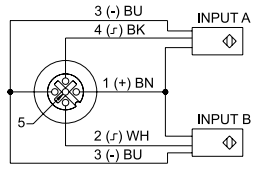
4 DeviceNet™ Powered Inputs "2S" Type (C0-C1)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use
RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors
use VBRS 4.4-2RK 4T-*/*

1= V +
2 = Input B
3 = V -
4 = Input A
5 = PE



Single Sensor

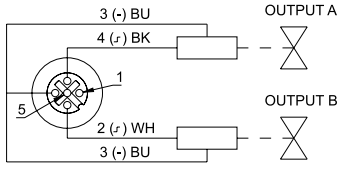


Splitter and 2 Sensors

4 Aux Powered Outputs "2G" Type (C2-C3)

Style: 5-Pin *eurofast*®
Cordset: Dual Output use RK 4.4T-*-RS 4.4T
Splitter: Dual Output or Dual Valve use
VB2-RS 4.5T-*/2VAS 22-A528-*/*("A"Style valve plug, other's available)
Field Wireable: Dual Output use BS8141-0

1 = N/C
2 = Output B (odd numbers)
3 = GND
4 = Output A (even numbers)
5 = PE

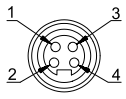


Dual Output

Aux Power, Type "M"

Style: 4-Pin *minifast*®
Cordset: Aux Power use RSM RKM 46-*M

1= Aux +
2= E+
3= E-
4= Aux-



Male

Auxiliary Power

Refer to page 51 for dimensions and DeviceNet/Aux specifications.

Abbreviations

I = Input Data (0=OFF, 1=ON) IGS = Input Group Status (0=Working, 1=Fault)
O = Output Data (0=OFF, 1=ON) OGS = Output Group Status (0=Working, 1=Fault)

FDNQ-Housing, Analog Station

The FDNQ-4AI-I-T station has four analog input connectors. Each connector provides a connection point for an analog transducer. The transducer can be self powered or loop powered. This station has a 16 bit resolution for the analog signal. Preset current ranges are 0 - 20 mA and 4 - 20 mA. The analog current level is measured across a differential pair. All the analog channels share a common ground. The analog channels are electrically isolated from the DeviceNet™ power when connected in the "Loop Powered" configuration. There is also an option to use the 24 V from DeviceNet™ to power the transducer. This is the "DeviceNet™ Powered Transducer" configuration. In this case the loop is not isolated from DeviceNet.

0-20 mA or 4-20mA range can be adjusted using a rotary switch on the front of the station. The node address can be set using the rotary switches or through software node commissioning.

This station supports Poll I/O messages. The connection can be established through UCMM or the predefined master slave connection set.

- Advanced DeviceNet analog station

Applications
- For wet or dry environments
- For use with 2,3 or 4-wire transducers

Features
- Overcurrent protected analog inputs
- Rotary address switches

FDNQ-4AI-I-T

Module Specifications

Supply Voltage	
Bus power	11-26 VDC
Internal current consumption	≤100 mA plus sum of sensor and output currents (from bus power)
Input Circuits	(4) Analog differential inputs, 0,4-20 mA
Input voltage (V+)	11-26 VDC (from bus power)
Input short circuit (V+)	<700mA (total, short-circuit protected)
Input signal current (I+,I-)	0-20mA over current protected
Input resistance	100 Ohms
Resolution	16 Bit A to D, 0.6104 μA/count, 0-32,767 counts
Accuracy	± 0.3% of full scale
Input Filter	60 Hz (default), 51 Hz
Isolation	between channels: 5 V
Calibration LED	Green: Working; Amber: calibrating; Red: invalid calibration
Module/Network Status LED	Green: established connection; Flashing Green: ready for connection Flashing red: connection time-out; Red: connection not possible
Adjustments	Address 0-63 via Rotary Switch or via Software
Current Range	0-20, 4-20 via Rotary Switch or via Software
Housing	Glass filled nylon with nickel plated brass connectors
Enclosure	NEMA 1, 3, 4, 12, 13, and IEC IP67
Operating Temperature	-40° to 70° C (-15° to 158°)

FDNQ-4AI-I-T, 4 analog input, self or loop powered

I/O Data Map

Product Type/Product Code: 100/2417(0 x 971) Input Data Size: 8 Bytes
Input Data Type: four 16-Bit signed integer
Input Data:

Byte 0 = INPUT 0 LSB Byte 4 = INPUT 2 LSB
Byte 1 = INPUT 0 MSB Byte 5 = INPUT 2 MSB
Byte 2 = INPUT 1 LSB Byte 6 = INPUT 3 LSB
Byte 3 = INPUT 1 MSB Byte 7 = INPUT 3 MSB

LSB = Least Significant Byte
MSB = Most Significant Byte

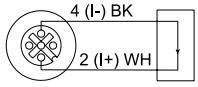
Measured Current		Data Returned	
0-20mA	4-20mA	HEX	Signed Integer
0mA	4mA	0000	0
20mA	20mA	7FFF	32,767

Connectors

Type "AI-I"

Style: 5-Pin *eurofast*®
Cordset: Isolated Loop
RK 4.5T-*M-RS4.5T/S653

1= VI +
2 = Input +
3 = V -
4 = Input -
5 = PE

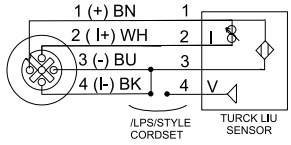


Loop Powered (Isolated)

Type "AI-I"

Style: 5-Pin *eurofast*®
Cordset: Loop Powered
RK 4.5T-*M-RS 4.5T/LPS/S653

1 = VI+
2 = Input +
3 = V-
4 = Input -
5 = PE



DeviceNet™ Powered Transducer

Note: The /LPS/ cordset designates that Pins 3 (-) and 4 (I -) are tied together inside the cordset. It is also possible to use a standard cordset and a field wireable connector. In this case, the user must jumper pins 3 and 4 together in the field wireable connector.

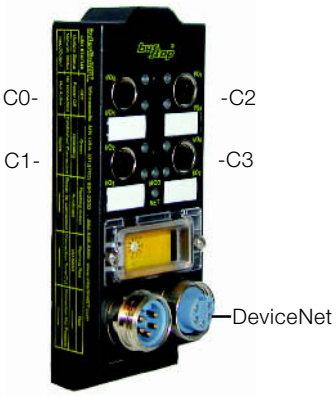
Refer to page 51 for dimensions and DeviceNet/Aux specifications.

FDNQ-Housing, Counter Station

This *busstop*® station has four input connectors. Each connector provides one counter input. This station is designed to work with flow sensors that produce a pulse rate proportional to the measuerd flow rate. The LED at each input point turns green when the input is on. Inputs are protected against short-circuit as a group. If any input is shorted, the entire group of inputs are disconnected from bus power.

The node address can be set using the rotary switches located under the device cover or through software node commissioning. The unit can automatically detect the network communication rate.

The FDNQ-C4-T supports explicit messaging, poll, change of state, and cyclic I/O messages. These connections are established through UCMM or predefined master/slave connection set.



FDNQ-C4-T

• Advanced DeviceNet™ counter station designed to work with flow sensors that produce a pulse rate proportional to the measured flow rate.

Applications
• For wet or dry environments
• For use with up to four 3-wire discrete sensors

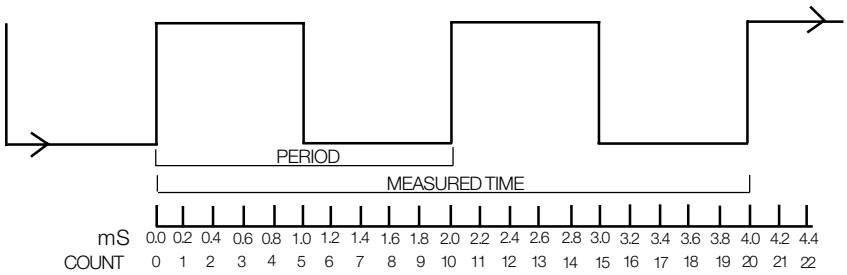
Features
• PNP short-circuit protected inputs
• Rotary address switches

Module Specifications

Supply Voltage	
Bus power	11-26 VDC
Internal current consumption	≤75mA plus sum of sensor and output currents (from bus power)
Input Circuits	(4) PNP 3-wire sensors or dry contacts
Input voltage (V+)	13-26 VDC (from bus power)
Input short circuit (V+)	<700mA (total, short-circuit protected)
Input signal current (Input)	OFF <2mA
	ON 3.0-3.4 mA at 24VDC
Input period range	1.0 mS-6 seconds (default settings)
	0.5 mS-510 seconds (maximum)
Input frequency range	.17Hz-1kHz (default)
	.001Hz-2kHz (maximum)
Resolution	0.2 mS default
	0.1 mS minimum
I/O LED Indications	Off=Off; Green=On
Module Status LED	Green: working properly; Flashing green: detecting autobaud rate
	Flashing red: I/O short-circuit
Network Status LED	Green: established connection; Flashing Green: ready for connection
	Flashing red: connection time-out; Red: connection not possible
Adjustments	Address 0-63 via Rotary Switch
Housing	Glass filled nylon with nickel plated brass connectors
Enclosure	NEMA 1, 3, 4, 12, 13, and IEC IP67

Module Specifications Continued

This station is designed to work with flow sensors that produce a pulse rate proportional to the measured flow rate.



The above example shows:

COUNT = 20 (value returned from station over DeviceNet™)

TIME BASE = 0.2 mS (default value)

SAMPLE NUMBER = 2 (default value)

MEASURED TIME = 4.0 mS (= TIME BASE X COUNT)

PERIOD = 2.0 mS (= $\frac{\text{TIME BASE X COUNT}}{\text{SAMPLE NUMBER}}$)

FREQUENCY = 510Hz (= $\frac{\text{SAMPLE NUMBER}}{\text{TIME BASE X COUNT}}$)

Using an EDS and a DeviceNet configuration tool it is possible to set the time base from 0.1mS to 8 mS.

The number of samples can be set to 1,2,3 or 4.

FDNQ-C4-T, Counter Station

I/O Data

Product Code: 0/2257 (801 hex)

Input Data Size: 8 Bytes

Input Data:

Byte 0 = COUNT 0 LSB
Byte 1 = COUNT 0 MSB
Byte 2 = COUNT 1 LSB
Byte 3 = COUNT 1 MSB
Byte 4 = COUNT 2 LSB
Byte 5 = COUNT 2 MSB
Byte 6 = COUNT 3 LSB
Byte 7 = COUNT 3 MSB

Count returned is proportional to the input signal period.

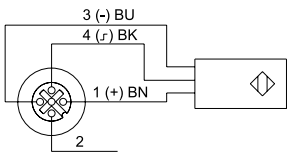
Using default settings, PERIOD = 0.1 mS x COUNT

Connectors

4 Inputs "S" Type (C0-C3)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use
RK 4.4T-*-RS 4.4T
Field Wireable: Single Sensor use
BS 8141-0

1= VI +
2 = N/C
3 = V -
4 = Input
5 = PE



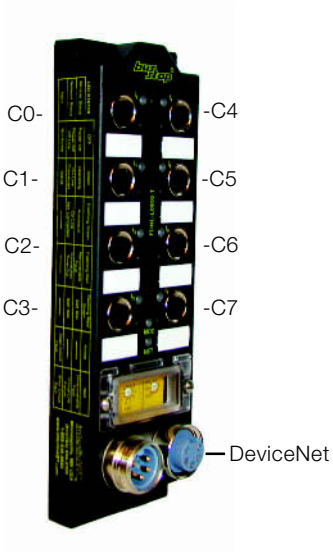
Single Sensor

Refer to page 51 for dimensions and DeviceNet/Aux specifications.

FDNL-Housing, Deluxe Diagnostics

The Deluxe FDNL stations offer unique diagnostic capabilities. Deluxe diagnostic data includes individual open and short indication for every sensor attached. This allows the PLC to pinpoint problems exactly which reduces down time and troubleshooting. There are two DeviceNet™ connectors on each station, one male and one female. No additional DeviceNet "T" is required. As with all AIM stations, the DeviceNet address is set using rotary switches on the front of the station. The station's address is clearly visible when installed, which simplifies troubleshooting.

All of these models are powered entirely from DeviceNet to reduce and simplify cabling. All inputs and outputs are also powered entirely by DeviceNet. Many I/O configurations are available. The I/O sizes include 8 in, 16 in, and 8 in/ 8out.



- Advanced DeviceNet Station

Applications
- Connecting standard sensor inputs
- Connecting world clamp style dual inputs
- Connecting push button pendants

Features
- PNP/NPN short-circuit protected inputs with open-circuit protection
- Powered entirely from DeviceNet to reduce and simplify cabling
- Rotary address switches

Module Specifications

Supply Voltage	
Bus power	11-26 VDC
Internal current consumption	100 mA plus sum of sensor currents (from bus power)
Input Circuits	
Input voltage (V+)	11-26 VDC (from bus power)
Open circuit current (V+)	< 1mA
Sensor current (V+)	<80 mA per input
Input signal current (Input)	OFF <2mA; ON 3.0-3.4 mA at 24VDC
Input delay	2.5 ms
I/O LED Indications	Amber=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: established connection; Flashing Green: ready for connection Flashing red: connection time-out; Red: connection not possible
Adjustments	Address: 0-63 via Rotary Switch Communication Rate: Auto/125k/251k/510k
Housing	Glass filled nylon with nickel plated brass connectors
Enclosure	NEMA 1,3,4,12,13 and IEC IP 67
Operating temperature	-25° to 70°C (-13° to 158°F)

FDNL-L0800-T, 8 NPN/PNP Input, Per Point Diagnostic

Product Code: 7/1201(4B1 hex)

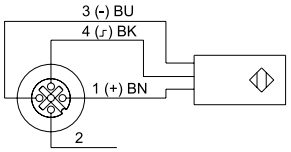
I/O Data Map

	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

Connectors

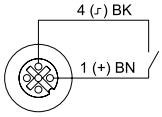
8 Inputs "L" Type (C0-C7)

Style: 5-Pin *eurofast*®
Cordsets: Single Sensor or
Dry Contact use RK 4.4T-*-RS 4.4T



Single Sensor

1= V +
2 = N/C
3 = V -
4 = Input
5 = V+



Mechanical Contact

Refer to page 51 for dimensions and DeviceNet™/Aux specifications.

FDNL-L1600-T, 16 NPN/PNP Input, Per Point Diagnostic

Product Code: 7/1521(5F1 hex)

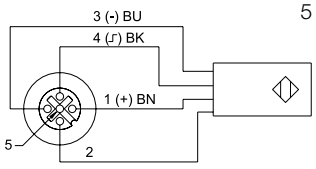
I/O Data Map

	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	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

Connectors

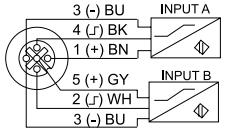
16 Inputs "2L" Type (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: Sensor with 2 Signals use
RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors
use VBRS 4.5-2RK 4T-*/*/S818



Senor with 2 Signals

1= V+(A)
2 = Input B
3 = V -
4 = Input A
5 = V+(B)



Splitter and 2 Sensors

Refer to page 51 for dimensions and DeviceNet/Aux specifications.

Abbreviations

I = Input Data (0=OFF, 1=ON) O = Output Data (0=OFF, 1=ON)
ISS = Input Short Status (0=Working, 1=Fault) OS = Output Status (0=Working, 1=Fault)
IOS = Input Open 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-CPG88-T, 8 Combined PNP Inputs and 0.5A Outputs, Per Point Diagnotics

Product Code: 7/1201(4B1 hex)

I/O Data Map

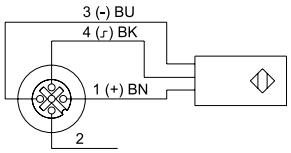
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	ISS-7	ISS-6	ISS-5	ISS-4	ISS-3	ISS-2	ISS-1	ISS-0
	2	IOS-7	IOS-6	IOS-5	IOS-4	IOS-3	IOS-2	IOS-1	IOS-0
	3	OS-7	OS-6	OS-5	OS-4	OS-3	OS-2	OS-1	OS-0
	4	-	APS	-	-	-	-	-	-
Output Data	0	O-7	O-6	O-5	O-4	O-3	O-2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

Connectors

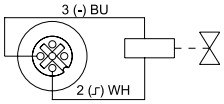
8 Inputs "C" Type (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: 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

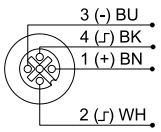


Single Sensor

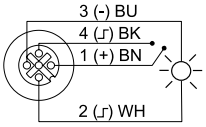


Single Output

1= V +
2 = Output Signal
3 = GND
4 = Input Signal
5 = PE



Part Verification Array



Push Button

Refer to page 51 for dimensions and DeviceNet™/Aux specifications.

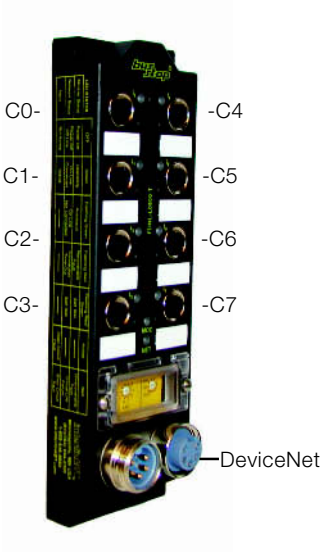
Abbreviations

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-Style Housing, Standard Diagnotics

The FDNL stations are the most popular AIM™ stations available. They are designed for a wide variety of industrial uses including automotive, semiconductor and packaging. There are two DeviceNet™ connectors on each station, one male and one female. No additional DeviceNet "T" is required. As with all AIM stations, the DeviceNet address is set using rotary switches on the front of the station. The station's address is clearly visible when installed, which simplifies troubleshooting.

All of these models are powered entirely from DeviceNet to reduce and simplify cabling. All inputs and outputs are also powered entirely by DeviceNet. Many I/O configurations are available. The I/O sizes include 8 in, 16 in, and 8 in/ 8out. Diagnostic data includes one bit for input power status and one bit for output power status.



- Advanced DeviceNet Station

Applications
- Connecting standard sensor inputs
- Connecting World Clamp style dual inputs
- Connecting push button pendants

Features
- PNP short-circuit protected inputs
- Powered entirely from DeviceNet to reduce and simplify cabling
- Rotary address switches

Module Specifications

Supply Voltage	
Bus power	11-26 VDC
Internal current consumption	<51 mA (at 24 VDC) plus sum of sensor currents (from bus power)
Input Circuits	
Input voltage (V+)	13-26 VDC (from bus power)
Input short circuit (V+)	<700 mA (total, short-circuit protected)
Input signal current (Input)	OFF <2mA ON 3.0-3.4 mA at 24VDC
Input delay	2.5 ms
I/O LED Indications	Off=Off Green=On
Module Status LED	Green: working properly; Flashing green: detecting autobaud rate Flashing red: I/O short-circuit
Network Status LED	Green: established connection; Flashing Green: ready for connection Flashing red: connection time-out; Red: connection not possible
Adjustments	Address 0-63 via Rotary Switch
Housing	Glass filled nylon with nickel plated brass connectors
Enclosure	NEMA 1,3,4,12,13 and IEC IP 67
Operating temperature	-40° to 70°C (-40° to 158°F)

FDNL-Style Housing, Standard Diagnotics

FDNL-S0800-T, 8 PNP Input, Group Diagnostic

I/O Data Map

Product Code: 7/1217 (4C1 hex)

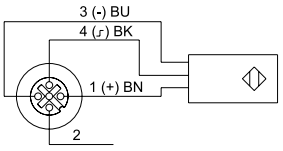
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	IGS	-	-	-	-	-	-	-

Connectors

8 Inputs "S" Type (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor or Dry Contact use
RK 4.4T-*-RS 4.4T

1= V +
2 = N/C
3 = V -
4 = Input
5 = PE



Single Sensor

Refer to page 51 for dimensions and DeviceNet™/Aux specifications.

FDNL-N0800-T, 8 NPN Input, Group Diagnostic

I/O Data Map

Product Code: 7/2209 (8A1 hex)

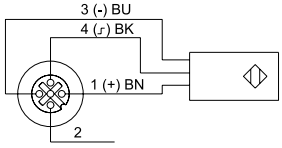
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	IGS	-	-	-	-	-	-	-

Connectors

8 Inputs "N" Type (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor or Dry Contact use
RK 4.4T-*-RS 4.4T
Field Wireable: Single Sensor use BS8141-0

1= V +
2 = N/C
3 = V -
4 = Input
5 = PE



Single Sensor

Refer to page 51 for dimensions and DeviceNet/Aux specifications.

FDNL-S1600-T, 16 PNP Input, Group Diagnostic

I/O Data Map

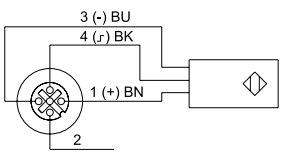
Product Code: 7/1233 (4D1 hex)

	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	-	-	-	-	-	-	-

Connectors

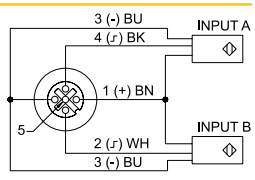
16 Inputs "2N" Type (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use
RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors
use VBRS 4.4-2RK 4T-*/*



Single Sensor

1= V +
2 = Input B
3 = V -
4 = Input A
5 = PE



Splitter and 2 Sensors

Refer to page 51 for dimensions and DeviceNet/Aux specifications.

Abbreviations

I = Input Data (0=OFF, 1=ON) IGS = Input Group Status (0=Working, 1=Fault)
O = Output Data (0=OFF, 1=ON) OGS = Output Group Status (0=Working, 1=Fault)

FDNL-N1600-T, 16 NPN Input, Group Diagnostic

Product Code: 7/1233 (4D1 hex)

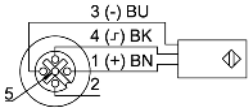
I/O Data Map

	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	-	-	-	-	-	-	-

Connectors

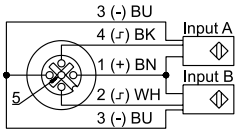
16 Inputs "2N" Type (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use RK 4.4T-*-RS 4.4T
Field Wireable: Single Sensor use BS8141-0



Single Sensor

1= V +
2 = Input B
3 = V -
4 = Input A
5 = PE



Splitter and 2 Sensors

Refer to page 51 for dimensions and DeviceNet™/Aux specifications.

FDNL-CSG88-T, 8 Combined PNP Input and 0.5A Output, Group Diagnostic

Product Code: 7/2081(821 hex)

I/O Data Map

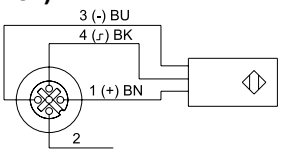
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	IGS	OGS	-	-	-	-	-	-
Output Data	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Connectors

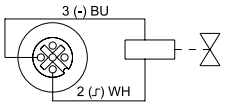
8 Combined Inputs/Outputs "C" Type (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: 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

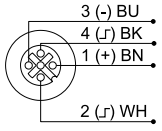


Single Sensor

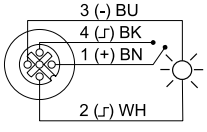


Single Output

1= V +
2 = Output Signal
3 = GND
4 = Input Signal
5 = PE



Part Verification Array



Push Button

Refer to page 51 for dimensions and DeviceNet/Aux specifications.

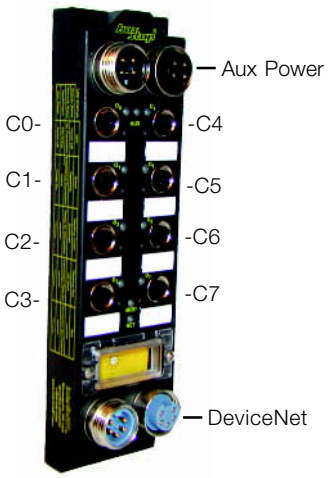
Abbreviations

I = Input Data (0=OFF, 1=ON) IGS = Input Group Status (0=Working, 1=Fault)
O = Output Data (0=OFF, 1=ON) OGS = Output Group Status (0=Working, 1=Fault)

FDNP-Housing, Deluxe Diagnostics

The Deluxe FDNP stations offer unique diagnostic capabilities. Deluxe diagnostic data includes individual open and short indication for every sensor attached. This allows the PLC to pinpoint problems exactly, which reduces down time and troubleshooting. There are two DeviceNet™ connectors on each station, one male and one female. No additional DeviceNet "T" is required. As with all AIM™ stations, the DeviceNet address is set using rotary switches on the front of the station. The station's address is clearly visible when installed, which simplifies troubleshooting.

The inputs are powered from DeviceNet; the outputs are powered from Auxiliary power. There are two Auxiliary power connectors on each station, one male and one female. No additional Auxiliary power "T" is required. Many I/O configurations are available. The I/O sizes include 4 in / 4 out, 8 in/ 8 out and 12 in/ 4 out.



- Advanced DeviceNet station

Applications
- For wet or dry environments
- Valve operations

Features
- PNP short-circuit protected inputs with open- circuit protection
- 0.5 amp and 2 amp short-circuit protected outputs with open-circuit protection
- Isolated auxiliary output power
- Rotary address switches

Module Specifications

Supply Voltage	
Bus power	11-26 VDC
Internal current consumption	≤ 100 mA plus sum of sensor currents (from bus power)
Auxiliary power	18-26 VDC, optically isolated
Input Circuits	NPN/PNP 3-wire sensors or dry contacts
Input voltage (V+)	11-26 VDC (from bus power)
Open circuit current (V+)	< 1mA
Sensor current (V+)	< 80 mA per input, short-circuit protected
Input signal current (Input)	OFF < 2mA ON 3.0-3.4 mA at 24VDC
Input delay	2.5 ms
Maximum switching frequency	100 Hz
Output Circuits	DC actuators
Output voltage	18-26 VDC (from auxiliary power)
Output load current	0.5 A per output on Type "G" and 2A on Type "H"(from auxiliary power)
Open circuit current	< 1 mA per output
Maximum switching frequency	100 HZ
I/O LED Indications	Amber=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: established connection; Flashing Green: ready for connection Flashing red: connection time-out; Red: connection not possible
Adjustments	Address: 0-63 via Rotary Switch Communication Rate: Auto/125k/251k/510k
Housing	Glass filled nylon with nickel plated brass connectors
Enclosure	NEMA 1, 3, 4, 12, 13, and IEC IP67
Operating Temperature	-25° to 70° C (-13° to 158°)

FDNP-L0404G-TT, 4 NPN/PNP Input and 4 0.5A Output, Per Point Diagnostic

Product Code: 7/1153 (481hex)

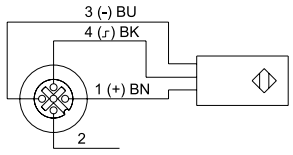
I/O Data Map

	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	-	-	-	-	-	-
Output Data	0	-	-	-	-	O-3	O-2	O-1	O-0

Connectors

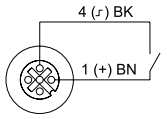
4 DeviceNet™ Powered Inputs "L" Type (C0-C3)

Style: 5-Pin *eurofast*®
Cordsets: Single Sensor or Dry Contact use RK 4.4T-*-RS 4.4T



Single Sensor

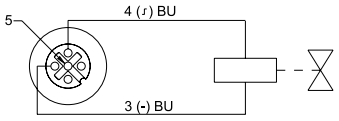
1= V +
2 = N/C
3 = V -
4 = Input
5 = V+



Mechanical Contact

4 Aux Powered Outputs "G" Type (C4-C7)

Style: 5-Pin *eurofast*®
Cordset: Single Output use RK 4.4T-*-RS 4.4T
Field Wireable: Single Output use BS8141-0



Single Output

Refer to page 51 for dimensions and DeviceNet/Aux specifications.

Abbreviations

I = Input Data (0=OFF, 1=ON) O = Output Data (0=OFF, 1=ON)
ISS = Input Short Status (0=Working, 1=Fault) OS = Output Status (0=Working, 1=Fault)
IOS = Input Open Status (0=Working, 1=Fault) OOS = Output Open Status (0=Working, 1=Fault)
OSS = Output Short Status (0=Working, 1=Fault) APS = Aux Power Status (0=OFF, 1=ON)

FDNP-L0808G-TT, 8 NPN/PNP Input and 8 0.5A Output, Per Point Diagnostic

Product Code: 7/1105(451hex)

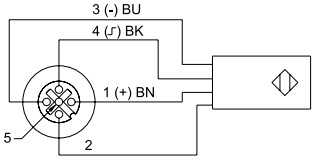
I/O Data Map

	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	-	-	-	-	-	-
Output Data	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Connectors

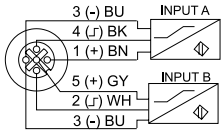
8 DN Powered Inputs "2L" Type (C0-C3)

Style: 5-Pin *eurofast*®
Cordsets: Single Sensor or
Dry Contact use RK 4.4T-*-RS 4.4T



Sensor with 2 Signals

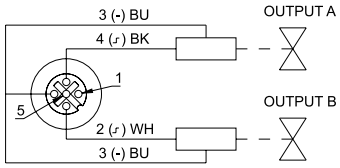
1 = V +(A)
2 = Input B
3 = V-
4 = Input A
5 = V+(B)



Splitter and 2 Sensors

8 Aux Powered Outputs "2G" Type (C4-C7)

Style: 5-Pin *eurofast*®
Cordset: Dual Output use RK 4.4T-*-RS 4.4T
Splitter: Dual Output or Dual Valve use
VB2-RS 4.5T-*/2VAS 22-A528-*/* ("A" Style valve plug,
other's available) Field Wireable: Dual Output use BS8141-0



Dual Output

1 = N/C
2 = Output B (odd numbers)
3 = GND
4 = Output A (even numbers)
5 = PE

Refer to page 51 for dimensions and DeviceNet™/Aux specifications.

Abbreviations

I = Input Data (0=OFF, 1=ON) O = Output Data (0=OFF, 1=ON)
ISS = Input Short Status (0=Working, 1=Fault) OS = Output Status (0=Working, 1=Fault)
IOS = Input Open Status (0=Working, 1=Fault) OOS = Output Open Status (0=Working, 1=Fault)
OSS = Output Short Status (0=Working, 1=Fault) APS = Aux Power Status (0=OFF, 1=ON)

FDNP-L0808H-TT, 8 NPN/PNP Input and 8 2A Output, Per Point Diagnostic

Product Code: 7/1537 (601hex)

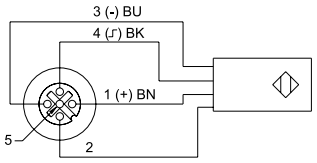
I/O Data Map

	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	-	-	-	-	-	-
Output Data	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Connectors

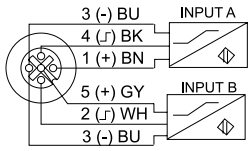
8 DeviceNet™ Powered Inputs "2L" Type (C0-C3)

Style: 5-Pin *eurofast*®
Cordsets: Single Sensor or
Dry Contact use RK 4.4T-*-RS 4.4T



Sensor with 2 Signals

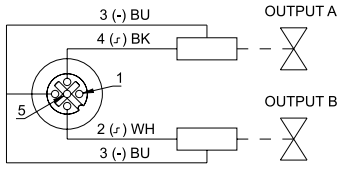
1 = V +(A)
2 = Input B
3 = V-
4 = Input A
5 = V+(B)



Splitter and 2 Sensors

8 Aux Powered Outputs "2H" Type (C4-C7)

Style: 5-Pin *eurofast*®
Cordset: Dual Output use RK 4.4T-*-RS 4.4T
Splitter: Dual Output or Dual Valve use
VB2-RS 4.5T-*/2VAS 22-A528-*/*
("A" Style valve plug, other's available)
Field Wireable: Dual Output use BS8141-0 use BS8141-0



Dual Output

1 = N/C
2 = Output B (odd numbers)
3 = GND
4 = Output A (even numbers)
5 = PE

Refer to page 51 for dimensions and DeviceNet/Aux specifications.

Abbreviations

I = Input Data (0=OFF, 1=ON) O = Output Data (0=OFF, 1=ON)
ISS = Input Short Status (0=Working, 1=Fault) OS = Output Status (0=Working, 1=Fault)
IOS = Input Open Status (0=Working, 1=Fault) OOS = Output Open Status (0=Working, 1=Fault)
OSS = Output Short Status (0=Working, 1=Fault) APS = Aux Power Status (0=OFF, 1=ON)

FDNP-P0808H-TT, 8 PNP Input and 8 2A Output, Per Point Diagnostic

Product Code: 7/1793 (701hex)

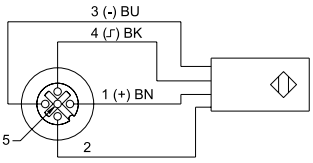
I/O Data Map

	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	-	-	-	-	-	-
Output Data	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Connectors

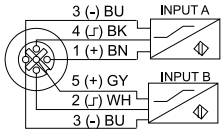
8 DeviceNet™ Powered Inputs "2P" Type (C0-C3)

Style: 5-Pin *eurofast*®
Cordset: Sensor with 2 Signals
use RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors
use VBRS 4.5-2RK 4T-*/*/S818



Sensor with 2 Signals

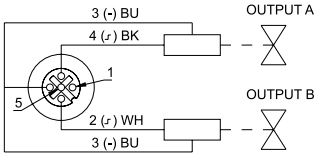
1= V+(A)
2 = Input B
3 = V -
4 = Input A
5 = V+(B)



Splitter and 2 Sensors

8 Aux Powered Outputs "2H" Type (C4-C7)

Style: 5-Pin *eurofast*®
Cordset: Dual Output use RK 4.4T-*-RS 4.4T
Splitter: Dual Output or Dual Valve use
VB2-RS 4.5T-*/2VAS 22-A528-*/* ("A" Style valve plug, other's available)
Field Wireable: Dual Output use BS8141-0



Dual Output

1 = N/C
2 = Output B (odd numbers)
3 = GND
4 = Output A (even numbers)
5 = PE

Refer to page 51 for dimensions and DeviceNet/Aux specifications.

Abbreviations

I = Input Data (0=OFF, 1=ON)
O = Output Data (0=OFF, 1=ON)
ISS = Input Short Status (0=Working, 1=Fault)
OS = Output Status (0=Working, 1=Fault)
IOS = Input Open Status (0=Working, 1=Fault)
OOS = Output Open Status (0=Working, 1=Fault)
OSS = Output Short Status (0=Working, 1=Fault)
APS = Aux Power Status (0=OFF, 1=ON)

FDNP-P1204G-TT, 12 PNP Input and 4 0.5A Output, Per Point Diagnostic

I/O Data Map

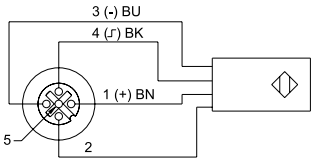
Product Code: 7/993 (3E1 hex)

	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-3	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
	5	OOS-3	OOS-2	OOS-1	OOS-0	IOS-11	IOS-10	IOS-9	IOS-8
Output Data	0	-	-	-	-	O-3	O-2	O-1	O-0

Connectors

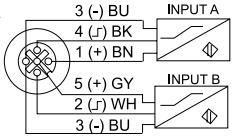
12 DeviceNet™ Powered Inputs "2P" Type (C1-C3, C5-C7))

Style: 5-Pin *eurofast*®
Cordset: Sensor with 2 Signals
use RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors
use VBRS 4.5-2RK 4T-*/*/S818



Sensor with 2 Signals

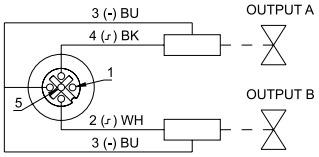
1= V+(A)
2 = Input B
3 = V -
4 = Input A
5 = V+(B)



Splitter and 2 Sensors

4 Aux Powered Outputs "2G" Type (C0, C4)

Style: 5-Pin *eurofast*®
Cordset: Dual Output use RK 4.4T-*-RS 4.4T
Splitter: Dual Output or Dual Valve use
VB2-RS 4.5T-*/2VAS 22-A528-*/* ("A" Style valve plug, other's available)
Field Wireable: Dual Output use BS8141-0



Dual Output

1 = N/C
2 = Output B (odd numbers)
3 = GND
4 = Output A (even numbers)
5 = PE

Refer to page 51 for dimensions and DeviceNet/Aux specifications.

Abbreviations

I = Input Data (0=OFF, 1=ON) O = Output Data (0=OFF, 1=ON)
ISS = Input Short Status (0=Working, 1=Fault) OS = Output Status (0=Working, 1=Fault)
IOS = Input Open Status (0=Working, 1=Fault) OOS = Output Open Status (0=Working, 1=Fault)
OSS = Output Short Status (0=Working, 1=Fault) APS = Aux Power Status (0=OFF, 1=ON)

FDNP-CPG88-TT, 8 Combined PNP Input and 0.5A Output, Per Point Diagnostic

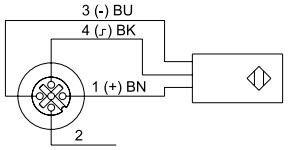
Product Code: 7/1321 (531hex)

I/O Data Map

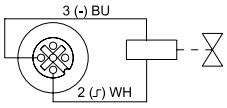
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	1	ISS-7	ISS-6	ISS-5	ISS-4	ISS-3	ISS-2	ISS-1	ISS-0
	2	IOS-7	IOS-6	IOS-5	IOS-4	IOS-3	IOS-2	IOS-1	IOS-0
	3	OS-7	OS-6	OS-5	OS-4	OS-3	OS-2	OS-1	OS-0
	4	-	APS	-	-	-	-	-	-
Output Data	0	O-7	O-6	O-5	O-4	O-3	O-2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

Connectors

8 Combined Aux Powered Inputs/Outputs "C" Type (C0-C7)



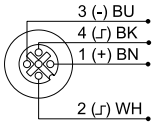
Single Sensor



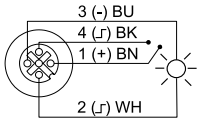
Single Output

Style: 5-Pin *eurofast*®
Cordset: 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

1 = V +
2 = Output Signal
3 = GND
4 = Input Signal
5 = PE



Part Verification Array



Push Button

Refer to page 51 for dimensions and DeviceNet™/Aux specifications.

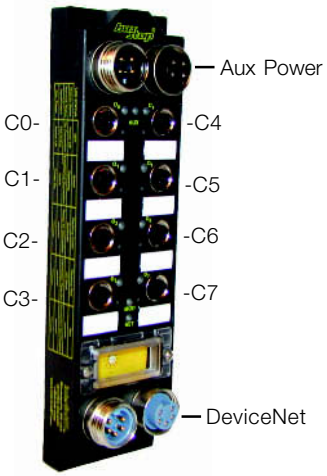
Abbreviations

I = Input Data (0=OFF, 1=ON)
O = Output Data (0=OFF, 1=ON)
ISS = Input Short Status (0=Working, 1=Fault)
OS = Output Status (0=Working, 1=Fault)
IOS = Input Open Status (0=Working, 1=Fault)
OOS = Output Open Status (0=Working, 1=Fault)
OSS = Output Short Status (0=Working, 1=Fault)
APS = Aux Power Status (0=OFF, 1=ON)

FDNP-Housing, Standard Diagnostics

The FDNP stations are designed with isolated output power. They are the most flexible AIM™ stations available, and are ideal in any application where output power must be separated from control (DeviceNet™) power. There are two DeviceNet connectors on each station, one male and one female. No additional DeviceNet "T" is required. As with all AIM stations, the DeviceNet address is set using rotary switches on the front of the station. The station's address is clearly visible when installed, which simplifies troubleshooting.

The inputs are powered from DeviceNet; the outputs are powered from Auxiliary power. There are two Auxiliary power connectors on each station, one male and one female. No additional Auxiliary power "T" is required. Many I/O configurations are available. The I/O sizes include 4 in/4 out, 8 in/8 out, 12 in/4 out and 8 out. The largest (and most popular) size is the XSG16 which handles 16 I/O points. Each of the I/O points can be either an input or an output. Diagnostic data includes one bit for input power status and one bit for output power status.



- Advanced DeviceNet station

Applications
- For wet or dry environments
- For firing valves or solenoids

Features
- 0.5, 1.4 amp outputs
- Short-circuit detection on every point
- Rotary address switches

Module Specifications

Supply Voltage	
Bus power	11-26 VDC
Internal current consumption	≤ 75mA (from bus power)
Auxiliary power	18-26 VDC
Input Circuits	PNP 3-wire sensors or dry contacts
Input voltage (V+)	13-26 VDC (from bus power)
Input short-circuit (V+)	700mA-2.0A (total)
Input signal current (Input)	OFF < 2mA
	ON 3.0-3.4 mA at 24VDC
Input delay	2.5 ms
Output Circuits	DC actuators
Output voltage	18-26 VDC (from auxiliary power)
Output load current	0.5 A per output (from auxiliary power) on Type "G", and 1.4A on Type SxxxxH
Open circuit current	< 1 mA per output
Maximum switching frequency	100 HZ
I/O LED Indications	Off=Off; Green=On
Module Status LED	Green: working properly; Flashing green: detecting autobaud rate
	Flashing red: I/O short-circuit
Network Status LED	Green: established connection; Flashing Green: ready for connection
	Flashing red: connection time-out; Red: connection not possible
Adjustments	Address 0-63 via Rotary Switch
Housing	Glass filled nylon with nickel plated brass connectors
Enclosure	NEMA 1,3,4,12,13 and IEC IP 67
Operating temperature	-40° to 70°C (-40° to 158°F)

FDNP-Housing, Standard Diagnostics

FDNP-S0404G-TT, 4 PNP Input and 4 0.5A Output, Group Diagnostic

Product Code: 7/1185 (4A1hex)

I/O Data Map

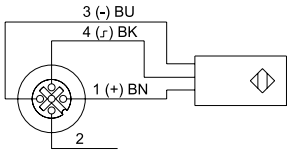
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	IGS	OGS	-	-	I-3	I-2	I-1	I-0
Output Data	0	-	-	-	-	O-3	O-2	O-1	O-0

Connectors

4 DeviceNet™ Powered Inputs "S" Type (C0-C3)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use RK 4.4T-*-RS 4.4T
Field Wireable: Single Sensor use BS 8141-0

1 = VI+
2 = N/C
3 = V-
4 = Input
5 = PE

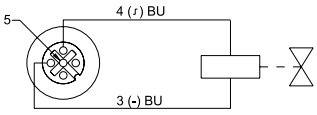


Single Sensor

4 Aux Powered Outputs "G" Type (C4-C7)

Style: 5-Pin *eurofast*®
Cordset: Single Output use RK 4.4T-*-RS 4.4T
Field Wireable: Single Output use BS8141-0

1 = N/C
2 = N/C
3 = GND
4 = Output
5 = PE



Single Output

Refer to page 51 for dimensions and DeviceNet/Aux specifications.

FDNP-S0808G-TT, 8 PNP Input and 8 0.5A Output, Group Diagnostic

Product Code: 7/1169 (491 hex)

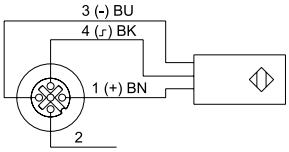
I/O Data Map

	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	-	-	-	-	-	-
Output Data	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Connectors

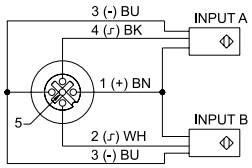
8 DeviceNet Powered Inputs "2S" Type (C0-C3)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use RK 4.4T-*-RS 4.4T
Field Wireable: Single Sensor use BS8141-0



Single Sensor

1= V +
2 = Input B
3 = V -
4 = Input A
5 = PE

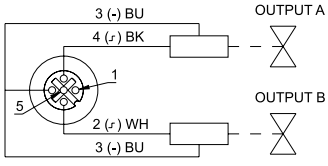


Splitter and 2 Sensors

8 Aux Powered Outputs "2G" Type (C4-C7)

Style: 5-Pin *eurofast*®
Cordset: Dual Output use RK 4.4T-*-RS 4.4T
Splitter: Dual Output or Dual Valve use VB2-RS 4.5T-*/2VAS 22-A528-*/* ("A" Style valve plug, other's available)
Field Wireable: Dual Output use BS8141-0

1 = N/C
2 = Output B (odd numbers)
3 = GND
4 = Output A (even numbers)
5 = PE



Dual Output

Refer to page 51 for dimensions and DeviceNet/Aux specifications.

Abbreviations

I = Input Data (0=OFF, 1=ON) IGS = Input Group Status (0=Working, 1=Fault)
O = Output Data (0=OFF, 1=ON) OGS = Output Group Status (0=Working, 1=Fault)

FDNP-S1204H-TT-0149, 12 PNP Input and 4 1.4A Output, Group Diagnostic

Product Code: 7/993 (3E1hex)

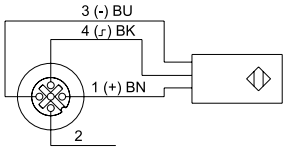
I/O Data Map

	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	-	-	I-11	I-10	I-9	I-8
Output Data	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

Connectors

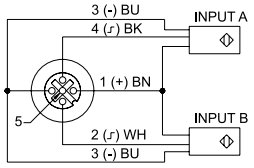
12 DeviceNet™ Powered Input "2S" Type (C0-C3, C6, C7)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors use VB2-RS 4.4T-*/2RK 4T-*/*



Single Sensor

1= V+
2 = Input B (odd numbers)
3 = V -
4 = Input A (even numbers)
5 = PE

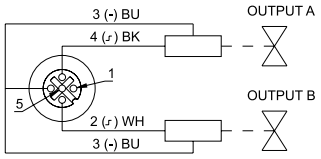


Splitter and 2 Sensors

4 Aux Powered Outputs "2H" Type (C4, C5)

Style: 5-Pin *eurofast*®
Cordset: Dual Output use RK 4.4T-*-RS 4.4T
Splitter: Dual Output or Dual Valve use VB2-RS 4.5T-*/2VAS 22-A528-*/*
("A" Style valve plug, other's available)
Field Wireable: Dual Output use BS8141-0

1 = AUX+
2 = Output B (odd numbers)
3 = GND
4 = Output A (even numbers)
5 = PE



Dual Output

Refer to page 51 for dimensions and DeviceNet/Aux specifications.

Abbreviations

I = Input Data (0=OFF, 1=ON) IGS = Input Group Status (0=Working, 1=Fault)
O = Output Data (0=OFF, 1=ON) OGS = Output Group Status (0=Working, 1=Fault)

FDNP-CSG88-TT, 8 Combined PNP Input and 0.5A Output, Group Diagnostic

Product Code: 7/2369 (941hex)

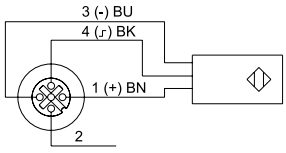
I/O Data Map

	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	-	-	-	-	-	-
Output Data	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

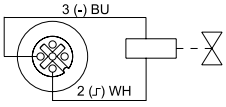
Connectors

8 Combined Aux Powered Inputs/Outputs "C" Type (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: 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

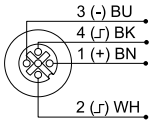


Single Sensor

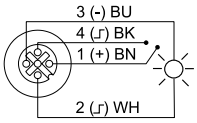


Single Output

1= V +
2 = Output Signal
3 = GND
4 = Input Signal
5 = PE



Part Verification Array



Push Button

Refer to page 51 for dimensions and DeviceNet™/Aux specifications.

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-XSG16-TT, 16 PNP Input or 0.5A Output, Group Diagnostic

Product Code: 7/2065 (811 hex)

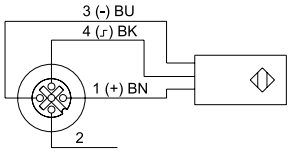
I/O Data Map

	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	-	-	-	-	-	-
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

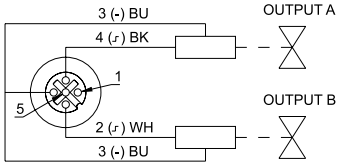
Connectors

16 Aux Powered Inputs or Outputs "2X" Type (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: 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

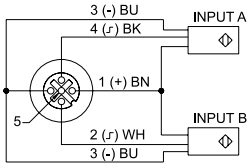


Single Sensor

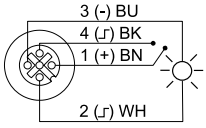


Outputs

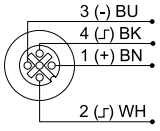
1= V +
2 = Input/Output B
3 = GND
4 = Input/Output A
5 = PE



Splitter and 2 Sensors



Push Button



Part Verification Array

Refer to page 51 for dimensions and DeviceNet™/Aux specifications.

Abbreviations

I = Input Data (0=OFF, 1=ON) IGS = Input Group Status (0=Working, 1=Fault)
O = Output Data (0=OFF, 1=ON) OGS = Output Group Status (0=Working, 1=Fault)

FDNP-Housing, Standard Diagnostics

FDNP-S0008G-TT, 8 0.5A Output

Product Code: 7/2161 (871hex)

I/O Data Map

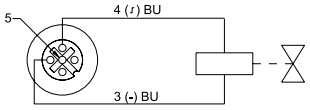
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	OS-7	OS-6	OS-5	OS-4	OS-3	OS-2	OS-1	OS-0
Output Data	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Connectors

8 Aux Powered Outputs "G" Type(C0-C7)

Style: 5-Pin *eurofast*®
Cordset: Single Output use RK 4.4T-*-RS 4.4T
Field Wireable: Single Output use BS8141-0

1 = N/C
2 = N/C
3 = GND
4 = Output
5 = PE



Single Output

Refer to page 51 for dimensions and DeviceNet™/Aux specifications.

FDNP-S0008H-TT, 8 1.4A Output

Product Code: 7/2177 (881hex)

I/O Data Map

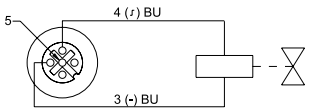
	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	OS-7	OS-6	OS-5	OS-4	OS-3	OS-2	OS-1	OS-0
Output Data	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Connectors

8 Aux Powered Outputs "H" Type (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: Single Output use RK 4.4T-*-RS 4.4T
Field Wireable: Single Output use BS8141-0

1 = N/C
2 = N/C
3 = GND
4 = Output
5 = PE



Single Output

Refer to page 51 for dimensions and DeviceNet/Aux specifications.

Abbreviations

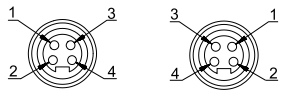
I = Input Data (0=OFF, 1=ON) IGS = Input Group Status (0=Working, 1=Fault)
O = Output Data (0=OFF, 1=ON) OGS = Output Group Status (0=Working, 1=Fault)
OS = Output Status (0=Working, 1=Fault)

Connectors

Aux Power Connectors

Style: 4-Pin *minifast*®
Cordset: Aux Power use RSM RKM 46- *M
Tee : Aux Power use RSM 2RKM 40

1= Aux +
2= E+
3= E-
4= Aux-

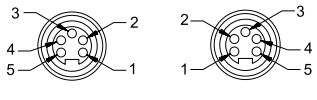


Auxiliary Power

Type "T" Connectors

Style: 5-Pin *minifast*®
Cordset: Bus Line use RSM RKM 579-*M
Tee : Bus Line use RSM 2RKM 57

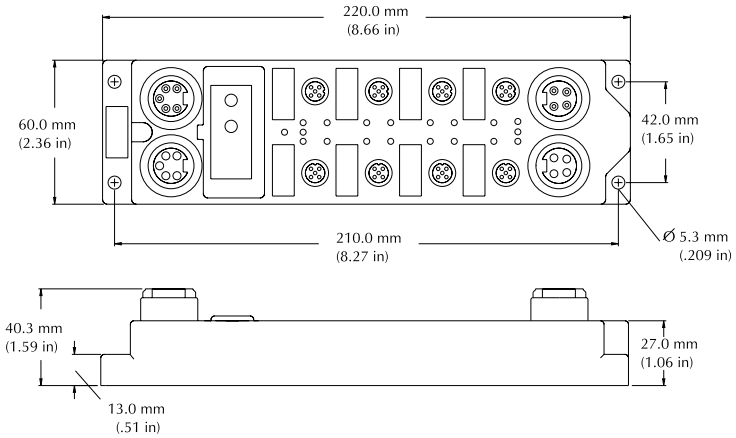
1= Shield
2= V+
3= V-
4= CAN_H
5= CAN_L



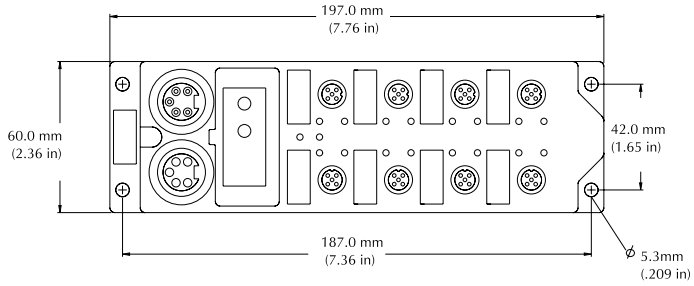
Through Bus

Dimensions

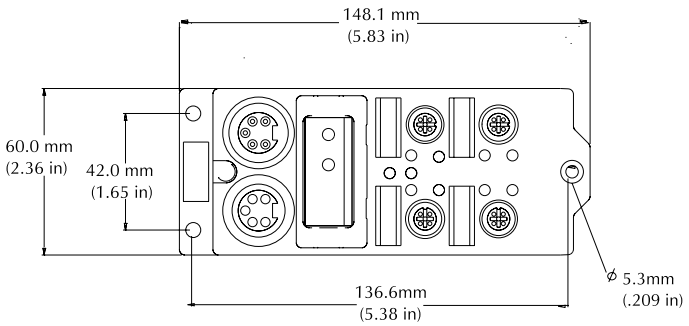
"FDNP" Style Housing



"FDNL" Style Housing



"FDNQ" Style Housing



Spanner Module for DeviceNet™

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

Theory of operation
The spanner transfers data between PLC A and PLC B by appearing as I/O to each PLC. The spanner immediately copies the output data from 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). When in software mode,the data size mapped to the PLC must be equal in opposite directions on either side of the spanner. For example, if side A produces 2 input bytes and consumes 12 output bytes, then side B must be set to produce 12 input bytes and consume 2 output bytes.

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

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

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

FDN-DN1

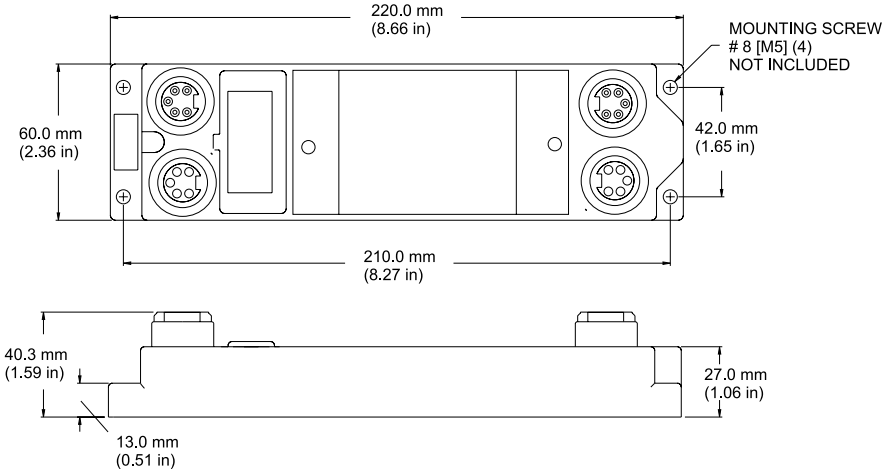
Applications

- For handoff between work cells and conveyor
- For bi-directional data transfer between PLC’s

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

Dimensions

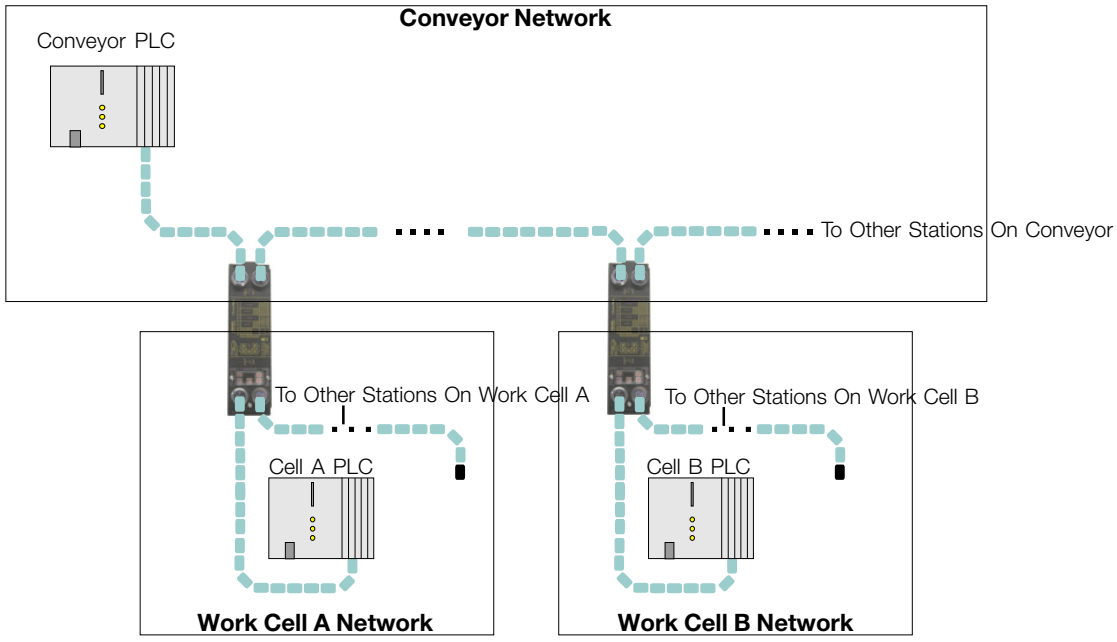


Specifications

Part number	FDN-DN1
Item Number	F0132
Supply Voltage	
Bus power	11-30 VDC
Node current consumption	125mA Segment A, 30 mA Segment B
Network Status LED	Amber: determining baudrate Flashing Green: ready for connection Green: established connection 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). IMPORTANT: The size of the transferred data must be equal in opposite directions on either side of the spanner. For example, if side A produces 2 input bytes and consumes 12 output bytes, then side B must be set to produce 12 input bytes and consume 2 output bytes.
Connections	
Bus line	5-pin *minifast*® connectors-RSM RKM 579-2M
Housing	Glass filled nylon nickel plated brass connectors
Mounting	Four through-holes, 5.3mm diameter
Enclosure	NEMA 1,3,4 12,13 and IEC IP67
Operating temperature	-40° to +70 °C (-40° to +158°F)

Spanner Topology

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



Repeater Module for DeviceNet™

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 millisecond 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 Baudrate is set via rotary switch. 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)
- Message Repeater

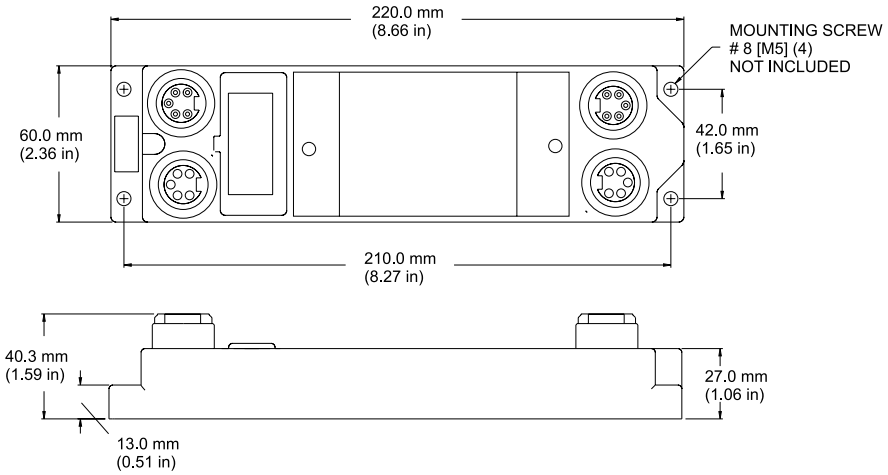
Applications

- Extending maximum trunk lengths
- Extending maximum drop lengths
- Isolating DeviceNet power
- Optically isolates two network segment

Features

- Extremely rugged
- Fully connectorized

Dimensions



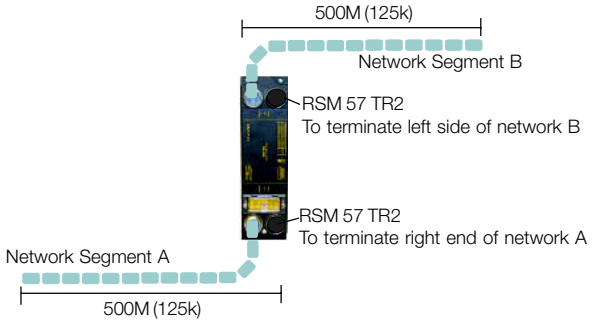
Specifications

Part number	REP-DN
Item Number	F0137
Supply Voltage	
Bus power	11-30 VDC
Node current consumption	125mA Segment A, 30 mA Segment B
Status LED	Amber: determining baudrate 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 *minifast*® connectors-RSM RKM 579-2M
Housing	Glass filled nylon nickel plated brass connectors
Mounting	Four through-holes, 5.3mm diameter
Enclosure	NEMA 1,3,4 12,13 and IEC IP67
Operating temperature	-40° to +70 °C(-40° to +158°F)

Repeater Configurations

Extended Trunk Line

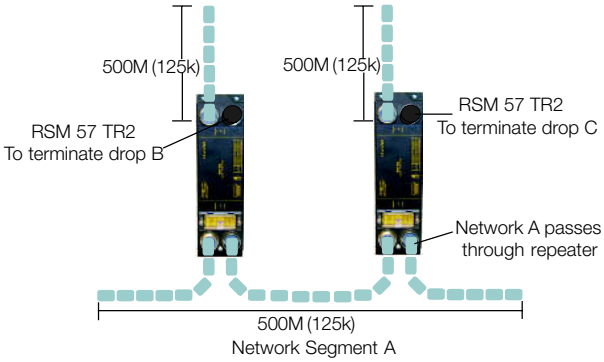
To extend the Trunk line, the repeaters are connected in series. The overall network delay is the sum of all the individual repeater delays. The total delay is 2ms x number of repeaters.



NOTE: Each segment will need its own power supply.

Extended Drop Line

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



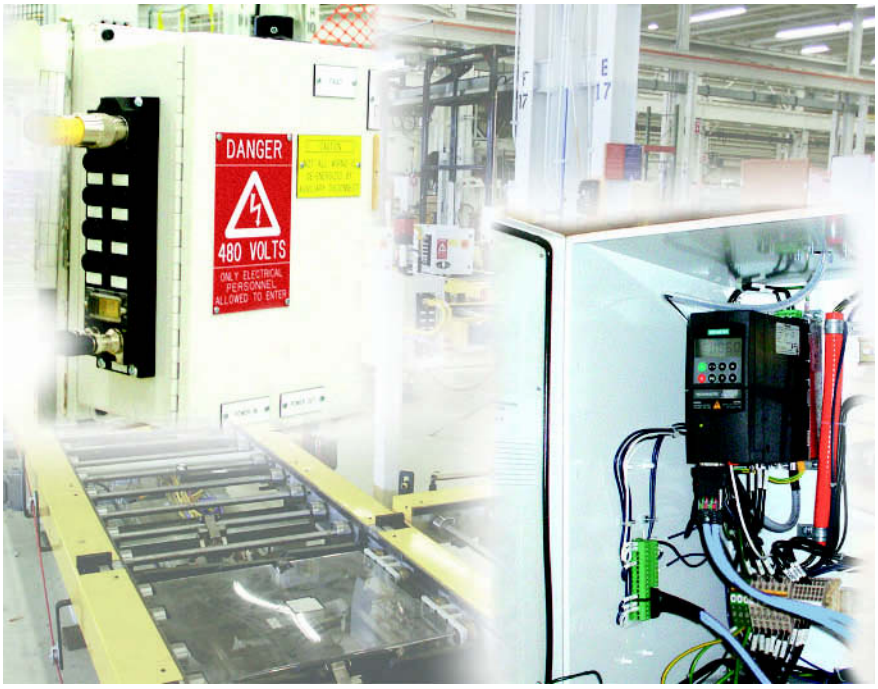
NOTE: Each segment will need its own power supply.

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) the repeater will continuously repeat to itself. This will cause the network to overload.

NOTES:

AIM™ "ST" *busstop*® Stations for DeviceNet™

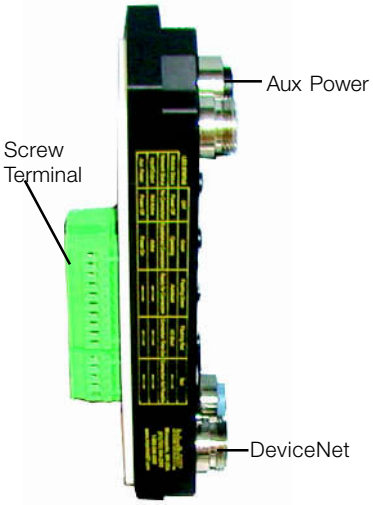


FDNP- “ST” Housing, Standard Diagnostics

The FDNP stations with screw ternminals and standard diagnostics offer unique capabilities. They have short-circuit detection on every output and input short-circuit detection as a group. The auxiliary output power is isolated.

The screw terminal stations can be mounted directly on small motor starters or push button panels. Once mounted, the I/O, power and network signals are available both inside and outside the enclosure.

Inside signals are accessed via the screw terminals on the back of the station. Outside the enclosure, signals are accessed via *eurofast*® or *minifast*® connectors on the front of the station.



- Advanced DeviceNet™ station with screw terminals

Applications
- Mount directly on small motor starter or push button panels

Features
- Short-circuit protection on every output
- Input short-circuit detection as a group
- Isolated auxiliary output power
- Screw terminals out the back
- Rotary address switches

Supply Voltage	
Bus power	11-26 VDC, powers communication
Internal current consumption	<75mA, plus sum of sensor and output currents (from bus power)
Auxiliary power	18-26 VDC, optically isolated, powers all I/O
Input Circuits	PNP 3-wire sensors or dry contacts
Input voltage (V+)	13-26 VDC (from auxiliary power)
Input Short-circuit (V+)	<700 mA (total, short-circuit protected)
Input signal current (Input)	OFF <2mA
	ON 3.0-3.4 mA at 24VDC
Input delay	2.5 ms
Output Circuits	DC actuators
Output voltage	18-26 VDC (from auxiliary power)
Output load current	0.5 A
Maximum switching frequency	100 HZ
I/O LED Indications	Off=Off; Green=On
Module Status LED	Green: working properly; Flashing green: detecting autobaud rate Flashing red: I/O short-circuit
Network Status LED	Green: established connection; Flashing Green: ready for connection Flashing red: connection time-out; Red: connection not possible
Adjustments	Address 0-63 via Rotary Switch
Housing	Glass filled nylon with nickel plated brass connectors
Enclosure	NEMA 1, 3, 4, 12, 13, and IEC IP67
Operating Temperature	-40° to 70° C (-40° to 158°)

FDNP-S0808G-ST, 8 PNP Input and 8 0.5A Output, Group Diagnostic

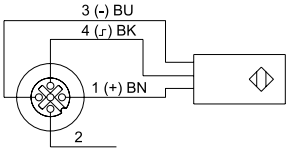
I/O Data Map

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input Data	0	C3P2 I-7	C3P4 I-6	C2P2 I-5	C2P4 I-4	C1P2 I-3	C1P4 I-2	C0P2 I-1	C0P4 I-0
	1	IGS	OGS	-	-	-	-	-	-
Output Data	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	0	C7P2 O-7	C7P4 O-6	C6P2 O-5	C6P4 O-4	C5P2 O-3	C5P4 O-2	C4P2 O-1	C4P4 O-0

Connectors

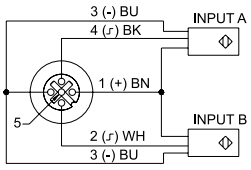
8 DeviceNet™ Powered Inputs "2S" Type (C0-C3)

Style: 5-Pin *eurofast*®
Cordset: Sensor Sensor use RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors use VBRS 4.4-2RK 4T-*/*



Single Sensor

1 = V_{ISC} +
2 = Input B
3 = GND
4 = Input A
5 = PE

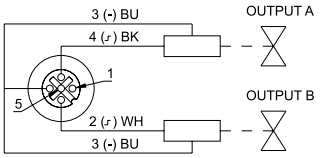


Splitter and 2 Sensors

8 Aux Powered Outputs "2G" Type (C4-C7)

Style: 5-Pin *eurofast*®
Cordset: Dual Output use RK 4.4T-*-RS 4.4T
Splitter: Dual Output or Dual Valve use VB2-RS 4.5T-*/2VAS 22-A528-*/* ("A" Style valve plug, other's available)
Field Wireable: Dual Output use BS 8141-0

1 = N/C
2 = Output B (odd numbers)
3 = GND
4 = Output A (even numbers)
5 = PE

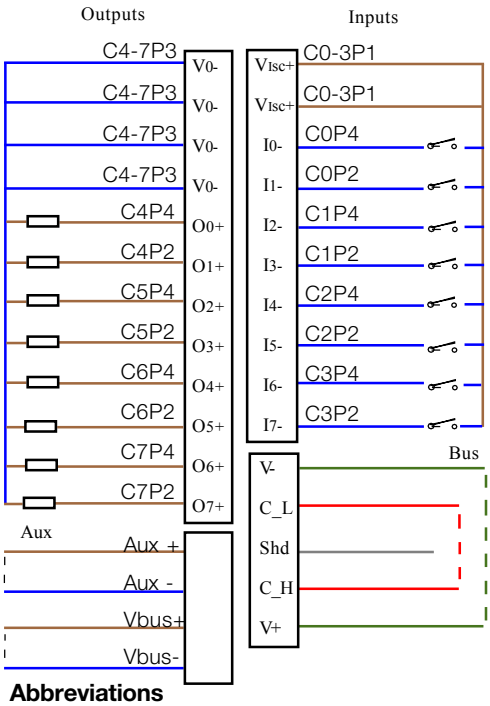


Dual Output

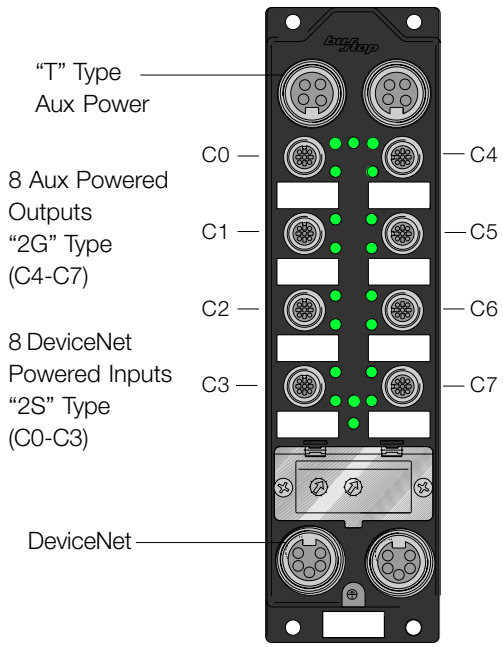
Refer to page 62 for dimensions and DeviceNet/Aux connectors.

Wiring

Back Screw Terminal



Front Connectors



Abbreviations

I = Input Data (0=OFF, 1=ON) O = Output Data (0=OFF, 1=ON)
OGS = Output Group Status (0=Working, 1=Fault)
IGS = Input Group Status (0=Working, 1=Fault)

FDNP-XSG16-ST, 16 PNP Input or 0.5A Output, Group Diagnostic

I/O Data Map

	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

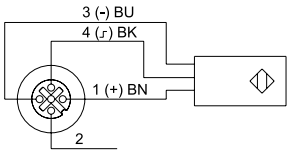
Because the inputs and outputs are powered off the same circuit, this station is not recommended for E-Stop controlled outputs.

Connectors

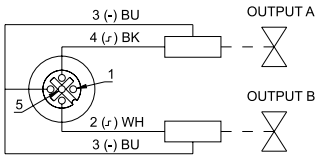
16 Aux Powered Inputs or Outputs "2X" Type (C0-C7)

Style: 5-Pin *eurofast*®

Cordsets: Single Sensor, Output or Push Button use RK 4.4T-*-RS 4.4T



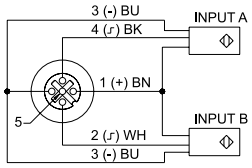
Single Sensor



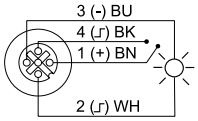
Outputs

1 = V_{IOSC} +
2 = Input/Output B
3 = V_{IO}-
4 = Input/Output A
5 = PE

Splitter: 2 Sensors or 2 Outputs use VBRS 4.4-2RK 4T-*/*

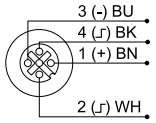


Splitter and 2 Sensors



Push Button

Parallel Splitter: Part Verification Array use VB2-RS 4.4T */2RK 4.4T-*/*/S651



Part Verification Array

Refer to page 62 for dimensions and DeviceNet™/Aux connectors.

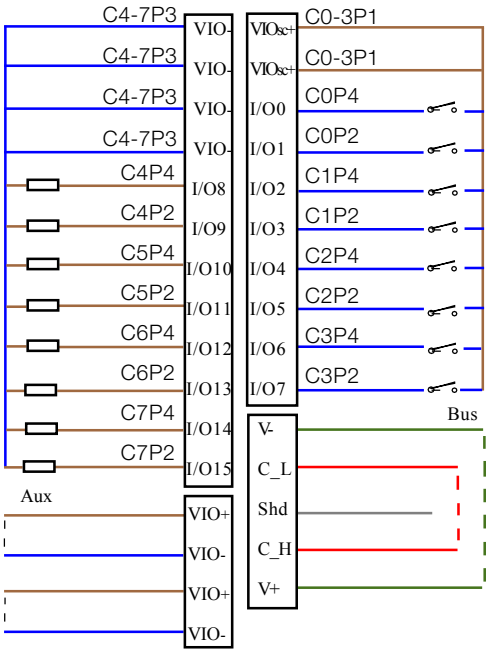
Abbreviations

I = Input Data (0=OFF, 1=ON) O = Output Data (0=OFF, 1=ON)
OGS = Output Group Status (0=Working, 1=Fault)
IGS = Input Group Status (0=Working, 1=Fault)

FDNP-XSG16-ST, 16 PNP Input or 0.5A Output, Group Diagnostic

Wiring

Back Screw Terminal



Front Connectors

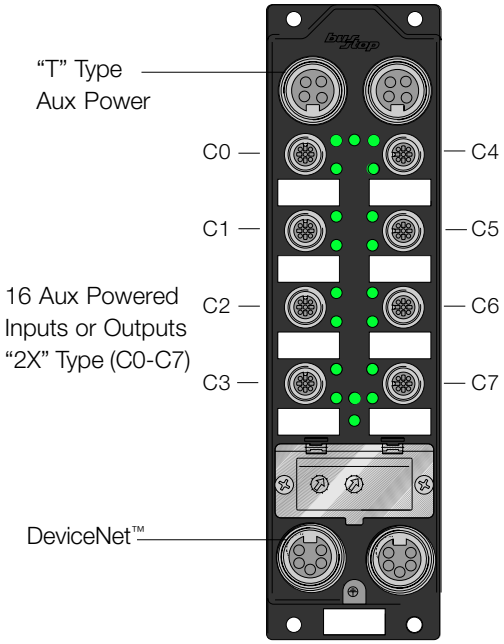


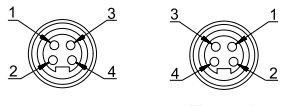
Diagram shows points 0-7 wired as inputs, and 8-15 as outputs. All I/O points can be wired as an input or an output.

Connectors

Aux Power Connectors

Style: 4-Pin *minifast*®
Cordset: Aux Power use RSM RKM 46- *M
Tee : Aux Power use RSM 2RKM 40

1= Aux +
2= E+
3= E-
4= Aux-



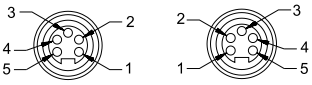
Male Female

Auxiliary Power

Type "T" Connectors

Style: 5-Pin *minifast*®
Cordset: Bus Line use RSM RKM 579-*M
Tee : Bus Line use RSM 2RKM 57

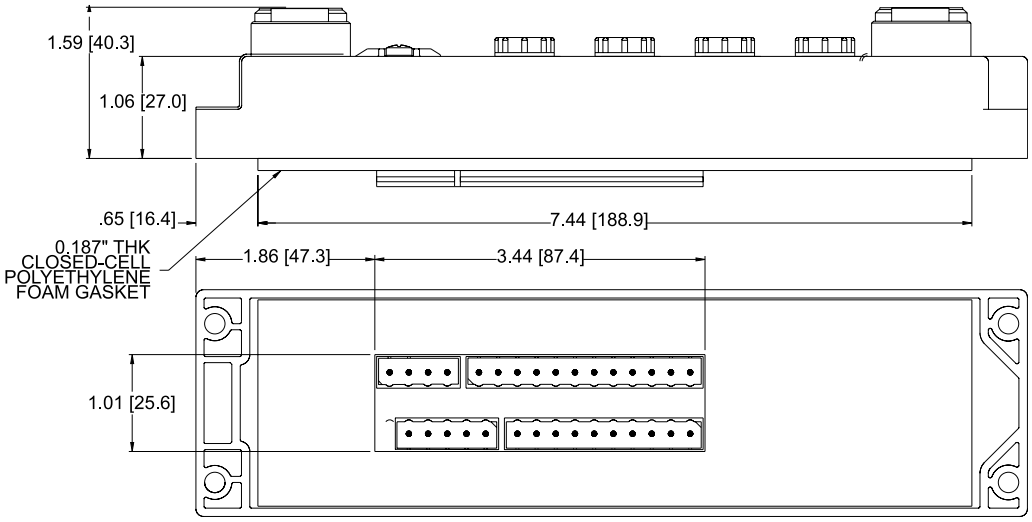
1= Shield
2= V+
3= V-
4= CAN_H
5= CAN_L



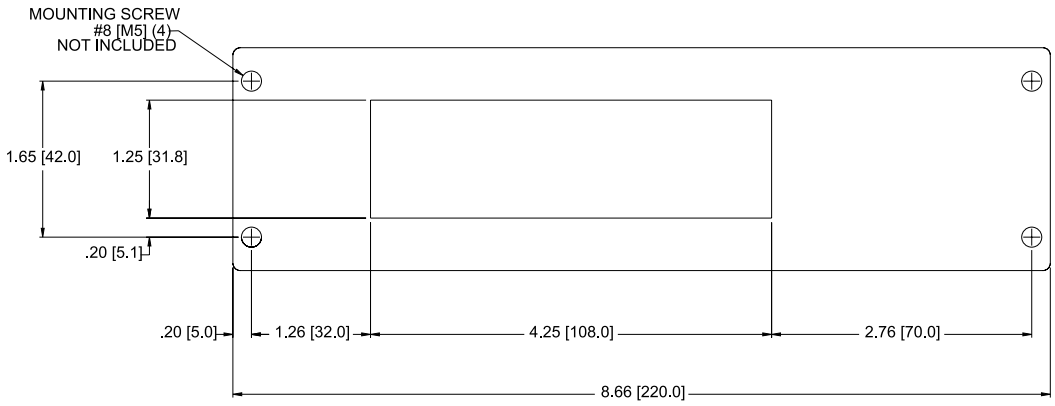
Male Female

Through Bus

Dimensions



Knock-Out Dimensions



Quick Selection Guide for CDN Series, Heavy Duty DeviceNet™ Stations

Part Number		Inputs					Outputs					DeviceNet™ Data			
CDN (Side Mount Connectors) Series	Height (mm)	Number of Inputs	Input Type	Inputs per Connector	Compatible with NPN/PNP Sensors?	Open Circuit Detection	Number of Outputs	Output Type	Outputs per Connector	Maximum Output Load	Open Circuit Detection	Product Code	Input Data Size in Bytes	Output Data Size in Bytes	Power Consumption(mA)
CDN-IM-4-0046	185	4	L	1	NPN/PNP	✓	-	-	-	-		737	1	-	80
CDN-IM-8-0024	185	8	L	1	NPN/PNP	✓	-	-	-	-		385	2	-	85
CDN-IM-8-0043	150	8	2L	1	NPN/PNP	✓	-	-	-	-		689	2	-	110
CDN-IM-16-0053	185	16	2L	2	NPN/PNP	✓	-	-	-	-		849	4	-	230
CDN-IOM-22-0032	150	2	2L	2	NPN/PNP		2	H	1	1A	✓	517	1	1	70
CDN-IOM-42-0048	150	4	2L	2	NPN/PNP	✓	2	H	1	2A	✓	769	2	1	85
CDN-IOM-44-0045	185	4	L	1	NPN/PNP	✓	4	H	1	2A	✓	723	2	1	90
CDN-OM-8-0026	185	-	-	-	-		8	H	1	1A	✓	417	1	1	60
CDN-IM-8-0039	190	8	L	1	NPN/PNP	✓	-	-	-	-		625	2	-	85
CDN-IOM-44-0041	190	4	L	1	NPN/PNP	✓	4	H	1	2A	✓	659	2	1	90
CDN-OM-8-0042	190	-	-	-	-		8	H	1	1A	✓	673	1	1	60

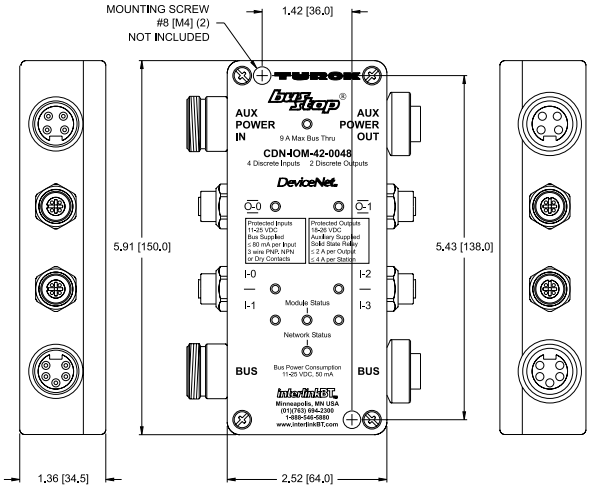
Supply Voltage	11-26 VDC
Internal Current Consumption	80-230 mA
Input Circuits	NPN/PNP; Per Point Diagnostics
Output Circuits	All auxiliary powered and optically isolated from DeviceNet™
Settings	Address 0-63 via DIP switches

CDN Series Heavy Duty DeviceNet™ Stations

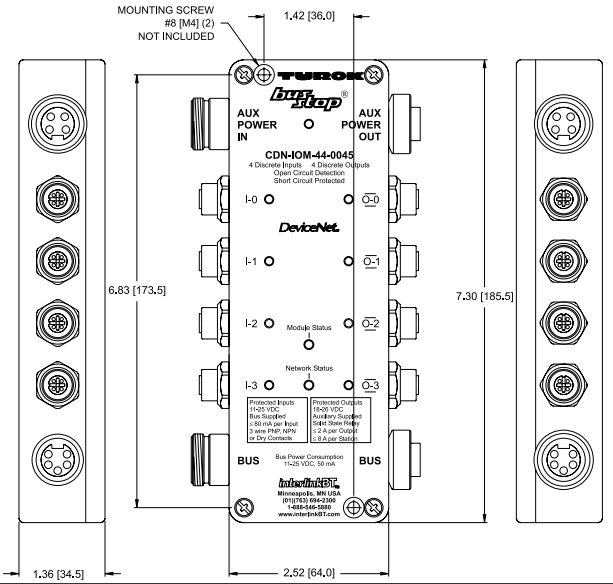
Applications
- For extremely rugged applications

Features
- Side mounted connectors provide a clean installed layout
- Individual short circuit protection
- Individual open circuit detection
- Compatible with PNP or NPN sensors

150 mm Metal Housing



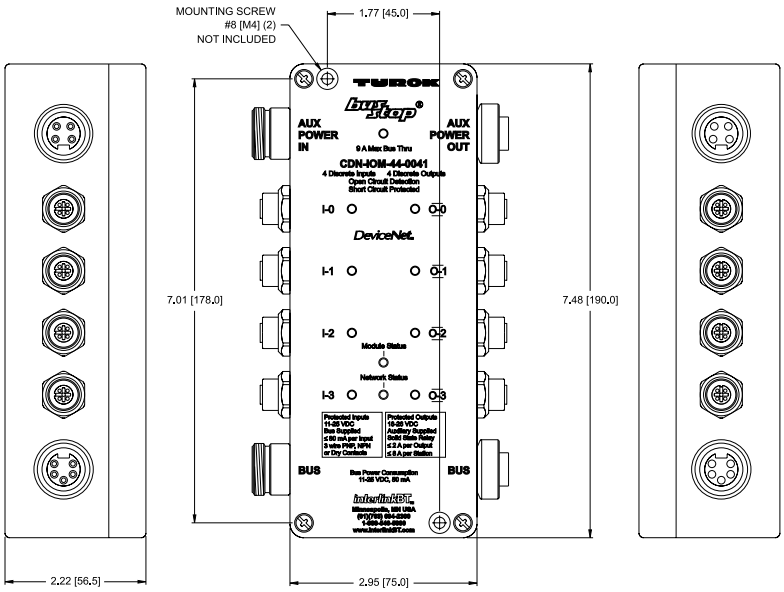
185 mm Metal Housing



Applications
- For corrosive environments

Features
- High density polyethylane housing
- Stainless steel connectors

190 mm Fiberglass Housing



Auxiliary Power

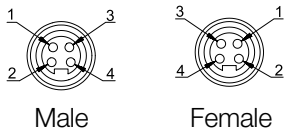
Type "T"

Style: 4-Pin *minifast*®

Cordset: Aux Power
use RSM RKM 46-*M

Tee : Aux Power use RSM 2RKM 40

1= Aux +
2= E+
3= E-
4= Aux-



Auxiliary Power

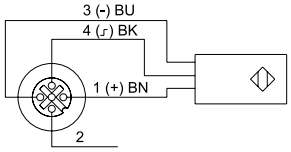
Input Connectors

Type "L"

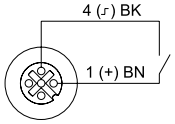
Style: 5-Pin *eurofast*®

Cordset: Single Sensor or
Dry Contact use RK 4.4T-*-RS 4.4T

1 = V+
2 = N/C
3 = V-
4 = Input
5 = V+



Single Sensor



Mechanical Contact

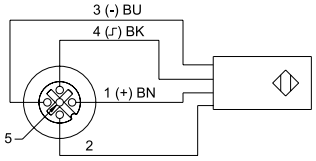
Type "2L"

Style: 5-Pin *eurofast*®

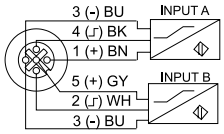
Cordset: Sensor with 2 Signals use
RK 4.4T-*-RS 4.4T

Splitter: Splitter and 2 Sensors
use VBRS 4.5-2RK 4T-*/*/S818

1= V + (A)
2 = Input B
3 = V -
4 = Input A
5 = V+ (B)



Sensor with 2 Signals



Splitter and 2 Sensors

Output Connectors

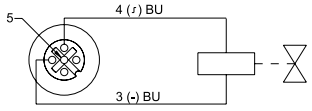
Type "H"

Style: 5-Pin *eurofast*®

Cordset: Single Output use RK 4.4T-*-RS 4.4T

Field Wireable: Single Output use BS 8141-0

1 = N/C
2 = N/C
3 = GND
4 = Output
5 = PE



Single Output

DeviceNet™

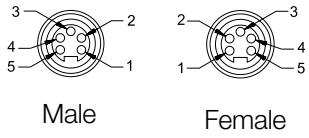
DeviceNet

Style: 5-Pin *eurofast*®

Cordset: Bus Line use RSM RKM 579- *M

Tee : Bus Line use RSM 2RKM 57

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



Through Bus

* indicates length in meters.

Quick Selection Guide for BD Series Stations

Part Number	Inputs		Outputs			DeviceNet Data		
BD2 (Smart "T") Series	Number of Inputs	Inputs per Connector	Number of Outputs	Maximum Output Load	Bus or Aux Power ?	Product Code	Input Data Size in Bytes	Output Data Size in Bytes
BD2DT1EP0	1	1	-	-	-	1	1	-
BD2DT1EX0	2	2	-	-	-	2	1	-
BD2DT2EP0	2	1	-	-	-	3	1	-
BD2DT2EX0	4	2	-	-	-	4	1	-
BD2DT1EP1EU	1	1	1	150mA	BUS	6	1	1
BD2DT1EX1EU	2	2	1	150mA	BUS	7	1	1
BD2DT02EU	-	-	2	150mA	BUS	5	1	1
BD8 (8 Port) Series								
BD8D4EP0	4	1	-	-	-	8	1	-
BD8D4EX0	8	2	-	-	-	9	2	-
BD8D8EP0	8	1	-	-	-	10	2	-
BD8D8EX0	16	2	-	-	-	11	3	-
BD8D2EP2ET	2	1	2	2.0A	AUX	12	1	1
BD8D2EX2ET	4	2	2	2.0A	AUX	13	1	1
BD8D4EP4ET	4	1	4	2.0A	AUX	14	1	1
BD8D4EX4ET	8	2	4	2.0A	AUX	15	2	1

Supply Voltage	11-26 VDC
Internal Current Consumption	<80mA BD8 Series; <35mA BD2 Series
Input Circuits	Compatible with PNP Sensors
Output Circuits	BD2 Series are Bus Powered; BD8 Series are optically isolated and powered by Aux Power
Settings	0-63 Address (via software)
ON/OFF Delay	0-60.000 Seconds ± 1ms (via software)

BD Series DeviceNet™ Stations

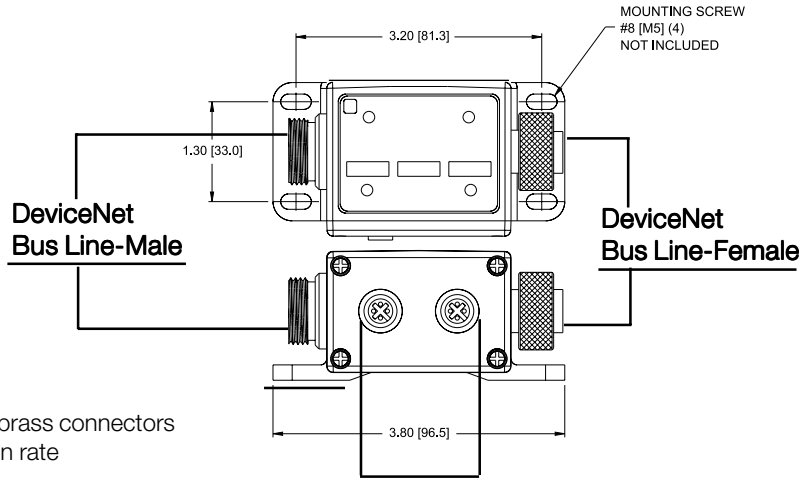
Applications

- For packaging machine and conveyor applications
- For use with PNP sensors, dry contacts, and 24V outputs

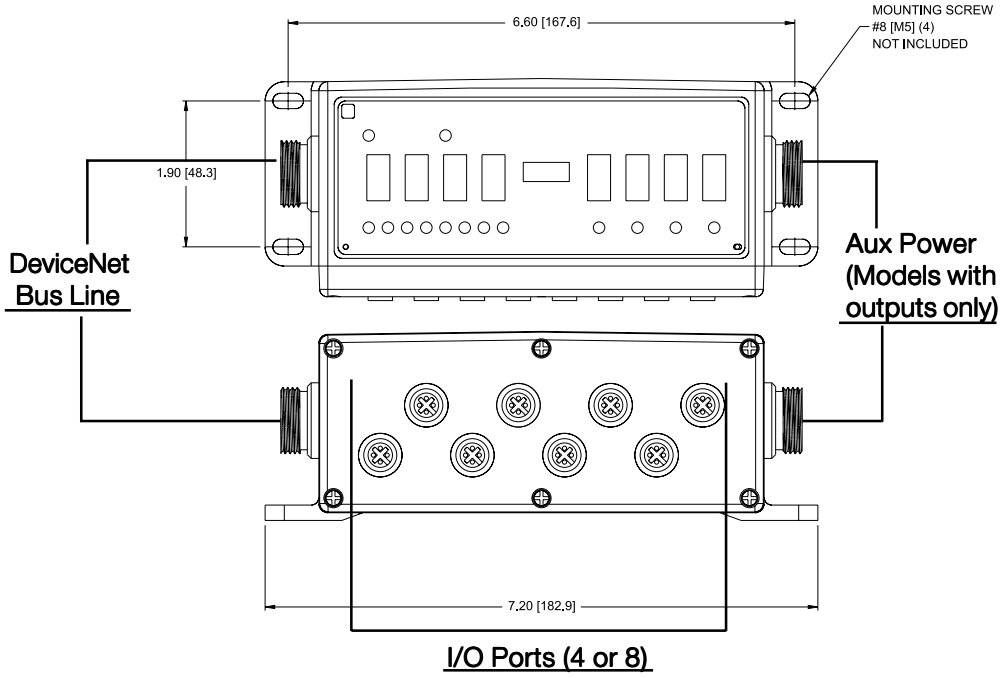
Features

- General duty DeviceNet stations
- 15 I/O configurations
- PNP short-circuit protected inputs
- 2 amp short-circuit protected outputs
- High-density Noryl housing with nickel plated brass connectors
- Software settable address and communication rate

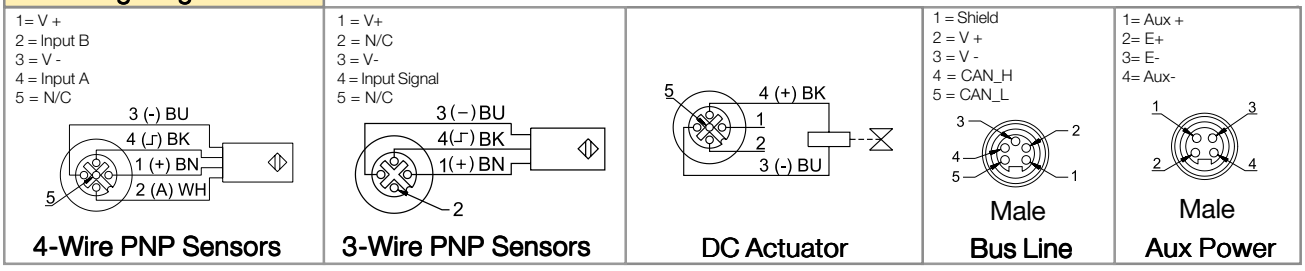
BD2 (Smart "T") Series



BD8 (8 Port) Series



Wiring Diagrams



NOTES:

DeviceNet™ Cables and Accessories

Pre-molded Fieldbus Cables for DeviceNet™

Standard lengths of pre-molded cordsets and bulk cable are listed below.

Standard Cable Lengths			
Cordsets		Bulk Cable	
meters	feet	meters	feet
0.3	1.0	30	98
0.5	1.6		
1.0	3.3		
1.5	4.9	75	246
2.0	6.6		
2.5	8.2		
3.0	9.8	150	492
4.0	13		
5.0	16		
6.0	20	225	738
8.0	26		
10	33		
15	49	300	984
20	66		
25	82		
30	98	- - -	- - -
40	131		
50	164		

Other lengths available upon request. Contact the factory at 1-888-546-5880.

Unit Conversions:

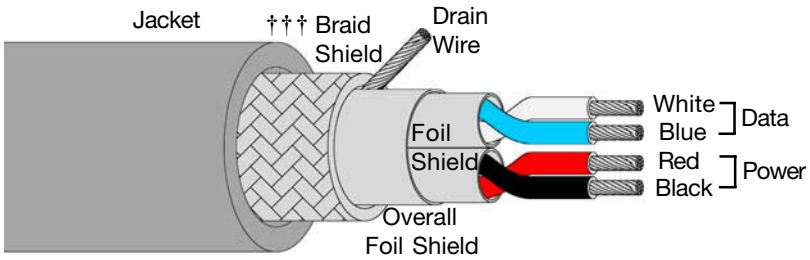
1 meter = 3.28 feet
1 meter = 39.8 inches

Tolerances:

0-1 meter: +35 / - 0 mm
> 1 m +85/-0 mm or +4% of length which ever 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 meters (20 feet) or trunk cable in networks up to a maximum length of 100 meters (328 feet).



††† Available on some cable types.

Data Rate	Maximum Trunk Length	Drop Length	
		Maximum	Cumulative
125 Kbaud	100M (328FT)	6M (20FT)	156M (512FT)
250 Kbaud	100M (328FT)		78M (256FT)
500 Kbaud	100M (328FT)		39M (128FT)

Type	Approvals	Power Pair		Data Pair		Outer Jacket	Shields	Bulk Cable†
		AWG Color Code	DCR (/1000 ft) Insulation	AWG Color Code	DCR (/1000ft) Insulation	Material Color Nominal O.D.	Type Drain Wire	
572 AWM 2464 75°C 300V	**NEC** PLTC **CEC** AWM-I/II A/B FT4	2/22 AWG Black/Red	16.5 Ω PVC	2/22 AWG Blue/White	16.5 Ω PE	PVC Light Gray 7.3 mm(.285 in)	Foil 22 AWG	RB50603-*M
577 AWM 2464 75°C 300V	**NEC** PLTC **CEC** AWM-I/II A/B FT4	2/22 AWG Black/Red	16.5 Ω SR-PVC	2/22 AWG Blue/White	16.5 Ω PE	PVC Light Gray 8.4 mm(.330 in)	Foil/Braid 22 AWG	RB50629-*M flexlife10 ††
578 AWM 2464 75°C 300V	**NEC** PLTC/CL2 **CEC** CMG	2/22 AWG Black/Red	16.5 Ω PVC	2/22 AWG Blue/White	16.5 Ω PE	PVC Light Gray 6.0 mm(.235 in)	Foil/Braid 22 AWG	RB50651-*M
5715 AWM 2095 80°C 300V	**NEC** AWM **CEC** AWM-I/II A/B FT1	2/22 AWG Black/Red	16.5 Ω PVC	2/22 AWG Blue/White	16.5 Ω PE	PVC Light Gray 6.0 mm(.235 in)	Foil (Data Only) 22AWG	RB50764-*M

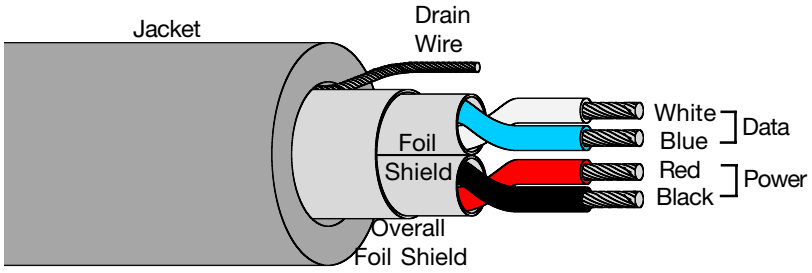
† See page 70 for standard bulk cable lengths.

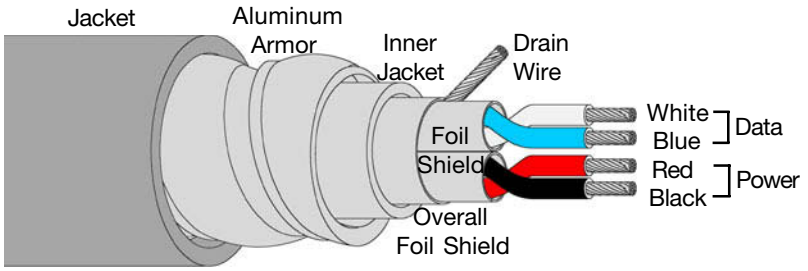
†† See page 194 for flexlife performance.

* indicates length in meters.

DeviceNet™ – Mid Cable Specifications

Cable that meets the requirements of ODVA Mid or Type III cable. It provides more flexibility when used as a trunk cable up to a maximum length of 300 meters (984 feet).





Data Rate	Maximum Trunk Length
125 Kbaud	300M (984FT)
250 Kbaud	250M (820FT)
500 Kbaud	100M (328FT)

Type	Approvals	Power Pair		Data Pair		Outer Jacket	Shields	Bulk Cable †
		AWG Color Code	DCR (/1000 ft) Insulation	AWG Color Code	DCR (/1000ft) Insulation	Material Color Nominal O.D.	Type Drain Wire	
5711 AWM 2464 75°C 300V	**NEC** PLTC **CEC** AWM-I/II A/B FT4	2/16 AWG Black/Red	4.1 Ω PVC	2/20 AWG Blue/White	10.4 Ω PE	PVC Light Gray 8.4 mm(.330 in)	Foil 22 AWG	RB50721-*M
5722 AWM 2464 75°C 300V	**NEC** PLTC **CEC** AWM-I/II A/B FT4	2/17 AWG Black/Red	5.2 Ω PVC	2/20 AWG Blue/White	10.4 Ω PE	PVC Light Gray 8.4 mm(.330 in)	Foil 22 AWG	RB50876-*M flexlife ††
5723 AWM 20233 80°C 300V	**NEC** AWM **CEC** AWM-I/II A/B FT1	2/17 AWG Black/Red	5.2 Ω PVC	2/20 AWG Blue/White	10.4 Ω PE	PUR Light Gray 8.4 mm(.330 in)	Foil 22 AWG	RB50877-*M flexlife ††
5721A 75°C 300V	**NEC** PLTC/CM **CEC** CMG	2/18 AWG Black/Red	6.7 Ω PVC	2/20 AWG Blue/White	10.4 Ω PE	PVC Light Gray 13.5 mm(.530 in) Aluminum Armor	Foil/Armor 20 AWG	RB50859-*M armorfast †††

† See page 70 for standard bulk cable lengths.

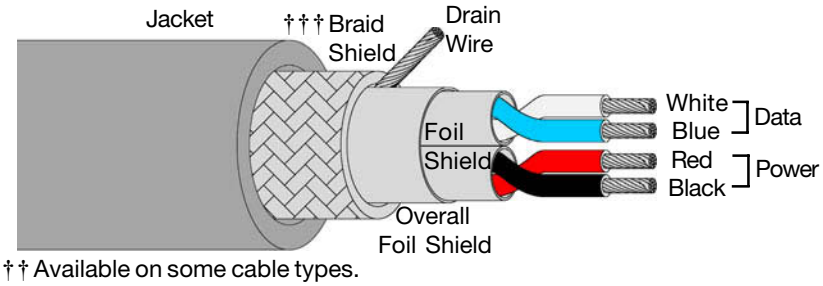
†† See page 194 for flexlife performance.

††† Armorfast Cable

* indicates length in meters.

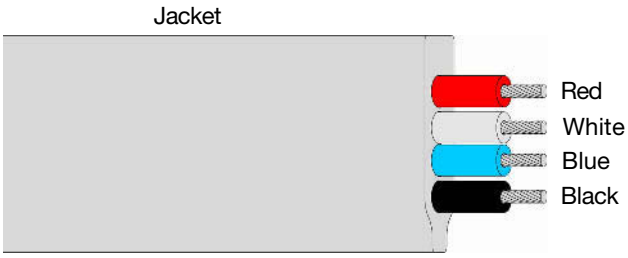
DeviceNet™ – Thick Cable Specifications

Cable that meets the requirements of ODVA Thick or Type II cable. It provides the most power to a network when used as a trunk cable up to a maximum standard cable length of 500 meters (1640 feet). Flat cable and TC rated cables may be used as a trunk cable to a maximum length of 420M (1378FT).



††† Available on some cable types.

Data Rate	Maximum Standard Trunk Length	Maximum Trunk Length (5713, 5720)
125 Kbaud	500M (1640FT)	420M (1378FT)
250 Kbaud	250M (820FT)	200M (656FT)
500 Kbaud	100M (328FT)	100M (328FT)

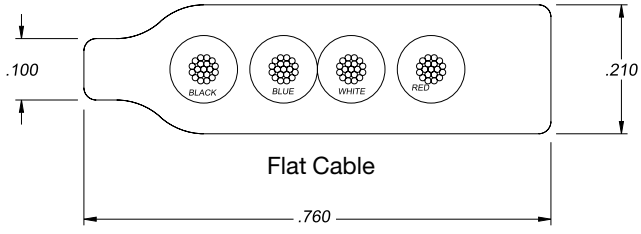


Type	Approvals	Power Pair		Data Pair		Outer Jacket	Shields	Bulk Cable Part† Number
		AWG Color Code	DCR (/1000 ft) Insulation	AWG Color Code	DCR (/1000ft) Insulation	Material Color Nominal O.D.	Type Drain Wire	
575 AWM20233 80°C300V	**NEC** AWM **CEC** AWM-I/II A/B FT1	2/15 AWG Black/Red	3.2 Ω PVC	2/18 AWG Blue/White	6.9 Ω PE	PUR Light Gray 10.4 mm(.409 in)	Foil/Braid 18 AWG	RB50633-*M
579 AWM2570 75°C300V	**NEC** PLTC/CL2 **CEC** CMB	2/15 AWG Black/Red	3.2 Ω SR-PVC	2/18 AWG Blue/White	6.9 Ω PE	PVC Light Gray 11 mm(.435 in)	Foil/Braid 18 AWG	RB50652-*M
5720 75°C600V	**NEC** TC	2/16 AWG Black/Red	3.6 Ω PVC	2/18 AWG Blue/White	6.9 Ω PE	PVC Light Gray 13 mm (.515)	Foil/Braid 18 AWG	RB50793-*M
5713 75°C300V	**NEC** CL2 **CEC** AWM-I/II A/B FT4	2/16 AWG Black/Red	4.1 Ω PVC	2/16 AWG Blue/White	4.1 Ω PE	PVC Light Gray Flat Profile ††	None	RB50787-*M

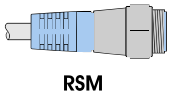
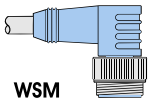
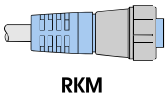
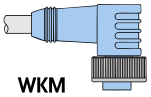
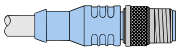
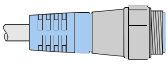
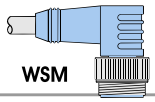
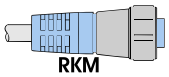
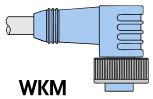
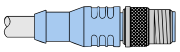
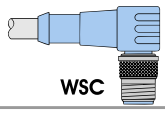
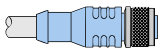
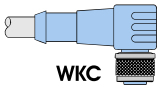
† See page 70 for standard bulk cable lengths.

†† Flat Profile is 19.3 mm (0.760 in) x 5.3 mm (0.210 in).

* indicates length in meters.



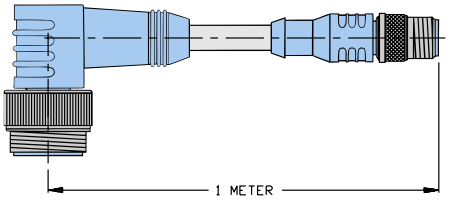
DeviceNet™ Thin, Mid, and Thick Cable and Cordsets

			minifast®				*eurofast*® (thin,mid only)
			Pin (Male)		Socket (Female)		Pin (Male)
			 RSM	 WSM	 RKM	 WKM	 RSC
		 Bare	RSM 57X-*M	WSM 57 X-*M	RKM 57X-*M	WKM 57 X-*M	RSC 57X-*M
minifast®	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 57X-*M
		 WSM		WSM WSM 57 X-*M	WSM RKM 57 X-*M	WSM WKM 57 X-*M	WSM RSC 57 X-*M
	Socket (Female)	 RKM			RKM RKM 57 X-*M	RKM WKM 57 X-*M	RKM RSC 57X-*M
		 WKM				WKM WKM 57X-*M	WKM RSC 57 X-*M
eurofast® (thin,mid only)	Pin (Male)	 RSC					RSC RSC 57X-*M
		 WSC					
	Socket (Female)	 RKC					
		 WKC					

x indicates cable type.
* indicates length in meters.

Example

WSM RSC 572-1M



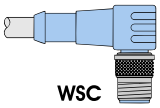
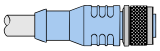
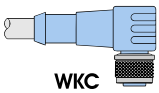
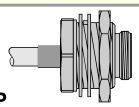
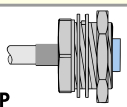
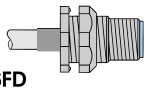
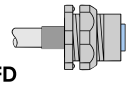
Standard cable lengths are 0.3, 0.5, 1.0, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0 ,6.0 ,8.0 ,10 ,15....50M. Consult factory for other lengths.

For stainless steel coupling nut:
Change part number (RSM...to RSV, RSC...to RSCV).

Refer to the Cordset Wizard CD (B9034) for assistance with cordset/cable combinations.

Armorfast cable only available with straight *minifast*® connectors (RSM, RKM).

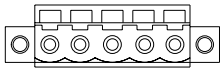
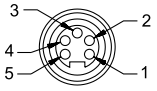
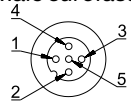
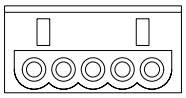
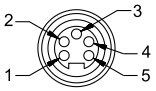
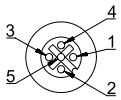
DeviceNet™ Thin, Mid, and Thick Cable and Cordsets

eurofast® (thin and mid only)			*minifast*® bulkhead		*eurofast*® bulkhead (thin only)	
Pin (Male)	Socket (Female)		Pin (Male)	Socket (Female)	Pin (Male)	Socket (Female)
 WSC	 RKC	 WKC	 RSFP	 RKFP	 FSFD	 FKFD
WSC 57X-*M	RKC 57X-*M	WKC 57X-*M	RSFP 57X-*M	RKFP 57X-*M	FSFD 57X-*M	FKFD 57X-*M
RSM WSC 57X-*M	RSM RKC 57X-*M	RSM WKC 57X-*M	RSM RSFP 57X-*M	RSM RKFP 57X-*M	RSM FSFD 57X-*M	RSM FKFD 57X-*M
WSM WSC 57X-*M	WSM RKC 57X-*M	WSM WKC 57X-*M	WSM RSFP 57X-*M	WSM RKFP 57X-*M	WSM FSFD 57X-*M	WSM FKFD 57X-*M
RKM WSC 57X-*M	RKM RKC 57X-*M	RKM WKC 57X-*M	RKM RSFP 57X-*M	RKM RKFP 57X-*M	RKM FSFD 57X-*M	RKM FKFD 57X-*M
WKM WSC 57X-*M	WKM RKC 57X-*M	WKM WKC 57X-*M	WKM RSFP 57X-*M	WKM RKFP 57X-*M	WKM FSFD 57X-*M	WKM FKFD 57X-*M
RSC WSC 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 WSC 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

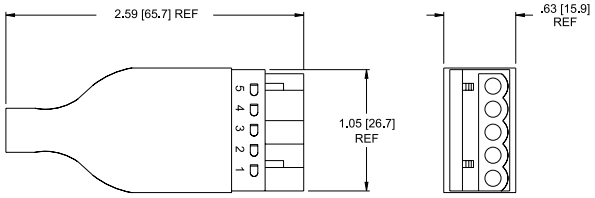
DeviceNet™ Open Connector Cordsets

		minifast®				*eurofast*®
		Pin (Male)		Socket (Female)		Pin (Male)
	Bare	RSM	WSM	RKM	WKM	RSC
CBC5	CBC5 57x-*M	RSM CBC5 57x-*M	WSM CBC5 57x-*M	RKM CBC5 57x-*M	WKM CBC5 57x-*M	RSC CBC5 57x-*M
BK52C	BK52C 57x-*M	RSM BK52C 57x-*M	WSM BK52C 57x-*M	RKM BK52C 57x-*M	WKM BK52C 57x-*M	RSC BK52C 57x-*M
	Thin, Mid and Thick					**Thin & Mid only**

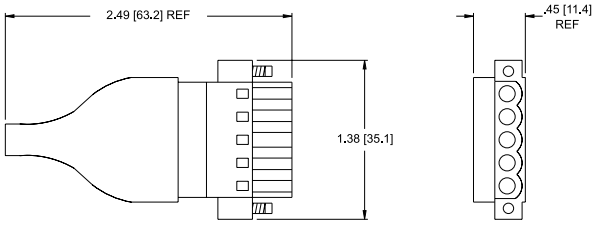
x indicates cable type
* indicates length in meters
For stainless steel coupling nut: Change part number (RSM...to RSV, RSC...to RSCV).

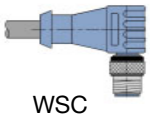
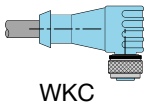
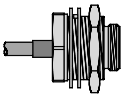
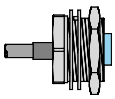
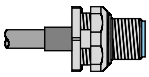
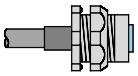
Part Number	Application	Pinouts	
CBC5 57x-*M	Open connector for devices	**CBC5** 1 = Black (-Voltage) 2 = Blue (CAN_L) 3 = Bare (Shield Drain) 4 = White (CAN_H) 5 = Red (+Voltage)  5 4 3 2 1	Male *minifast*®  1 = Bare (Shield Drain Wire) 2 = Red (+ Voltage) 3 = Black (-Voltage) 4 = White (CAN_H) 5 = Blue (CAN_L) Male *eurofast*® 
BK52C 57x-*M	Open connector for bus terminals	**BK52C** 1 = Black (-Voltage) 2 = Blue (CAN_L) 3 = Bare (Shield Drain) 4 = White (CAN_H) 5 = Red (+Voltage)  5 4 3 2 1	Female *minifast*®  1 = Bare (Shield Drain Wire) 2 = Red (+ Voltage) 3 = Black (-Voltage) 4 = White (CAN_H) 5 = Blue (CAN_L) Female *eurofast*® 

BK52C



CBC5



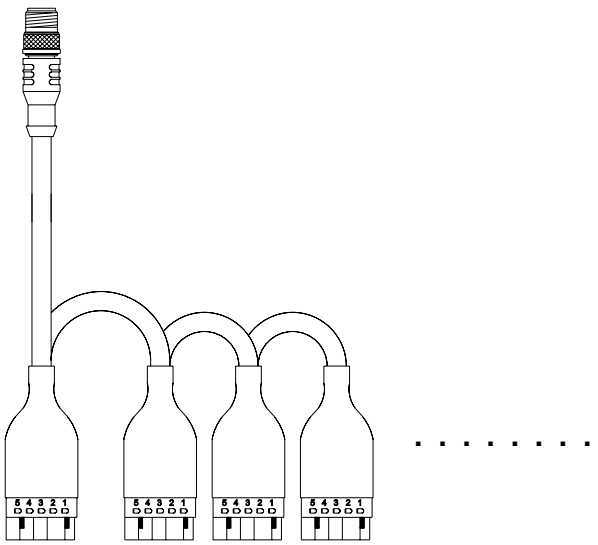
eurofast®			*minifast*® bulkhead		*eurofast*® bulkhead	
Pin (Male)	Socket (Female)		Pin (Male)	Socket (Female)	Pin(Male)	Socket (Female)
 WSC	 RKC	 WKC	 RSFP	 RKFP	 FSFD	 FKFD
WSC CBC5 57X-*M	RKC CBC5 57X-*M	WKC CBC5 57X-*M	RSFP CBC5 57x-*M	RKFP CBC5 57x-*M	FSFD CBC5 57x-*M	FKFD CBC5 57x-*M
WSC BK52C 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
Thin and Mid only			**Thin, Mid and Thick**		**Thin only**	

See page 76 for bare lead options on bulkheads.

Refer to the Cordset Wizard CD (B9034) for assistance with cordset/cable combinations.

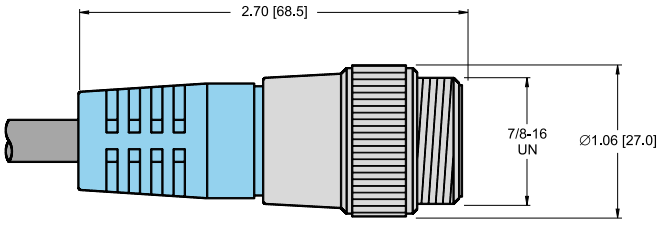
Standard cable lengths are 0.3, 0.5, 1.0, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0 ,6.0 ,8.0 ,10 ,15....50M. Consult factory for other lengths.

Consult factory for daisy chain options. Other harness assemblies available upon request.

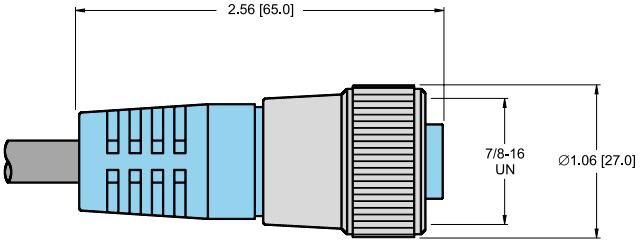


minifast® Cordset and Receptacle Connector Dimensions/Configuration

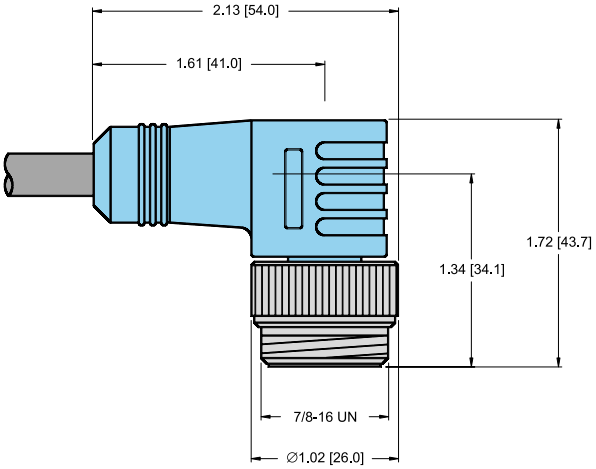
RSM



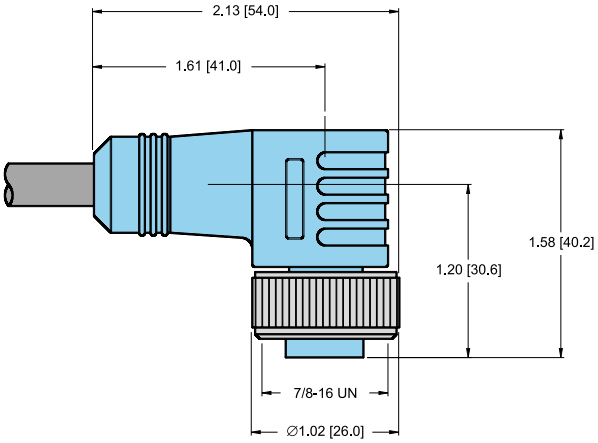
RKM



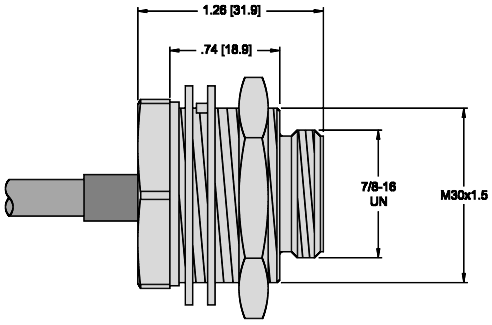
WSM



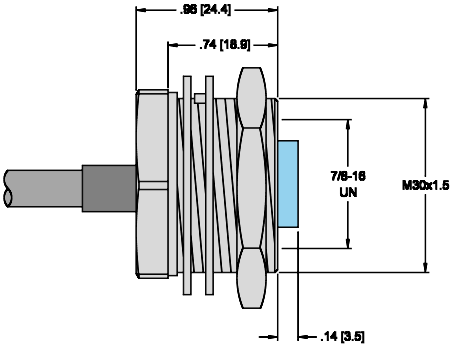
WKM



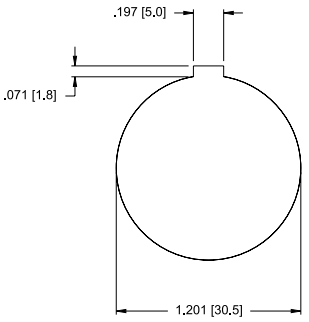
RSFP



RKFP

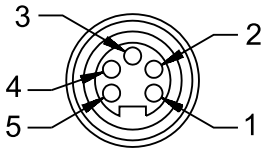


Mounting Installation



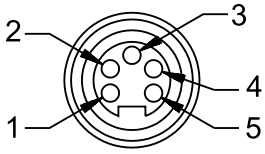
Pinouts

Male



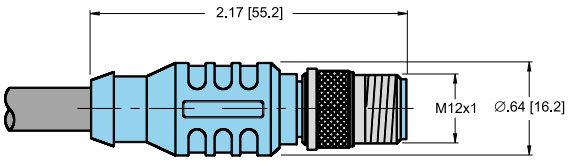
1. Bare (Shield Drain Wire)
2. Red (+ Voltage)
3. Black (- Voltage)
4. White (CAN_H)
5. Blue (CAN_L)

Female

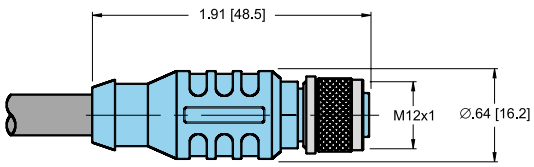


eurofast® Cordset and Receptacle Connector Dimensions/Configuration

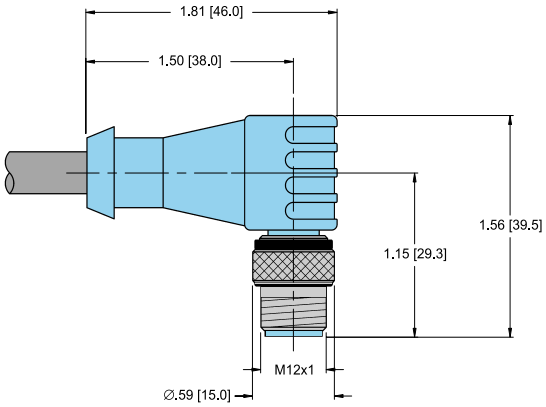
RSC



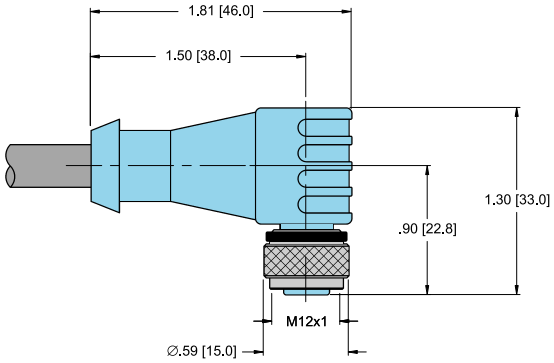
RKC



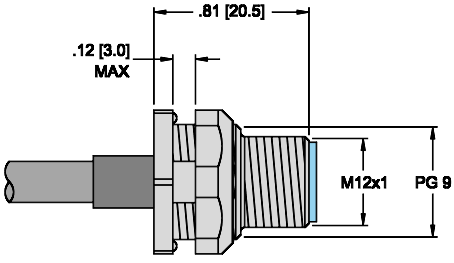
WSC



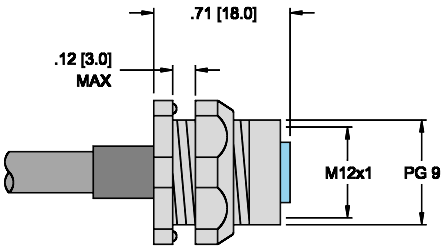
WKC



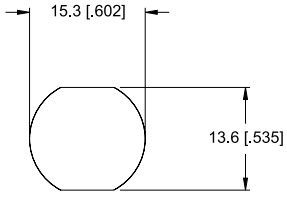
FSFD



FKFD

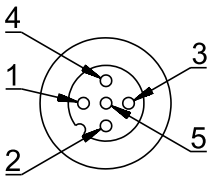


Mounting Installation



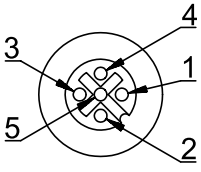
Pinouts

Male

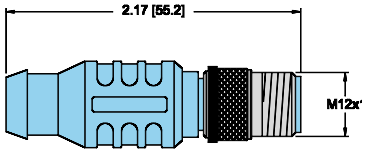
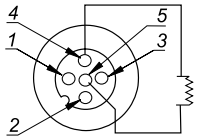
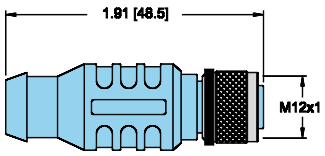
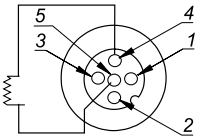
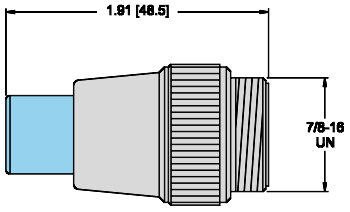
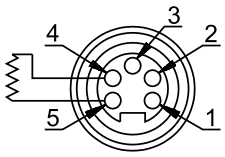
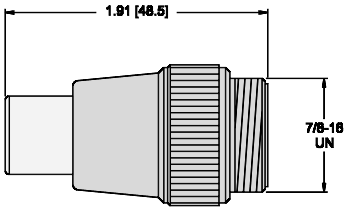
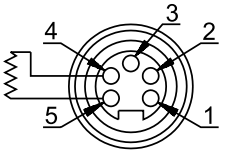
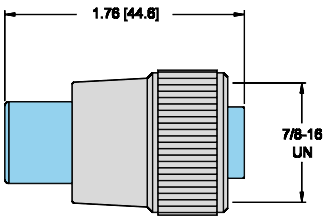
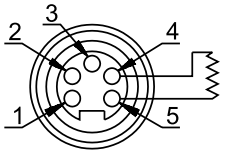


1. Bare (Shield Drain Wire)
2. Red (+ Voltage)
3. Black (- Voltage)
4. White (CAN_H)
5. Blue (CAN_L)

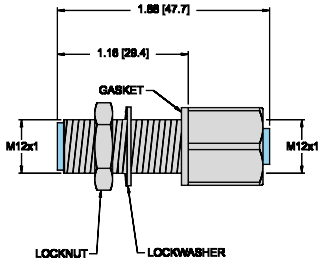
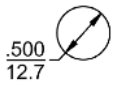
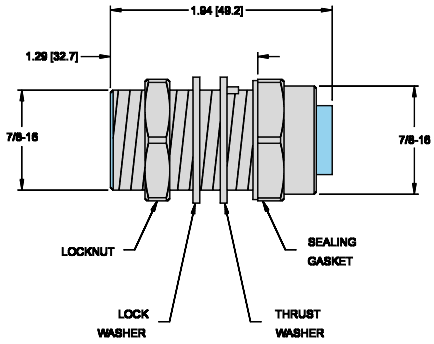
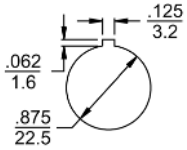
Female



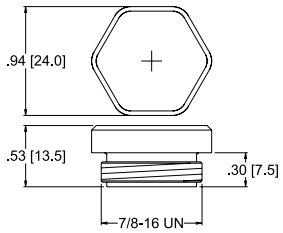
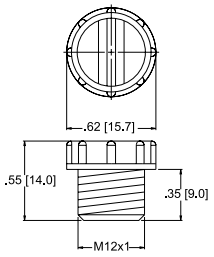
DeviceNet™ Terminating Resistors

Type	Applications	Wiring diagram / Pin configuration
RSE 57-TR2 	*eurofast*® terminating resistor • internal resistor • male *eurofast*® connector	 nominal voltage: 24 VDC internal resistance: 120 Ω, 1/4 W
RKE 57-TR2 	*eurofast*® terminating resistor • internal resistor • female *eurofast*® connector	 nominal voltage: 24 VDC internal resistance: 120 Ω, 1/4 W
RSM 57-TR2 	*minifast*® terminating resistor • internal resistor • male *minifast*® connector	 nominal voltage: 24 VDC internal resistance: 120 Ω, 1/4 W
RSM 57VM-TR2 	*minifast*® terminating resistor with voltage monitoring • internal resistor • male *minifast*® connector • led indication red-reverse polarity green-okay	 nominal voltage: 24 VDC internal resistance: 120 Ω, 1/4 W
RKM 57-TR2 	*minifast*® terminating resistor • internal resistor • female *minifast*® connector	 nominal voltage: 24 VDC internal resistance: 120 Ω, 1/4 W

DeviceNet™ Feed Through Connectors

Type	Applications	Panel Cutout
FKM FS 57/M12 	*eurofast*® feed through connection, M 12 x 1 • straight male/female connector • for pre-molded *eurofast*® cables	
RSF RKF 57/22 	*minifast*® Bulkhead Receptacle • straight male/female feed-through • for use with DeviceNet *minifast*® cordsets	

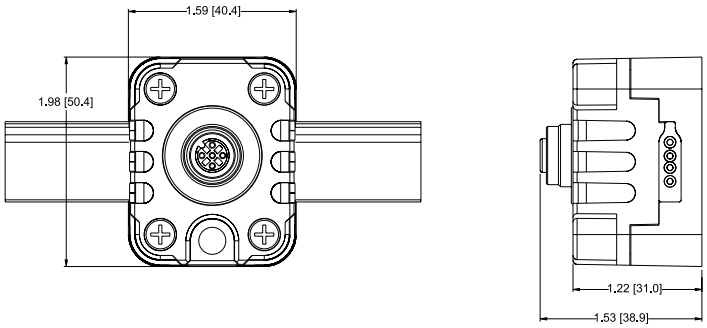
Closure Caps

Type	Applications
RSFK-BC (10/BAG) 	*minifast*® Closure Cap • mates to female receptacles • nylon
VZ-3 (8/BAG) 	*eurofast*® Closure Cap • mates to female receptacles • nylon

Flat Cable Connectors

eurofast® Flat Cable Connector

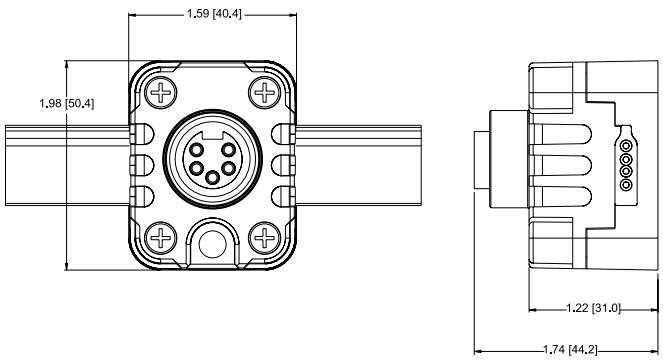
Flat cable connector to
female *eurofast*® drop

Type	Dimensions
FK 57-IDC	

For stainless steel: Change part number (FK...to FKV).

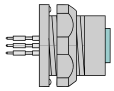
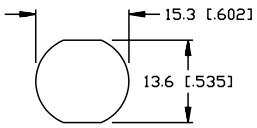
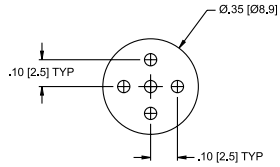
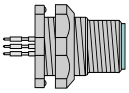
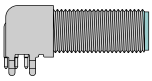
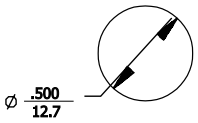
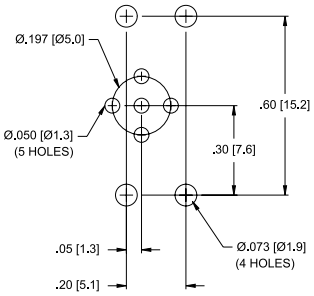
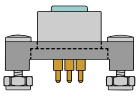
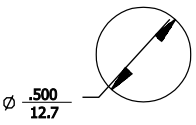
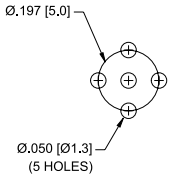
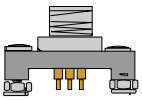
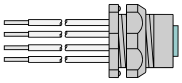
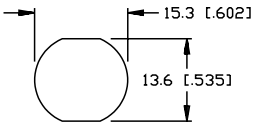
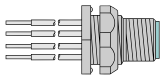
minifast® Flat Cable Connector

Flat cable connector to
female *minifast*® drop

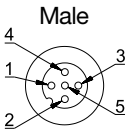
Type	Dimensions
RKF 57-IDC	

For stainless steel: Change part number (RKF...to RKFV).

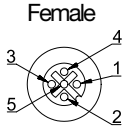
Circuit Board Connectors and Receptacles with Leads

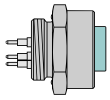
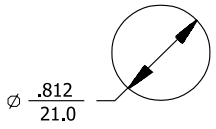
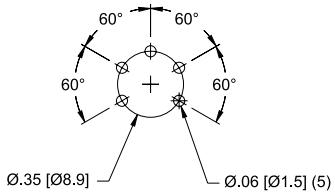
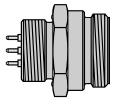
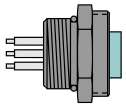
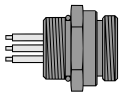
eurofast®		Panel Cut-out	Board Layout (reference only**)
FKFD 57 PCB			
FSFD 57 PCB			
WFS 57 PCB			
FK 57 PCB			
FS 57 PCB			
FKFD 57- *M			
FSFD 57- *M			

Pin Out

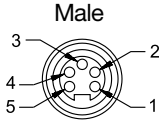


1. Bare
2. (+Volt)
3. (-Volt)
4. (CAN_H)
5. (CAN_L)

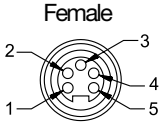


minfast®		Panel Cut-out	Board Layout (reference only**)
RKF 57 PCB			
RSF 57 PCB			
RKF 57- * M			
RSF 57- *M			

Pin Out

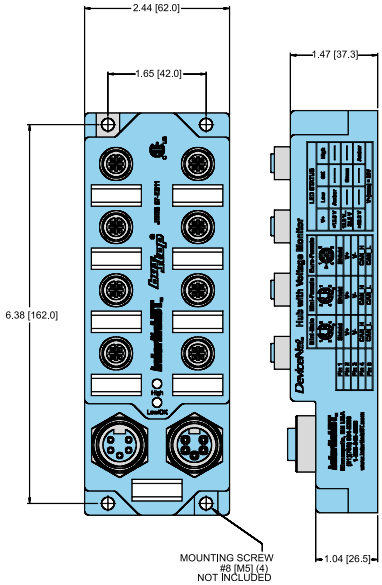
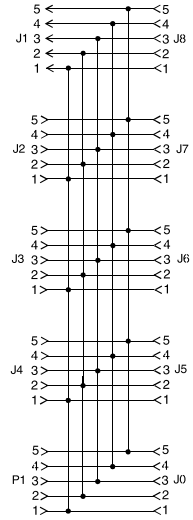


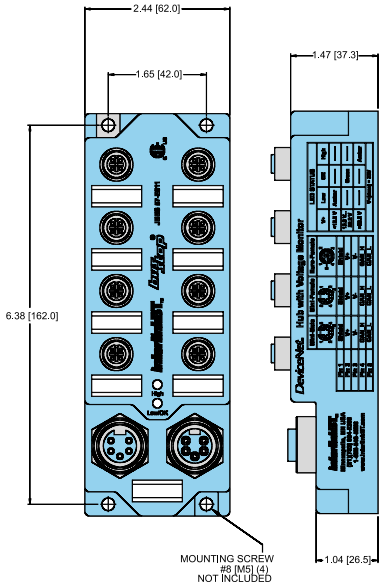
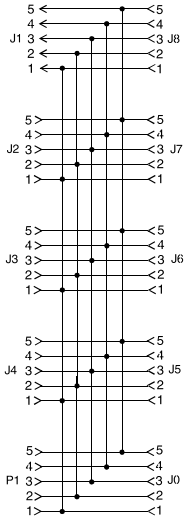
1. Bare
2. (+Volt)
3. (-Volt)
4. (CAN_H)
5. (CAN_L)



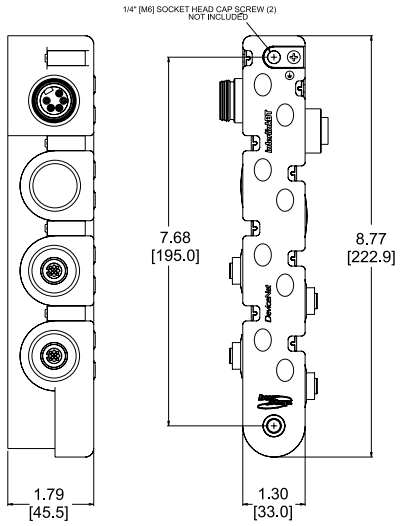
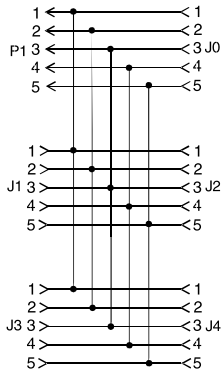
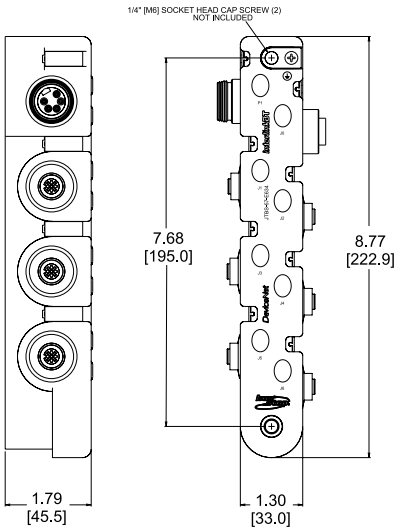
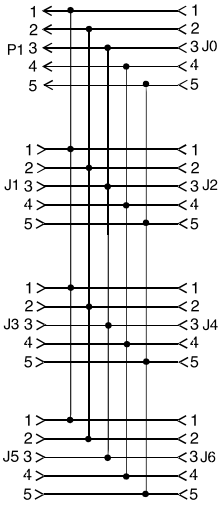
* indicates length in meters.
** consult source drawing for board layout.
Refer to page 70 for standard cable lengths.

DeviceNet™ *eurofast*® Junction- Standard and with Voltage Monitoring

Type	Applications	Wiring diagram / Pin configuration
JBBS-57-E811 	8-port *busstop*® junction with voltage monitoring • bus in/bus out connections (7/8" *minifast*®) • eight *eurofast*® connectors for field connections • voltage monitoring provides low voltage (12.9V) and high voltage (25.6V) indication. LED Indication (Lo) < 12.9V Amber (Ok) 12.9V-25.6V Green (Hi) > 25.6V Amber	

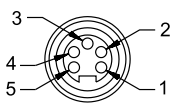
Type	Applications	Wiring diagram / Pin configuration
JBBS-57-E812 	8-port *busstop*® junction • bus in/bus out connections (7/8" *minifast*®) • eight *eurofast*® connectors for field connections	

DeviceNet™ *eurofast*® Junction Tee

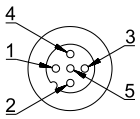
Type	Applications	Wiring diagram / Pin configuration
JTBS 57-E434 	4-port *busstop*® junction tee • *minifast*® bus in/bus out connections • four *eurofast*® device ports • for stainless steel connectors change part number to JTBS 57-E433	
JTBS 57-E634 	6-port *busstop*® junction tee • *minifast*®bus in/bus out connections • six *eurofast*® device ports • for stainless steel connectors change part number to JTBS 57-E633	

Pinouts

minifast® Male

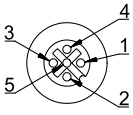


eurofast® Male

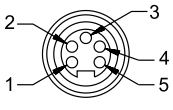


1. Bare (Shield Drain Wire)
2. Red (+Voltage)
3. Black (-Voltage)
4. White (CAN_H)
5. Blue (CAN_L)

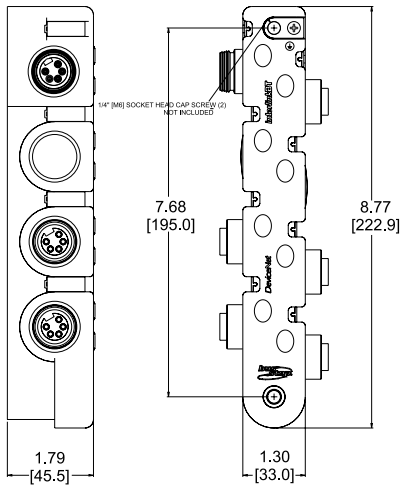
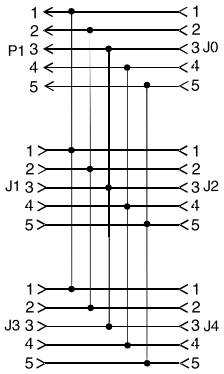
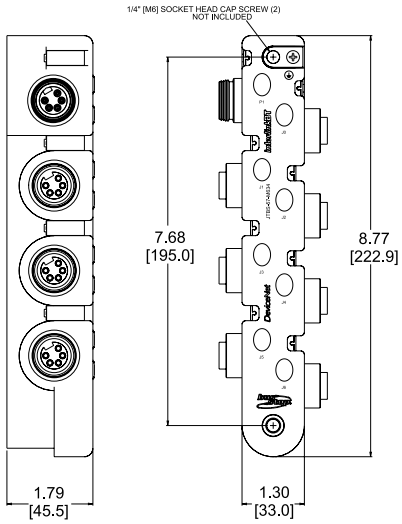
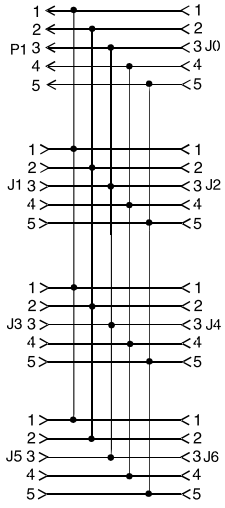
eurofast® Female



minifast® Female

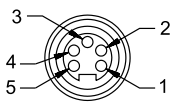


DeviceNet™ *minifast*® Junction Tee

Type	Applications	Wiring diagram / Pin configuration
JTBS 57-M434 	4-port *busstop*® junction tee • *minifast*® bus in/bus out connections • four *minifast*® device ports • for stainless steel connectors change part number to JTBS 57-M433	
JTBS 57-M634 	6-port *busstop*® junction tee • *minifast*®bus in/bus out connections • six *minifast*® device ports • for stainless steel connectors change part number to JTBS 57-M633	

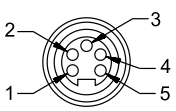
Pinouts

minifast® Male

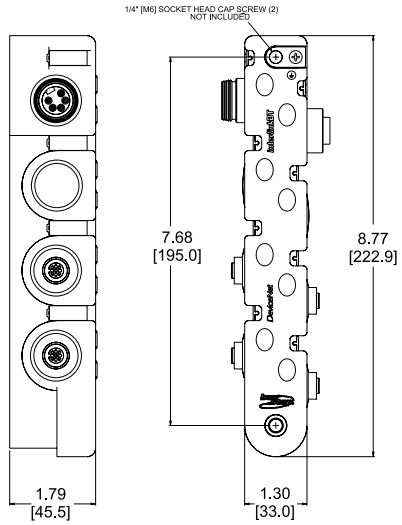
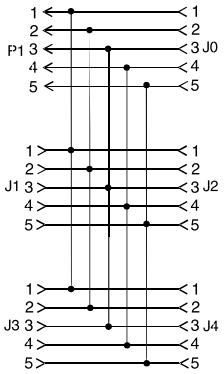
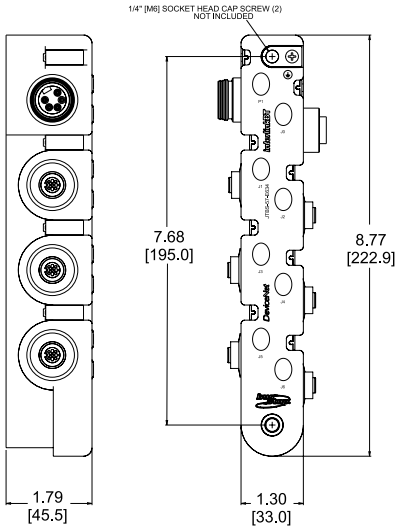
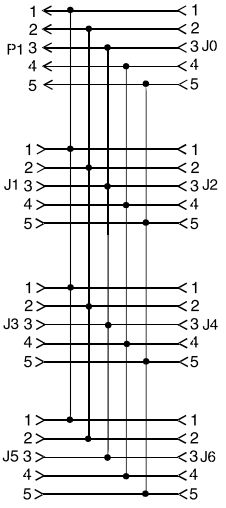


1. Bare (Shield Drain Wire)
2. Red (+Voltage)
3. Black (-Voltage)
4. White (CAN_H)
5. Blue (CAN_L)

minifast® Female

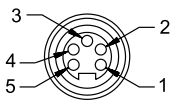


DeviceNet™ *eurofast*® Junction Tee with Voltage Monitoring

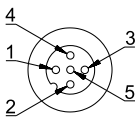
Type	Applications	Wiring diagram / Pin configuration
JTBS 57VM-E434 	4-port *busstop*® junction tee with voltage monitoring • *minifast* ® bus in/bus out connections • four *eurofast*® device ports • for stainless steel connectors change part number to JTBS 57-E433 • voltage monitoring provides low voltage (12.9V) and high voltage (25.6) indication. Led Indication (Lo) < 12.9V Amber (Ok) 12.9-25.6V Green (Hi) > 25.6V Amber	
JTBS 57VM-E634 	6-port *busstop*® junction tee with voltage monitoring • *minifast*®bus in/bus out connections • six *eurofast*® device ports • for stainless steel connectors change part number to JTBS 57-E633 • voltage monitoring provides low voltage (12.9V) and high voltage (25.6) indication. Led Indication (Lo) < 12.9V Amber (Ok) 12.9-25.6V Green (Hi) > 25.6V Amber	

Pinouts

minifast® Male

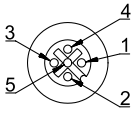


eurofast® Male

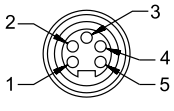


1. Bare (Shield Drain Wire)
2. Red (+Voltage)
3. Black (-Voltage)
4. White (CAN_H)
5. Blue (CAN_L)

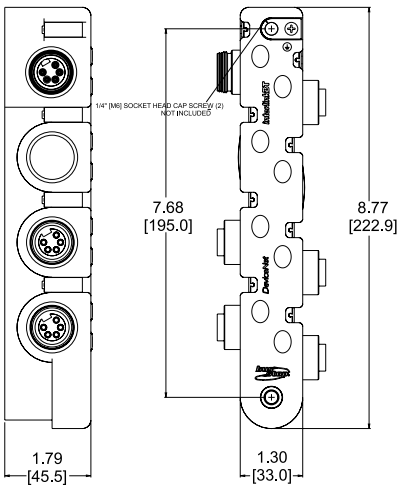
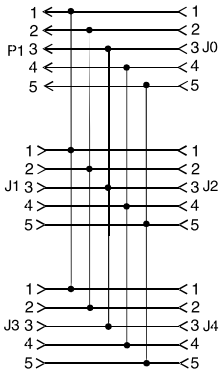
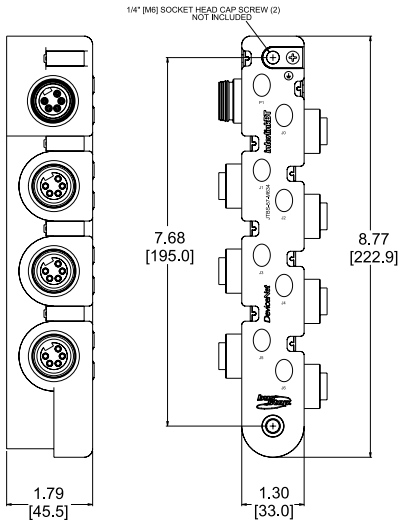
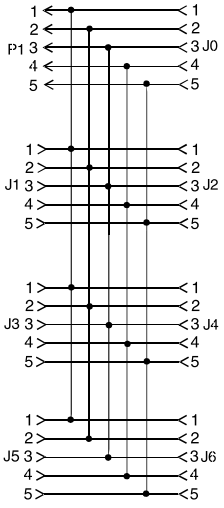
eurofast® Female



minifast® Female

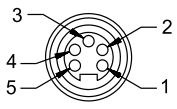


DeviceNet™ *minifast*® Junction Tee with Voltage Monitoring

Type	Applications	Wiring diagram / Pin configuration
JTBS 57VM-M434 	4-port *busstop*® junction tee with voltage monitoring • *minifast*® bus in/bus out connections • four *minifast*® device ports • for stainless steel connectors change part number to JTBS 57-M433 • voltage monitoring provides low voltage (12.9V) and high voltage (25.6) indication. Led Indication (Lo) < 12.9V Amber (Ok) 12.9-25.6V Green (Hi) > 25.6V Amber	
JTBS 57VM-M634 	6-port *busstop*® junction tee with voltage monitoring • *minifast*®bus in/bus out connections • six *minifast*® device ports • for stainless steel connectors change part number to JTBS 57-M633 • voltage monitoring provides low voltage (12.9V) and high voltage (25.6) indication. Led Indication (Lo) < 12.9V Amber (Ok) 12.9-25.6V Green (Hi) > 25.6V Amber	

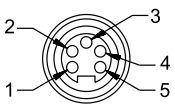
Pinouts

minifast® Male

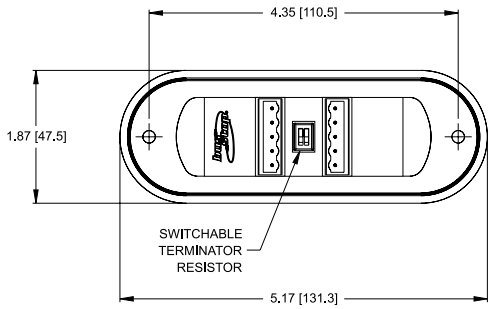


1. Bare (Shield Drain Wire)
2. Red (+Voltage)
3. Black (-Voltage)
4. White (CAN_H)
5. Blue (CAN_L)

minifast® Female



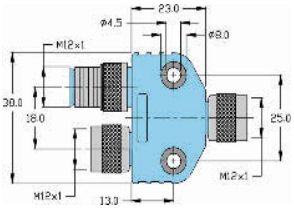
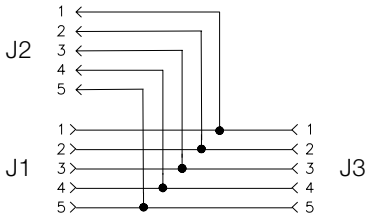
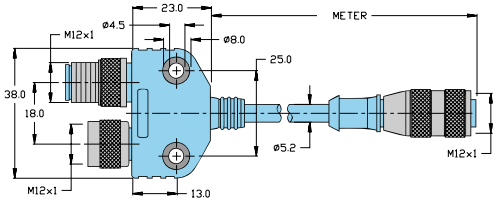
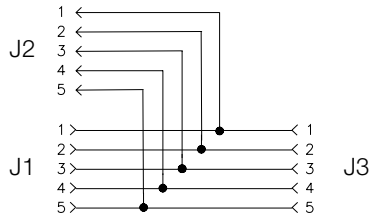
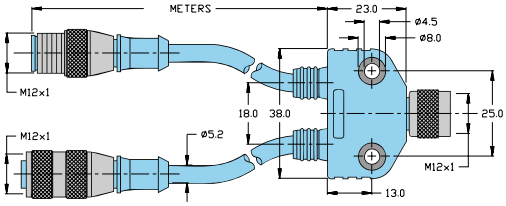
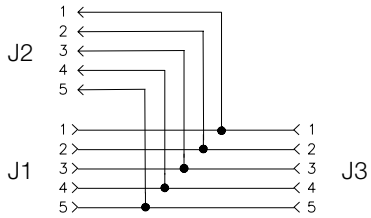
	minifast®	*eurofast*®
1-port	BCA 57-M123	BCA 57-E123
2-port	BCA 57-M223	BCA 57-E223

Description	The conduit adapter attaches to a standard conduit body for transition to *minifast*® or *eurofast*® connectors. Gasket and mounting hardware included (8-32 x 1/2”).
Dimensions	 Check network layout to see if the terminator should be turned on. Default is to off position.

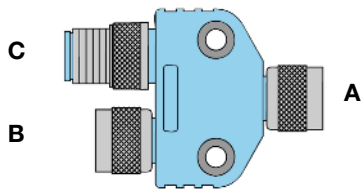
Conduit Bodies

CROUSE - HINDS Hub Size = 3/4		
Shape	**Style**	**Part Number**
 C	Form 8 Mark 9	C28 C29
 LB	Form 8 Mark 9	LB28 LB29
 LL	Form 8 Mark 9	LL28 LL29
 LR	Form 8 Mark 9	LR28 LR29

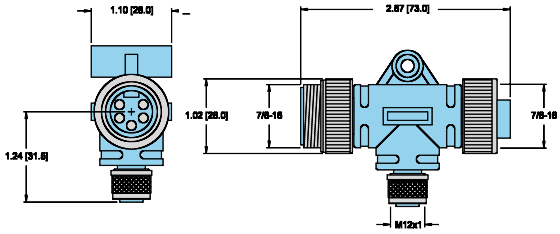
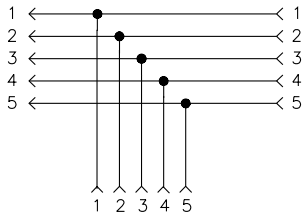
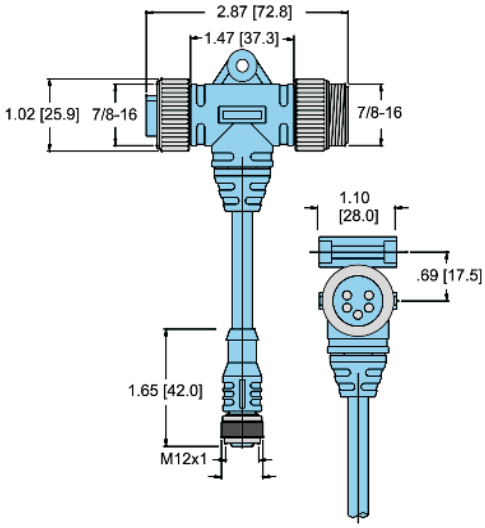
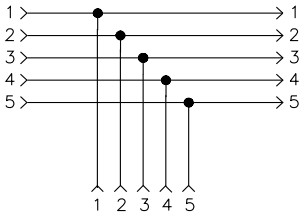
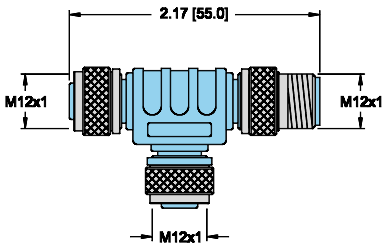
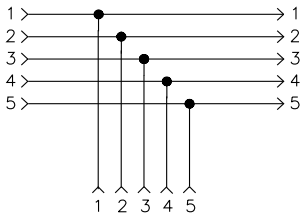
DeviceNet™ *eurofast*® Drop Junctions

Type	Applications	Wiring diagram / Pin configuration
VB2-FKM/FKM/FSM 57 	VB2 junction • ready for *eurofast*® branch and trunk cordsets • maximum 6 meter drop	
VB2-RKC57x-*M-FKM FSM 	VB2 junction with trunk line • ready for *eurofast*® trunk line • maximum 6 meter drop	
VB2-FKM/RKC RSC57x-*M/*M 	VB2 junction with trunk line • reduced power and data branch • maximum 6 meter branch	

* indicates cable length.
X indicates cable type.

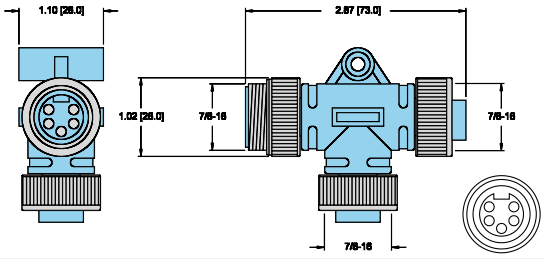
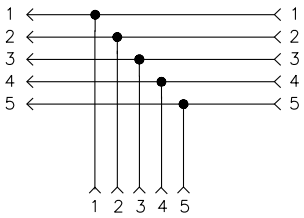
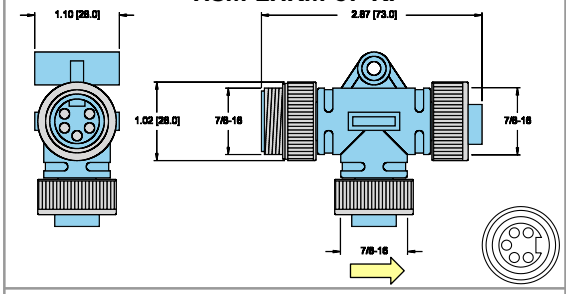
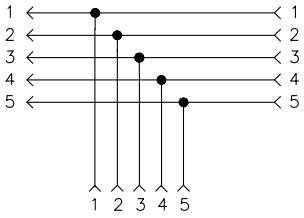
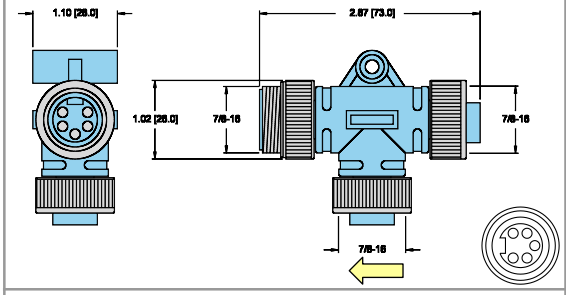
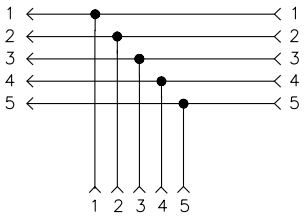
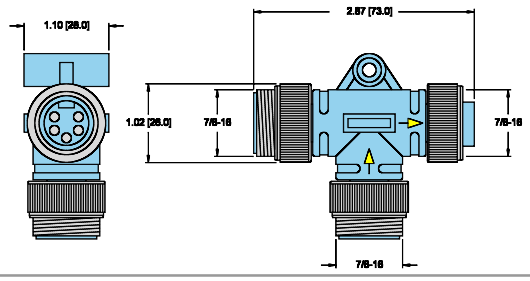
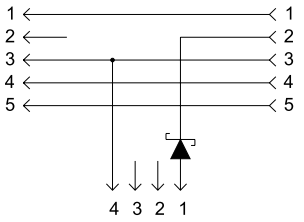
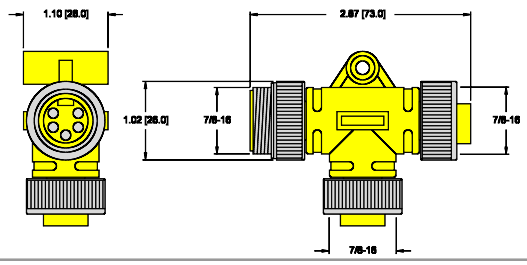
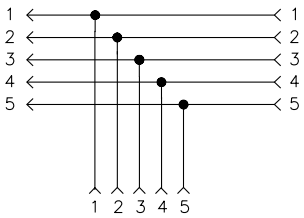
Part Number Definition	
	Connector Cordset VB2 FKM ____ / FKM FSM 57 ____ VB2 RKC 57X *M / RKC RSC 57X *M *M Family Type Connector / Cordset A Cable Type A Length A Length C Length B Cable Type B and C Connector / Cordset C Connector / Cordset B * indicates cable length. x indicates cable type; thin and mid only.

DeviceNet™ *eurofast*® Bus Tees

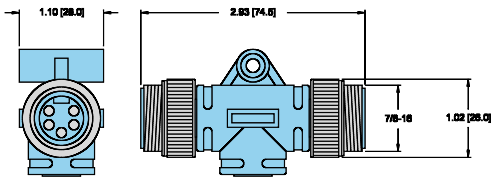
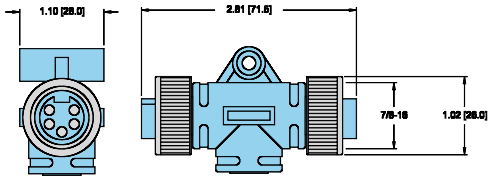
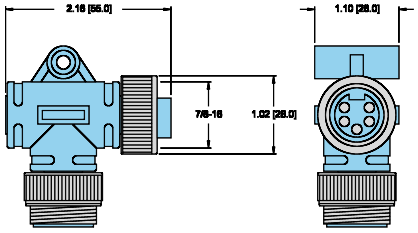
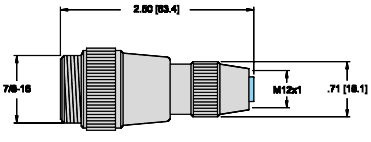
Type	Applications	Wiring diagram / Pin configuration
RSM-FKM-RKM57 	*eurofast*® Branch • *minifast*® (7/8“) to *eurofast*® (M12 x 1) • bus power and data branch	
RSM RKC 57x-*M RKM 57 	*eurofast*® Cordset Branch • *minifast*® (7/8“) to *eurofast*® (M12 x 1) extension cable • available with all thin cables; limit 6 M branch • for right angle connector, change RKC to WKC	
RSC 2RKC 57 	*eurofast*® Tee • *eurofast*® (M12 x 1) trunk and drop	

* indicates cable length.
X indicates cable type.

Bus Drop, Power and Diagnostic Tees

Type	Applications	Wiring diagram / Pin configuration
RSM 2RKM 57 	*minifast*® Drop Off Bus Line • full power and data drop • maximum 6 meter branch • standard keyway	
RSM 2RKM 57-KF 	*minifast*® Drop Off Bus Line • full power and data drop • maximum 6 meter branch • keyway facing female	
RSM 2RKM 57-KM 	*minifast*® Drop Off Bus Line • full power and data drop • maximum 6 meter branch • keyway facing male	
RSM RKM 57 WSM 40 PST 	*busstop*® Power Tee • provides segment power • includes reverse current protection	
RSM 2RKM 57 DGT 	*busstop*® Diagnostic Tee • provides easy connection for diagnostic tools • tap protected with cover when not in use (not shown)	

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

Type	Applications
RSM RSM 57 	Male *minifast*® Gender Changer • changes female cordset to male receptacle
RKM RKM 57 	Female *minifast*® Gender Changer • changes male cordset to female receptacle
WSM RKM 57 	*minifast*® Elbow • right angle male to female connector
RSM 57-FK 4.5 † 	*minifast*® to *eurofast*® Adapter • *minifast* male to *eurofast* female connector

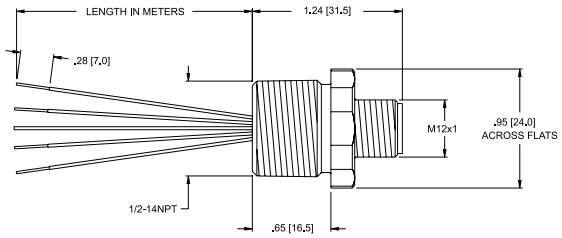
For stainless steel coupling nuts: Change part number (RKM RKM.. to RKV RKV..).

† not available in stainless steel.

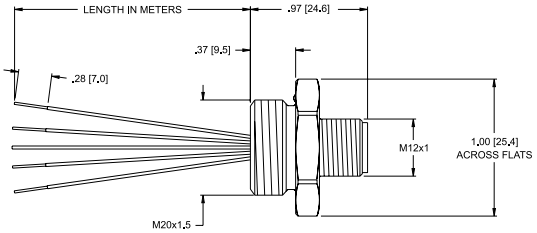
Device Gland Receptacles

Selection Guide	*eurofast*®	*minifast*®
1/2 - NPT	FSV 57-*M / 14.5	RSFV 57-*M / 14.5
M20	FSV 57-*M / M20	RSFV 57-*M / M20

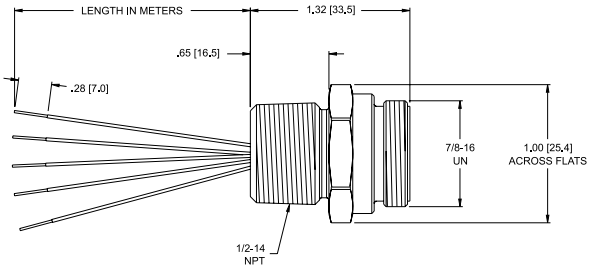
FSV 57-*M / 14.5



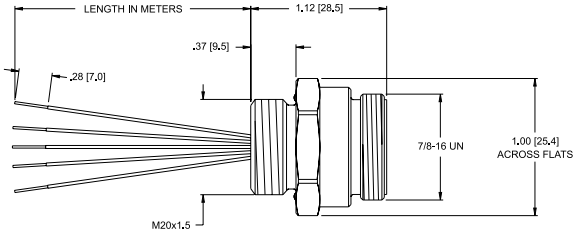
FSV 57-*M / M20



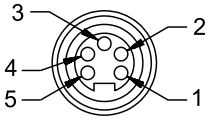
RSFV 57-*M / 14.5



RSFV 57-*M / M20

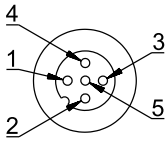


Male *minifast*®



1. Grey (Shield)
2. Red (+ Voltage)
3. Black (- Voltage)
4. White (CAN_H)
5. Blue (CAN_L)

Male *eurofast*®

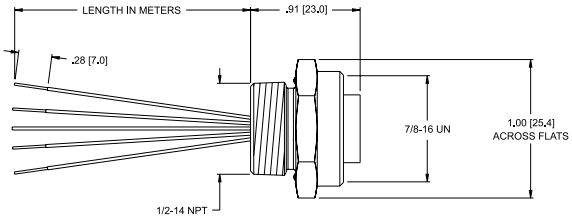


* indicates cable length.
Consult factory for availability of nickel plated brass.

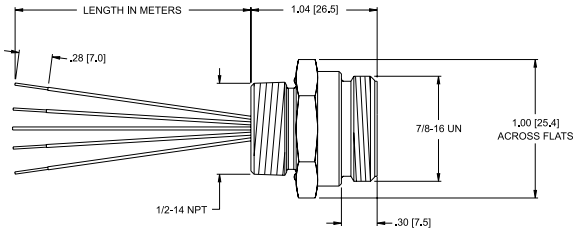
Panel Mount Receptacles - *minifast*®, *eurofast*®

	Selection Guide	Female	Male
Leads	*minifast*®	RKF 57 - *M	RSF 57 - *M
	eurofast®	FK 57 - *M	FS 57 - *M
Cable	*minifast*®	RKF 57x - *M	RSF 57x - *M
	eurofast®	FK 57x - *M	FS 57x - *M

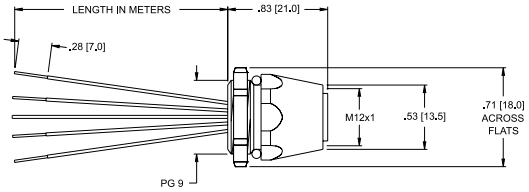
RKF 57



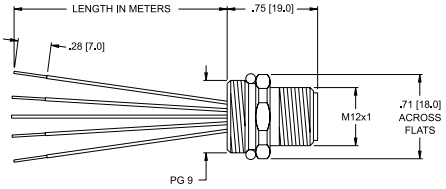
RSF 57



FK 57



FS 57



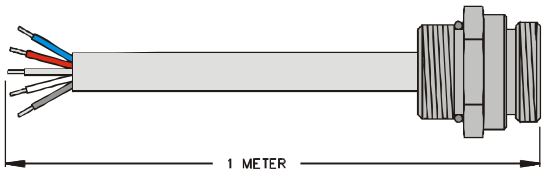
Parts in photo represent solder cups only. For solder cup only order part number RKF 57, FS 57 etc.

For stainless steel add "V" to housing identifier. Example: RKF...to RKFV or FK...to FKV...

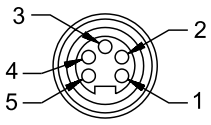
Panel locknuts: LN 1/2-14/10 (10 pieces) for RSF and RKF styles.

Receptacles also available with DeviceNet cable; see pages 71-73 for cable specifications.

Example: RSF 57x-*M
x indicates cable type (57 only for bare lead option).
* indicates cable length.

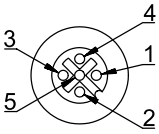


Female *minifast*®

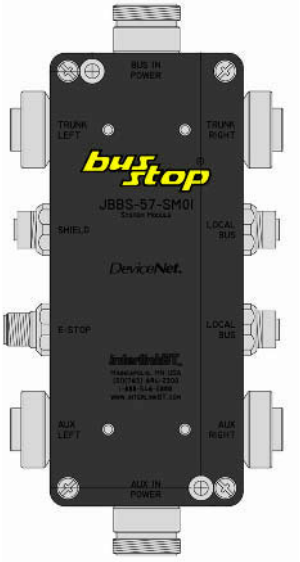
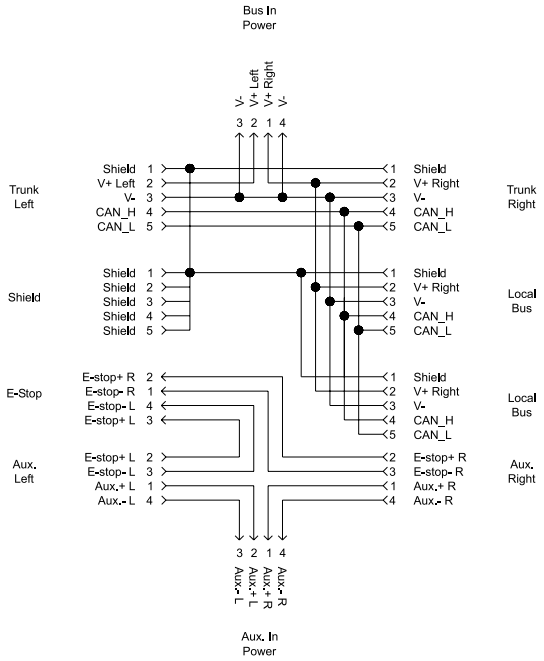


1. Grey (Shield)
2. Red (+ Voltage)
3. Black (- Voltage)
4. White (CAN_H)
5. Blue (CAN_L)

Female *eurofast*®

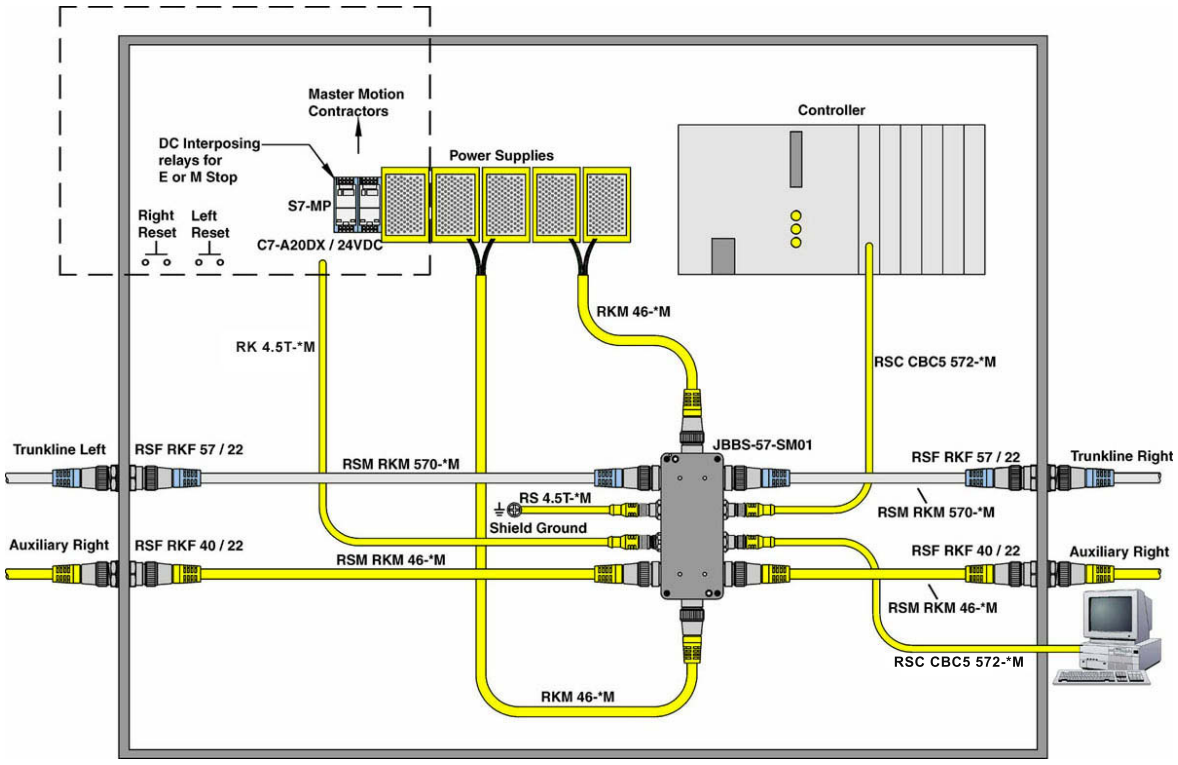


eurofast® System Module Junction

Part Number	Applications	Schematic
JBBS-57-SM01 	System Module with Two Circuit Groups • DeviceNet™ Circuit - Supplies DC power - Two Drops • Auxiliary Power - Supplies DC power - Category 2 E-stop - General Purpose M(achine)-stop	

Typical Application

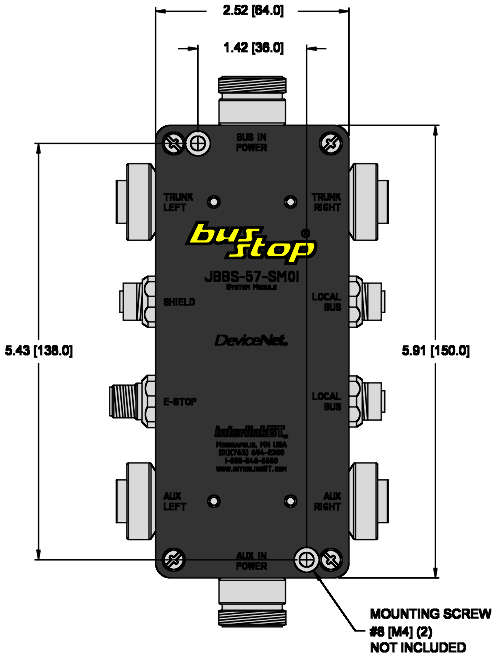
Note: See following page for descriptions of part numbers.



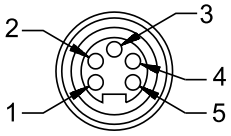
* indicates length in meters.

*Interlink*BT™ 3000 Campus Drive Minneapolis, MN 55441 Phone: (01) (763) 694-2300 Fax: (01) (763) 694-2399 Toll Free: 1-888-546-5880

Dimensions

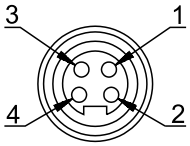


Pinouts-*minifast*®



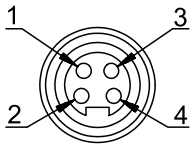
Female
Trunk Left & Right

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



Female
Aux Power
Left & Right

1 = V+
2 = E-Stop +
3 = E-Stop-
4 = V-

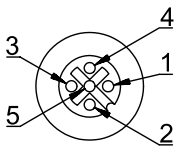


Male
Bus Power in
Aux Power in

1 = V+Right (Red)
2 = V+Left (Green)
3 = V-Left (White)
4 = V-Right (Black)

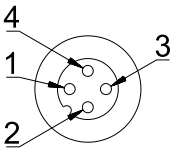
RKM 46-*M

Pinouts-*eurofast*®



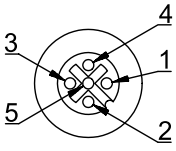
Female
Shield

1 = Shield
2 = Shield
3 = Shield
4 = Shield
5 = Shield



Male
E-Stop

1 = E-Stop -Right
2 = E-Stop +Right
3 = E-Stop -Left
4 = E-Stop +Left



Female
Dropline Local

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

***Interlink*BT™**

RSC CBC5 572-*M	*-meter, DeviceNet™ 5-pin *eurofast*® connector to 5 combicon connector
RSM RKM 570-*M	*-meter, full trunkline (bus line) DeviceNet cable, male/female molded ends
RSF RKF 57/22	male/female, 5-pin *minifast*® through-wall connector
RKC 572-*M	*-meter, 5-wire DeviceNet thin cable, female/tinned ends
RSC 572-*M	*-meter, 5-wire DeviceNet thin cable, male/tinned ends
JBBS-57-SM01	System Module

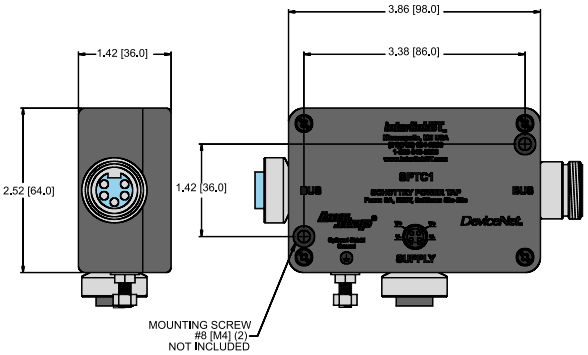
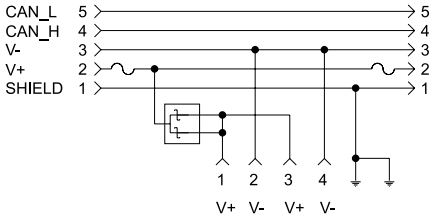
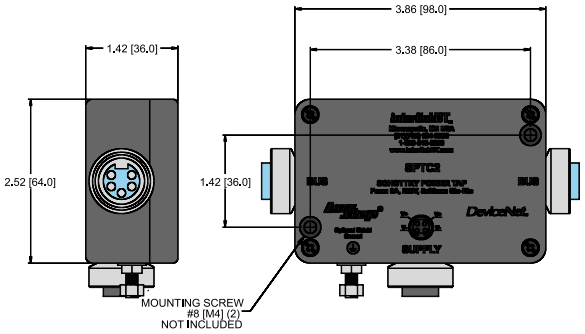
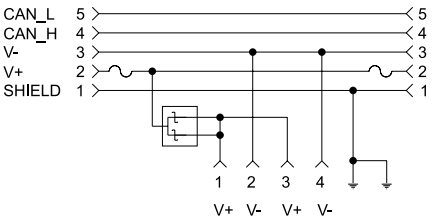
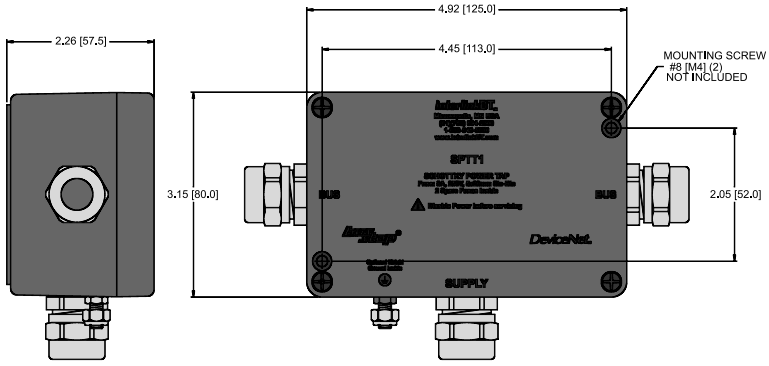
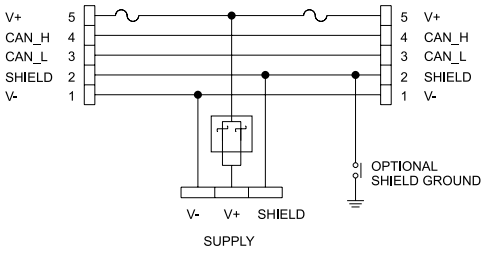
Turck

RS 4.5T-*M	*-meter, 5-wire *eurofast* cable, male/tinned ends, 20 AWG,gry PVC, ground all
RSF RKF 40/22	male/female, 4-pin *minifast*® through-wall connector
RSM RKM 46-*M	*-meter, 4-wire, male/female molded *minifast*® cable, 16 AWG, yellow PVC jacket
RKM 46-*M	*-meter, 4-wire, female/tinned ends *minifast*® 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 coil with free-wheeling diode, 10A, DPDT Caution! Install with S9-N blank plug to disable Push-To-Test/Pull-To-Lock functions.

* indicates cable length.

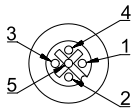
Power Taps

Bus Line	Auxiliary Power
1. Shield	1. + Voltage
2. + Voltage	2. - Voltage
3. - Voltage	3. + Voltage
4. CAN_H	4. - Voltage
5. CAN_L	

Type	Wiring diagram / Pin configuration
SPTC1  *busstop*® Power Tap with *minifast*® connectors • *minifast*® male to female bus connector • *minifast*® female power connector	
SPTC2  *busstop* Power Tap with *minifast*® connectors • *minifast*® female to female bus connector • *minifast*® female power connector	
SPTT1  *busstop*® Power Tap with terminal connectors • terminal strip bus connectors • terminal strip power connector	

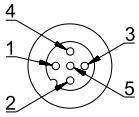
eurofast® Field Wireable Connectors

Female *eurofast*®

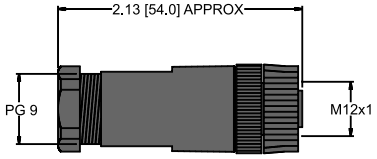
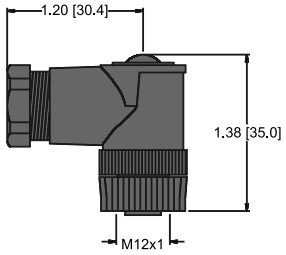
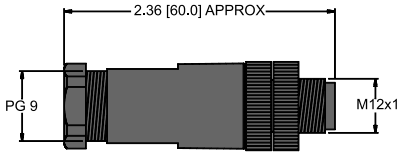
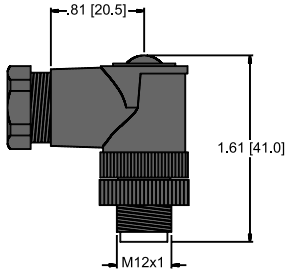


Rating: 3 A, 36 VDC

Male *eurofast*®

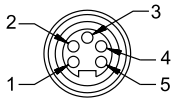


Rating: 3 A, 36 VDC

	Straight	Right Angle
Female	**B 8151-0** 	**B 8251-0** 
Male	**BS 8151-0** 	**BS 8251-0** 

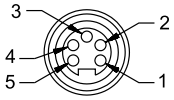
minifast® Field Wireable Connectors

Female *minifast*®

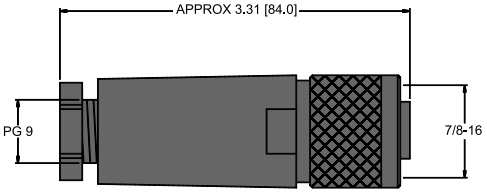
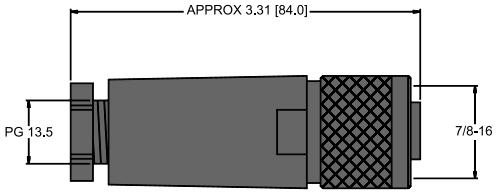
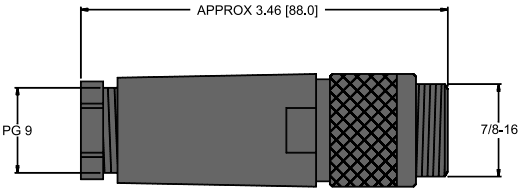
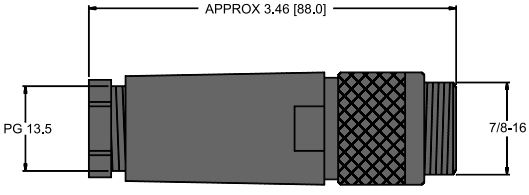


Rating: 9 A, 300 VDC

Male *minifast*®



Rating: 9 A, 300 VDC

	Thin Cable	Thick Cable
Female	**B 4151-0/9** 	**B 4151-0/13.5** 
Male	**BS 4151-0/9** 	**BS 4151-0/13.5** 

For stainless steel housing: Change part number (BS 4151...to BSV 4157 or B 4151...to BV 4157...).

Turck Power Cordsets for DeviceNet™ - *minifast*® Connectors

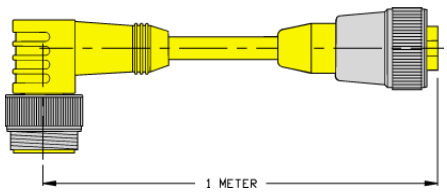
		minifast®			
		Pin (Male)		Socket (Female)	
		 RSM	 WSM	 RKM	 WKM
		RSM 46-*M	WSM 46-*M	RKM 46-*M	WKM 46-*M
minifast® Pin (Male)	 RSM	RSM RSM 46-*M	RSM WSM 46-*M	RSM RKM 46-*M	RSM WKM 46-*M
minifast® Pin (Male)	 WSM		WSM WSM 46-*M	WSM RKM 46-*M	WSM WKM 46-*M
minifast® Socket (Female)	 RKM			RKM RKM 46-*M	RKM WKM 46-*M
minifast® Socket (Female)	 WKM				WKM WKM 46-*M

* indicates length in meters.

For stainless steel coupling nuts: Change part number (RSM..to RSV..).

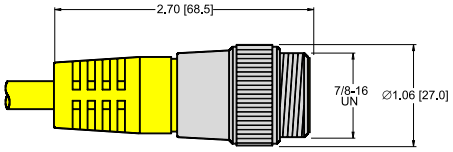
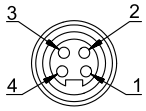
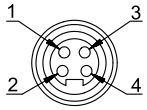
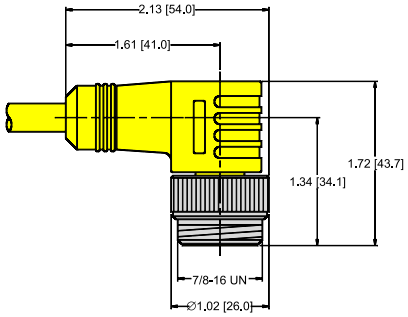
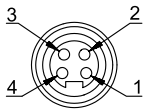
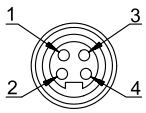
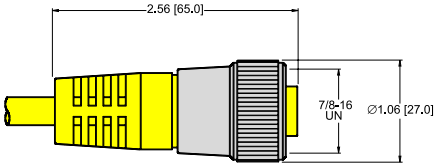
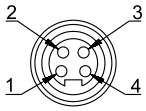
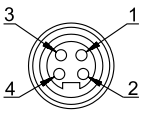
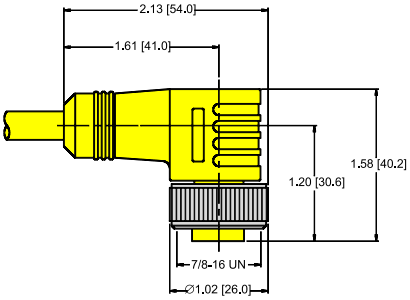
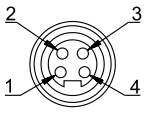
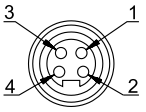
Standard cable lengths are 0.3, 0.5, 1.0, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0 ,6.0 ,8.0 ,10 ,15....50M.
Consult factory for other lengths.

Example WSM RKM 46-1M



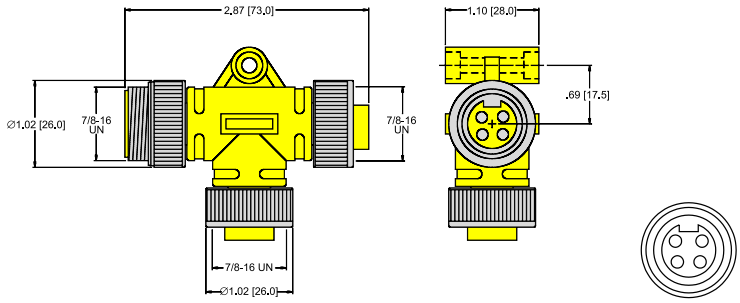
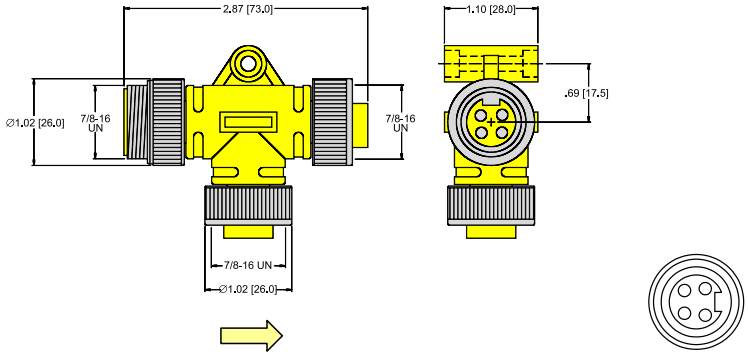
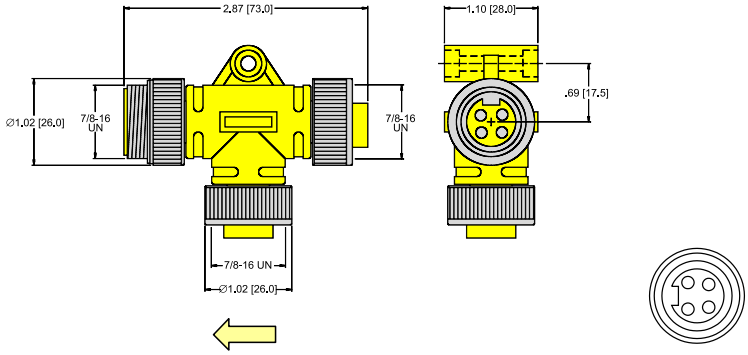
Specifications for DeviceNet™ Systems

Cable Type	Approvals	Power Pair		Outer Jacket	Shields	Bulk Cable
		AWG Color Code	DCR (/1000 ft) Insulation	Material Color Nominal O.D.	Type Drain Wire	
46 AWM 2464 105°C 300V	**NEC** STOW **CEC** STOW FT2	4/16 AWG Bk,Wh,Rd, Gn	4.3 **Ω** PVC	PVC Yellow 11 mm(.435 in)	None	RF50538-*M

Dimensions	Cordset Pinouts (per SAE-J-1738 A)	Station Pinouts (per EN 50 044)
	RSM Male *minifast*® 	RSM Male *minifast*® 
	WSM Male *minifast*® 	WSM Male *minifast*® 
	RKM Female *minifast*® 	RKM Female *minifast*® 
	WKM Female *minifast*® 	WKM Female *minifast*® 

Color Codes	
1. Black (-Voltage) 2. White (E-) 3. Red (+ Voltage) 4. Green (E+)	1. Red (+ Voltage) 2. Green (E+) 3. White (E-) 4. Black (-Voltage)

Turck Power Tees for DeviceNet™ - *minifast*® Connectors

Part Number	Applications
RSM 2RKM 40 	*minifast*® Power Tee • standard keyway
RSM 2RKM 40-KF 	*minifast*® Power Tee • keyway facing female
RSM 2RKM 40-KM 	*minifast*® Power Tee • keyway facing male

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

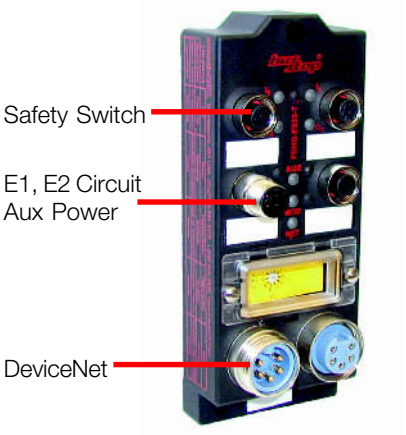
E-*connect*™ Bus Stations

E-*con*nect™ Bus Stations

This *busstop*® station is designed specifically for use with machine safety switches. It provides a convenient way to connect redundant circuits to the machine safety switches using off the shelf cordsets. The station monitors the machine safety switch state. The state of the switch is reported to the PLC via DeviceNet™.

The machine safety switch is connected via an eight pin *eurofast*® connector. Four pins are required to provide redundant safety switch circuits. Two pins are used to monitor the state of the machine safety switch. Two pins are used as an output circuit. This output can be set by the PLC on DeviceNet.

The auxiliary power is connected via four pin *eurofast*® connector. Two of the pins are used to provide external power for the station's input and output circuits. Two of the pins are used to provide redundant safety switch circuits.



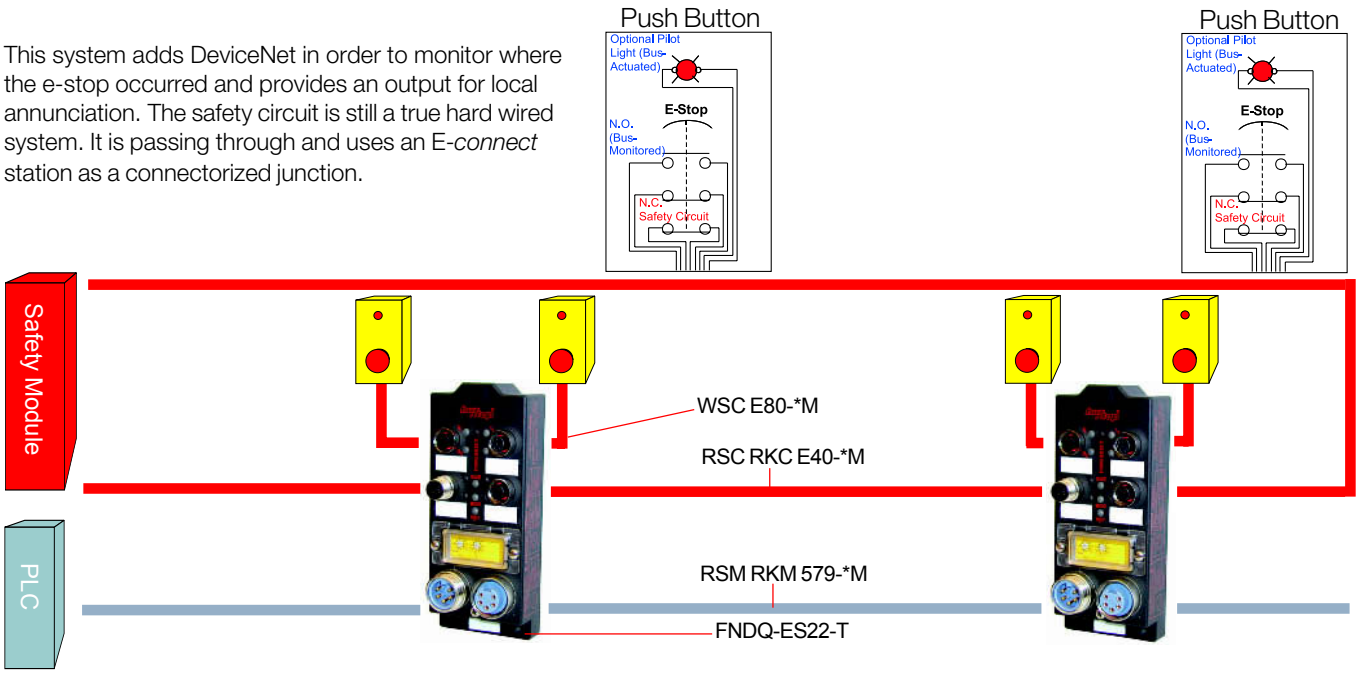
E-*connect* Bus Station

Applications
- For machine safety switches

Features
- DeviceNet PLC monitors the state of the safety switch
- 4 Pin *eurofast*® for quick series connection of E-*connect* station to safety relay module
  - -2-isolated wires for redundant safety circuits
  - -2-wires for auxiliary power for local pilot light annunciation
- 8 Pin *eurofast*® for quick connection to E-Stop devices
  - -4-wires for redundant safety circuit contacts
  - -2-wires for monitoring contacts
  - -2-wires for optional local annunciation controlled via DeviceNet
- 5 Pin *minifast*® DeviceNet connectors
- Less than 50 mA current consumption on DeviceNet power bus
- Visible rotary address switches

Series E-*connect* with Monitoring and Annunciation

This system adds DeviceNet in order to monitor where the e-stop occurred and provides an output for local annunciation. The safety circuit is still a true hard wired system. It is passing through and uses an E-*connect* station as a connectorized junction.



* indicates length in meters.

Supply Voltage	
Bus power	11-26 VDC
Internal current consumption	< 50 mA
Auxiliary power	18-26 VDC
Input Circuits	
Input voltage	18-26 VDC auxiliary powered (optically isolated from bus)
Input signal current	OFF <2mA
	ON 3.0-3.4 mA at 24VDC
Input delay	2.5 ms
Output Circuits	
Output voltage	18-26 VDC auxiliary powered (optically isolated from bus)
Output load current	0.5 A per output
Maximum switching frequency	100 HZ
I/O LED Indications	Off=Off
	Green=On
Module Status LED	Green: working properly
	Flashing green: detecting autobaud rate
Network Status LED	Green: established connection
	Flashing Green: ready for connection
	Flashing red: connection time-out
	Red: connection not possible
Adjustments	Address 0-63 via Rotary Switch

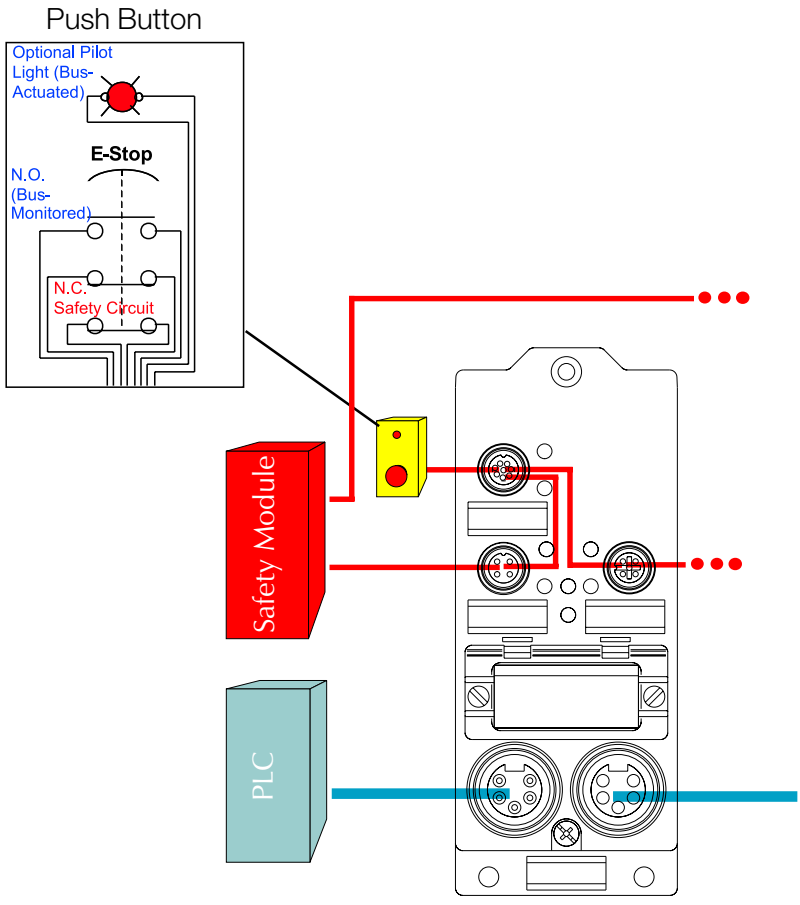
FDNQ-ES11-T

Product Type/Code: 7/2481 (9B1 hex)

I/O Data Map

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

Wiring Configuration



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)

Refer to page 109 for dimensions and specifications.

WARNING!
NEVER bypass or otherwise defeat the protective function of a safety switch. To do so may create an unsafe situation which could lead to serious injury or death.

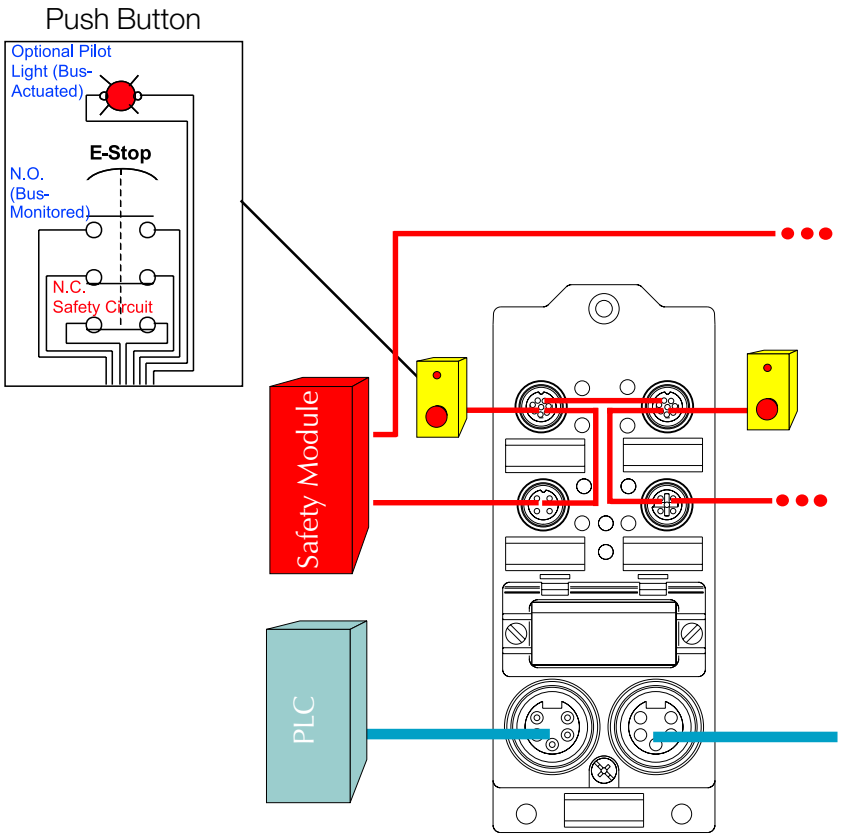
FDNQ-ES22-T

Product Code: 7/2241 (8C1hex)

I/O Data Map

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

Wiring Configuration



Abbreviations

Refer to page 109 for dimensions and specifications.

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)

WARNING!
NEVER bypass or otherwise defeat the protective function of a safety switch. To do so may create an unsafe situation which could lead to serious injury or death.

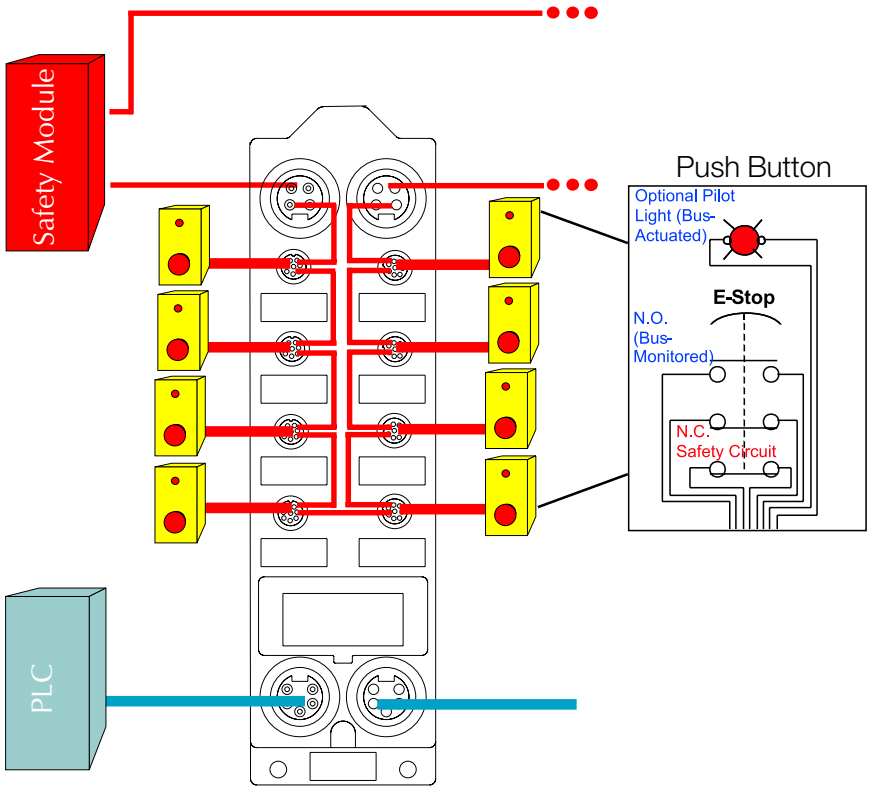
FDNP-ES88-T

Product Code: 7/2513 (9D1hex)

I/O Data Map

	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	-	-	-	-	-	-	-
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

Wiring Configuration



Abbreviations

Refer to page 109 for dimensions and specifications.

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)

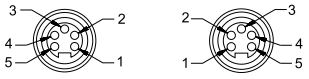
WARNING!
NEVER bypass or otherwise defeat the protective function of a safety switch. To do so may create an unsafe situation which could lead to serious injury or death.

Connectors

DeviceNet

Style: 5-Pin *minifast*®
Cordset: Bus Line use RSM RKM 579- *M
Tee : Bus Line use RSM 2RKM 57

1 = Shield	Bare
2 = V +	Red
3 = V -	Black
4 = CAN_H	White
5 = CAN_L	Blue

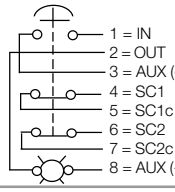


Male Female

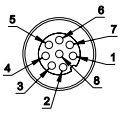
DeviceNet™

E-Stop Push Button-Pilot Light Station

Style: 8-Pin *eurofast*®
Cordset: RSC RKC E80-*M



1 = IN	Black
2 = OUT	White
3 = AUX (+)	Brown
4 = SC1	Red
5 = SC1c	White/Red
6 = SC2	Orange
7 = SC2c	White/Orange
8 = AUX (-)	Blue



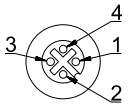
Female

Note: The local pilot light output 2-8 is optional. Monitoring contacts 1-3 are reported back to the controller as true logic (i.e. 0=open, 1=closed). Normally closed monitor contacts in this example can be used but the controller would need to invert the logic.
Refer to http://support.interlinkbt.com/docstart.htm and click "wiring diagrams" for the E-*connect*™ function, pinning, and wire color key.

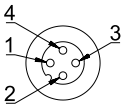
Auxiliary Power, E1 & E2 Circuit

Style: 4-Pin *eurofast*®
Cordset: RSC RKC E40-*M

1= Aux+	Brown
2= SC1	Red
3= SC2	Orange
4= Aux-	Blue



Female



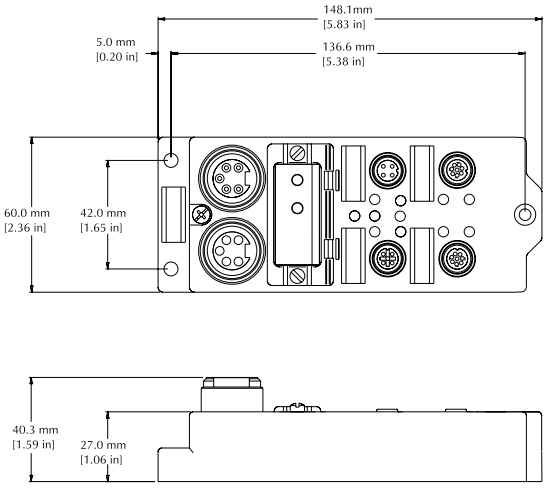
Male

1= Aux+	Brown
2= SC1	Red
3= SC2	Orange
4= Aux-	Blue

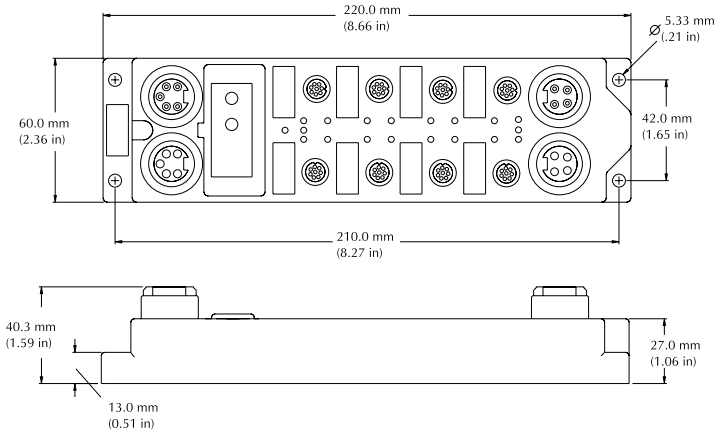
3

Dimensions

FDNQ ES11-T and FDNQ ES22-T Style Housings



FDNP ES88-T Style Housing



Cordset Standard Lengths

Standard lengths of pre-molded cordsets and bulk cable are listed below.

Standard Cable Lengths			
Cordsets		Bulk Cable	
meters	feet	meters	feet
0.3	1.0	30	98
0.5	1.6		
1.0	3.3		
1.5	4.9	75	246
2.0	6.6		
2.5	8.2		
3.0	9.8	150	492
4.0	13		
5.0	16		
6.0	20	225	738
8.0	26		
10	33		
15	49	300	984
20	66		
25	82		
30	98	- - -	- - -
40	131		
50	164		

Other lengths available upon request. Contact the factory at 1-888-546-5880.

Unit Conversions:

1 meter = 3.28 feet
1 meter = 39.8 inches

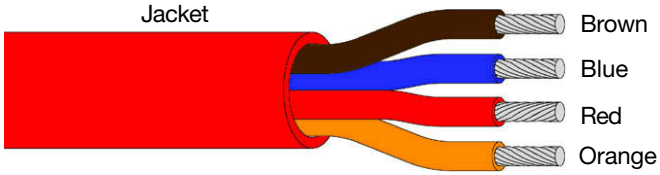
Tolerances:

0-1 meter: +35 / - 0 mm
> 1 m +85/-0 mm or +4% of length which ever is greater

E-*connect*™ Cables and Accessories

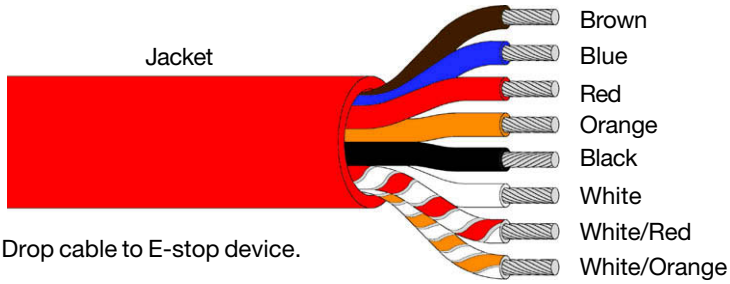
E-*connect*™ Cable Specifications

Figure A



E-line from safety module to field device.

Figure B



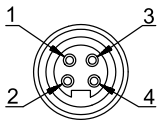
Drop cable to E-stop device.

Type	Approvals	AWG Color Code	DCR (1000 ft) Insulation	Outer Jacket Material Color Nominal O.D.	Bulk Cable†	Figure
E40 AWM2517 105°C300V	**NEC** PLTC/ITC/CL2 **CEC** AWM-I/II A/B FT4	4/18 AWG BN,BU,RD,OR	6.5 ohms PVC	PVC Red 7.2mm (.285")	RB50896-*M	A
E46 AWM2517 105°C300V	**NEC** PLTC/ITC/CL2 **CEC** AWM-I/II A/B FT4	4/16 AWG BN,BU,RD,OR	4.3 ohms PVC	PVC Red 8.4mm (.330")	RB50925-*M	A
E80 AWM2517 105°C300V	**NEC** CL2 **CEC** AWM-I/II A/B FT4	8/24 BN,BU,RD,OR,BK WH,WH/RD,WH/OR	27.7 ohms PVC	PVC Red 5.7mm (.224")	RB50897-*M	B

† See page 110 for standard bulk cable lengths.

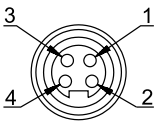
* indicates length in meters.

Pinouts

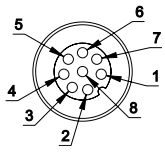


Male *minifast*®

1. Brown (+ AUX)
2. Red (E1L)
3. Orange (E2L)
4. Blue (- AUX)

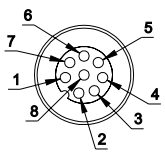


Female *minifast*®



Female *eurofast*®

1. Black (IN)
2. White (OUT)
3. Brown (AUX+)
4. Red (SC1)
5. Wht/Red (SC1c)
6. Orange (SC2)
7. Wht/Org (SC2c)
8. Blue (AUX-)



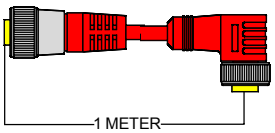
Male *eurofast*®

E-*connect*™ Cordset Matrix

			minifast®				*eurofast*® (E40 and E80 only)			
			Pin (male)		Socket (female)		Pin (male)		Socket (female)	
			RSM	WSM	RKM	WKM	RSC	WSC	RKC	WKC
minifast®	Pin (male)	RSM	RSM RSM Exx - *M							
		WSM	RSM WSM Exx - *M	WSM WSM Exx - *M						
	Socket (female)	RKM	RSM RKM Exx - *M	WSM RKM Exx - *M	RKM RKM Exx - *M					
		WKM	RSM WKM Exx - *M	WSM WKM Exx - *M	RKM WKM Exx - *M	WKM WKM Exx - *M				
eurofast®	Pin (male)	RSC	RSM RSC Exx - *M	WSM RSC Exx - *M	RKM RSC Exx - *M	WKM RSC Exx - *M	RSC RSC Exx - *M			
		WSC	RSM WSC Exx - *M	WSM WSC Exx - *M	RKM WSC Exx - *M	WKM WSC Exx - *M	RSC WSC Exx - *M	WSC WSC Exx - *M		
	Socket (female)	RKC	RSM RKC Exx - *M	WSM RKC Exx - *M	RKM RKC Exx - *M	WKM RKC Exx - *M	RSC RKC Exx - *M	WSC RKC Exx - *M	RKC RKC Exx - *M	
		WKC	RSM WKC Exx - *M	WSM WKC Exx - *M	RKM WKC Exx - *M	WKM WKC Exx - *M	RSC WKC Exx - *M	WSC WKC Exx - *M	RKC WKC Exx - *M	WKC WKC Exx - *M
minifast® *bulkhead*	male	RSFP	RSM RSFP Exx - *M	WSM RSFP Exx - *M	RKM RSFP Exx - *M	WKM RSFP Exx - *M	RSC RSFP Exx - *M	WSC RSFP Exx - *M	RKC RSFP Exx - *M	WKC RSFP Exx - *M
	female	RKFP	RSM RKFP Exx - *M	WSM RKFP Exx - *M	RKM RKFP Exx - *M	WKM RKFP Exx - *M	RSC RKFP Exx - *M	WSC RKFP Exx - *M	RKC RKFP Exx - *M	WKC RKFP Exx - *M
eurofast® bulkhead	male	FSFD	RSM FSFD Exx - *M	WSM FSFD Exx - *M	RKM FSFD Exx - *M	WKM FSFD Exx - *M	RSC FSFD Exx - *M	WSC FSFD Exx - *M	RKC FSFD Exx - *M	WKC FSFD Exx - *M
	female	FKFD	RSM FKFD Exx - *M	WSM FKFD Exx - *M	RKM FKFD Exx - *M	WKM FKFD Exx - *M	RSC FKFD Exx - *M	WSC FKFD Exx - *M	RKC FKFD Exx - *M	WKC FKFD Exx - *M
bare			RSM Exx - *M	WSM Exx - *M	RKM Exx - *M	WKM Exx - *M	RSC Exx - *M	WSC Exx - *M	RKC Exx - *M	WKC Exx - *M

Example

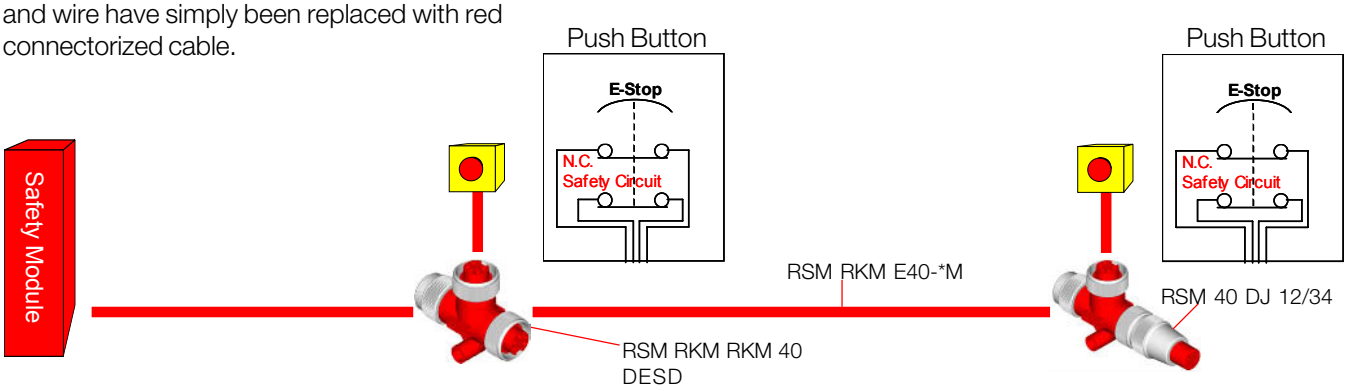
RKM WKM E40 - 1 M



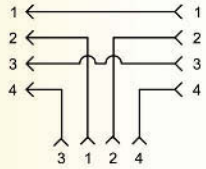
xx indicates cable type.
* indicates length in meters.
Refer to the Cordset Wizard CD (B9034) for assitance with Cordset/Cable combinations.
Standard cable lengths are 0.3, 0.5, 1.0, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0 ,6.0 ,8.0 ,10 ,15....50M. Consult factory for other lengths.

Series E-*connect*™

The series E-*connect* system provides quick, basic e-stop with a total of only seven different components and cabling. The red cables, tees and mini connectors go together quickly and can be maintained easily. The only difference from a standard pipe and wire solution is that it is connectorized. It is still a true hard wired system. The pipe and wire have simply been replaced with red connectorized cable.

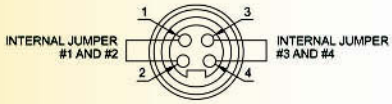


E&M Dual Stop Drop Tee
- provides dual interruption to auxiliary power
- terminate with *minifast*® internal jumper



RSM RKM RKM 40 DESD

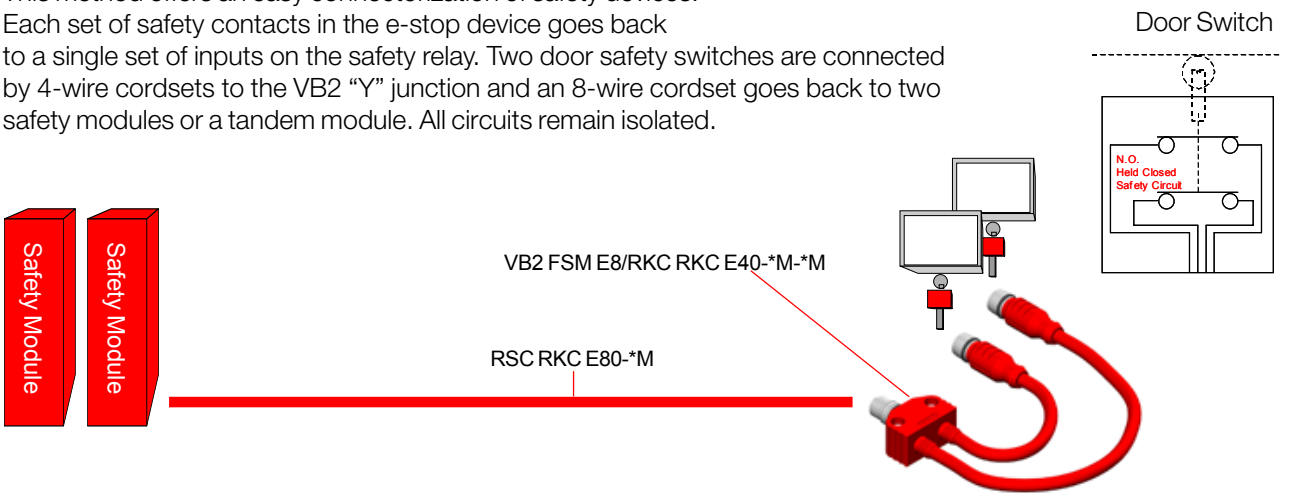
minifast® with Dual Internal Jumper
- internally jumpered to complete dual E & M Stop Circuits



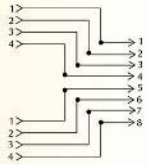
RSM 40 DJ 12/34

Dedicated E-*connect*™

This method offers an easy connectorization of safety devices. Each set of safety contacts in the e-stop device goes back to a single set of inputs on the safety relay. Two door safety switches are connected by 4-wire cordsets to the VB2 "Y" junction and an 8-wire cordset goes back to two safety modules or a tandem module. All circuits remain isolated.



VB2 junction with trunk line
- reduced power and data branch
- maximum 6 meter branch



VB2 FSM E8/RKC RKC E40-*M-*M

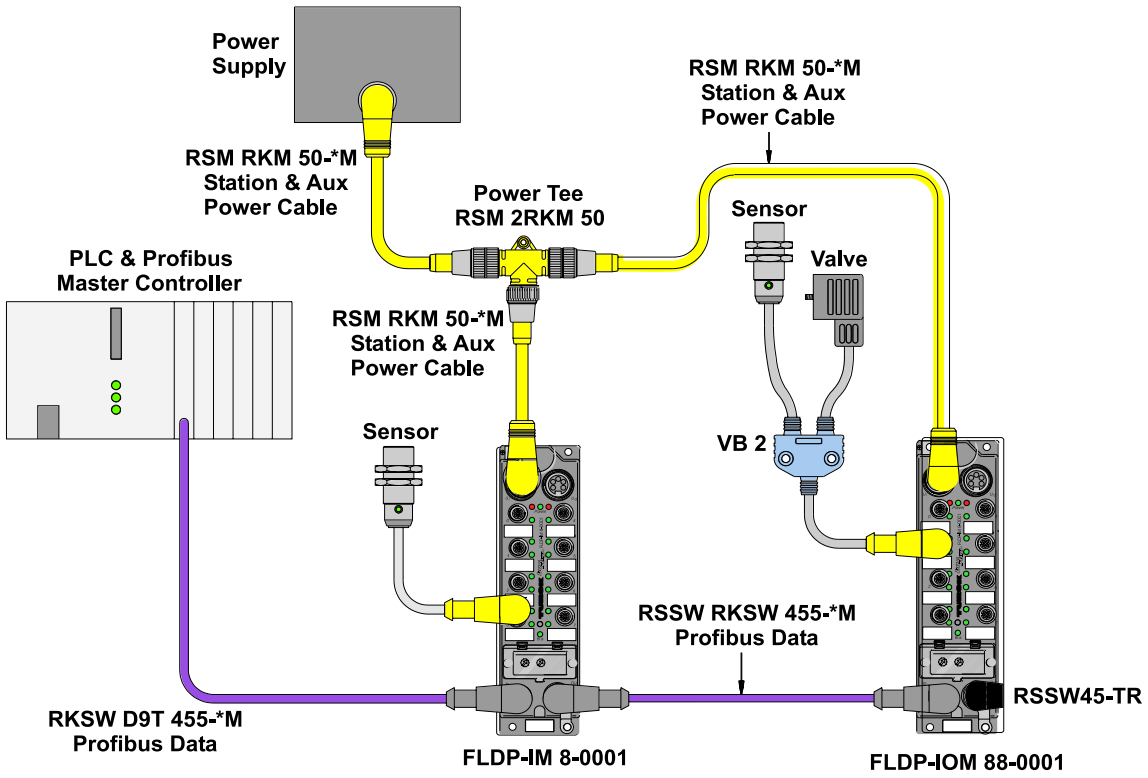
PROFIBUS®-DP Stations

System Description

PROFIBUS®, or “Process Field Bus”, is a standardized, open communication network. It complies with the DIN 19 245 standard and consists of three different protocol profiles:

PROFIBUS®-FMS (Fieldbus Message Specification) is designed to handle the data exchange between PLC’s or PC-based controllers. *Interlink*BT™ stations are designed to support PROFIBUS®DP, not FMS.
PROFIBUS®-PA (Process Automation) is an intrinsically safe network for the process industry. *Interlink*BT I/O stations do not support PA.
PROFIBUS®-DP (Decentral Periphery) is designed to handle the data exchange between PLC’s and their I/O. *Interlink*BT stations support PROFIBUS®-DP.
PROFIBUS®-DP operates as a master slave system. It usually consists of a single Master (PLC) and from 4 to 30 or more slaves (I/O Blocks). When the system is running, the master simply polls each slave in sequence. It is possible to have multiple masters on a network. The masters then share the network by passing a token.
PROFIBUS®-DP uses an industrially proven physical layer based on the RS-485 standard. It is a two-wire differential system that is extremely resistant to electrical interference. At 12 Mbps it’s the fastest in its class.
PROFIBUS®-DP can accommodate a large number of I/O points. With up to 126 addressable nodes, systems may have thousands of analog and digital I/O points per network.
Every PROFIBUS®-DP device has a Device Master File (GSD File) associated with it. This file contains detailed information about the device, including: I/O data size, comm rates supported, revision, etc. To configure a station within a PROFIBUS®-DP system a GSD File for that station is required. GSD files are available at www.interlinkbt.com.
*Interlink*BT stations and cordsets are certified by the Profibus Trade Organization (PTO).

System Configuration



* indicates cable length.

Basic Parts List

For a PROFIBUS®-DP system like the one shown on the previous page the following parts are needed:

Components	Cordsets	
(1) FLDP-IM-8-0001 Input Module	(1) RSSW RKSW 455-2M	PROFIBUS Cordset
(1) FLDP-IOM-88-0001 I/O Module	(1) RKSW D9T 455-2M	PROFIBUS Cordset
	(2) RSSW 45-TR	Terminating Resistor
	(1) RSM-2RKM 50	Power T
	(3) RSM RKM 50-4M	Bus and Auxiliary Power Cable

PLC/Controller Connectivity

A complete network assembled with the corresponding modules, bus cables and terminating resistors from this section can be operated with the following PROFIBUS-DP compatible PLC's and controllers:

-SIEMENS S7/300 and S7/400
-SIEMENS S5 with IM 318 interface module
-ALLEN BRADLEY PLC-5 with 1785-PFB interface module, SLC500 with SST-PFB-SLC interface module
-GE-Fanuc Series 90™-70 with Profibus-DP interface module
-MODICON QUANTUM™
-MITSUBISHI MELSEC-A™ Family
-BOSCH PLC with DESI-DP™ interface module
-S-S TECHNOLOGIES - ISA, PC/104, PCMCIA, MULTIBUS AND VME interface cards.

Cordsets

*Interlink*BT™ offers a complete line of molded PROFIBUS-DP cordsets to facilitate network installation, resulting in faster start-up and reduced wiring errors. The bus cable for the PROFIBUS-DP network is a specially designed shielded, twisted-pair data cable that conforms to the RS-485 standard. It is rated at 12Mbps. The station's bus connector is a shielded, reverse-keyed *eurofast*®.

A 5-pin *minifast*® connector on top of the station provides the connection of 24 VDC power. There are two separate power circuits. The "Bus" circuit powers the station and the attached inputs. The second "Power" circuit powers the outputs. Both power circuits are connected via the same *minifast*® connector. Input and output connections are industry standard 12mm *eurofast*® connectors. Cordsets for PROFIBUS-DP are available in standard and custom lengths.

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 results in a breakdown of the communication network.

Diagnostics

Each station has LED's that provide valuable diagnostic information.

Inputs and outputs have associated LED's to indicate their status.

Communication status is indicated by the red/green "Bus" LED.

Auxiliary power status is indicated by the green "Power" LED.

A detailed description of the LED's is shown in the section titled "LED Indication".

Information on station fault conditions is communicated to the PROFIBUS®-DP master, where it is available for further fault handling by the control program.

Addressing

Although 126 bus components can be on a PROFIBUS-DP network, only addresses 1-99 are available on the *Interlink*BT™ stations.

Station addressing is performed manually. Two decimal rotary switches are located on the station under protective caps. One switch is for the most significant digit, the other for the least.

Addresses must be assigned prior to system start-up.

If multiple stations have the same address during start-up, the PLC or interface module and the affected stations will indicate a communication error.

Communication Rate/Cycle Time

The comm rate configured in the PROFIBUS-DP master determines the system comm rate. This can range from 9.6 kbps to 12Mbps. The comm rate of the *Interlink*BT stations is automatically set. There is no adjustment on the stations. The network is extremely fast. At 12Mbps, typical response times are less than 1 ms per 1000 I/O points. Normally this is insignificant compared with the speed of the control program.

GSD File

GSD Files are located at www.interlinkbt.com.

Maximum Ratings

No more than 32 devices per segment may be used. A segment is the portion between repeaters. If no repeaters are used, the entire network is one segment. Segments must be within specified maximum length at a given comm rate.
No more than 4 repeaters can be used on a network above 500kbps. At 500 kpbs and below up to 7 may be used. The maximum ratings for busline length in one segment and the number of repeaters are shown in the table below.

Communication Rate	Bus segment (length of bus line)	Repeaters (max. number)	Nodes (max. number)
9.6 kbps	1200 m (3942 ft)	7	126
19.2 kbps	1200 m (3942 ft)	7	126
93.75 kbps	1200 m (3942 ft)	7	126
187.5 kbps	1000 m (3285 ft)	7	126
500 kbps	400 m (1314 ft)	7	126
1.5 Mbps	200 m (656 ft)	4	126
12 Mbps	100 m (320 ft)	4	126

LED Indication

Bus LED		
State	**LED is**	**Indication**
Power off	Off	No bus power
Module Operational	Green	Module is operating normally
Bus Fault	Red	No communication

Power LED		
State	**LED is**	**Indication**
Power off	Off	No bus power
Module Operational	Green	Module is operating normally
Bus Fault	Red	No communication

Input LED	
LED is	**Indication**
Off	Input not active
Red	Input fault, short-circuit
Yellow	Input active

Output LED	
LED is	**Indication**
Off	Output not energized
Red	Output fault, short-circuit or overload
Green	Output energized

Quick Selection Guide

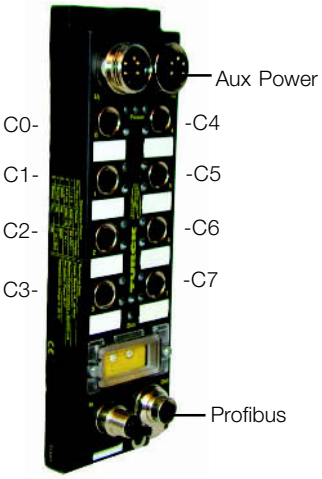
Part Number		Input Parameters					Output Parameters					
FLDP (Compact Flat) Housing (page 121)	Page Numbers	Number of Inputs	Input Type	Inputs per Connector	Compatible with NPN/PNP	Short Circuit * Protection	Number of Outputs	Output Type	Outputs per Connector	Maximum Output Load	Bus or Aux. Power?	Short Circuit * Protection
FLDP-IM-8-0001	122	8	S	1	PNP	G	-	-	-	-	-	-
FLDP-IM-16-0001	122	16	2S	2	PNP	G	-	-	-	-	-	-
FLDP-IM-32-0001	127	32	2S	2	PNP	G	-	-	-	-	-	-
FLDP-IOM-84-0001	123	8	2S	2	PNP	G	4	H	1	2.0A	AUX	I
FLDP-IOM-88-0002-ST	136	8	2S	2	PNP	G	8	2G	2	0.5A	AUX	I
FLDP-IOM-88-0001	123	8	C	1	PNP	G	8	C	1	0.5A	AUX	I
FLDP-IOM-88-0002	124	8	2S	2	PNP	G	8	2G	2	0.5A	AUX	I
FLDP-IOM-88-0004**	124	8	2S	2	PNP	G	8	2G	2	0.5A	AUX	I
FLDP-IOM-1616-0001	128	16	2S	2	PNP	G	16	2G	2	0.5A	AUX	I
FLDP-IOM-2012-0001	131	20	2S	2	PNP	G	12	2G	2	0.5A	AUX	I
FLDP-IOM-248-0001	129	24	2S	2	PNP	G	8	2G	2	0.5A	AUX	I
FLDP-OM-8-0001	125	-	-	-	-	-	8	G	1	0.5A	AUX	I
FLDP-OM-8-0002	125	-	-	-	-	-	8	H	1	2.0A	AUX	I
FLDP-OM-16-0001	125	-	-	-	-	-	16	2G	2	0.5A	AUX	I

* I = Individual G = Group

** High Speed (0.2ms) Inputs

FLDP- Eight Port PROFIBUS®-DP Station

These PROFIBUS stations provide up to 16 I/O connection points, including 8 in, 16 in, 8 in/4 out, 8 in/8 out, 8 out and 16 out.



- Advanced PROFIBUS-DP station

Applications
- For wet or dry environments
- For connecting 24V PNP sensors
- For firing 24V valves, solenoids, or contactors

Features
- Rotary address switch
- Compact size
- 0.5 or 2A outputs

Module Specifications

Electronic / Load supply	18...30 VDC
Internal current consumption	< 110 mA (Input only stations) from V_I (U_b)
	< 150mA (stations with outputs) from V_I (U_b)
Settings	
Address	0...99 (decimal) via 2 rotary switches located under protective cover.
Diagnosis Function	The third switch is used to turn ON/OFF the diagnostic message from a loss of output power.
Input Circuits	PNP 3-wire sensors/2-wire sensors
Input voltage	18...30 VDC from V_I (U_b)
Input current	< 500 mA per 8 inputs, short-circuit protection
Switching threshold OFF/ON	2 mA / 4 mA
Input time delay	2.5 ms
Switching frequency	< 250 Hz
Isolation	to bus
Output Circuits	DC actuators
Output voltage	18...30 VDC from V_O (U_L)
Output current	0.5 A per output, short-circuit protection or
	2.0 A per output, short-circuit protection
Switching frequency	< 250 Hz
Isolation	to bus
LED Indications	
Bus	Green/ Red: normal operation/ no communication
Voltage supply	Green/ Red: proper voltage/under voltage
Input status/output status	Green: I/O ON
Short-circuit indication	Red: short-circuit
Connection	
Electronic and load supply	5-pole 7/8" *minifast*® connector
Bus line	*eurofast*® connector (M 12 x 1), reverse-keyed
Inputs/outputs	*eurofast*® connector (M 12 x 1)
Housing	Glass filled nylon with nickel plated brass connectors
Enclosure	NEMA 1, 3, 4, 12, 13, and IEC IP67
Operating temperature	0° to 55°C (32° to 131°F)

FLDP-Housing, Standard Diagnostics

FLDP-IM-8-0001, 8 PNP Inputs, Group Diagnostic

I/O Data Map

Input data 1 byte

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C7P4	C6P4	C5P4	C4P4	C3P4	C2P4	C1P4	C0P4

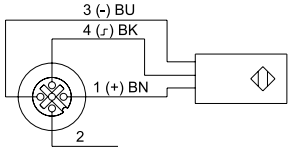
Diagnosis data 1 byte

Status	Bit	7	6	5	4	3	2	1	0
Data	Meaning	-	-	-	-	-	V_I	-	SC

Connectors

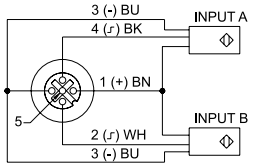
8 Outputs "2S" Type (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors use VBRS 4.4-2RK 4T-*/*



Single Sensor

1 = V_I +
2 = Input B
3 = GND
4 = Input A
5 = PE



Splitter and 2 Sensors

Refer to page 130 for dimensions and PROFIBUS/Auxiliary connectors.

FLDP-IM-16-0001, 16 PNP Inputs, Group Diagnostic

I/O Data Map

Input data byte 1

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C3P2	C3P4	C2P2	C2P4	C1P2	C1P4	C0P2	C0P4

Input data byte 2

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C7P2	C7P4	C6P2	C6P4	C5P2	C5P4	C4P2	C4P4

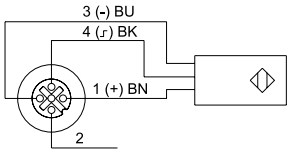
Diagnosis data 1 byte

Status	Bit	7	6	5	4	3	2	1	0
Data	Meaning	-	-	-	-	-	V_I	-	SC

Connectors

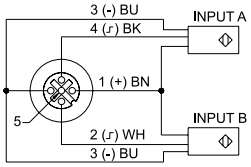
8 Outputs "2S" Type (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors use VBRS 4.4-2RK 4T-*/*



Single Sensor

1 = V_I +
2 = Input B
3 = GND
4 = Input A
5 = PE



Splitter and 2 Sensors

Refer to page 130 for dimensions and PROFIBUS/Auxiliary connectors.

Abbreviations

C1P4 = connector 1, pin 4
C1P2 = connector 1, pin 2
0 = OFF, 1 = ON
SC = common short-circuit indication of inputs, I > 500 mA
V_O = Output, V_O < 18 VDC
V_I = Input and station supply, V_I < 18 VDC

FLDP-IOM-84-0001, 8 Inputs, Group Diagnostic

I/O Data Map

Input data 1 byte

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C3P2	C3P4	C2P2	C2P4	C1P2	C1P4	C0P2	C0P4

Output data 1 byte

Output	Bit	7	6	5	4	3	2	1	0
Data	Meaning	-	C7P4	-	C6P4	-	C5P4	-	C4P4

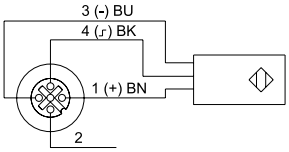
Diagnosis data 1 byte

Status	Bit	7	6	5	4	3	2	1	0
Data	Meaning	-	-	-	-	-	V_I	V_O	SC

Connectors

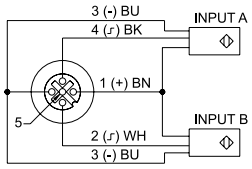
8 Inputs "2S" Type (C0-C3)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors use VBRS 4.4-2RK 4T-*/*



Single Sensor

1 = V_I +
2 = Input B
3 = GND
4 = Input A
5 = PE

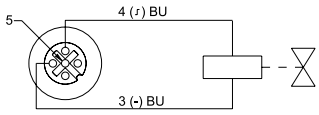


Splitter and 2 Sensors

4 Outputs "H" Type (C4-C7)

Style: 5-Pin *eurofast*®
Cordset: Single Output use RK 4.4T*-RS 4.4T
Field Wireable: Single Output use BS8141-0

1 = N/C
2 = N/C
3 = GND
4 = Output
5 = PE



Single Output

Refer to page 130 for dimensions and PROFIBUS/Auxiliary connectors.

FLDP-IOM-88-0001, 8 Combined Inputs and 0.5A Outputs, Group Diagnostic

I/O Data Map

Input data 1 byte

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C7P4	C6P4	C5P4	C4P4	C3P4	C2P4	C1P4	C0P4

Output data 1 byte

Output	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C7P2	C6P2	C5P2	C4P2	C3P2	C2P2	C1P2	C0P2

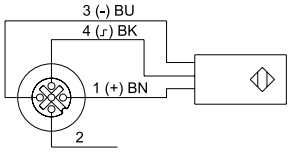
Diagnosis data 1 byte

Status	Bit	7	6	5	4	3	2	1	0
Data	Meaning	-	-	-	-	-	V_I	V_O	SC

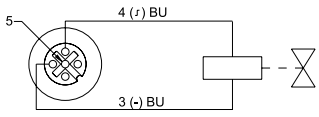
Connectors

8 Combined Inputs/Outpus "C" Type (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: Single Sensors, Outputs or Push Buttons use RK 4.4T-*-RS 4.4T
Splitter: Part Verification Array use VB2-RS 4.4T*/2RK 4.4T-*/*/S651

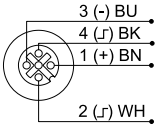


Single Sensor

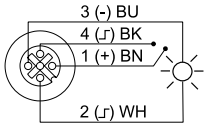


Single Output

1 = V_I +
2 = Output Signal
3 = GND
4 = Input Signal
5 = PE



Part Verification Array



Push Button

Abbreviations

C1P4 = connector 1, pin 4
C1P2 = connector 1, pin 2
0 = OFF, 1 = ON

SC = common short-circuit indication of inputs, I > 500 mA
V_O = Output, V_O < 18 VDC
V_I = Input and station supply, V_I < 18 VDC

Refer to page 130 for dimensions and PROFIBUS/Auxiliary connectors.

FLDP-Housing, Standard Diagnostics

FLDP-IOM-88-0002, 8 Inputs and 8 0.5A Outputs, Group Diagnostic

I/O Data Map

Input data 1 byte

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C3P2	C3P4	C2P2	C2P4	C1P2	C1P4	C0P2	C0P4

Output data 1 byte

Output	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C7P2	C7P4	C6P2	C6P4	C5P2	C5P4	C4P2	C4P4

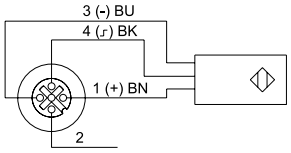
Diagnosis data 1 byte

Status	Bit	7	6	5	4	3	2	1	0
Data	Meaning	-	-	-	-	-	V_I	V_O	SC

Connectors

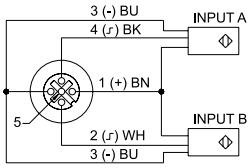
8 Inputs "2S" Type (C0-C3)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors use VBRS 4.4-2RK 4T-*/*



Single Sensor

1 = V_I +
2 = Input B
3 = GND
4 = Input A
5 = PE

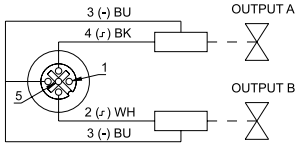


Splitter and 2 Sensors

8 Outputs "2G" Type (C4-C7)

Style: 5-Pin *eurofast*®
Cordset: Dual Output use RK 4.4T-*-RS 4.4T
Splitter: Dual Output or Dual Valve use VB2-RS 4.5T-*/2VAS 22-A528-*/* ("A" Style valve plug, other's available)
Field Wireable: Dual Output use BS8141-0

1 = N/C
2 = Output B (odd numbers)
3 = GND
4 = Output A (even numbers)
5 = PE



Dual Output

Refer to page 130 for dimensions and PROFIBUS/Auxiliary connectors.

FLDP-IOM-88-0004, 8 High Speed Inputs (0.2ms) and 8 0.5A Outputs, Group Diagnostic

I/O Data Map

Input data 1 byte

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C3P2	C3P4	C2P2	C2P4	C1P2	C1P4	C0P2	C0P4

Output data 1 byte

Output	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C7P2	C7P4	C6P2	C6P4	C5P2	C5P4	C4P2	C4P4

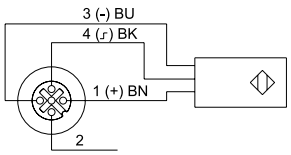
Diagnosis data 1 byte

Status	Bit	7	6	5	4	3	2	1	0
Data	Meaning	-	-	-	-	-	V_I	V_O	SC

Connectors

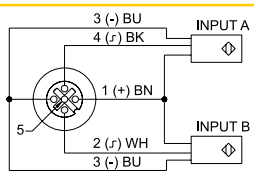
8 Inputs "2S" Type (C0-C3)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors use VBRS 4.4-2RK 4T-*/*



Single Sensor

1 = V_I +
2 = Input B
3 = GND
4 = Input A
5 = PE

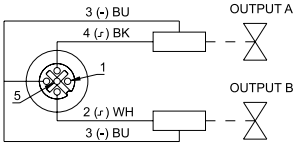


Splitter and 2 Sensors

8 Outputs "2G" Type (C4-C7)

Style: 5-Pin *eurofast*®
Cordset: Dual Output use RK 4.4T-*-RS 4.4T
Splitter: Dual Output or Dual Valve use VB2-RS 4.5T-*/2VAS 22-A528-*/* ("A" Style valve plug, other's available)
Field Wireable: Dual Output use BS8141-0

1 = N/C
2 = Output B (odd numbers)
3 = GND
4 = Output A (even numbers)
5 = PE



Dual Output

Abbreviations

C1P4 = connector 1, pin 4
C1P2 = connector 1, pin 2
0 = OFF, 1 = ON
SC = common short-circuit indication of inputs, I > 500 mA
V_O = Output, V_O < 18 VDC
V_I = Input and station supply, V_I < 18 VDC

Refer to page 130 for dimensions and PROFIBUS/Auxiliary connectors.

FLDP-Housing, Standard Diagnostics

FLDP-OM-8-0001, 8 0.5A Outputs, Group Diagnostic

I/O Data Map

Output data 1 byte

Output	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C7P4	C6P4	C5P4	C4P4	C3P4	C2P4	C1P4	C0P4

Diagnosis data 1 byte

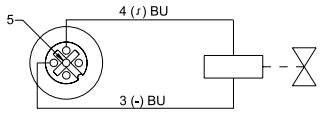
Status	Bit	7	6	5	4	3	2	1	0
Data	Meaning	-	-	-	-	-	V_I	V_O	-

Connectors

8 Outputs "G" Type (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: Single Output use RK 4.4T-*-RS 4.4T
Field Wireable: Single Output use BS8141-0

1 = N/C
2 = N/C
3 = GND
4 = Output
5 = PE



Single Output

Refer to page 130 for dimensions and PROFIBUS/Auxiliary connectors.

FLDP-OM-8-0002, 8 2A Outputs, Group Diagnostic

I/O Data Map

Output data 1 byte

Output	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C7P4	C6P4	C5P4	C4P4	C3P4	C2P4	C1P4	C0P4

Diagnosis data 1 byte

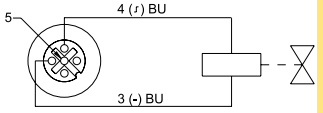
Status	Bit	7	6	5	4	3	2	1	0
Data	Meaning	-	-	-	-	-	V_I	V_O	-

Connectors

8 Outputs 'H" Type (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: Single Output use RK 4.4T-*-RS 4.4T
Field Wireable: Single Output use BS8141-0

1 = N/C
2 = N/C
3 = GND
4 = Output
5 = PE



Single Output

Refer to page 130 for dimensions and PROFIBUS/Auxiliary connectors.

FLDP-OM-16-0001, 16 0.5A Outputs, Group Diagnostic

I/O Data Map

Output data byte 1

Output	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C3P2	C3P4	C2P2	C2P4	C1P2	C1P4	C0P2	C0P4

Output data byte 2

Output	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C7P2	C7P4	C6P2	C6P4	C5P2	C5P4	C4P2	C4P4

Diagnosis data 1 byte

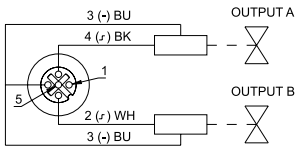
Status	Bit	7	6	5	4	3	2	1	0
Data	Meaning	-	-	-	-	-	V_I	V_O	-

Connectors

16 Outputs "2G" Type (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: Dual Output use RK 4.4T-*-RS 4.4T
Splitter: Dual Output or Dual Valve use
VB2-RS 4.5T-*/2VAS 22-A528-*/* ("A" Style valve plug, other's available)
Field Wireable: Dual Output use BS8141-0

1 = N/C
2 = Output B (odd numbers)
3 = GND
4 = Output A (even numbers)
5 = PE



Dual Output

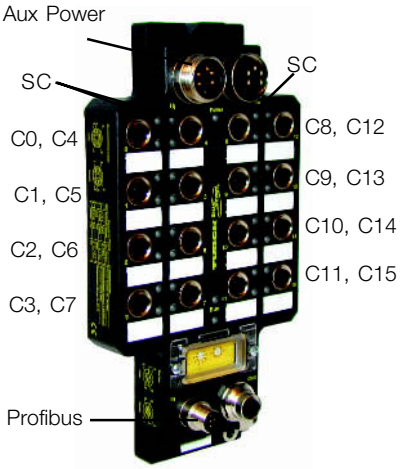
Abbreviations

C1P4 = connector 1, pin 4
C1P2 = connector 1, pin 2
0 = OFF, 1 = ON
SC = common short-circuit indication of inputs, I > 500 mA
V_O = Output, V_O < 18 VDC
V_I = Input and station supply, V_I < 18 VDC

Refer to page 130 for dimensions and PROFIBUS/Auxiliary connectors.

FLDP-Sixteen Port PROFIBUS®-DP Station

These PROFIBUS stations provide up to 32 I/O connection points, including 32 in, 16 in/16 out and 24 in/ 8 out.



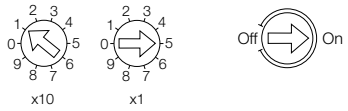
- Advanced PROFIBUS-DP station

Applications
- For wet or dry environments
- For connecting 24V PNP sensors
- For firing 24V valves, solenoids, or contactors

Features
- Rotary address switch
- Compact size
- 0.5 outputs

Module Specifications

Electronic / Load supply	18...30 VDC
Internal current consumption	< 110 mA (Input only stations) from V_I (U_b) < 150mA (stations with outputs) from V_I (U_b)
Settings	
Address	0...99 (decimal) via 2 rotary switches, located under protective cover
Diagnosis Function	The third switch is used to turn ON/OFF the diagnostic message from a loss of output power.



Input Circuits	PNP 3-wire sensors/2-wire sensors
Input voltage	18...30 VDC from V_I (U_b)
Input current	< 500 mA per 8 inputs, short-circuit protection
Switching threshold OFF/ON	2 mA / 4 mA
Input time delay	2.5 ms
Switching frequency	< 250 Hz
Isolation	To bus
Output Circuits	8 DC actuators
Output voltage	18...30 VDC from V_O (U_L)
Output current	0.5 A per output, short-circuit protection or
Switching frequency	< 250 Hz
Isolation	To bus
LED Indications	
Bus	Green/ Red: normal operation/ no communication
Voltage supply	Green/ Red: proper voltage/under voltage
Input status/output status	Green: I/O ON
Short-circuit indication	Red: short-circuit
Connection	
Electronic and load supply	5-pole 7/8" *minifast*® connector
Bus line	*eurofast*® connector (M 12 x 1), reverse-keyed
Inputs/outputs	*eurofast*® connector (M 12 x 1)
Housing	Glass filled nylon with nickel plated brass connectors
Enclosure	NEMA 1, 3, 4, 12, 13, and IEC IP67
Operating temperature	0° to 55°C (32° to 131°F)

FLDP-IM-32-0001, 32 PNP Inputs, Group Diagnostic

I/O Data Map

Input data byte 1

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C3P2	C3P4	C2P2	C2P4	C1P2	C1P4	C0P2	C0P4

Input data byte 2

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C7P2	C7P4	C6P2	C6P4	C5P2	C5P4	C4P2	C4P4

Input data byte 3

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C11P2	C11P4	C10P2	C10P4	C9P2	C9P4	C8P2	C8P4

Input data byte 4

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C15P2	C15P4	C14P2	C14P4	C13P2	C13P4	C12P2	C12P4

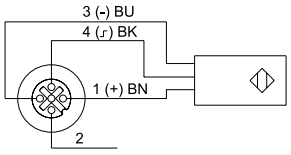
Diagnosis data 1 byte

Status	Bit	7	6	5	4	3	2	1	0
Data	Meaning	-	-	-	-	-	V_I	-	SC

Connectors

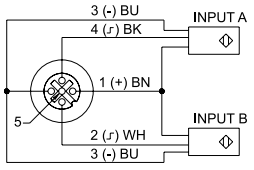
32 Inputs "2S" Type (C0-C15)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors use VBRS 4.4-2RK 4T-*/*



Single Sensor

1 = V_I +
2 = Input B
3 = GND
4 = Input A
5 = PE



Splitter and 2 Sensors

Refer to page 130 for dimensions and PROFIBUS/Auxiliary connectors.

Abbreviations

C1P4 = connector 1, pin 4
C1P2 = connector 1, pin 2
0 = OFF, 1 = ON

SC = common short-circuit indication of inputs, I > 500 mA
V_O = Output, V_O < 18 VDC
V_I = Input and station supply, V_I < 18 VDC

FLDP-IOM-1616-0001, 16 Inputs and 16 0.5A Outputs, Group Diagnostic

I/O Data Map

Input data byte 1

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C3P2	C3P4	C2P2	C2P4	C1P2	C1P4	C0P2	C0P4

Input data byte 2

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C7P2	C7P4	C6P2	C6P4	C5P2	C5P4	C4P2	C4P4

Output data byte 1

Output	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C11P2	C11P4	C10P2	C10P4	C9P2	C9P4	C8P2	C8P4

Output data byte 2

Output	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C15P2	C15P4	C14P2	C14P4	C13P2	C13P4	C12P2	C12P4

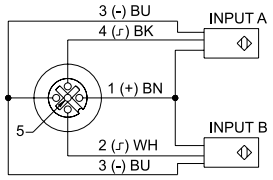
Diagnosis data 1 byte

Status	Bit	7	6	5	4	3	2	1	0
Data	Meaning	-	-	-	-	-	V_I	V_O	SC

Connectors

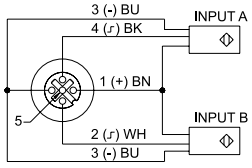
16 Inputs "2S" Type (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors use VBRS 4.4-2RK 4T-*/*



Single Sensor

1 = V_I +
2 = Input B
3 = GND
4 = Input A
5 = PE

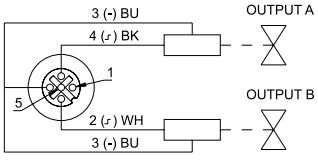


Splitter and 2 Sensors

16 Outputs "2G" Type (C8-C15)

Style: 5-Pin *eurofast*®
Cordset: Dual Output use RK 4.4T-*-RS 4.4T
Splitter: Dual Output or Dual Valve use VB2-RS 4.5T-*/2VAS 22-A528-*/*
("A" Style valve plug, other's available)
Field Wireable: Dual Output use BS8141-0

1 = N/C
2 = Output B (odd numbers)
3 = GND
4 = Output A (even numbers)
5 = PE



Dual Output

Abbreviations

C1P4 = connector 1, pin 4
C1P2 = connector 1, pin 2
0 = OFF, 1 = ON
SC = common short-circuit indication of inputs, I > 500 mA
V_O = Output, V_O < 18 VDC
V_I = Input and station supply, V_I < 18 VDC

Refer to page 130 for dimensions and PROFIBUS/Auxiliary connectors.

FLDP-IOM-248-0001, 24 Inputs and 8 0.5A Outputs, Group Diagnostic

I/O Data Map

Input data byte 1

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C3P2	C3P4	C2P2	C2P4	C1P2	C1P4	C0P2	C0P4

Input data byte 2

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C7P2	C7P4	C6P2	C6P4	C5P2	C5P4	C4P2	C4P4

Input data byte 3

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C11P2	C11P4	C10P2	C10P4	C9P2	C9P4	C8P2	C8P4

Output data 1 byte

Output	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C15P2	C15P4	C14P2	C14P4	C13P2	C13P4	C12P2	C12P4

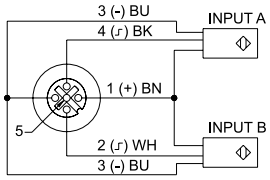
Diagnosis data 1 byte

Status	Bit	7	6	5	4	3	2	1	0
Data	Meaning	-	-	-	-	-	V_I	V_O	SC

Connectors

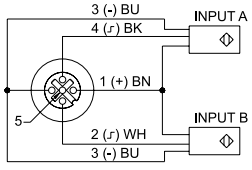
24 Inputs "2S" Type (C0-C11)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use
RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors
use VBRS 4.4-2RK 4T-*/*



Single Sensor

1 = V_I +
2 = Input B
3 = GND
4 = Input A
5 = PE

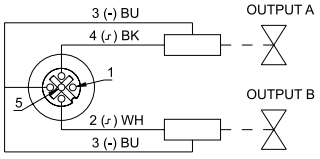


Splitter and 2 Sensors

8 Outputs "2G" Type (C12-C15)

Style: 5-Pin *eurofast*®
Cordset: Dual Output use RK 4.4T-*-RS 4.4T
Splitter: Dual Output or Dual Valve use VB2-RS 4.5T-*/2VAS 22-A528-*/*
("A" Style valve plug, other's available)
Field Wireable:Dual Output use BS8141-0

1 = N/C
2 = Output B (odd numbers)
3 = GND
4 = Output A (even numbers)
5 = PE



Dual Output

Refer to page 130 for dimensions and PROFIBUS/Auxiliary connectors.

Abbreviations

C1P4 = connector 1, pin 4
C1P2 = connector 1, pin 2
0 = OFF, 1 = ON
SC = common short-circuit indication of inputs, I > 500 mA
V_O = Output, V_O < 18 VDC
V_I = Input and station supply, V_I < 18 VDC

Connectors

Auxiliary Power

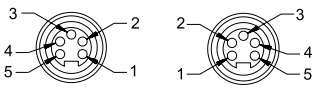
Type "T"

Style: 5-Pin *minifast*®

Cordset: RKM 50-*M, RSM 50-*M

Tee : RSM 2RKM 50

1= GND
2= GND
3= PE
4= VInputs
5= Voutputs



Auxiliary Power

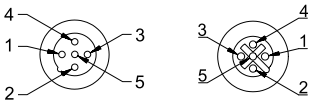
Bus Power

Profibus

Style: 5-Pin *eurofast*®

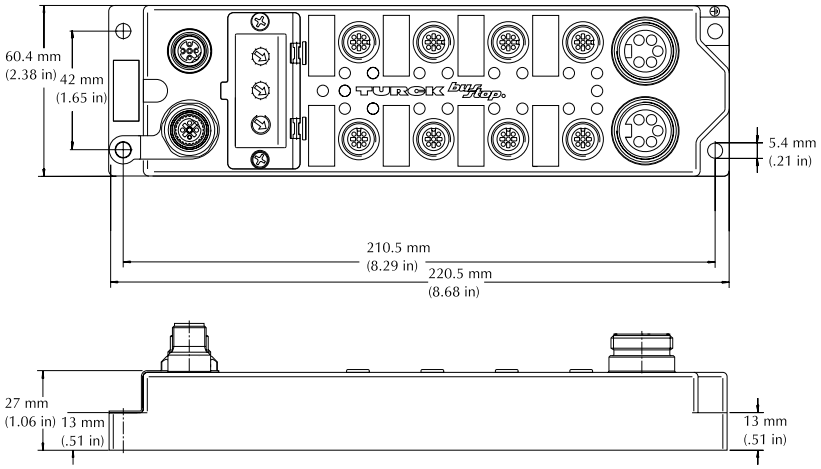
Cordset: Bus Line use RSSW RKSW 456-*M
Tee: Bus Line use RKSW 2RSSW 45

1 = 5 VDC
2 = Bus - A
3 = BUS GND
4 = Bus - B
5 = Shield

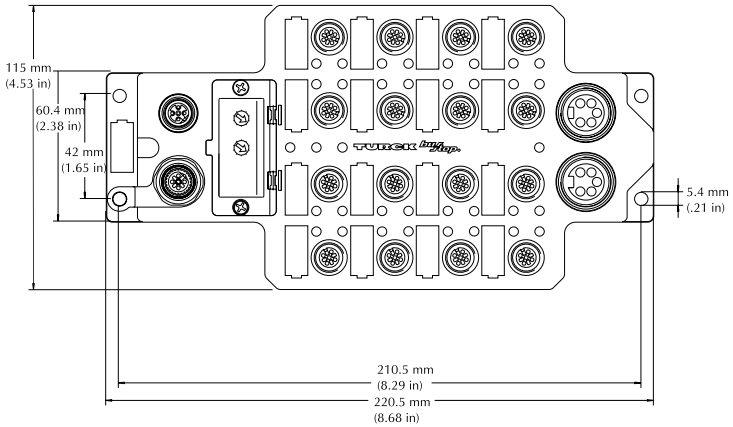


Dimensions

"Eight Connector" Style Housing



"Sixteen Connector" Style Housing



FLDP- Two Port (19-pin) PROFIBUS®-DP Station

The FLDP-IOM2012-0001 *busstop*® station provides a direct connection to PROFIBUS-DP. Up to twenty 3-wire pnp sensors or 2-wire sensors and up to twelve actuators may be connected to the station via two 16-channel passive junction boxes, type VB 80-P7X9-CS12. The junction boxes are connected directly to the station by the 19-pin Burndy connectors. The inputs feature common short-circuit monitoring (in groups of 8/12 inputs). The signal status of the inputs/outputs is indicated by green LEDs. The ON-LINE/OFF-LINE status of the station is signalled by a green/red „Bus“ LED.

The station supports transmission rates of up to 12 Mbd and adjusts automatically to the communication rate determined by the master station. The address of the station is set via two rotary switches located under a protective cover. It can be set from 1 to 99.

The robust station is epoxy-encapsulated and equipped throughout with metal connectors. Connection to PROFIBUS-DP is accomplished with M12 connectors. Power is connected via a 5-pin 7/8" connector. A green „Power“ LED indicates that the station is powered, while a red „Power“ LED signals that the Load voltage is missing.

Recommended connection components

PROFIBUS:	Type:	RSSW-RKSW 456-2M
Power supply:	Type:	RSM RKM 50
Inputs/outputs:	Type:	Round Burndy connector

FLDP-IOM 2012-0001

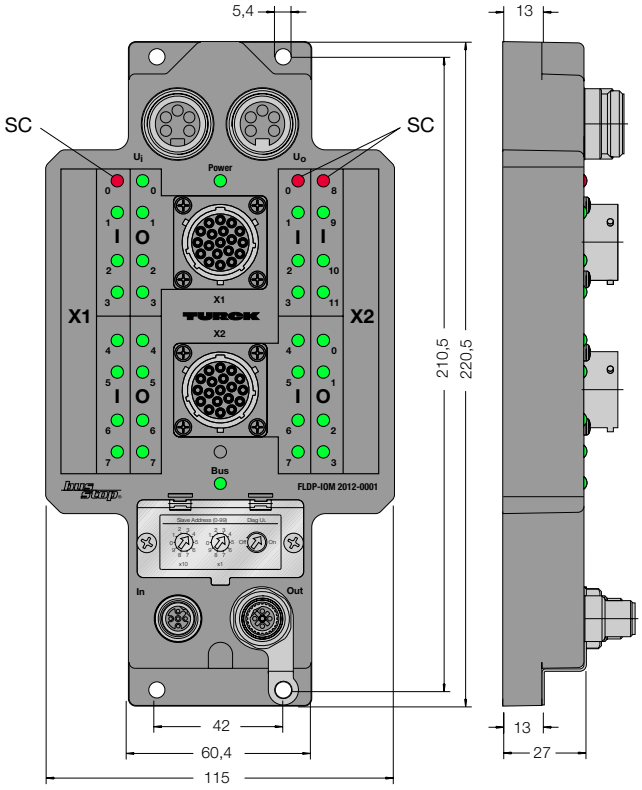
- Robust PROFIBUS-DP station
- 20 x 1 input/12 x 1 output
- Compact flat housing

Applications

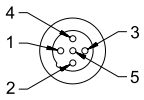
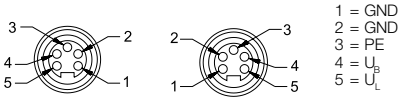
- For conveyor and other field applications
- For connection of twenty 2/3-wire sensors or mechanical contacts
- For connection of twelve actuators, 0.5 A max.

Features

- Common short-circuit monitoring of pnp inputs
- Glass fibre filled plastic housings with encapsulated electronics and nickel-plated brass connectors meet protection degree IP65
- Transmission rate up to 12 MBd
- Load voltage diagnosis can be disabled via coded rotary switch

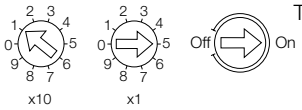


Wiring diagram

Burndy connector	Profibus †	Aux Power
	 1 = 5 VDC †† 2 = Bus - A 3 = GND 4 = Bus - B 5 = Shield	 1 = GND 2 = GND 3 = PE 4 = U_B 5 = U_L
female Burndy connector	male female	male female

†Reverse-keyed according to PTO-guidelines / ††Female bus connector only

Input/Output Module FLDP-IOM 2012-0001
20 Inputs/12 Outputs, DC

Type	FLDP-IOM 2012-0001
Operating/load voltage	18...30 VDC
Internal current consumption	< 110 mA from V_I (U_b)
Settings	
Address	1...99 (decimal) via 2 coded rotary switches under protective transparent cover
Diagnosis function	 The third switch is used to turn ON/OFF the diagnostic message from a loss of output power.
Input Circuits	(20) pnp 3-wire sensors/2-wire sensors
Input voltage/input current	18...30 VDC from V_I (U_b) /< 500 mA per 8/12 inputs, short-circuit protection
Switching threshold OFF / ON	2 mA / 4 mA
Input delay	2.5 ms
Switching frequency	< 250 Hz
Isolation	To bus
Output Circuits	(12) DC actuators
Output voltage/output current	18...30 VDC from V_O (U_L) /0.5 A per output, short-circuit protection
Switching frequency	< 250 Hz
Isolation	To bus
LED Indications	
Bus/Supply voltage	Green/Red: normal operation/no communication; green/red: operating voltage/load voltage missing
Input status/output status	(20) green: input ON/ (12) green: output ON
Common short-circuit indication	LED SC = red (3): short-circuit at one input
Connection	
Operating and load voltage	5-pin 7/8" connector
Bus line/inputs and outputs	M12 x 1 connector, reverse-keyed/2 x 19-pin Burndy connectors

I/O Data Mapping

(Abbreviations/specification X1I7, X1I6, ... see table on page 133)

SC = common short-circuit indication of inputs, I > 500 mA
V_O = load voltage, V_O < 18 VDC
V_I = operating voltage, V_I < 18 VDC

Input data byte 1

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	X1I7	X1I6	X1I5	X1I4	X1I3	X1I2	X1I1	X1I0

Input data byte 2

Input	Bit								
Data	Meaning	X2I7	X2I6	X2I5	X2I4	X2I3	X2I2	X2I1	X2I0

Input data byte 3

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	-	-	-	-	X2I11	X2I10	X2I9	X2I8

Output data byte 4

Output	Bit	7	6	5	4	3	2	1	0
Data	Meaning	X1O7	X1O6	X1O5	X1O4	X1O3	X1O2	X1O1	X1O0

Output data byte 5

Output	Bit	7	6	5	4	3	2	1	0
Data	Meaning	-	-	-	-	X2O3	X2O2	X2O1	X2O0

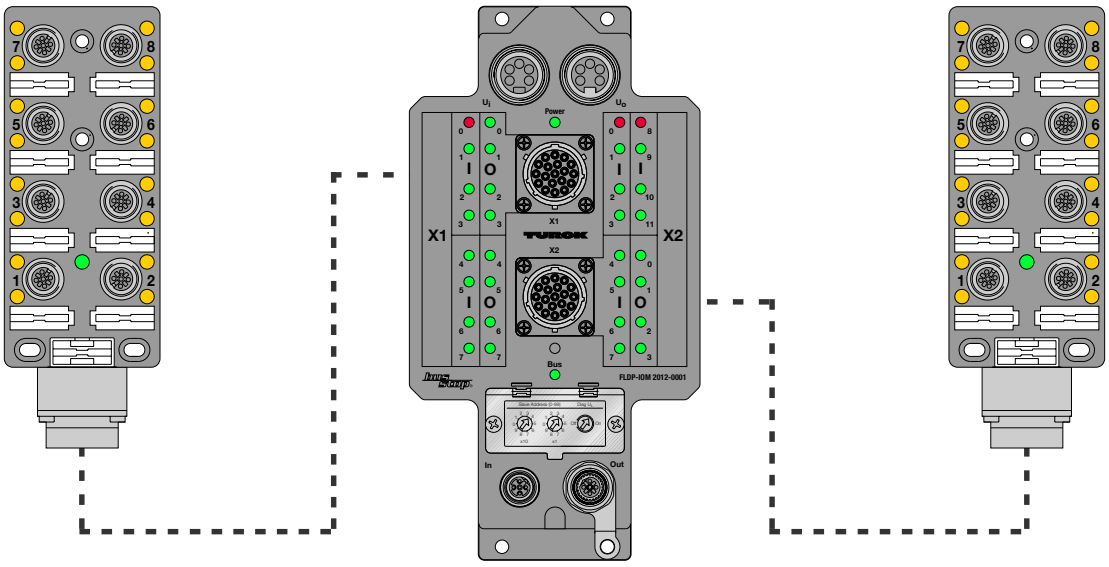
Diagnosis data 1 byte

Status	Bit	7	6	5	4	3	2	1	0
Data	Meaning	-	-	-	-	-	U_I	U_O	SC

Housing	220.5mm x 115mm x 27mm (H x W x D)
Material	PA6-GF30; nickel-plated brass connectors
Mounting	Via 4 through-holes, Ø 5.4 mm
Protection degree (IEC 60529/EN 60529)	IP65 (NEMA 1, 3, 4, 12, 13)
Shock and vibration test	According to DIN EN 60068-2-6/2-27

Input/Output Module FLDP-IOM 2012-0001
20 Inputs/12 Outputs, DC

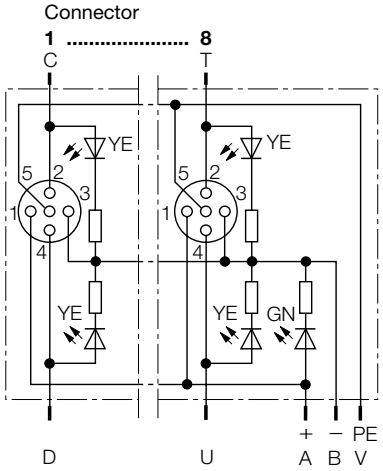
Passive Junction Box VB 80-P7X9-CS12 (X1) **Input/Output Module FLDP-IOM2012** **Passive Junction Box VB 80-P7X9-CS12 (X2)**



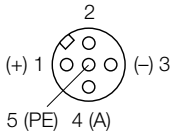
Connections: input/output module FLDP-IOM2012 – junction box VB 80-P7X9-CS12

Burndy	FLDP-IOM2012		VB 80-P7X9-CS12		Input/Output Bytes	
	X1	X2	X1	X2	X1	X2
A	+	+	+	+		
B	-	-	-	-		
S	I0	I0	S7/4	S7/4	I 0.0	I 1.0
R	I1	I1	S7/2	S7/2	I 0.1	I 1.1
M	I2	I2	S5/4	S5/4	I 0.2	I 1.2
L	I3	I3	S5/2	S5/2	I 0.3	I 1.3
H	I4	I4	S3/4	S3/4	I 0.4	I 1.4
G	I5	I5	S3/2	S3/2	I 0.5	I 1.5
D	I6	I6	S1/4	S1/4	I 0.6	I 1.6
C	I7	I7	S1/2	S1/2	I 0.7	I 1.7
U	O0	I8	S8/4	S8/4	O0.0	I 2.0
T	O1	I9	S8/2	S8/2	O0.1	I 2.1
P	O2	I10	S6/4	S6/4	O0.2	I 2.2
N	O3	I11	S6/2	S6/2	O0.3	I 2.3
K	O4	O0	S4/4	S4/4	O0.4	O1.0
J	O5	O1	S4/2	S4/2	O0.5	O1.1
F	O6	O2	S2/4	S2/4	O0.6	O1.2
E	O7	O3	S2/2	S2/2	O0.7	O1.3
V	PE	PE	PE	PE		

Block diagram/pin configuration passive junction box VB 80-P7X9-CS12



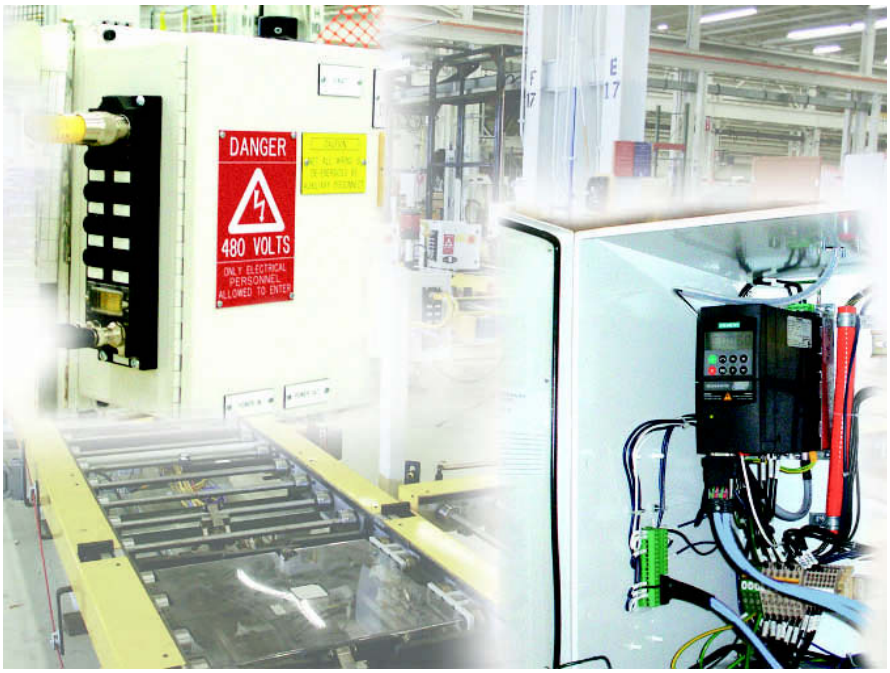
M12 x 1 connector



4

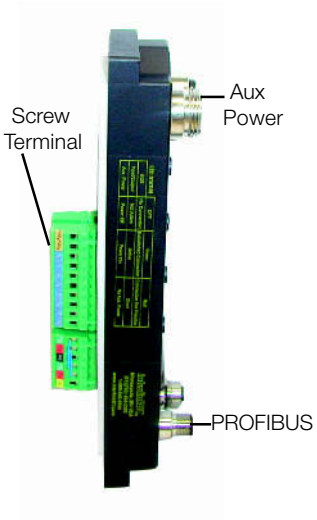
NOTES:

AIM™ “ST” *busstop*® Station for PROFIBUS®-DP



FLDP- “ST” Housing, Standard Diagnostics

The FLDP-IOM 88-0002-ST *busstop*® station is designed to be mounted directly on motor control enclosures. Once mounted, the I/O, power and PROFIBUS® signals are available both inside and outside the enclosure. Inside the enclosure, the signals are accessed via removable screw terminals on the back of the station. Outside the enclosure, the signals are accessed via *eurofast*® or *minifast*® connectors on the front of the station.



Up to eight dry contact inputs and eight contactor outputs in the enclosure can be connected via the screw terminals. If an I/O point is not needed inside the enclosure, it can be connected to three-wire PNP sensors and actuators via the eight *eurofast*® ports on the front of the station. This unprecedented flexibility allows users to have a total of eight inputs and eight outputs, some inside the enclosure and some outside. The rear screw terminals also provide a clean way to get power and PROFIBUS signals inside the cabinet.

All LED’s are on the front of the station. The signal status of the inputs/outputs is indicated by a green LED. The ON-LINE/OFF-LINE status of the station is signaled by a green/red “Bus” LED.

The station supports transmission rates of up to 1.5 Mbaud and adjusts automatically to the communication rate determined by the master station. The address of the station is set via two rotary switches located under a protective cover. It can be set from 0 to 99.

The robust station is epoxy-encapsulated and equipped throughout with metal connectors. Connection PROFIBUS®-DP is accomplished with M12 *eurofast*® connectors. Power is connected via a 5-pole 7/8” *minifast*® connector. Power and PROFIBUS signals are also available inside the enclosure via the screw terminals on the back of the station. A green “Power” LED indicates that the station is powered, while a red “Power” LED signals that the load supply is missing.

GSD files for this station are available at www.interlinkbt.com

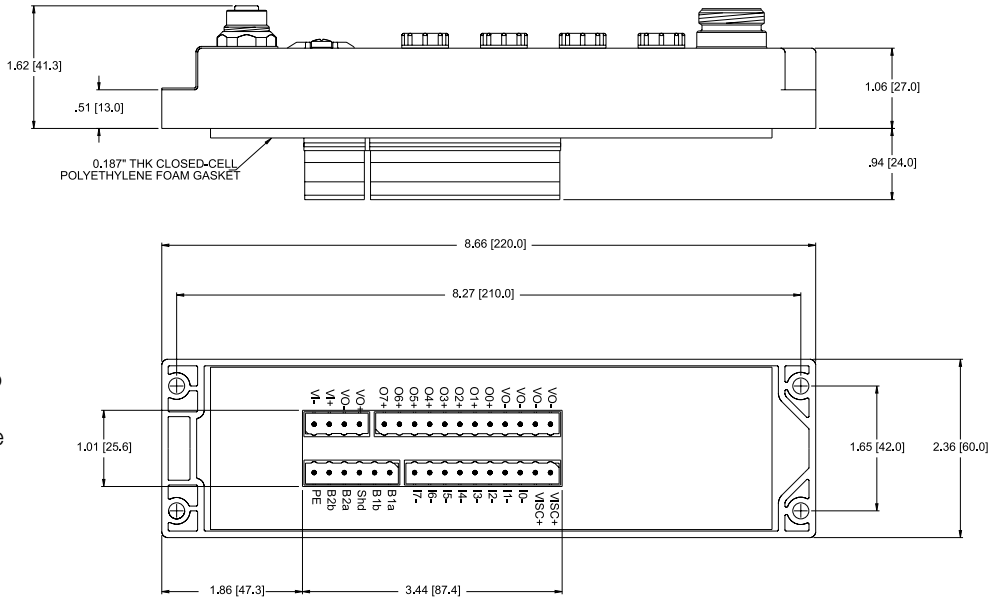
FLDP-IOM-88-0002-ST

- Inside/Outside enclosure PROFIBUS station
- Eight Inputs/Eight Outputs

Applications
- For small motor starter enclosures
- Ideal anywhere small enclosure I/O counts are needed

Features
- Provides I/O, Power and PROFIBUS connections inside the enclosure
- Sensors can be connected directly to the front of the station
- Removable screw terminals inside the enclosure

Dimensions



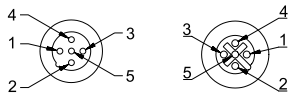
Connectors

Profibus

Style: 5-Pin *eurofast*®

Cordset: Bus Line use RSSW RKSW 456-*M
Tee: Bus Line use RKSW 2RSSW 45

1 = 5 VDC
2 = Bus - A
3 = BUS GND
4 = Bus - B
5 = Shield

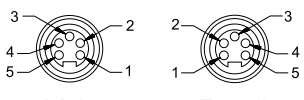


Type “T”

Style: 5-Pin *minifast*®

Cordset: RKM 50-*M, RSM 50-*M
Tee: RSM 2RKM 50

1= GND
2= GND
3= PE
4= V_{Inputs}
5= $V_{outputs}$



Auxiliary Power

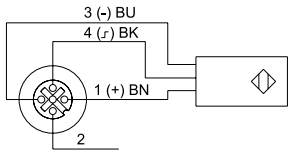
Connectors

Type "2S"

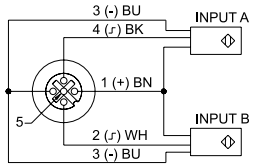
Style: 5-Pin *eurofast*®

Cordset: Single Sensor use
RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors use
VBRS 4.4-2RK 4T-*/*

1 = V_I+
2 = Input B
3 = GND
4 = Input A
5 = PE



Single Sensor



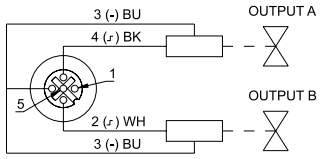
Splitter and 2 Sensors

Type "2G"

Style: 5-Pin *eurofast*®

Cordset: Dual Output use RK 4.4T-*-RS 4.4T
Splitter: Dual Output or Dual Valve use VB2-RS 4.5T-*/2VAS 22-A528-*/*("A" Style valve plug, other's available)
Field Wireable: Dual Output use BS 8141-0

1 = N/C
2 = Output B (odd numbers)
3 = GND
4 = Output A (even numbers)
5 = PE



Dual Output

I/O Data Mapping

Input data 1 byte

Input	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C3P2 I_7	C3P4 I_6	C2P2 I_5	C2P4 I_4	C1P2 I_3	C1P4 I_2	C0P2 I_1	C0P4 I_0

Output data 1 byte

Output	Bit	7	6	5	4	3	2	1	0
Data	Meaning	C7P2 O_7	C7P4 O_6	C6P2 O_5	C6P4 O_4	C5P2 O_3	C5P4 O_2	C4P2 O_1	C4P4 O_0

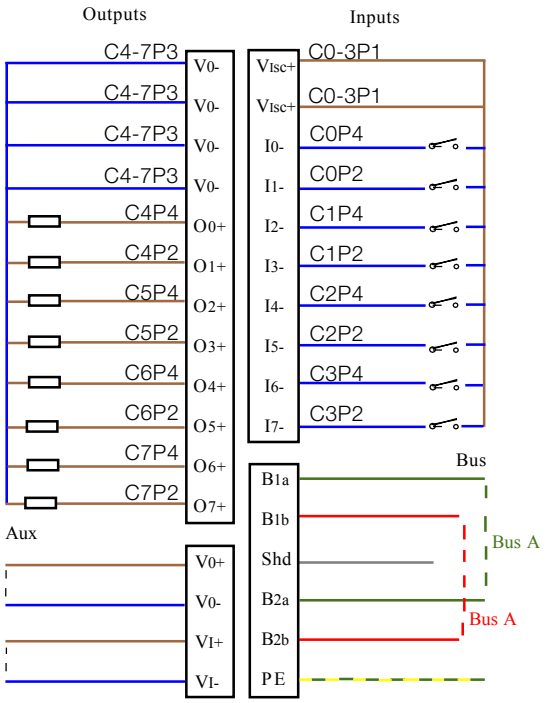
Diagnosis data 1 byte

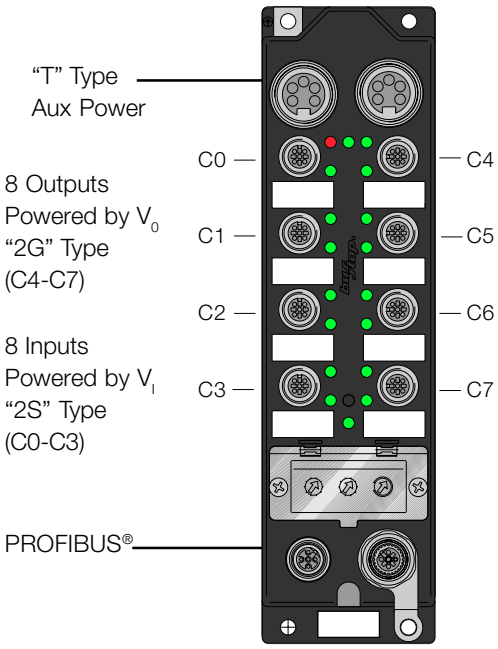
Status	Bit	7	6	5	4	3	2	1	0
Data	Meaning	-	-	-	-	-	V_I	V_O	SC

Abbreviations

0 = OFF, 1=ON
SC = common short-circuit indication of inputs, I > 500 m
V_I = Bus Power, V_I < 18 VDC
V_O = Auxiliary Power, V_O< 18 VDC
C1P4 = connector 1, pin 4

Wiring Diagram





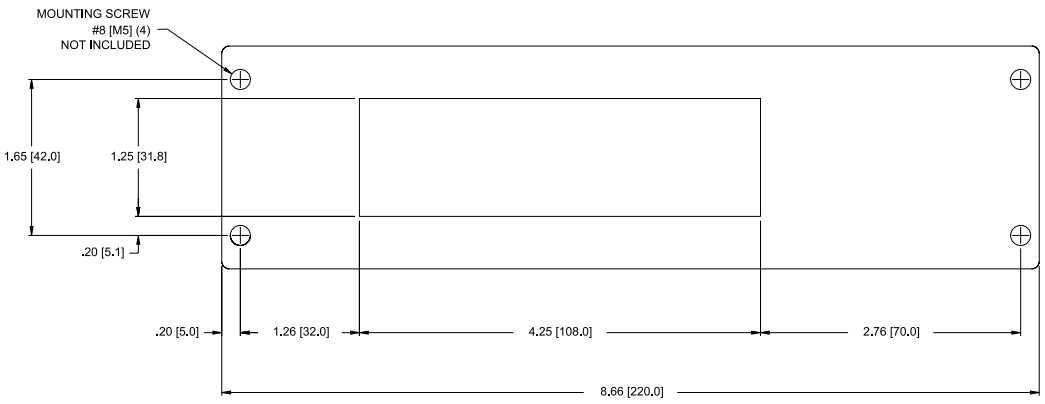
Note: All Screw Terminal I/O points are electrically tied to the *eurofast*® connectors on the front of the station.

Module Specifications

FLDP-IOM-88-0002-ST
Eight Inputs and Eight 0.5A Outputs, Group Diagnostic

Supply Voltage	
Bus power	18-30 VDC
Internal current consumption	< 150mA from V_I (U_b)
Input Circuits	(8) PNP 3-wire sensors or Dry Contacts
Input voltage (V+)	18-30 VDC from V_I (U_b)
Input signal current (Input)	OFF 2mA, ON 4mA
Input short-circuit (V+)	< 500 mA per 8 inputs, short-circuit protection
Input delay	2.5 ms
Switching frequency	< 250 Hz
Isolation	To bus
Output Circuits	(8) DC actuators or Contactors
Output voltage	18-30 VDC from V_o (U_L)
Output load current	0.5 A per output (from bus power), short-circuit protection
Maximum switching frequency	< 250 HZ
Isolation	To bus
I/O LED Indications	
	Off=Off
	Green=On
Module Status LED	
	Green: normal operation
	Red: no communication
Network Status LED	
	Green: normal operation
	Red: load supply missing
Adjustments	
Address	0-99 (decimal) via 2 rotary switches, located under protective cover
Diagnosis function	Disabling of diagnosis function for load supply U_L via third rotary switch
Housing	PA6-GF30; nickel-plated brass connectors
Mounting	via 4 through holes, O 5.4 mm
Enclosure (IEC 60529/EN60529)	NEMA 1,3,4,12,13 and IEC IP 67
Operating temperature	0° to 55°C (32° to 131°F)
Compliances	CSA, CE, PTO

Knock Out Dimensions



REP-DP-0002 PROFIBUS®-DP Repeater

The REP-DP-0002 is a repeater with IP67 protection for PROFIBUS-DP.

Function:
The repeater REP-DP serves to assemble two galvanically isolated PROFIBUS-DP segments in RS-485 technology with 32 participants each. Up to four repeaters can be connected in series so that up to 127 nodes can be operated via a single master. Thus PROFIBUS networks can be extended significantly by using repeaters (depending on the baud rate).

The transmission rate is detected automatically (up to 12 Mbaud). The signals are regenerated in amptitude. If there are faulty protocols in one of the segments, e.g. caused by a wire-break, short-circuit in the bus line or by a defective node, that segment is decoupled and an error indication is provided by the LED.

Connection:
The individual segments are connected via M12 x 1 connectors (see technical guidelines for PROFIBUS connection technology). The repeater is equipped with three female and one male connector. Unused connections must be terminated with a terminating resistor (type: RSSW 45-TR). The shield of the PROFIBUS cable can be grounded directly via a grounding screw (internally the shield is coupled capacitively with the ground). Power (24VDC) is supplied via standard 7/8" connectors.

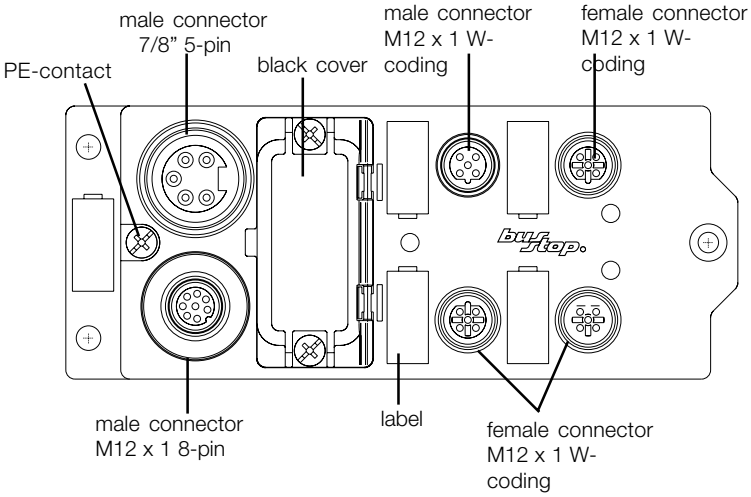
REP-DP-0002

- Robust PROFIBUS-DP repeater
- Two galvanically isolated segments
- Compact flat housing

Applications
- For connection of more than 32 slaves to one master
- For extension of PROFIBUS-DP networks

Special Features
- Galvanically isolated segments
- Fiberglass reinforced plastic housing, IP67 protection, with encapsulated electronics and nickel-plated brass connectors
- Automatic baud rate detection up to 12 Mbaud
- Decoupling of defective segments

Dimensions



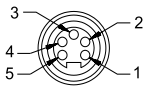
Attention: The 8-pin M12 x 1 connector is the service interface and must always be terminated with the sealing cover supplied.

Connectors

Type "T"

Style: 5-Pin *minifast*®
Cordset: RKM 50-*M, RSM 50-*M
Tee : RSM 2RKM 50

1= GND
2= GND
3= PE
4= V_i
5= -

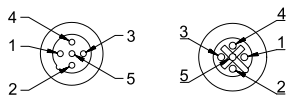


Male
Auxiliary Power

PROFIBUS

Style: 5-Pin *eurofast*®
Cordset: Bus Line use RSSW RKSW 456-*M
Tee : Bus Line use RKSW 2RSSW 45

1 = 5 VDC †
2 = Bus - A
3 = BUS GND
4 = Bus - B
5 = Shield



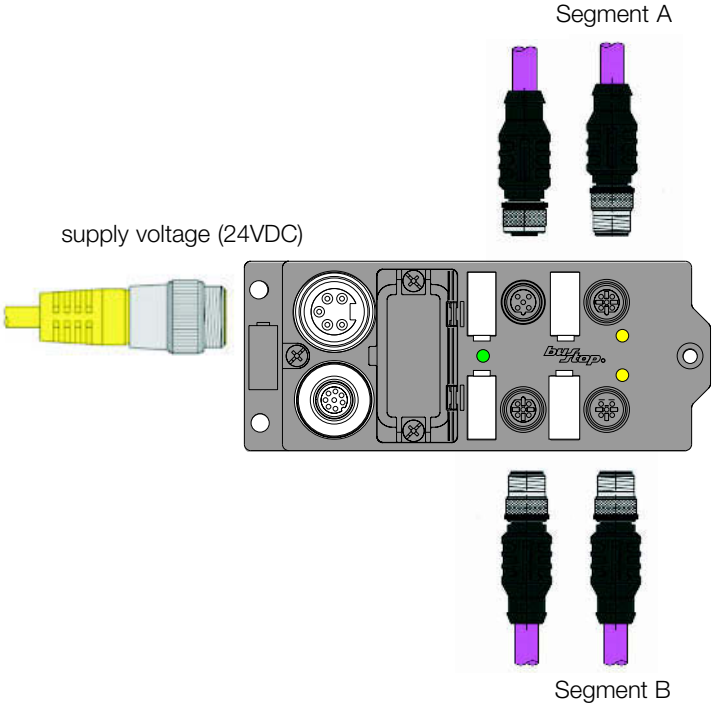
Male Female

† female bus connector only.

Repeater REP-DP-0002

Type	REP-DP-0002
Ident/-No.	M6825354
Supply Voltage	
Voltage	18-30 VDC
Internal current consumption	< 60 mA from V_I (U_b)
Connection	
Power supply	5-pin 7/8" minifast® connector
Bus line	3 *eurofast*® connectors (M 12 x 1), female, reverse-keyed
	1 *eurofast*® connector (M 12 x 1), male, reverse-keyed
Terminating resistor	M12
Features	
Automatic baud rate detection	12 Mbaud
LED indications	
Bus (function) 2 x	Yellow Flashing: communication o.k.
	Red/Off: no communication
Power supply (power on)	Green Flashing: baud rate detection active
	Constant Green: power on
Housing	
Dimensions	148.1 x 60 x 27 (40)mm (h x w x d)(40mm = max. height incl. connector insert)
Material	PA6-GF30; nickel-plated brass connectors
Mounting	Via 3 through-holes, Ø 5.4 mm
Protection degree (IEC 60529/EN 60529)	IP67 (NEMA 1, 3, 4, 12, 13)
Temperature range	0° up to +55°C (+32 °F up to +131°F)

Connection



PROFIBUS®-DP Cables and Accessories

Pre-molded Fieldbus Cables for PROFIBUS®-DP

Standard lengths of pre-molded cordsets and bulk cable are listed below.

Standard Cable Lengths			
Cordsets		Bulk Cable	
meters	feet	meters	feet
0.3	1.0	30	98
0.5	1.6		
1.0	3.3		
1.5	4.9	75	246
2.0	6.6		
2.5	8.2		
3.0	9.8	150	492
4.0	13		
5.0	16		
6.0	20	225	738
8.0	26		
10	33		
15	49	300	984
20	66		
25	82		
30	98	- - -	- - -
40	131		
50	164		

Other lengths available upon request. Contact the factory at 1-888-546-5880.

Unit Conversions:

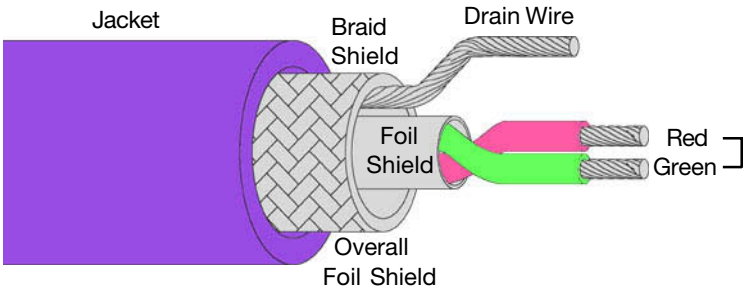
1 meter = 3.28 feet
1 meter = 39.8 inches

Tolerances:

0-1 meter: +35 / - 0 mm
> 1 m +85/-0 mm or +4% of length which ever is greater

PROFIBUS®-DP Cable Specifications

Cable that meets the requirements of EN50170-2-2:1996 for communications up to 12Mbaud.



Baud Rate (k baud)	9.6	19.2	93.75	187.5	500	1500	12000
Maximum Trunk Length	1200m	1200m	1200m	1000m	400m	200m	100m

Type	Approvals	Data Pair		Outer Jacket	Shields	Bulk Cable †
		AWG Color Code	DCR (/1000ft) Insulation	Material Color Nominal O.D.	Type Drain Wire	
455 AWM 2464 75°C 300V	**NEC** PLTC **CEC** AWM-I/II A/B FT4	2/22 AWG Red/Green	16.5 Ω PE	PVC Purple 8.1 mm(0.319 in)	Foil/Braid 22 AWG	RB50672-*M
456 AWM 20233 80°C 300V	**NEC** AWM **CEC** AWM-I/II A/B FT1	2/22 AWG Red/Green	16.5 Ω PE	PUR Purple 8.1 mm(0.319 in)	Foil/Braid 22 AWG	RB50683-*M
457 75°C 100V	**NEC** CMX	2/22 AWG Red/Green	16.5 Ω PE	PUR Purple 8.0 mm(0.315 in)	Foil/Braid No Drain	RB50708-*M
458 AWM 20233 80°C 300V	**NEC** AWM **CEC** AWM-I/II A/B FT1	2/22 AWG Red/Green	16.5 Ω PE	PUR Plum 8.1 mm(0.319 in)	Foil/Braid 22 AWG	RB50692-*M flexlife 10 ††
4511 105°C 300V	**NEC** PLTC **CEC** AWM-I/II A/B FT4	2/22 AWG Red/Green	16.5 Ω PE	PVC Purple 8.1 mm(0.319 in)	Foil/Braid 22 AWG	RB50881-*M flexlife 10 ††
4510A 105°C 300V	**NEC** PLTC **CEC** CM-CMG	2/22 AWG Red/Green	16.5 Ω PE	Aluminum Armor/PVC Purple 14.2 mm (.560 in)	Armor Foil/Braid 22 AWG	RB50875-*M armorfast †††

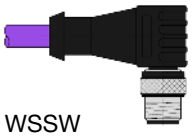
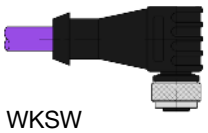
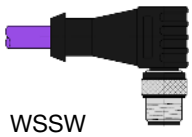
† See page 142 for standard bulk cable lengths.

†† See page 194 for flexlife performance.

††† Armorfast Cable

* indicates length in meters.

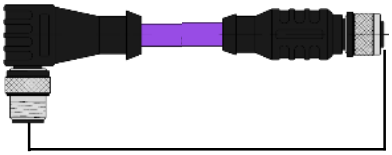
PROFIBUS®-DP Cables, Extensions, *eurofast*®

			eurofast®			
			Pin (Male)		Socket (Female)	
			 RSSW	 WSSW	 RKSW	 WKSW
			RSSW 45x-*M	WSSW 45x-*M	RKSW 45x-*M	WKSW 45x-*M
eurofast®	Pin (Male)	 RSSW	RSSW RSSW 45x-*M	RSSW WSSW 45x-*M	RSSW RKSW 45x-*M	RSSW WKSW 45x-*M
		 WSSW		WSSW WSSW 45x-*M	WSSW RKSW 45x-*M	WSSW WKSW 45x-*M
	Socket (Female)	 RKSW			RKSW RKSW 45x-*M	RKSW WKSW 45x-*M
		 WKSW				WKSW WKSW 45x-*M

x indicates cable type.
* indicates length in meters.
Refer to the Cordset Wizard CD (B9034) for assistance with cordset/cable combinations.
Standard cable lengths are 0.3, 0.5, 1.0, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0 ,6.0 ,8.0 ,10 ,15....50M. Consult factory for other lengths.

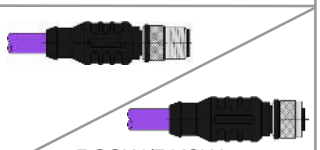
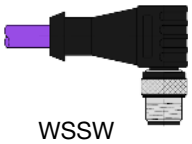
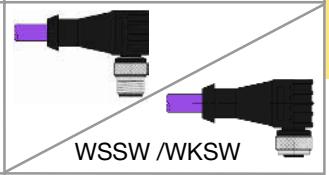
Example

WSSW RKSW 45X- 1M



1 Meter

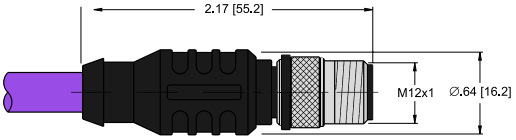
PROFIBUS®-DP Cables, Extensions, eurofast®

			eurofast®		
			Pin (Male)	Socket (Female)	Pin (Male)/Socket (Female)
		Field Wireable	 45x	 RSSW	 RKSW	 RSSW/RKSW
9-Pin Sub D Connector	Terminator	 D9S/T	D9S/T 45x-*M	RSSW D9S/T 45x-*M	RKSW D9S/T 45x-*M	
	Node	 D9S	D9S 45x-*M	RSSW D9S RSSW 45x-*M-*M	RKSW D9S RKSW 45x-*M-*M	RSSW D9S RKSW 45x-*M-*M
	Master	 D9SM/T	D9SM/T 45x-*M	RSSW D9SM/T 45x-*M	RKSW D9SM/T 45x-*M	
	Straight	 SD9S	SD9S 45x-*M	RSSW SD9S RSSW 45x-*M-*M	RKSW SD9S RKSW 45x-*M-*M	RSSW SD9S RKSW 45x-*M-*M
		Field Wireable	45x	 WSSW	 WKSW	 WSSW /WKSW
	Terminator	 D9S/T		WSSW D9S/T 45x-*M	WKSW D9S/T 45x-*M	
	Node	 D9S		WSSW D9S WSSW 45x-*M-*M	WKSW D9S WKSW 45x-*M-*M	WSSW D9S WKSW 45x-*M-*M
	Master	 D9SM/T		WSSW D9SM/T 45x-*M	WKSW D9SM/T 45x-*M	
	Straight	 SD9S		WSSW SD9S WSSW 45x-*M-*M	WKSW SD9S WKSW 45x-*M-*M	WSSW SD9S WKSW 45x-*M-*M

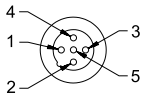
x indicates cable type. * indicates length in meters.

PROFIBUS®-DP Dimensions / Configuration

RSSW

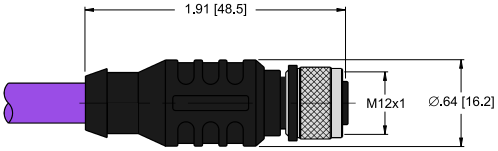


Male

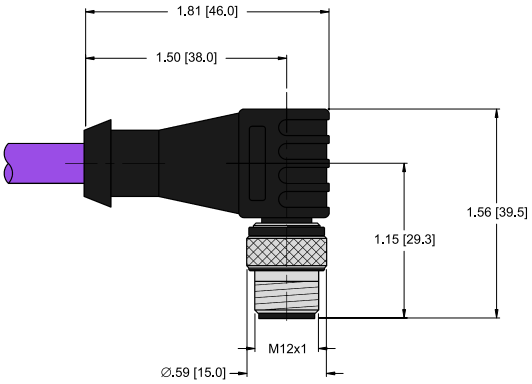


1. N/C
2. Green
3. N/C
4. Red
5. Bare (shield drain)

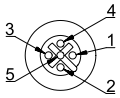
RKSW



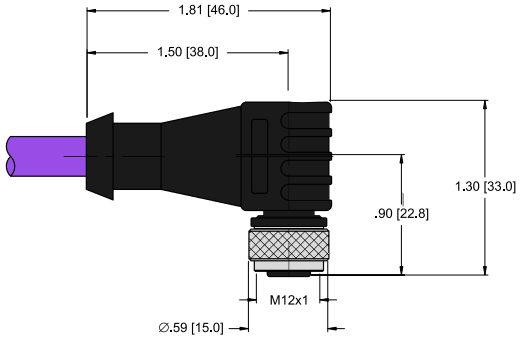
WSSW



Female



WKSW

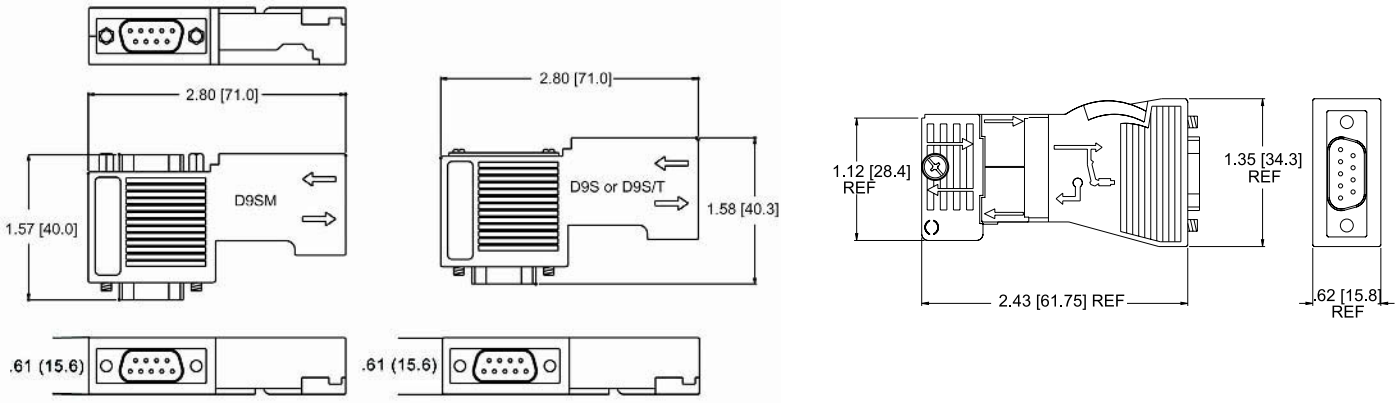


PROFIBUS-DP D9 Sub Connector

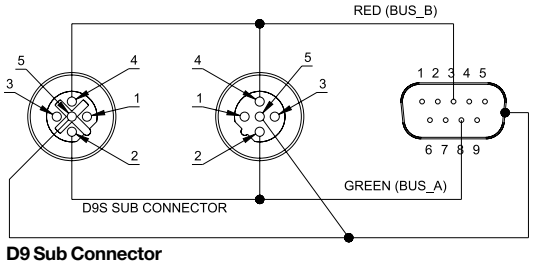
D9SM

D9S or D9S/T

SD9S

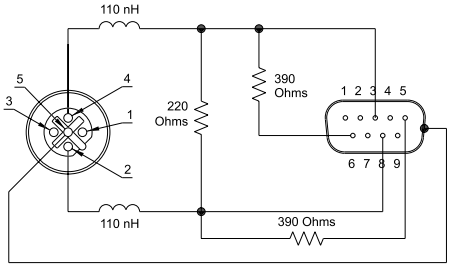


Schematic for RSSW D9S RKSW 45x-*M-*M

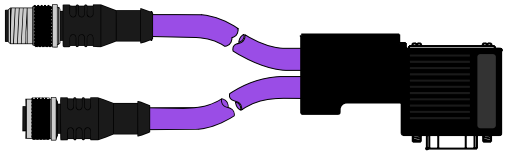


D9 Sub Connector

Schematic for RKSW D9S/T 45x-*M



RSSW D9S RKSW 45x-*M-*M



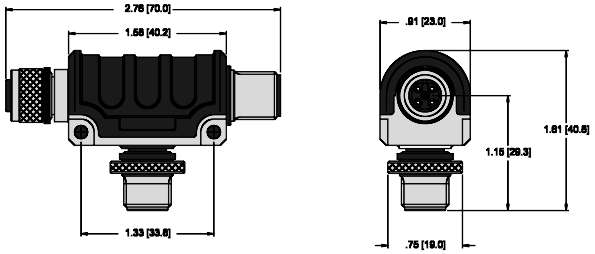
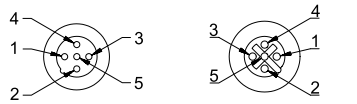
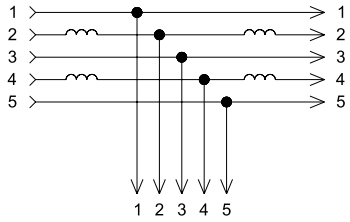
x indicates cable type.
* indicates length in meters.

PROFIBUS®-DP Bus Tees

RKSW 2RSSW 45

fully shielded *eurofast*® tee

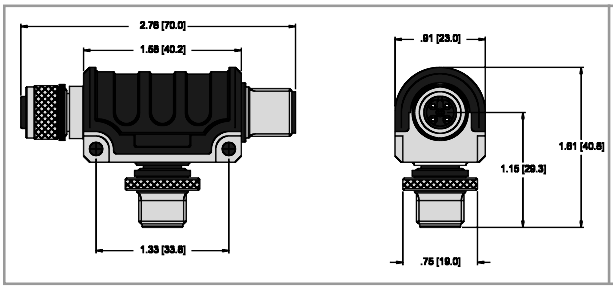
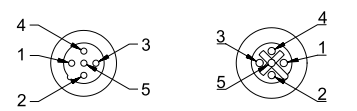
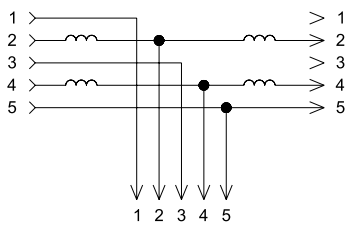
PROFIBUS-DP tee (12 M baud), M 12x1

Dimensions	Pin Configuration	Wiring diagram
		

RKSW 2RSSW 45-0001

fully shielded *eurofast*® tee

PROFIBUS-DP tee (12 M baud), M 12x1

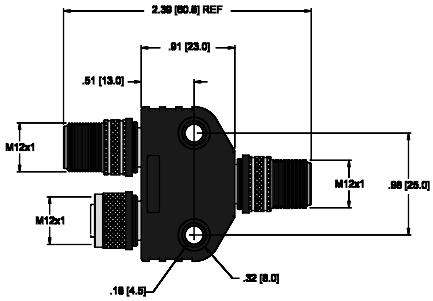
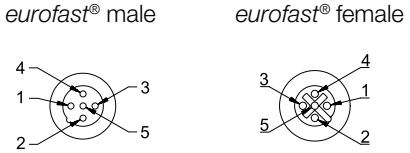
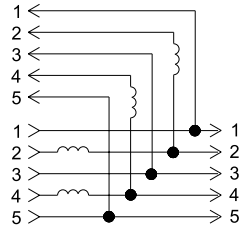
Note: This part must be used when joining two tees together directly. A female terminating resistor will not work with this tee since there is no ground and power connection on the male side.

PROFIBUS-DP Bus Y-junction

VB2/FSW/FKW/FSW 45

fully shielded *eurofast*®

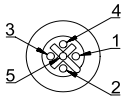
PROFIBUS tee (12MBd), M12x1

Dimensions	Pin configuration	Wiring diagram
		

4

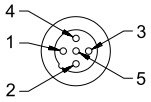
PROFIBUS®-DP -*eurofast*® Field Wireable Connectors

eurofast® female

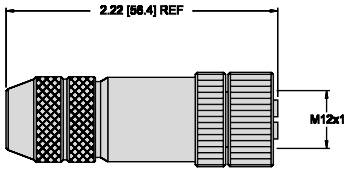
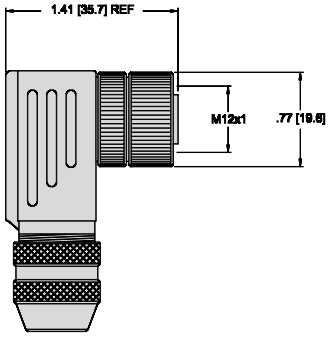
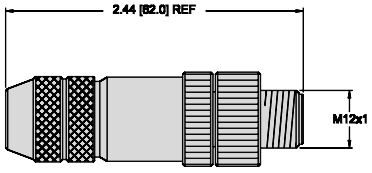
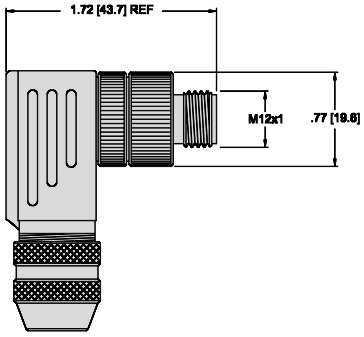


rating: 3 A,
36 VDC

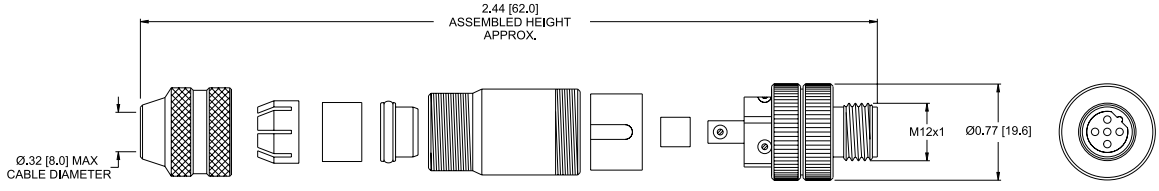
eurofast® male

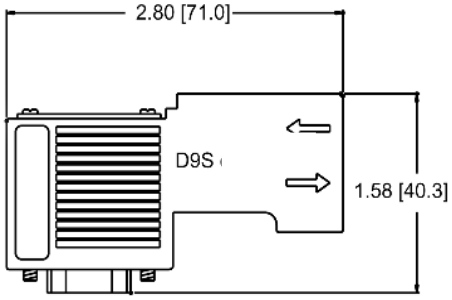
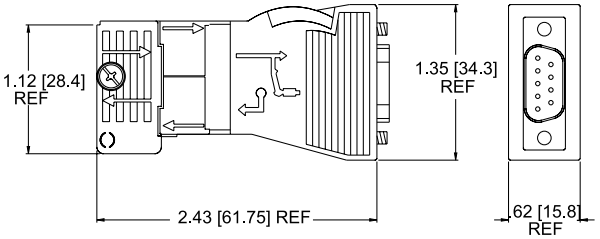
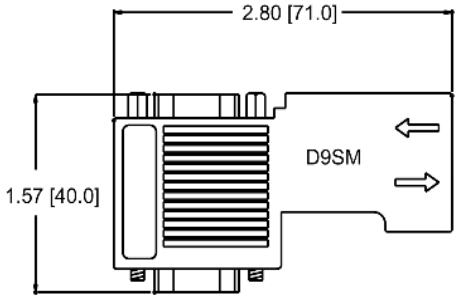


rating: 3 A,
36 VDC

	Straight	Right Angle
Female	**BMWS 8151-0** 	**BMWS 8251-0** 
Male	**BMSWS 8151-0** 	**BMSWS 8251-0** 

Assembly

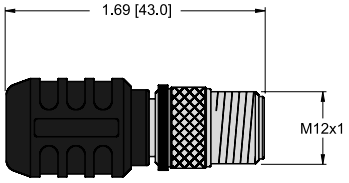
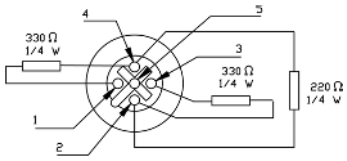
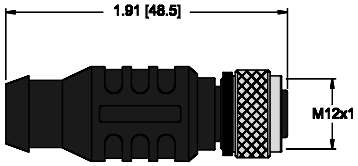
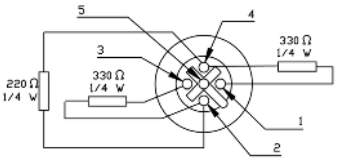


	Right Angle	Straight
Standard	 **Connector-PDP-D9S**	 **Connector-PDP-SD9S**
Master	 **Connector-PDP-D9SM**	

Pinouts

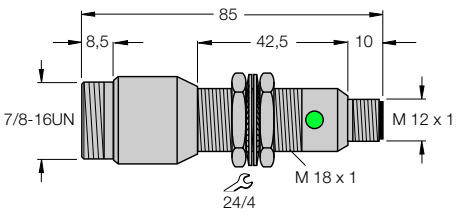
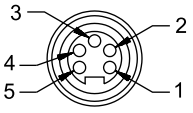
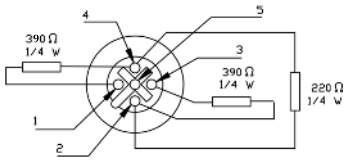
1 - N/C
2 - N/C
3 - Red (Bus_B)
4 - N/C
5 - N/C
6 - N/C
7 - N/C
8 - Green (Bus_A)
9 - N/C

PROFIBUS®-DP Terminating Resistors

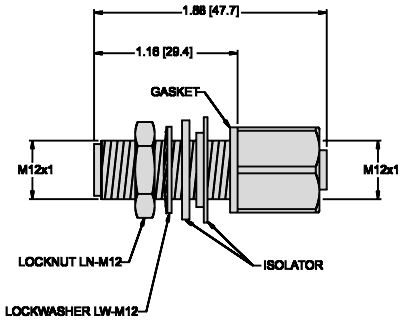
Type	Applications	Wiring diagram/pin configuration
RSSW 45-TR 	*eurofast*® terminating resistor (M 12 x 1) • internal resistor • male *eurofast*® connector • reverse-keyed	 nominal voltage: 50 VDC internal resistance: 330 Ω, 1/4 W (2) 220 Ω, 1/4 W
RKSW 45-TR 	*eurofast*® terminating resistor (M 12 x 1) • internal resistor • female *eurofast*® connector • reverse-keyed	 nominal voltage: 50 VDC internal resistance: 330 Ω, 1/4 W (2) 220 Ω, 1/4 W

PROFIBUS-DP Active Terminating Resistors

The active terminating resistor PDP-TRA is used to terminate a PROFIBUS-DP segment. Due to its external power supply it is possible to connect/disconnect any of the bus occupants without causing interferences on the bus. An LED signals the power status.

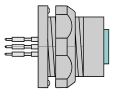
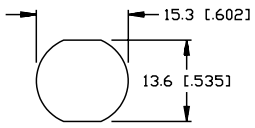
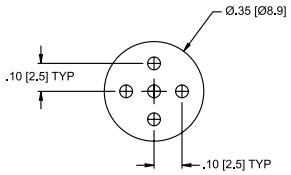
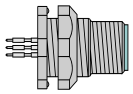
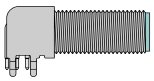
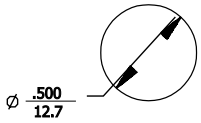
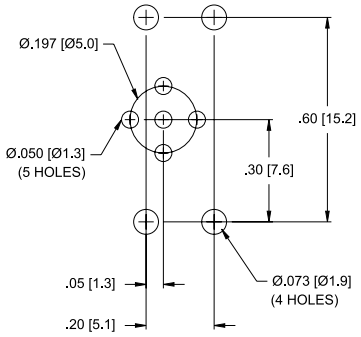
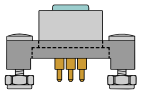
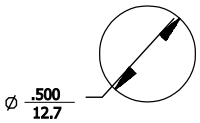
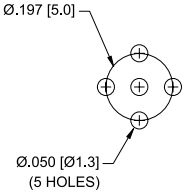
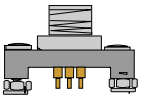
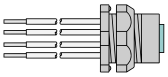
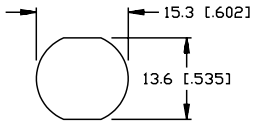
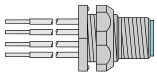
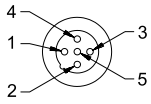
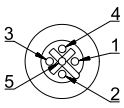
Type	Wiring diagrams	
PDP-TRA 	1. N/C 2. GND 3. N/C 4. U_I = 24 VDC 5. N/C  *minifast*® connector	1. N/C 2. Bus_A 3. N/C 4. Bus_B 5. N/C  *eurofast*® connector nominal voltage: 50 VDC internal resistance: 390 Ω, 1/4 W (2) 220 Ω, 1/4 W

PROFIBUS®-DP – Feed Through Receptacles - type *eurofast*®

Type	Applications	Recommended Panel Cutout
FKW FSW 45/M12 	*eurofast*® feed-through receptacle, M 12 x 1 • straight male/female connector • for premolded, reverse-keyed *eurofast*® cables	0.63 15.9 

4

Circuit Board Connectors and OEM Receptacles

eurofast®		Panel Cut-out	Board Layout (reference only**)
FKFD 45 PCB			
FSFD 45 PCB			
WFS 45 PCB			
FK 45 PCB			
FS 45 PCB			
FKFD 45- *M			
FSFD 45- *M			
Pin Out	Male 	1. N/C 2. Bus_A 3. N/C 4. Bus_B 5. Bare	Female 

* indicates length in meters.
** consult source drawing for board layout.
Refer to page 142 for standard cable lengths.

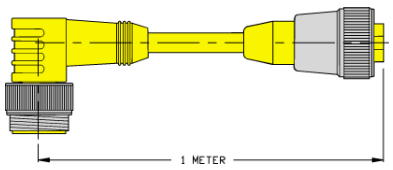
Turck Power Cordsets for PROFIBUS®-DP-*minifast*® Connectors and Tees

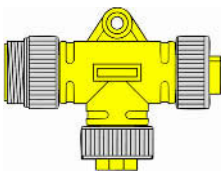
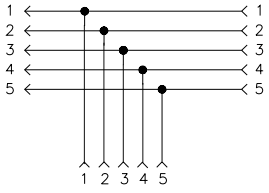
			minifast® Pin (Male)		*minifast*® Socket (Female)	
			 RSM	 WSM	 RKM	 WKM
			RSM 50-*M	WSM 50-*M	RKM 50-*M	WKM 50-*M
minifast®	Pin (Male)	 RSM	RSM RSM 50-*M	RSM WSM 50-*M	RSM RKM 50-*M	RSM WKM 50-*M
		 WSM		WSM WSM 50-*M	WSM RKM 50-*M	WSM WKM 50-*M
	Socket (Female)	 RKM			RKM RKM 50-*M	RKM WKM 50-*M
		 WKM				WKM WKM 50-*M

For stainless steel coupling nuts: Change part number (RSM.... to RSV....).

Example

WSM RKM 50-1M



Part Number	Applications	Schematic
RSM 2RKM 50 	*minifast*® Power Tee	

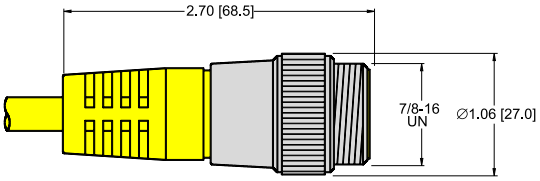
For stainless steel coupling nuts: Change part number (RSM 2RKM.. to RSV 2RKV..).

Specifications for PROFIBUS®-DP Systems

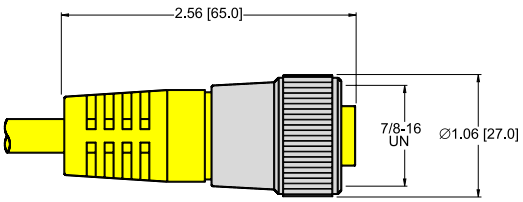
Cable Type	Approvals	Power Pair		Outer Jacket	Shields	Bulk Cable
		AWG Color Code	DCR (/1000 ft) Insulation	Material Color Nominal O.D.	Type Drain Wire	
50 AWM 2517 105°C 300V	**NEC** AWM **CEC** AWM FT1	5/18 AWG Bk,Bu, Gn/Ye,Bn, Wh	6.9 **Ω** PVC	PVC Yellow 7.2 mm(.285 in)	None	RF50549-*M

Dimensions

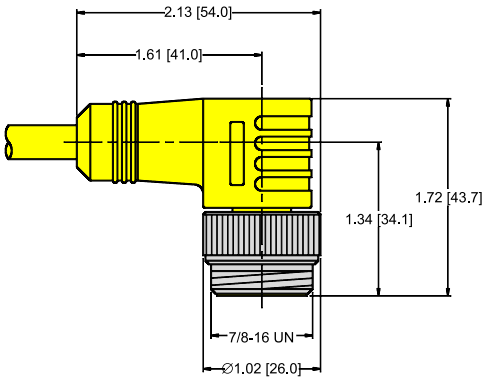
RSM



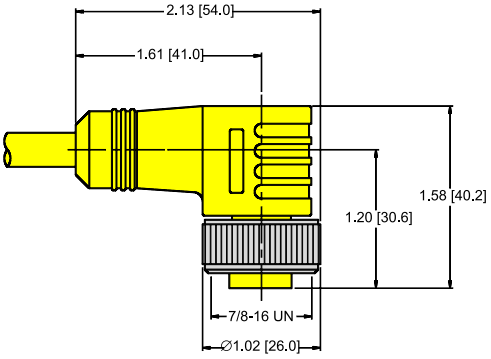
RKM



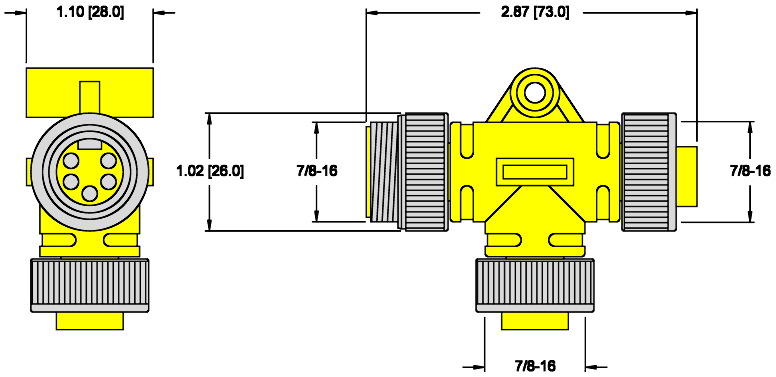
WSM



WKM

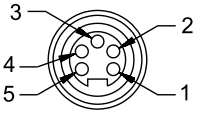


RSM 2RKM 50



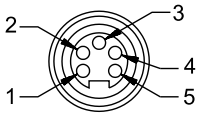
Pinouts

Male *minifast*®



1. Black
2. Blue
3. Green/Yellow
4. Brown
5. White

Female *minifast*®



Ethernet AIM™ Stations, Switches, and Accessories

System Description

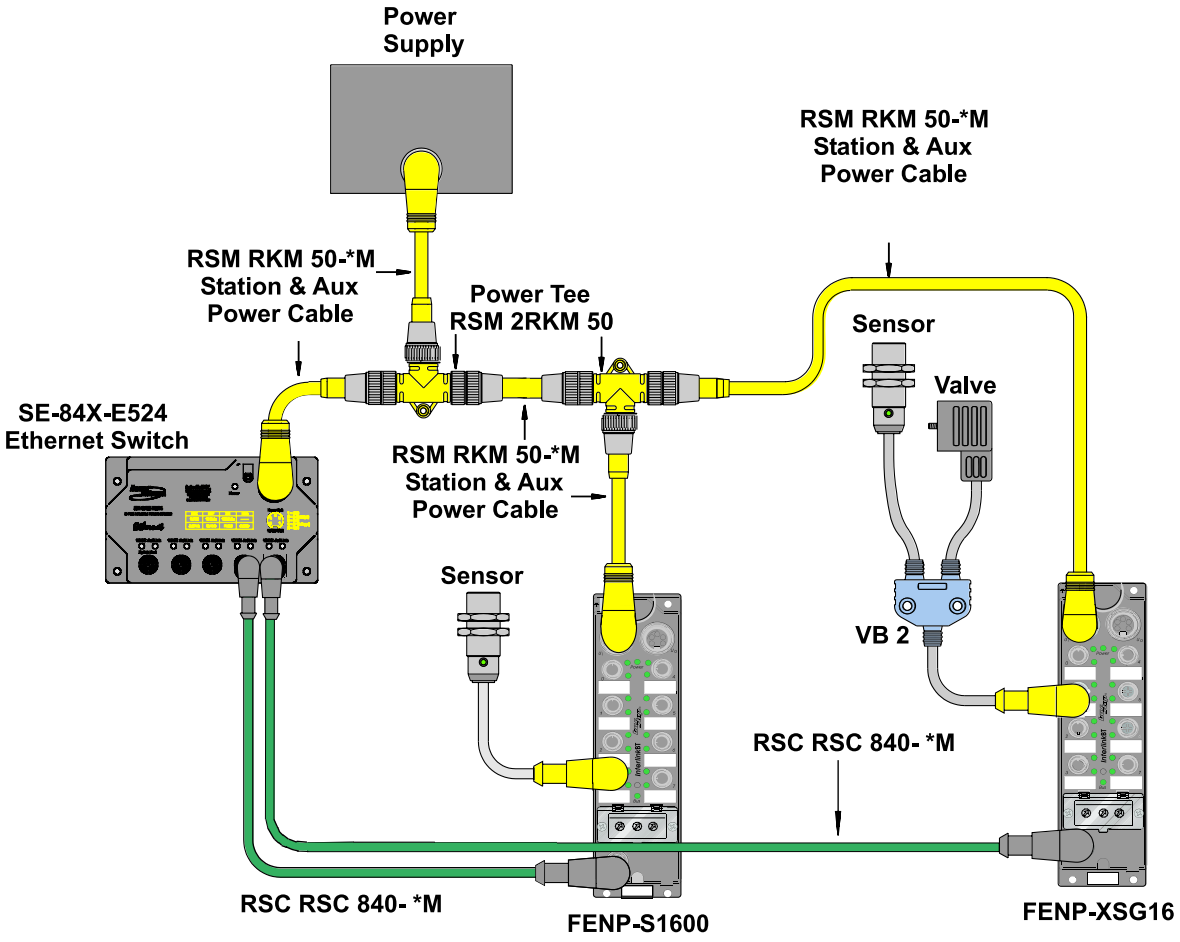
Ethernet is the most popular way to connect office computers and peripherals today. Because of its popularity, it is increasingly finding its way into other applications. It is rapidly becoming the network of choice for higher level industrial control applications. Ethernet is used primarily to connect PLC's, Computers, Flat panel displays, and other high level components. FEN series Ethernet stations provide a convenient way to connect I/O directly to the Ethernet network.

Station Configuration using Microsoft Internet Explorer or Netscape

FEN stations can be configured or monitored using standard web browser software. Simply type IP address of the station into the web browser's address box and an interactive website is displayed. This web page will allow you to:

-Monitor inputs
-Monitor Diagnostic data
-Set outputs
-Upload/Download device configuration

System Configuration



*indicates cable length.

Basic Parts List

For an Ethernet system like the one show on the previous page the followoing parts are needed:

Components		Cordsets	
(1) SE-84X-E524	Ethernet Switch	(5) RSM RKM 50-*M	Bus and Auxiliary Power Cable
(1) FENP-S1600	Input Module	(2) RSM 2RKM 50	Power T
(1) FENP-XSG16	Universal Input or Output Module	(2) RSC RSC 840-*M	Ethernet Cordsets

Maximum Ratings

FEN series stations communicate at 10 or 100M baud, half or full duplex. Ethernet cables can be up to 100 Meters each.

Internet Protocol (IP) Addressing

Using DHCP
If the leftmost rotary switch is set to DHCP, then the DHCP server on the network will set the IP Address, Netmask and Default Gateway automatically. The last two rotary switches will be ignored.

Addressing using rotary switches
If the rotary switches are set from 2-254 then the switches are used to define the last byte of the IP Address. The first 3 bytes of the IP Address, the Netmask and the Default Gateway are read from non volatile memory. These will either be the default values or the last values written with a DHCP server.

To reset the address to the factory defaults
Set all 3 switches to zero, then power up the station. All of the address parameters will be reset to the following:

IP Address:	192.168.0.0
Netmask:	255.255.255.0
Default Gateway:	192.168.0.1

Quick Selection Guide

Part Number		Input Parameters					Output Parameters				
	Page Numbers	Number of Inputs	Input Type	Inputs per Connector	Compatible with NPN/PNP	Short Circuit * Protection	Number of Outputs	Output Type	Outputs per Connector	Maximum Output Load	Short Circuit * Protection
FENP-S0800	161	8	S	1	PNP	G	-	-	-	-	-
FENP-S1600	161	16	2S	2	PNP	G	-	-	-	-	-
FENP-S0808G	162	8	2S	2	PNP	G	8	2G	2	0.5A	I
FENP-XSG16	163	16	2X	2	PNP	G	16	2X	2	0.5A	I
FENP-S0008G	164	-	-	-	-	-	8	G	1	0.5A	I

* I = Individual G = Group

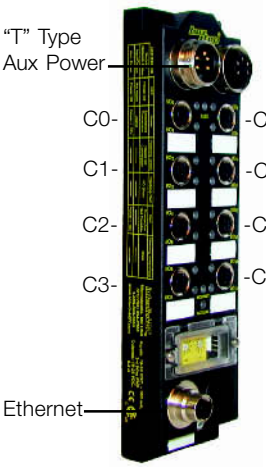
FENP-Style Housing

Ethernet is rapidly becoming the network of choice for higher level industrial control applications. Ethernet is used primarily to connect PLC's, Computers, Flat panel displays, and other high level components. FEN series ethernet stations provide a convenient way to connect I/O directly to the ethernet network.

FEN stations can be configured or monitored using standard web browser software. Simply type IP address of the station into the web browser's address box and an interactive website is displayed. This web page will allow you to:

-Monitor inputs
-Monitor Diagnostic data
-Set outputs
-Upload/Download device configuration

FEN series stations communicate at 10 or 100M baud, half or full duplex. Ethernet cables can be up to 100 Meters each.



• Advanced Ethernet Station

Applications
• Connect to any existing Ethernet network
• Data acquisition or control
• Auxiliary I/O for vision systems

Features
• 10/100 Mbaud
• Web browser for configuration
• Rugged housing

Module Specifications

Electronic / Load supply	18...30 VDC
Internal current consumption	< 100mA

Internet Protocol (IP) Addressing

Using DHCP:	If the leftmost rotary switch is set to DHCP, then the DHCP server on the network will set the IP Address, Netmask and Default Gateway automatically. The last two rotary switches will be ignored.
Using BOOT P:	If the leftmost rotary switch is set to BOOT P, then the BOOT P server on the network will set the IP Address, Netmask and Default Gateway automatically. The last two rotary switches will be ignored.
Addressing using rotary switches:	If the rotary switches are set from 2-254 then the switches are used to define the last byte of the IP Address. The first three bytes of the IP Address, the Netmask and the Default Gateway are read from non-volatile memory. These will either be the default values or the last values written with a DHCP server.
To reset the address to the factory defaults:	Set all three switches to zero, then power up the station. All of the address parameters will be reset to the following: IP Address 192.168.0.0 Netmask 255.255.255.0 Default Gateway 192.168.0.1

Module Specifications

Input Circuits	PNP 3-wire sensors/2-wire sensors	
Input voltage	18...30 VDC (from V_1)	
Input current	< 500 mA total, short-circuit protection	
Switching threshold OFF/ON	2 mA / 4 mA	
Input time delay	2.5 ms	
Switching frequency	<250 Hz	
Isolation	To bus	

Output Circuits	
Output voltage	18...30 VDC (from V_o)
Output current	0.5 A per output, short-circuit protection (G Type)
Switching frequency	< 250 Hz
Isolation	To bus

LED Indications	
Voltage supply	Green/ Red: proper voltage/under voltage
Input status/output status	Green: I/O ON
Short-circuit indication	Red: short-circuit

Module	
	Flashing Green- ready to establish communication; Green- communication established; Flashing Red- I/O short-circuit; Red- unable to communicate

Connection	
Electronic and load supply	5-pole 7/8" *minifast*® connector
Bus line	*eurofast*® connector (M 12 x 1), 8 Pin
Inputs/outputs	*eurofast*® connector (M 12 x 1), 5 Pin

Ethernet Specifications		
Half duplex - CSMA-CD	IEEE 802.3	Auto-sensing
Full duplex	IEEE 802.3x	Auto-sensing
10Base-T	IEEE 802.3i	N-Way negotiation
100Base-TX	IEEE 802.3u	N-Way negotiation

Supported Internet Protocols OSI-ISO layer 3-5	
UDP	RFC's 768
UDP Bootstrap for BOOTP	RFC 950
IP	RFC 791
TCP	RFC 793
ARP	RFC 826
BOOTP	RFC's 906,951
DHCP	RFC 1541

Presentation and Application Protocols OSI-ISO layer 6 & 7	
HTTP	Suite of RFC HyperText Transfer Protocols for web page
HTML	Suite of RFC HyperText Mark-up Language for web page
MODBUS TCP	
Ethernet I/P	

FENP-S0800, 8 PNP Inputs, Group Diagnostic

I/O Data Map

Input Data, 16 Bit Word, Offset 0

Bit	15	14	13	12	11	10	9	8	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

Input data, 16 Bit Word, Offset 1

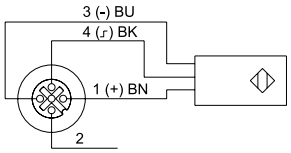
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Meaning	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	SC

Connectors

8 Inputs“ S” Type Powered by V_{Input} (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use RK 4.4T-*-RS 4.4T
Field Wirable: Single Sensor BS 8141-0

1 = V_I +
2 = N/C
3 = GND
4 = Input
5 = PE



Single Sensor

Refer to page 165 for dimensions and Ethernet Connector specifications.

FENP-S1600, 16 PNP Inputs, Group Diagnostic

I/O Data Map

Input Data, 16 Bit Word, Offset 0

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Meaning	I-15	I-14	I-13	I-12	I-11	I-10	I-9	I-8	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0

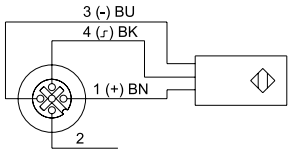
Input data, 16 Bit Word, Offset 1

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Meaning	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	SC

Connectors

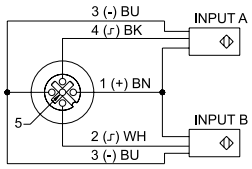
16 Inputs “2S” Type Powered by V_{Input} (C0-C7)

Style: 5-Pin *eurofast*®
Cordsets: Single Sensor use RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors use VBRS 4.4-2RK 4T-*/*



Single Sensor

1 = V_I +
2 = Input B
3 = GND
4 = Input A
5 = PE



Splitter and 2 Sensors

Abbreviations

SC = common short-circuit indication of inputs, I>500 mA
$V_I = V_{input}$
$V_O = V_{output}$

Refer to page 165 for dimensions and Ethernet Connector specifications.

FENP-S0808G, 8 PNP Inputs and 8 0.5A Outputs, Group Diagnostic

I/O Data Map

Input Data, 16 Bit Word, Offset 0

Bit	15	14	13	12	11	10	9	8	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

Input data, 16 Bit Word, Offset 1

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Meaning	-	-	-	-	-	-	-	-	-	-	-	-	-	-	V_O	SC

Input data, 16 Bit Word, Offset 2

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Meaning	-	-	-	-	-	-	-	-	OS-7	OS-6	OS-5	OS-4	OS-3	OS-2	OS-1	OS-0

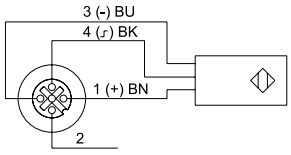
Output data, 16 Bit Word, Offset 0

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Meaning	-	-	-	-	-	-	-	-	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Connectors

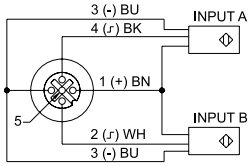
8 Inputs "2S" Type Powered by V_{input} (C0-C3)

Style: 5-Pin *eurofast*®
Cordset: Single Sensor use RK 4.4T-*-RS 4.4T
Splitter: Splitter and 2 Sensors use VBRS 4.4-2RK 4T-*/*



Single Sensor

1 = V_I +
2 = Input B
3 = GND
4 = Input A
5 = PE

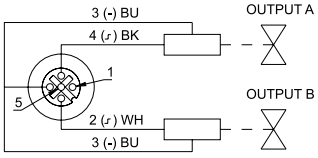


Splitter and 2 Sensors

8 Outputs "2G" Type Powered by V_{output} (C4-C7)

Style: 5-Pin *eurofast*®
Cordset: Dual Output use RK 4.4T-*-RS 4.4T
Field Wireable: Single Output use BS 8141-0

1 = N/C
2 =Output B (odd numbers)
3 = GND
4 = Ouput A (even numbers)
5 = PE



Dual Output

Abbreviations

SC = common short-circuit indication of inputs, I>500 mA
$V_I = V_{input}$
$V_O = V_{output}$

Refer to page 165 for dimensions and Ethernet Connector specifications.

FENP-XSG16, 16 PNP Inputs or 0.5A Outputs, Group Diagnostic

I/O Data Map

Input Data, 16 Bit Word, Offset 0

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Meaning	I-15	I-14	I-13	I-12	I-11	I-10	I-9	I-8	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0

Input data, 16 Bit Word, Offset 1

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Meaning	-	-	-	-	-	-	-	-	-	-	-	-	-	-	V_O	SC

Input data, 16 Bit Word, Offset 2

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Meaning	OS-15	OS-14	OS-13	OS-12	OS-11	OS-10	OS-9	OS-8	OS-7	OS-6	OS-5	OS-4	OS-3	OS-2	OS-1	OS-0

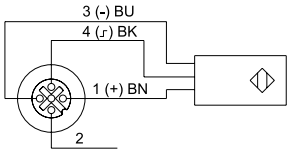
Output data, 16 Bit Word, Offset 0

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Meaning	O-15	O-14	O-13	O-12	O-11	O-10	O-9	O-8	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Connectors

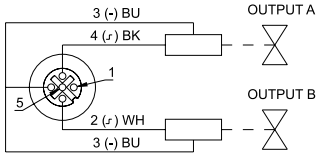
16 Inputs or Outputs "2X" Type Powered by V_{Input} (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: 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

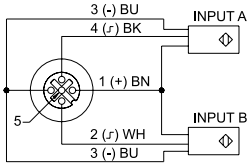


Single Sensor

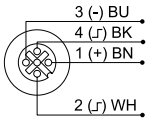
1 = V_I +
2 = Input/Output B
3 = GND
4 = Input/Output A
5 = PE



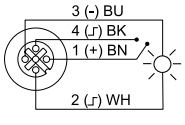
Outputs



Splitter and 2 Sensors



Part Verification Array



Push Button

Abbreviations

SC = common short-circuit indication of inputs, I>500 mA
$V_I = V_{input}$
$V_O = V_{output}$

Refer to page 165 for dimensions and Ethernet Connector specifications.

FENP-S0008G, 8 0.5A Outputs, Group Diagnostic

I/O Data Map

Input data, 16 Bit Word, Offset 1

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Meaning	-	-	-	-	-	-	-	-	-	-	-	-	-	-	V_O	-

Input data, 16 Bit Word, Offset 2

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Meaning	-	-	-	-	-	-	-	-	OS-7	OS-6	OS-5	OS-4	OS-3	OS-2	OS-1	OS-0

Output data, 16 Bit Word, Offset 0

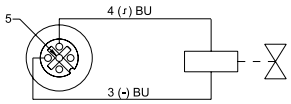
Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Meaning	-	-	-	-	-	-	-	-	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Connectors

8 Outputs "G" Type Powered by V_{output} (C0-C7)

Style: 5-Pin *eurofast*®
Cordset: Single Output use RK 4.4T-*-RS 4.4T
Field Wireable: Single Output use BS 8141-0

1 = N/C
2 = N/C
3 = GND
4 = Output
5 = PE



Single Output

Refer to page 165 for dimensions and Ethernet Connector specifications.

Abbreviations

SC = common short-circuit indication of inputs, I>500 mA
$V_I = V_{input}$
$V_O = V_{output}$

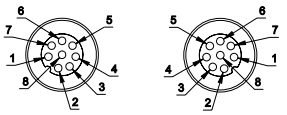
Connectors

Ethernet

Style: 5-Pin *eurofast*®

Cordset: Bus Line use RSC RSC 842-*M

1 = N/C
2 = N/C
3 = N/C
4 = Tx-
5 = Rx +
6 = Tx +
7 = N/C
8 = Rx -



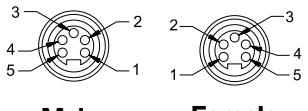
Aux Power Connectors

Style: 5-Pin *minifast*®

Cordset: RKM 50-*M, RSM 50-*M

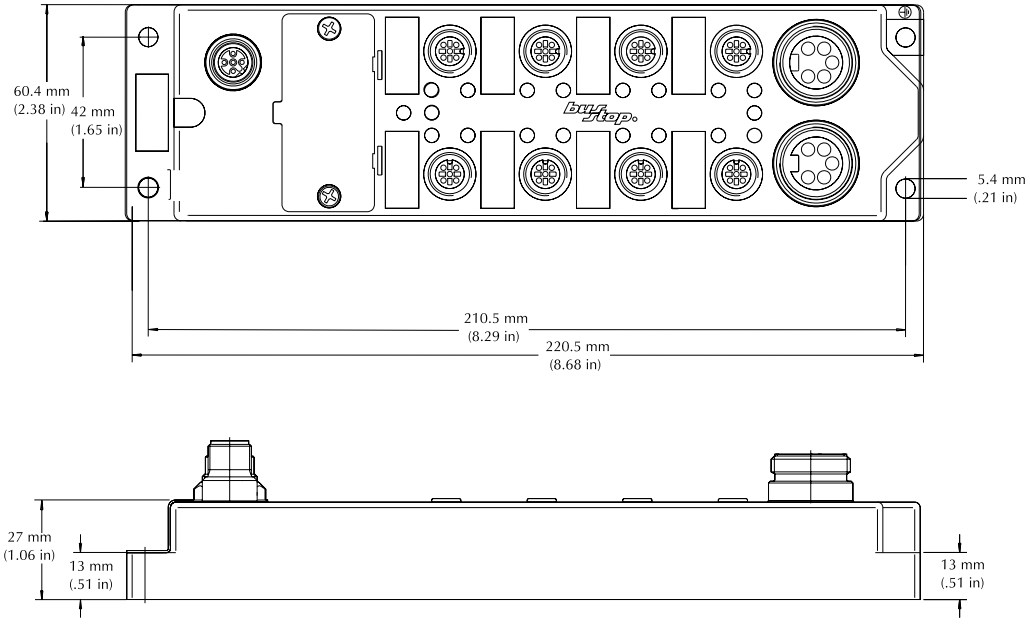
Tee: RSM 2RKM 50

1= GND
2= GND
3= PE
4= V_{inputs}
5= $V_{outputs}$



Auxiliary Power

Dimensions



5

5-Port Unmanaged Ethernet Switch

The high performance Industrial Ethernet Switch provides five *eurofast*® ports. The switch complies with IEEE 802.3 10Base-T Ethernet and 802.3u 100Base-TX Fast Ethernet Standards. Use the Ethernet Switch in your application to:

- Segment network traffic
- Extend ethernet connection distance
- Convert data packets between different transmission speeds

The switch auto-senses transmission speeds. It stores addresses in its routing table. The switch supports store-and-forward switching architecture.

SE-84X-E524	5-Pin Power
SE-84X4-E524	4-Pin Power

Communication

- 10/100 Mbps Ports: 4 ports plus dedicated uplink port
- Standards: IEEE 802.3, 802.3u, 802.3x
- Switching Architecture: Store and Forward
- Buffer: 128 bytes
- Nway Auto-Negotiation: All Ports
- Full-Duplex/Half-Duplex: All Ports
- Non-blocking Full Duplex Mode (no collision)
- Memory Bandwidth: 1.4 Gbps

NOTE: If uplink port is used as an active port you must use a crossover cable (i.e. RSC RJ45 CR 840- *M).

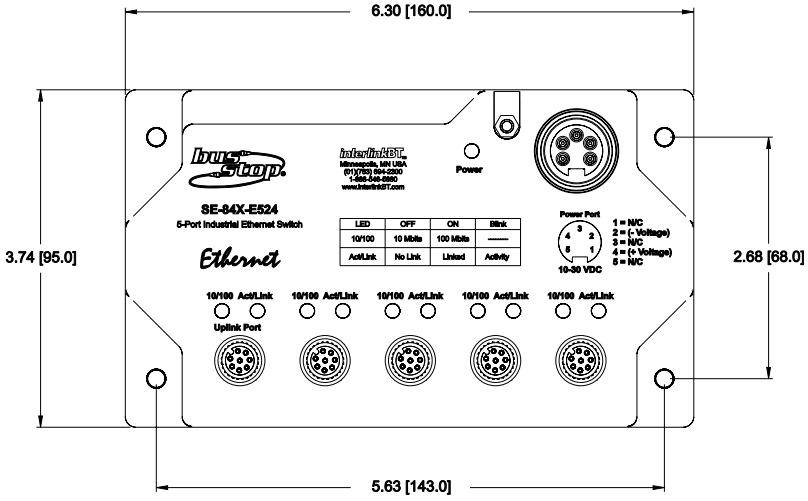
Diagnostic

- Power LED Indications: Green-Power
- Port LED Indications: Link/Activity
  Amber-100 Mbps Yellow
  Green-10 Mbps Green

Mechanical

- Protection: NEMA 1,3,4,12,13 and IEC IP67
- Operating Voltage: 10-30 VDC
- Power: 1.9 Watts (typical)
- Operating Temperature: -40 to 185°F (-40° to 85°C)

Dimensions



Connectors

Ethernet	Power (SE 84X-E524)	Power (SE 84X4-E524)
1. N/C 2. N/C 3. N/C 4. TX- 5. RX+ 6. TX+ 7. N/C 8. RX-	1. N/C 2. -Voltage 3. N/C 4. +Voltage 5. N/C	1. + Voltage 2. N/C 3. N/C 4. -Voltage
Uplink		
1. N/C 2. N/C 3. N/C 4. RX- 5. TX+ 6. RX+ 7. N/C 8. TX-		
Downlink		
Female	**Male**	**Male**

9-Port Unmanaged Ethernet Switch

The high performance Industrial Ethernet Switch provides nine *eurofast*® ports. The switch complies with IEEE 802.3 10Base-T Ethernet and 802.3u 100Base-TX Fast Ethernet Standards. Use the Ethernet Switch in your application to:

- Segment network traffic
- Extend ethernet connection distance
- Convert data packets between different transmission speeds

The switch auto-senses transmission speeds. It stores addresses in its routing table. The switch supports store-and-forward switching architecture.

SE-84X-E924	5-Pin Power
SE-84X4-E924	4-Pin Power

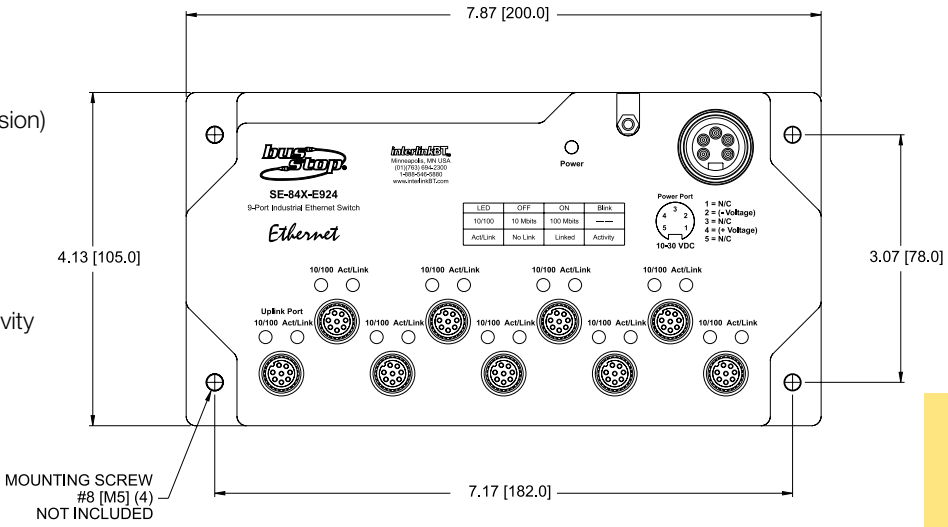
Communication

- 10/100 Mbps Ports: 9 ports or 8 plus an uplink port
- Standards: IEEE 802.3, 802.3u, 802.3x
- Switching Architecture: Store and Forward
- Buffer: 128 bytes
- Nway Auto-Negotiation: All Ports
- Full-Duplex/Half-Duplex: All Ports
- Auto MDI-X
- Non-blocking Full Duplex Mode (no collision)
- Memory Bandwidth: 1.4 Gbps

Diagnostic

- Power LED Indications: Green-Power
- Port LED Indications: Green - Link/Activity
- Connection Speed: Green - 100 Mbps
  Off - 10 Mbps

Dimensions



Mechanical

- Protection: NEMA 1,3,4,12,13 and IEC IP67
- Operating Voltage: 10-30 VDC
- Power: 1.9 Watts (typical)
- Operating Temperature: -40 to 185°F (-40° to 85°C)

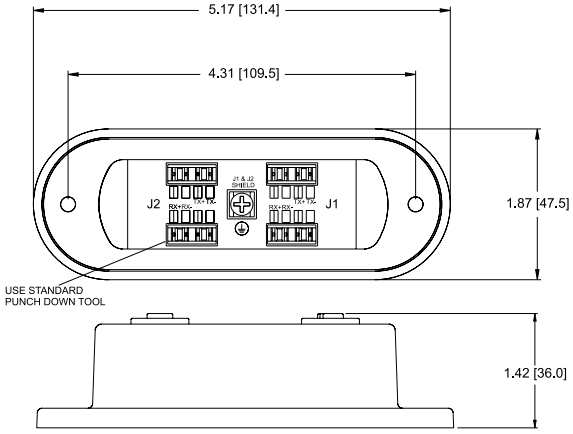
Connectors

Ethernet	Power (SE 84X-E924)	Power (SE 84X4-E924)
1. N/C 2. N/C 3. N/C 4. TX- 5. RX+ 6. TX+ 7. N/C 8. RX- **Uplink** **Female**	1. N/C 2. N/C 3. N/C 4. RX- 5. TX+ 6. RX+ 7. N/C 8. TX- **Downlink**	1. N/C 2. -Voltage 3. N/C 4. +Voltage 5. N/C **Male**	1. + Voltage 2. N/C 3. N/C 4. -Voltage **Male**

Ethernet Conduit Adapter

	eurofast®
1-port	BCA 84-E124
2-port	BCA 84-E224

Consult factory for stainless steel connectors.

Description	The conduit adapter attaches to a standard conduit body for transition to *minifast*® or *eurofast*® connectors. Gasket and mounting hardware included (8-32 x 1/2").
Dimensions	

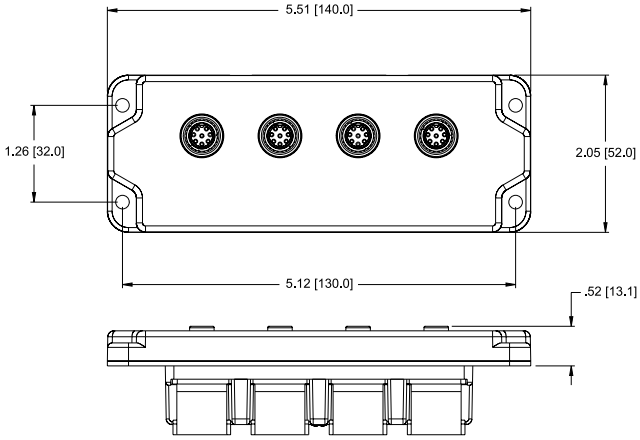
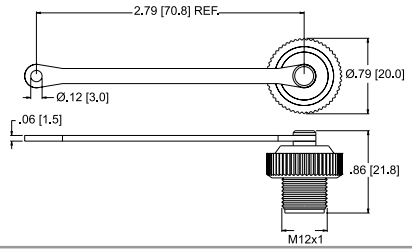
Conduit Bodies

CROUSE - HINDS Hub Size = 3/4		
Shape	**Style**	**Part Number**
 **C**	Form 8 Mark 9	C28 C29
 **LB**	Form 8 Mark 9	LB28 LB29
 **LL**	Form 8 Mark 9	LL28 LL29
 **LR**	Form 8 Mark 9	LR28 LR29

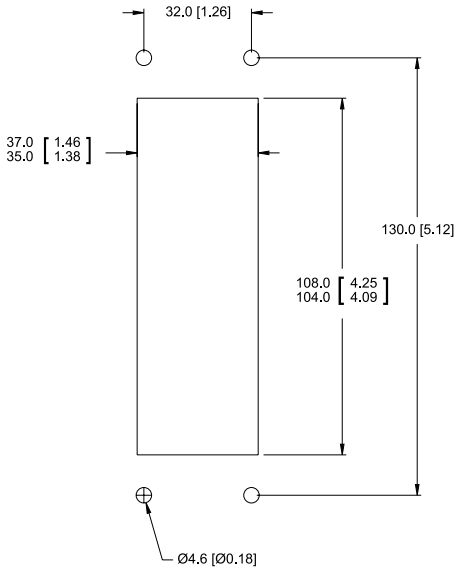
Accessory	
	TOOL, PUNCHDOWN/ETHERNET - Non-impact punchdown tool

Ethernet Cabinet Adapter

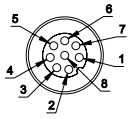
	eurofast®
2-port	BIC 84-E424

Description	The cabinet adapter attaches to a standard cabinet for transition to RJ45 connectors. *Gasket and mounting hardware included (8-32 x 1/2”).
Dimensions	
Accessory	**Closure Cap** **FSK-CC** 

Panel Dimensions



Pinouts



Female *eurofast*®

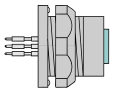
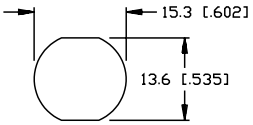
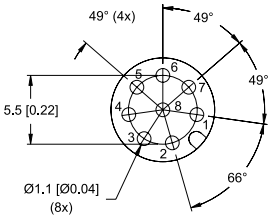
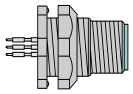
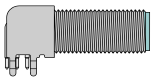
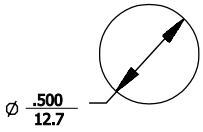
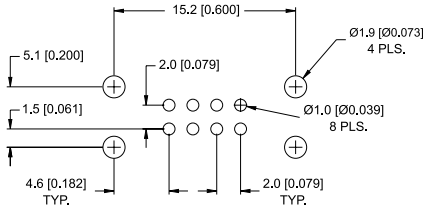
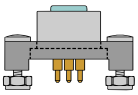
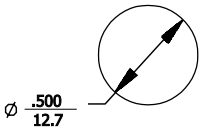
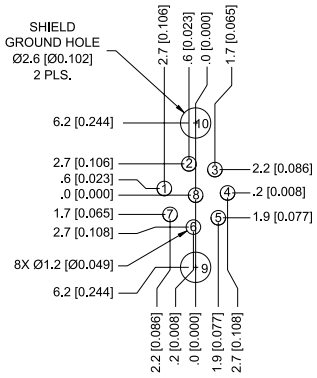
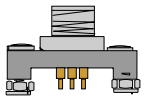
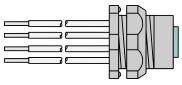
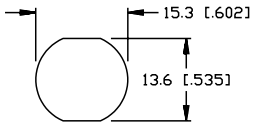
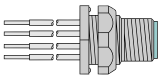
1. White/Blue
2. White/Brown
3. Brown
4. Orange
5. White/Green
6. White/Orange
7. Blue
8. Green

Pinout per EIA 568B

1. White/Orange
2. Orange
3. White/Green
4. Blue
5. White/Blue
6. Green
7. White/Brown
8. Brown

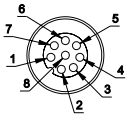
5

Circuit Board Connectors and Receptacles

eurofast®		Panel Cut-out	Board Layout (reference only**)
FKFD 84 PCB			
FSFD 84 PCB			
WFS 84 PCB			
FK 84 PCB			
FS 84 PCB			
FKFD 84- *M			
FSFD 84- *M			

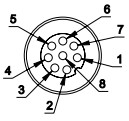
* indicates length in meters.
** consult source drawing for board layout.
Refer to page 172 for standard cable lengths.

Pin Out



Male

1. White/Blue
2. White/Brown
3. Brown
4. Orange (TX-)
5. White/Green (RX+)
6. White/Orange (TX+)
7. Blue
8. Green (RX-)



Female

Ethernet Cables and Connectors

Pre-molded Fieldbus Cables for Ethernet

Standard lengths of pre-molded cordsets and bulk cable are listed below.

Standard Cable Lengths			
Cordsets		Bulk Cable	
meters	feet	meters	feet
0.3	1.0	30	98
0.5	1.6		
1.0	3.3		
1.5	4.9	75	246
2.0	6.6		
2.5	8.2		
3.0	9.8	150	492
4.0	13		
5.0	16		
6.0	20	225	738
8.0	26		
10	33		
15	49	300	984
20	66		
25	82		
30	98	- - -	- - -
40	131		
50	164		

Other lengths available upon request. Contact factory at 1-888-546-5880.

Unit Conversions:

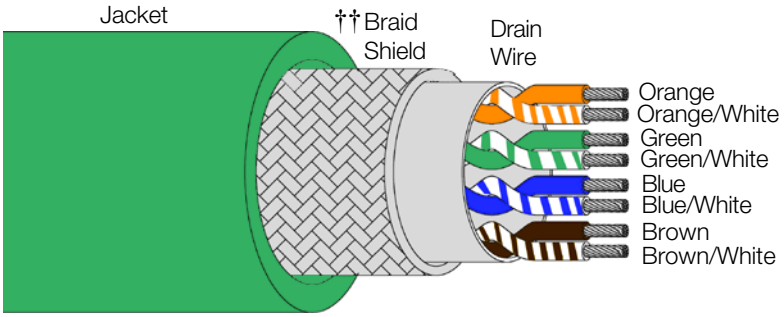
1 meter = 3.28 feet
1 meter = 39.8 inches

Tolerances:

0-1 meter: +35 / - 0 mm
> 1 m +85/-0 mm or +4% of length which ever is greater

Ethernet Cable Specifications

Cable that meets the requirements of TIA/EIA568-B category 5e cable for 10, 100, and 1000Base-T ethernet.



††Available on some cable types.

- Maximum 100M of cable of which:
  - 90 M Horizontal Cable (SOLID - 842 or 843)
  - 2 x 5 M Patch Cables (STRANDED - 840 or 841)

(OR)

- Direct Connect 30 M stranded

Type	Approvals	Data Pair		Outer Jacket	Shields	Bulk Cable†
		AWG	DCR (/1000ft) Insulation	Material Color Nominal O.D.	Type	
840†† 75°C 300V	**NEC** CMR(ETL) **CEC** C(ETL)	8/24 Stranded	28.6 PE	PVC Teal 5.9mm (.231)	None	RB50856-*M
841†† 75°C 300V	**NEC** CMR(ETL) **CEC** C(ETL)	8/24 Stranded	28.6 PE	PVC Teal 7.3mm (.286)	Foil/Braid	RB50893-*M
842††† 75°C 300V	**NEC** CMR(ETL) **CEC** C(ETL)	8/24 Solid	28.6 PE	PVC Teal 5.9mm (.231)	None	RB50857-*M
843††† 75°C 300V	**NEC** CMR(ETL) **CEC** C(ETL)	8/24 Solid	28.6 PE	PVC Teal 7.3mm (.286)	Foil/Braid	RB50894-*M

Cable is UL rated for sunlight and oil resistant.

* indicates length in meters.

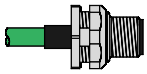
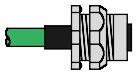
† See page 172 for standard bulk cable lengths.

†† Flex life - 4 million cycles on C-track flexing machine at 1.5" bend radius.

††† Flex life - 85,000 cycles on C-track flexing machine at 1.5" bend radius.

5

Ethernet Cables, Extensions, *eurofast*®-Cable Type 840, 842 Only

			eurofast®				
			Pin (Male)	Socket (Female)	Pin (Male)	Socket (Female)	Receptacle
			 RSC	 RKC	 FSFD	 FKFD	 RJ45
		 84x	RSC 84x-*M	RKC 84x-*M	FSFD 84x-*M	FKFD 84x-*M	RJ45 84x-*M
eurofast®	Pin (Male)	 RSC	RSC RSC 84x-*M	RSC RKC 84x-*M	RSC FSFD 84x-*M	RSC FKFD 84x-*M	RSC RJ45 84x-*M †
	Socket (Female)	 RKC		RKC RKC 84x-*M	RKC FSFD 84x-*M	RKC FKFD 84x-*M	RKC RJ45 84x-*M †
	Receptacle	 RJ45			RJ45 FSFD 84x-*M	RJ45 FKFD 84x-*M	RJ45 RJ45 84x-*M †

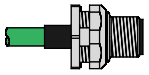
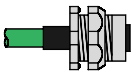
x indicates cable type.
* indicates length in meters.
Refer to the Cordset Wizard CD (B9034) for assistance with cordset/cable combinations.
Standard cable lengths are 0.3, 0.5, 1.0, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0 ,6.0 ,8.0 ,10 ,15....50M. Consult factory for other lengths.

For stainless steel coupling nut: Change part number (RSC to RSCV ... FSFD to FSFDV).

† Change part number from RSC RJ45 to RSC RJ45 CR for cross-over cable.

NOTE: If uplink port on Ethernet Switch is used as an active port you must use a crossover cable (i.e. RSC RJ45 CR 840- *M).

Ethernet Cables, Extensions, Shielded *eurofast*®-Cable Type 841, 843 Only

			eurofast®				
			Pin (Male)	Socket (Female)	Pin (Male)	Socket (Female)	Receptacle
			 RSS	 RKS	 FSSD	 FKSD	 RJ45S
		 84x	RSS 84x-*M	RKS 84x-*M	FSSD 84x-*M	FKSD 84x-*M	RJ45S 84x-*M
eurofast®	Pin (Male)	 RSS	RSS RSS 84x-*M	RSS RKS 84x-*M	RSS FSSD 84x-*M	RSS FKSD 84x-*M	RSS RJ45S 84x-*M †
	Socket (Female)	 RKS		RKS RKS 84x-*M	RKS FSSD 84x-*M	RKS FKSD 84x-*M	RKS RJ45S 84x-*M †
	Receptacle	 RJ45S			RJ45S FSSD 84x-*M	RJ45S FKSD 84x-*M	RJ45S RJ45S 84x-*M †

x indicates cable type.
* indicates length in meters.
Refer to the Cordset Wizard CD (B9034) for assistance with cordset/cable combinations.
Standard cable lengths are 0.3, 0.5, 1.0, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0 ,6.0 ,8.0 ,10 ,15....50M. Consult factory for other lengths.

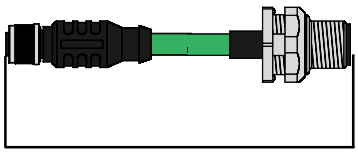
For stainless steel coupling nut: Change part number (RSS to RSSV ... FSSD to FSSDV).

†Change part number from RSS RJ45S to RSS RJ45S CR for cross-over cable.

NOTE: If uplink port on Ethernet Switch is used as an active port you must use a crossover cable (i.e. RSS RJ45S CR 840- *M).

Example

RKS FSSD 84x-1 M

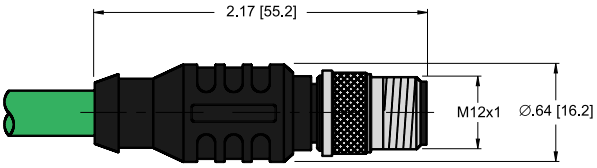


1 Meter

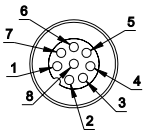
5

Ethernet Dimensions / Configuration

RSC/RSS

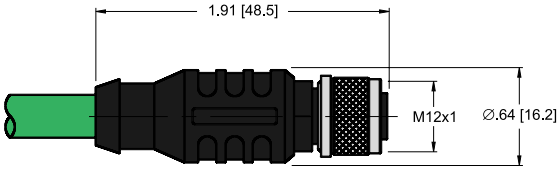


Male

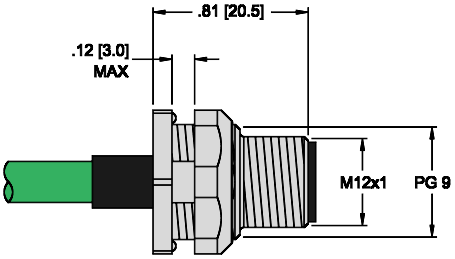


1. White/Blue
2. White/Brown
3. Brown
4. Orange
5. White/Green
6. White/Orange
7. Blue
8. Green

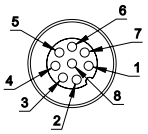
RKC/RKS



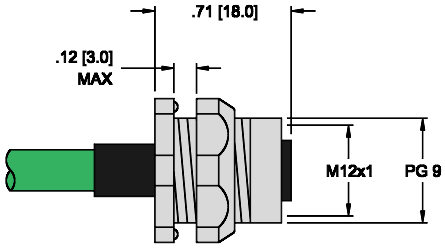
FSFD



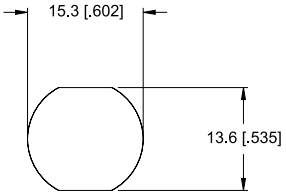
Female



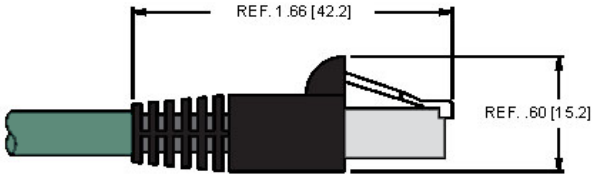
FKFD



Mounting Installation



RJ45/RJ45S

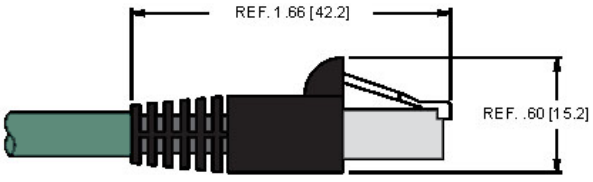


Male

Pinout per EIA 568B

1. White/Orange
2. Orange
3. White/Green
4. Blue
5. White/Blue
6. Green
7. White/Brown
8. Brown

RJ45 CR/RJ45S CR



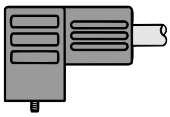
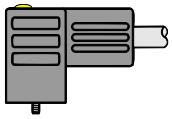
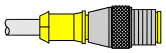
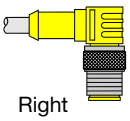
Male

Pinout per EIA 568B

1. White/Green
2. Green
3. White/Orange
4. Blue
5. White/Blue
6. Orange
7. White/Brown
8. Brown

I/O Cordsets

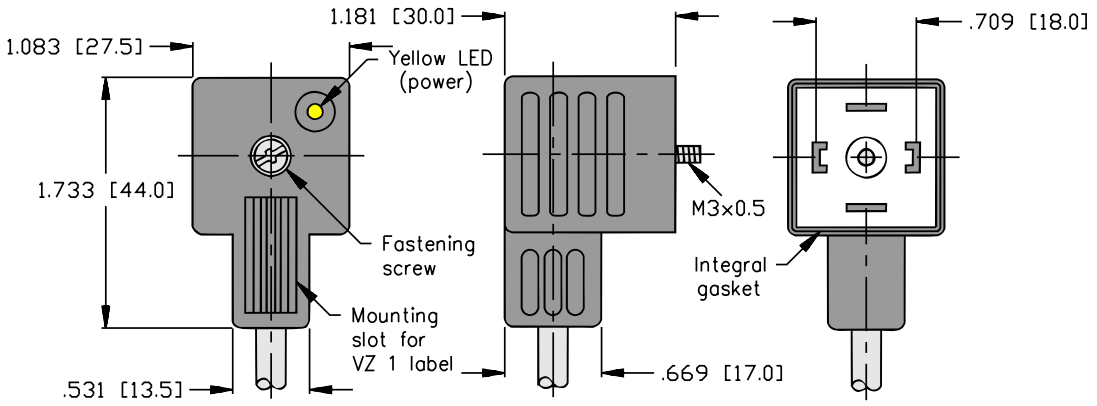
Turck Valve Connectors and *eurofast*® Extensions

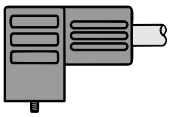
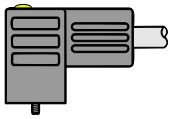
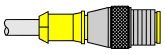
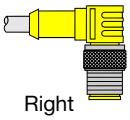
		"A" Style (18 mm)					
							
		Without LED Indicator			With LED Indicator		
	Cable / Connector	Standard Duty PVC	Standard Duty PUR	Heavy Duty Rubber	Standard Duty PVC	Standard Duty PUR	Heavy Duty Rubber
Male *eurofast*®	 Straight	VAS 22-A653-*M-RS 5.3T	VAS 22-A669-*M-RS 5.3T	VAS 22-A654-*M-RSE 5.3T	VAS 22-B653-*M-RS 5.3T	VAS 22-B669-*M-RS 5.3T	VAS 22-B654-*M-RSE 5.3T
Male *eurofast*®	 Right	VAS 22-A653-*M-WS 5.3T	VAS 22-A669-*M-WS 5.3T	VAS 22-A654-*M-WSE 5.3T	VAS 22-B653-*M-WS 5.3T	VAS 22-B669-*M-WS 5.3T	VAS 22-B654-*M-WSE 5.3T
Leaded Ends	 Standard	VAS 22-A653-*M	VAS 22-A669-*M		VAS 22-B653-*M	VAS 22-B669-*M	
Leaded Ends	 IEC	VAS 22-A642-*M	VAS 22-A587-*M	VAS 22-A654-*M	VAS 22-B642-*M	VAS 22-B587-*M	VAS 22-B654-*M
Leaded Ends	 Automotive			VAY 22-A658-*M			VAY 22-B658-*M

* indicates length in meters.

For additional options, consult Turck Tech Support (1-800-544-7769).

Dimensions

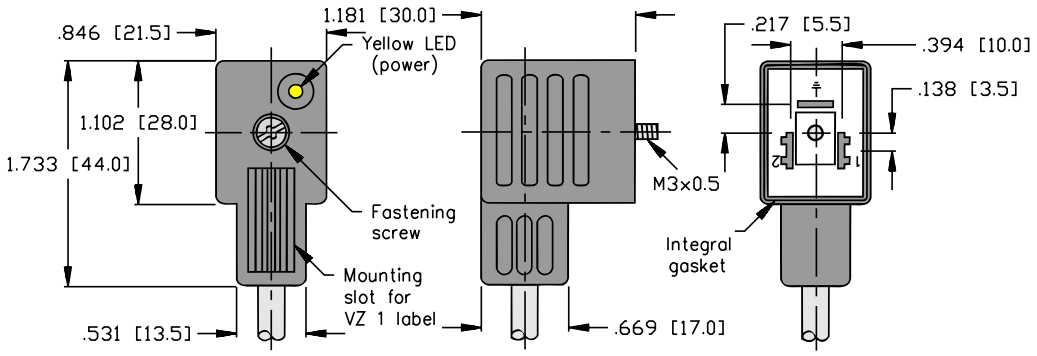


		"B" Style (10 mm)					
							
		Without LED Indicator			With LED Indicator		
	Cable / Connector	Standard Duty PVC	Standard Duty PUR	Heavy Duty Rubber	Standard Duty PVC	Standard Duty PUR	Heavy Duty Rubber
Male *eurofast*®	 Straight	VBS 2-A653-*M-RS 5.3T	VBS 2-A669-*M-RS 5.3T	VBS 2-A654-*M-RS E 5.3T	VBS 2-B653-*M-RS 5.3T	VBS 2-B669-*M-RS 5.3T	VBS 2-B654-*M-RSE 5.3T
Male *eurofast*®	 Right	VBS 2-A653-*M-WS 5.3T	VBS 2-A669-*M-WS 5.3T	VBS 2-A654-*M-WSE 5.3T	VBS 2-B653-*M-WS 5.3T	VBS 2-B669-*M-WS 5.3T	VBS 2-B654-*M-WSE 5.3T
Leaded Ends	 Standard	VBS 2-A653-*M	VBS 2-A669-*M		VBS 2-B653-*M	VBS 2-B669-*M	
Leaded Ends	 IEC	VBS 2-A642-*M	VBS 2-A587-*M	VBS 2-A654-*M	VBS 2-B642-*M	VBS 2-B587-*M	VBS 2-B654-*M
Leaded Ends	 Automotive			VBY 2-A658-*M			VBY 2-B658-*M

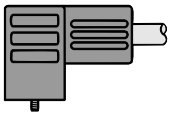
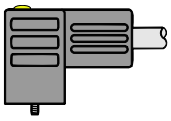
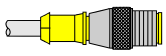
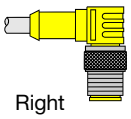
* indicates length in meters.

For additional options, consult Turck Tech Support (1-800-544-7769).

Dimensions



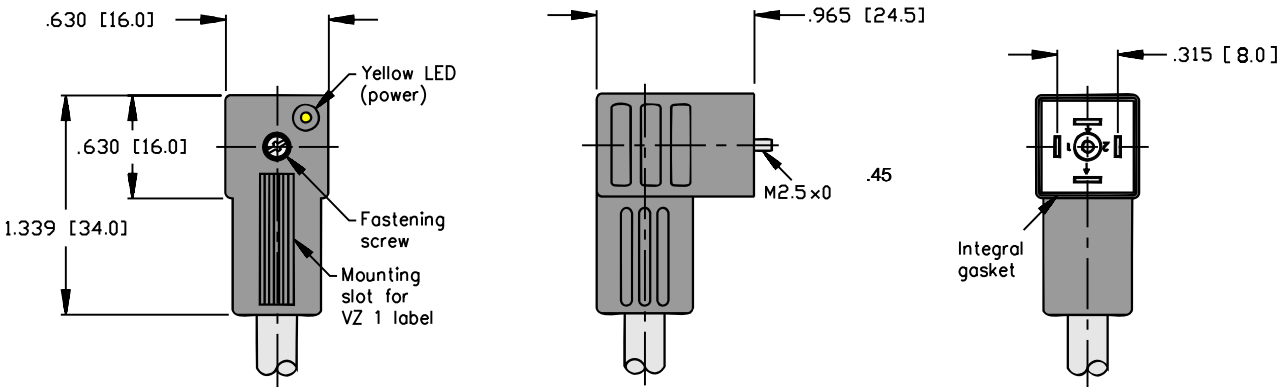
Turck Valve Connectors and *eurofast*® Extensions

		"C" Style (8 mm)					
							
		Without LED Indicator			With LED Indicator		
	Cable / Connector	Standard Duty PVC	Standard Duty PUR	Heavy Duty Rubber	Standard Duty PVC	Standard Duty PUR	Heavy Duty Rubber
Male *eurofast*®	 Straight	TC8S 2-A653-*M-RS 5.3T	TC8S 2-A669-*M-RS 5.3T		TC8S 2-L653-*M-RS 5.3T	TC8S 2-L669-*M-RS 5.3T	
	 Right	TC8S 2-A653-*M-WS 5.3T	TC8S 2-A669-*M-WS 5.3T		TC8S 2-L653-*M-WS 5.3T	TC8S 2-L669-*M-WS 5.3T	
Leaded Ends	 Standard	TC8S 2-A653-*M	TC8S 2-A669-*M		TC8S 2-L653-*M	TC8S 2-L669-*M	
	 IEC	TC8S 2-A642-*M	TC8S 2-A587-*M		TC8S 2-L642-*M	TC8S 2-L587-*M	
	 Automotive						

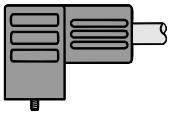
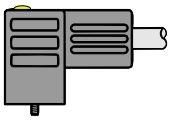
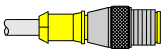
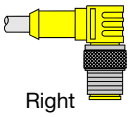
* indicates length in meters.

For additional options, consult Turck Tech Support (1-800-544-7769).

Dimensions



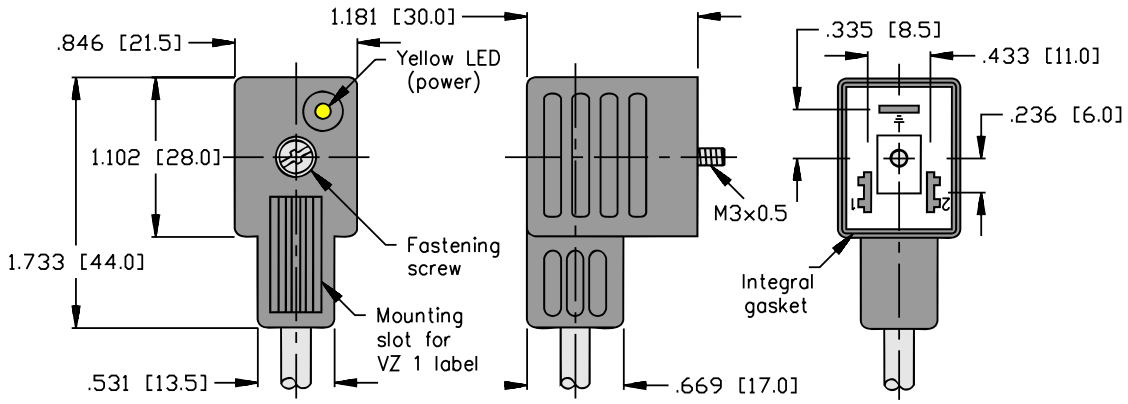
Turck Valve Connectors and *eurofast*® Extensions

		"I" Style (11 mm)					
							
		Without LED Indicator			With LED Indicator		
	Cable / Connector	Standard Duty PVC	Standard Duty PUR	Heavy Duty Rubber	Standard Duty PVC	Standard Duty PUR	Heavy Duty Rubber
Male *eurofast*®	 Straight	VIS 2-A653-*M-RS 5.3T	VIS 2-A669-*M-RS 5.3T	VIS 2-A654-*M-RSE 5.3T	VIS 2-B653-*M-RS 5.3T	VIS 2-B669-*M-RS 5.3T	VIS 2-B654-*M-RSE 5.3T
	 Right	VIS 2-A653-*M-WS 5.3T	VIS 2-A669-*M-WS 5.3T	VIS 2-A654-*M-WSE 5.3T	VIS 2-B653-*M-WS 5.3T	VIS 2-B669-*M-WS 5.3T	VIS 2-B654-*M-WSE 5.3T
Leaded Ends	 Standard	VIS 2-A653-*M	VIS 2-A669-*M		VIS 2-B653-*M	VIS 2-B669-*M	
	 IEC	VIS 2-A642-*M	VIS 2-A587-*M	VIS 2-A654-*M	VIS 2-B642-*M	VIS 2-B587-*M	VIS 2-B654-*M
	 Automotive			VIY 2-A658-*M			VIY 2-B658-*M

* indicates length in meters.

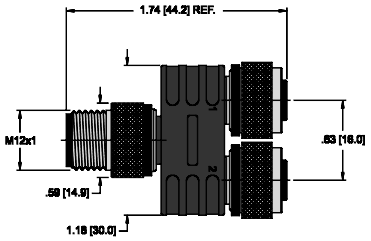
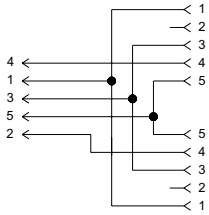
For additional options, consult Turck Tech Support (1-800-544-7769).

Dimensions

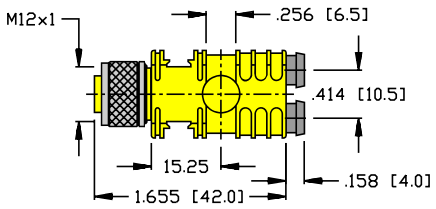
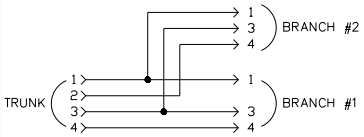
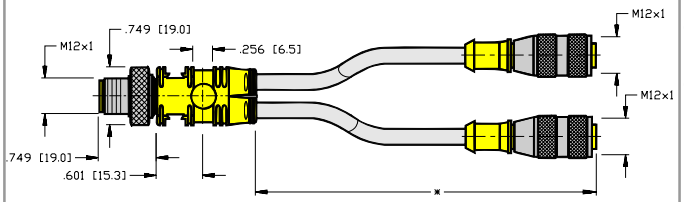
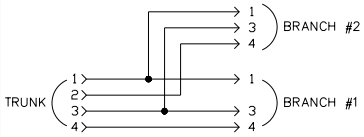
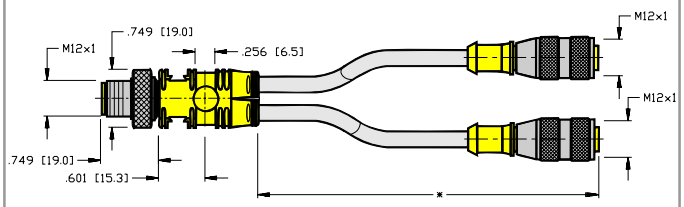
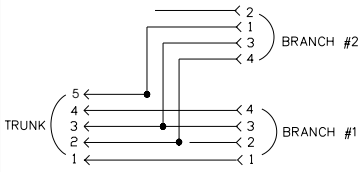


6

eurofast® 2-Branch Molded Splitters

Type	Applications	Wiring diagram
YB2-FSM 4.5-2FKM 4.5 	• for sensors with complimentary outputs, split signal. • branches have *eurofast*® connectors. • combines 2 sensors into the input connector.	

Turck *eurofast*® 2-Branch Molded Splitters

Type	Applications	Wiring diagram
VBRK 4.4-2ESM 3S 	• for sensors with complimentary outputs, split signal. • branches have *picofast*® snap lock. • combines 2 sensors into the input connector.	
VBRS 4.4-2RK 4T-*/* 	• for sensors with complimentary outputs, split signal. • combines 2 sensors into 1 input connector.	
VBRS 4.5-2RK 4T-*/*/S818 	• combines 2 sensors into 1 input connector. • allows open circuit detection on both inputs.	

* indicates length in meters.

For additional options, consult Turck Tech Support (1-800-544-7769).

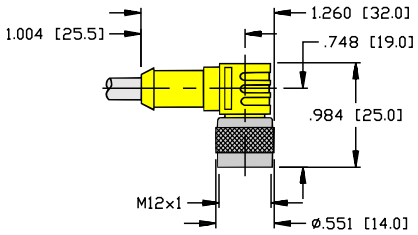
			eurofast®			
			Female		Male	
			RK	WK	RS	WS
		Stripped and Tinned Ends	RK 4.4T-*	WK 4.4T-*	RS 4.4T-*	WS 4.4T-*
eurofast®	Female	RK	RK 4.4T-*-RK 4.4T	RK 4.4T-*-WK 4.4T	RK 4.4T-*-RS 4.4T	RK 4.4T-*-WS 4.4T
		WK		WK 4.4T-*-WK 4.4T	WK 4.4T-*-RS 4.4T	WK 4.4T-*-WS 4.4T
	Male	RS			RS 4.4T-*-RS 4.4T	RS 4.4T-*-WS 4.4T
		WS				WS 4.4T-*-WS 4.4T

* indicates length in meters.

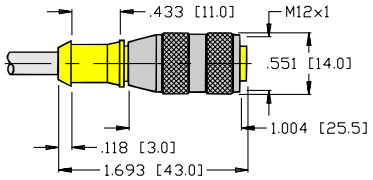
For additional options, consult Turck Tech Support (1-800-544-7769).

Dimensions

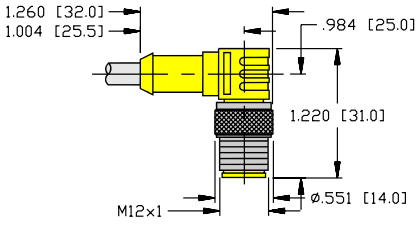
WK



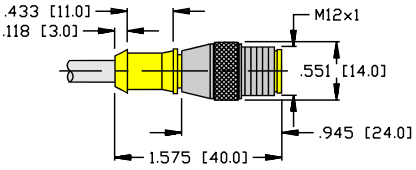
RK



WS

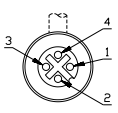


RS

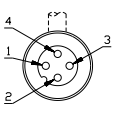


eurofast® Pinouts

Female



Male



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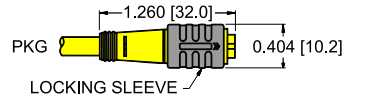
Turck *eurofast*® and *piconet*® Cable and Connectors

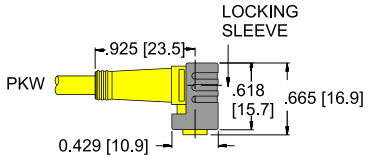
			picofast®			
			Female		Male	
			PKG 4M	PKW 4M	PSG 4M	PSW 4M
		Stripped and Tinned Ends	PKG 4M-*	PKW 4M-*	PSG 4M-*	PSW 4M-*
eurofast®	Female	RK	RK 4.4T-*-PKG 4M	RK 4.4T-*-PKW 4M	RK 4.4T-*-PSG 4M	RK 4.4T-*-PSW 4M
		WK	WK 4.4T-*-PKG 4M	WK 4.4T-*-PKW 4M	WK 4.4T-*-PSG 4M	WK 4.4T-*-PSW 4M
	Male	RS	RS 4.4T-*-PKG 4M	RS 4.4T-*-PKW 4M	RS 4.4T-*-PSG 4M	RS 4.4T-*-PSW 4M
		WS	WS 4.4T-*-PKG 4M	WS 4.4T-*-PKW 4M	WS 4.4T-*-PSG 4M	WS 4.4T-*-PSW 4M

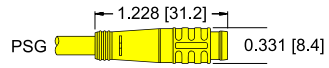
* indicates length in meters.

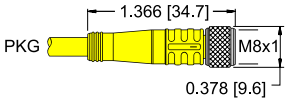
For additional options, consult Turck Tech Support (1-800-544-7769).

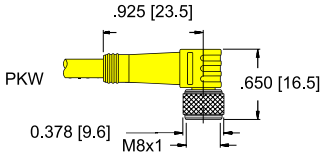
Dimensions

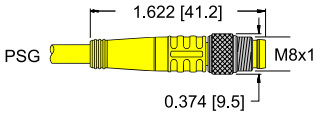


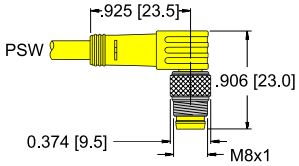




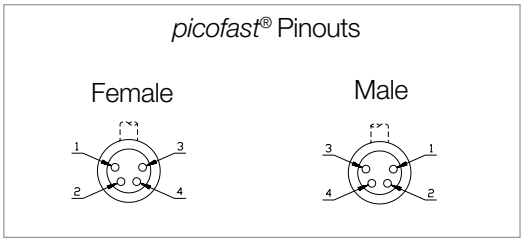








picofast® Pinouts



Cable Lengths and Connectors

Standard lengths of pre-molded cordsets and bulk cable are listed below.

Standard Cable Lengths			
Cordsets		Bulk Cable	
meters	feet	meters	feet
0.3	1.0	30	98
0.5	1.6		
1.0	3.3		
1.5	4.9	75	246
2.0	6.6		
2.5	8.2		
3.0	9.8	150	492
4.0	13		
5.0	16		
6.0	20	225	738
8.0	26		
10	33		
15	49	300	984
20	66		
25	82		
30	98	- - -	- - -
40	131		
50	164		

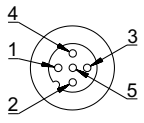
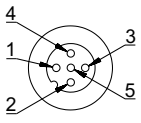
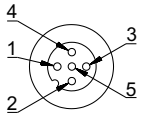
Other lengths available upon request. Contact the factory at 1-888-546-5880.

Unit Conversions:

1 meter = 3.28 feet
1 meter = 39.8 inches

Tolerances:

0-1 meter: +35 / - 0 mm
> 1 m +85/-0 mm or +4% of length
which ever is greater

Leaded End Color Codes and Connectors		
1. N/C 2. N/C 3. Black 2 4. Black 1 5. Gn/Yel	1. N/C 2. N/C 3. Blue 4. Brown 5. Black	1. N/C 2. N/C 3. Red 2 4. Red 1 5. Gray
		
Standard	IEC	Automotive

Turck Cable Characteristics

Cable Type Designator	Blank	/S90	/S90/S101	/S90-SP	/S600	/S622	/S653
Type	PVC	PUR	PUR-flexlife	PUR Coil	Rubber	PVC	PVC Shielded
Description	AWG/Amp /Diag/Color	AWG/Amp /Diag/Color	AWG/Amp /Diag/Color	AWG/Amp /Diag/Color	AWG/Amp /Diag/Color	AWG/Amp /Diag/Color	AWG/Amp /Diag/Color
3W eurofast - leads	20-4-a-Gray	22-4-a-Gray	22-4-a-Gray	22-4-a-Gray	18-4-a-Yellow	18-4-a-Yellow	N/A
3W eurofast - eurofast	20-4-b-Gray	22-4-b-Gray	22-4-b-Gray	22-4-b-Gray	18-4-b-Yellow	18-4-b-Yellow	N/A
3W picofast - leads	24-4-c-Yellow	24-4-c-Black	24-4-c-Black	24-4-c-Black	N/A	N/A	N/A
3W picofast - eurofast	24-4-d-Yellow	24-4-d-Black	24-4-d-Black	24-4-d-Black	N/A	N/A	N/A
3W picofast - picofast	24-4-e-Yellow	24-4-e-Black	24-4-e-Black	24-4-e-Black	N/A	N/A	N/A
4W eurofast - leads	22-4-a-Gray	22-4-a-Gray	22-4-a-Gray	22-4-a-Gray	18-4-a-Yellow	18-4-a-Yellow	N/A
4W eurofast - eurofast	22-4-a-Gray	22-4-a-Gray	22-4-a-Gray	22-4-a-Gray	18-4-a-Yellow	18-4-b-Yellow	N/A
4W+drain eurofast - leads	N/A	N/A	N/A	22-4-f-Gray	N/A	N/A	22-4-f-Gray
4W+drain eurofast - eurofast	N/A	N/A	N/A	22-4-f-Gray	N/A	N/A	22-4-f-Gray
Temperature Range	-105°C	-105°C	-105°C	-105°C	-105°C	-105°C	-105°C
Oxidation	E	E	E	E	E	E	E
Heat	G/E	G	G	G	E	G/E	G/E
Oil	F/G	E	E	E	E	F/G	F/G
Low Temperature Flexibility	P/G	G	G	G	E	P/G	P/G
Weather, Sun	G/E	G	G	G	E	G/E	G/E
Ozone	E	E	E	E	E	E	E
Abrasion	F/G	E	E	E	E	F/G	F/G
Electrical Properties	F/G	P	P	P	E	F/G	F/G
Flame	E	P	P	P	E	F/G	F/G
Water	F/G	P/G	P/G	P/G	E	F/G	F/G
Acid	G/E	F	F	F	E	G/E	G/E
Alkali	G/E	F	F	F	E	G/E	G/E
Gasoline, Kerosene (Aliphatic Hydrocarbons)	P	P/G	P/G	P/G	E	P	P
Benzol, Toluol, etc. (Aromatic Hydrocarbons)	P/F	P/G	P/G	P/G	G/E	P/F	P/G
Degreaser Solvents (Halogenated Hydrocarbons)	P/F	P/G	P/G	P/G	E	P/F	P/F
Alcohol	G/E	P/G	P/G	P/G	E	G/E	G/E

P=Poor F=Fair G=Good E=Excellent

PLUG & ~~PLAY.~~ *work*

Installations

PLUG & ~~PLAY.~~ *Work*

The Benefits of Connectorized IO

Plug and play connectorization has been standard practice in industries ranging from appliance manufacturers to industrial sensors for many years. These industries have found it necessary to compete in a business climate where speed and consistency of connection is king. Connectorization is the perfect complement to fieldbus systems. The concepts and goals are identical: reduced installation, reduced troubleshooting, and easy expansion. The fieldbus system minimizes point to point wiring which can be time consuming and difficult to troubleshoot. Connectorization takes that one step further, almost completely eliminating troubleshooting. Troubleshooting costs can be significant, but difficult to measure during the initial planning stages. Plants that have implemented plug-and-play connectorization claim up to 75 percent reduction in start-up costs. These are real cost savings.

Cost Savings

The initial capital cost is the major factor in selecting a method of connecting devices. These include material and installation costs. Incorporating plug-and-play connectivity can result in a 10 to 60 percent savings. Actual savings will depend on the size and complexity of the installation.

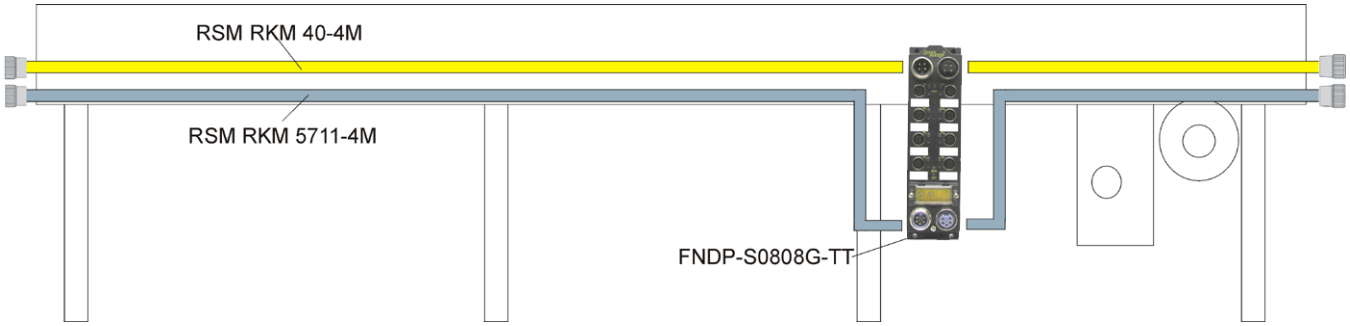
Other savings include reduced design, maintenance, troubleshooting and expansion costs. Although some of these cost savings are difficult to determine until the condition exists, they quickly change from potential cost savings to real cost savings when the installation begins.

Modular Design

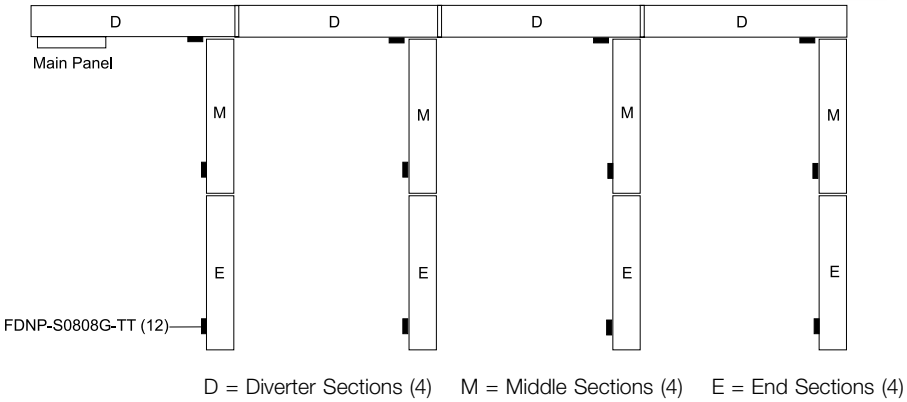
Connectorized networks allow for modularity. By their very nature, traditional wiring methods are not modular. You cannot easily modify an electronic control system using conduit and individual wires. By contrast, connectorized networks can be modified and designed quickly and easily. This significantly reduces both design and manufacturing time.

Example of a Typical Conveyor System

Modular Section



Overall Layout



This conveyor system consists of (4) Diverter, (4) Middle and (4) End sections.

The electrical controls for each section consists of the following network items:

- (1) FDNP-S0808G-TT
- (1) RSM RKM 5711- 4 M
- (1) RSM RKM 40- 4 M

In addition, it includes:

- (1) Motor, and small starter enclosure (with 2 motors on Diverter sections)
- (2) Proximity Sensors
- (1) Machine Stop Button

Design Cost

Since the modular systems consists of predefined sections, the preliminary design and costing steps can often be done much quicker. Using the above conveyor system example, each section already has a known cost associated with it. The system design is simply a list of the modular sections. (Costs are in U.S.dollars)

	Connectorized Modular Design	Time	Cost	Traditional PLC Design	Time	Cost
	Create System Design and Bill of Material	16 hours	$448	Create System Diagram	32 hours	$896
				Layout Main Panel	32 hours	$896
Total Design		**16 hours**	**$448**		**64 hours**	**$1792**

Material Costs

Material costs for the connectorized modular design are typically higher than the traditional PLC design. In this example we have the following: (Cost are in U.S. dollars)

	Connectorized Modular Design	Qty	Cost	Traditional PLC Design	Qty	Cost
Main Control Panel	Small Panel	1	$275	Large Panel	1	$625
Wiring Tray for I/O					240 ft	$240
Network Cable for I/O	RSM-RKM-5711-4.0M	12	$626	18 AWG Cable	3000 ft	$540
Power Cable	RSM-RKM-40-4.0M	12	$550			
Cable for Motors	Group Motor Cable	120 ft	$60	Individual Motor Cable		$600
Cost of I/O	FDNP-S0404G-TT	12	$3840	Input / Output Cards	2000 ft	$1440
Total Material			**$4801**		6-8 ea	**$3445**

Installation Savings

The cost of installing a plug-and-play connectorized system can be 90 percent lower than cage clamp terminations. The time required to make a plug-and-play connection is less than 30 seconds per connection. The time required to strip the jacket, prepare the conductors, feed the cable through a gland, insert the wires into the terminals and tighten the cable gland is 5 to 10 minutes per connection. This is often complicated when the installation is in a physically demanding location. At a labor cost of $28.00/hour per NECA labor units, this adds up fast. Terminating this many connections on just a 6-port junction brick means a difference of $33.00 as compared to $3.30. However, real savings are often hidden since wiring errors are eliminated using plug-and-play connectorization. Additionally, the real savings are often still hidden since connectorized costs do not take into consideration the savings from the elimination of wiring errors. (Costs are in U.S. dollars)

	Connectorized Modular Design	Time	Cost	Traditional PLC Design	Time	Cost
Wiring I/O	2 Electricians	4 hours	$224	Make 144 screw terminals, Pull 24 cables - 2 electricians	2 days	$896
Troubleshooting and ringing out system	2 Electricians	1/2 hour	$28	2 Electricians	2 days	$896
Total Installation			**$252**			**$1792**

Add It Up

The total cost to design and build the above connectorized conveyor example is 20-25 percent less in terms of direct costs. (Costs are in U.S. dollars)

	Connectorized Modular Design	Traditional PLC Design
Design Cost	$448	$1792
Material Cost	$4801	$3445
Installation Cost	$252	$1792
Total Cost	**$5501**	**$7029**

In addition to these savings, there are other indirect benefits that are actually much more significant.

- 80 percent Shorter Design Cycle
- 80 percent Shorter Installation Cycle
- 80 percent Reduced Maintenance/Down Time

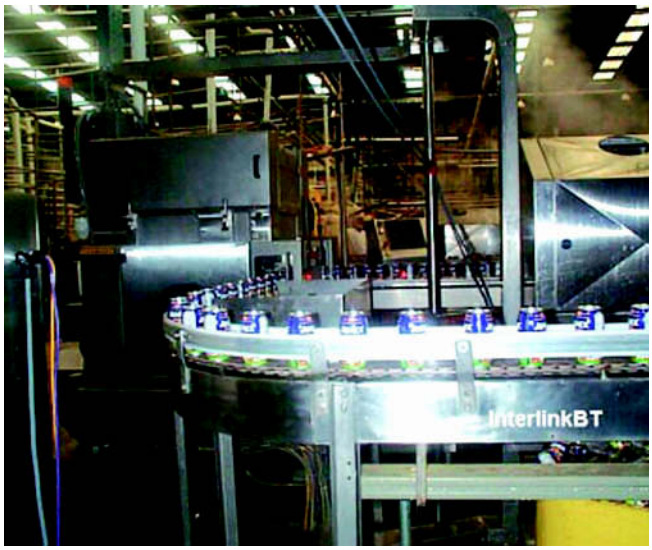
Shorter Design and Installation Cycles

Drastically reducing the design and installation cycles results in a tremendous benefit to the manufacturer. It allows them to build much more equipment without increasing the physical size of their facility. It also allows them to meet demanding customer deadlines more easily.

Maintenance/Down Time Savings

One of the most important features of connectorized networks is that repairs can be made in minutes instead of hours. Any section of a connectorized network or I/O cable can be replaced in seconds. Fully connectorized fieldbus networks essentially eliminate signal wire troubleshooting and repair.

Photo Gallery



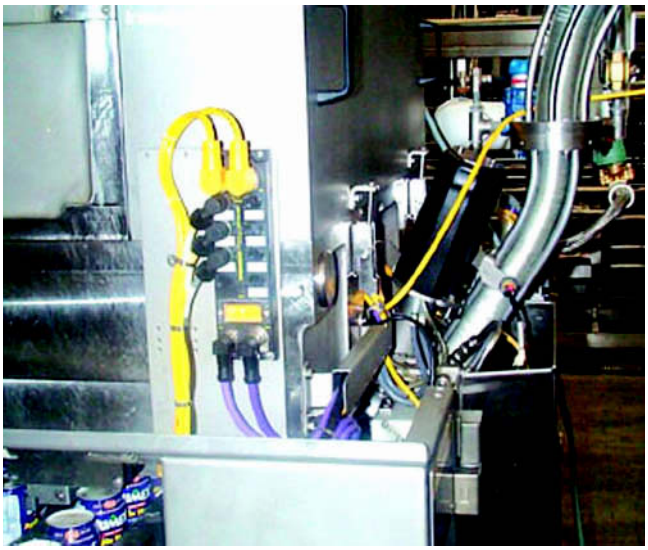
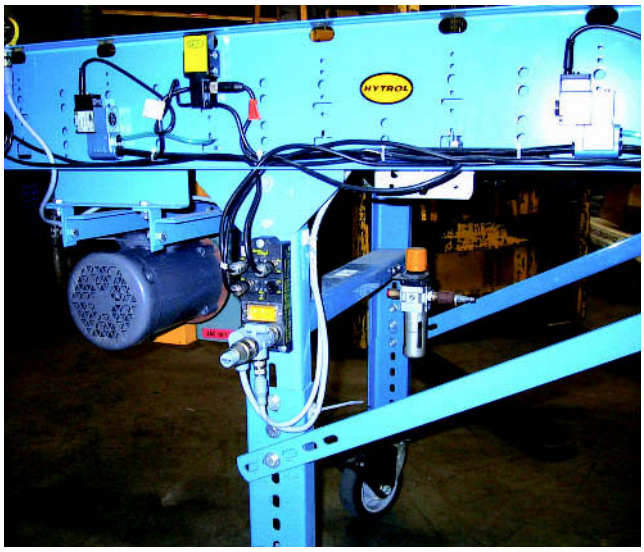
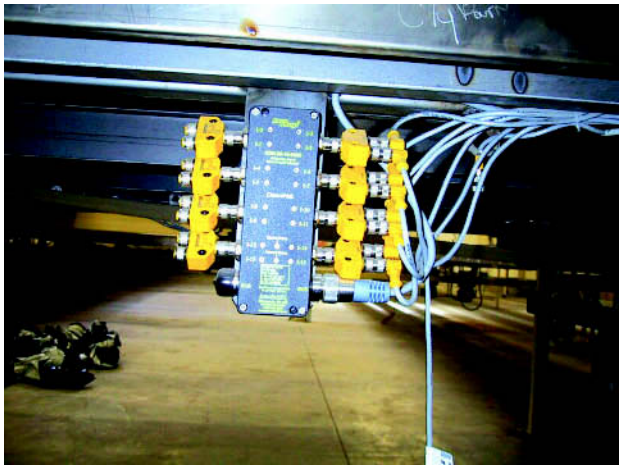


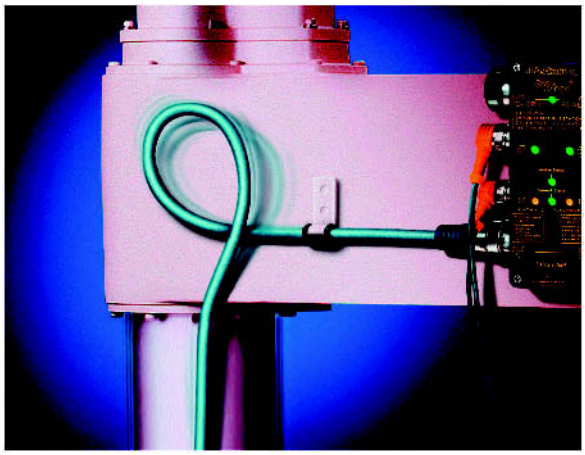
Photo Gallery

Photo Gallery



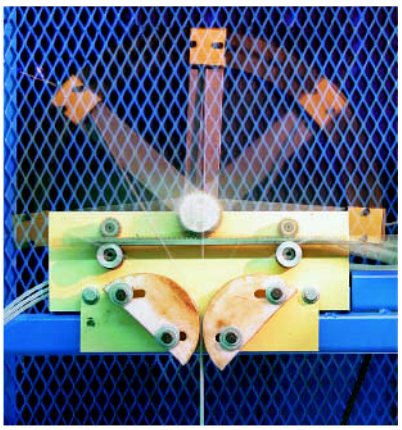


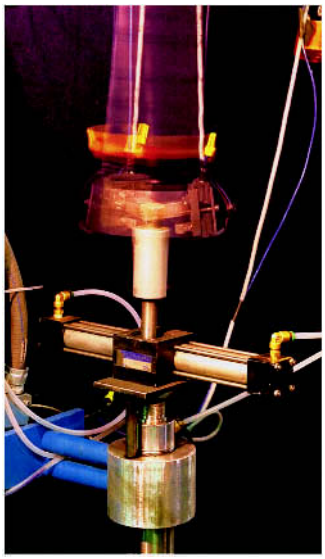
Flexlife® 10 Performance



Flexlife cables and cordsets are designed to handle the abuse of constant motion and bending. To ensure this, *FlexLife*® cables undergo a series of rigorous tests to ensure longer life in industrial settings. The tests exceed ASTM tests and MIL-specs for bend and torsional flex testing. In addition to their flexibility, they meet the signal attenuation requirements of *DeviceNet*™ and PROFIBUS® networks.

The Bend Radius Test repeatedly bends the cable back and forth with a 6.5 inch radius on a 180 degree plane, at a rate of 30 cycles per minute. During the test all conductors are monitored until a conductor fails. This "tick-tock" motion replicates the strenuous abuse of bending and contact with industrial machines. *Flexlife* cables can withstand 10 million cycles of the Bend Radius Test.



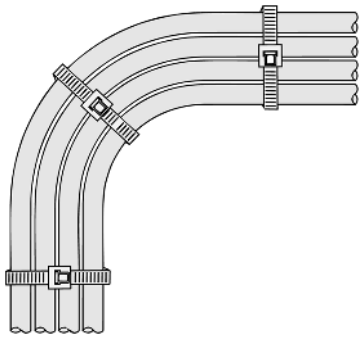


The Torsional Flex Test repeatedly moves and twists the cable through 360 degrees of torsional twisting. Simultaneously, it is rolling 14 inches back and forth over an eight inch diameter sheave, which remains in contact throughout the test. This action is continuous (30 cycles per minute) and replicates the most abusive robotic movements for an industrial cable. Again, all conductors are monitored until a conductor fails. *Flexlife* cables withstand 10 million cycles of the Torsional Flex Test.

Cable Bundling Techniques

When bundling several cables together, always keep the bundle loose enough to move within itself. Tightly tied bundles create both compression and tension stresses when the bundle is moved.

Correct



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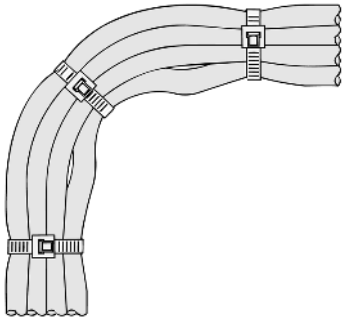
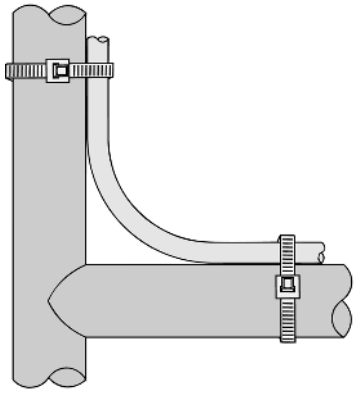


Tying Cables with Cable Ties

When tying cable with self locking ties, always leave the ties loose enough for the cables to slide freely under the tie. Over-tightening will create stress concentrations that can cause the conductors to fail prematurely. Never tighten the tie to the point where the cable jacket becomes deformed or pinched.

Correct



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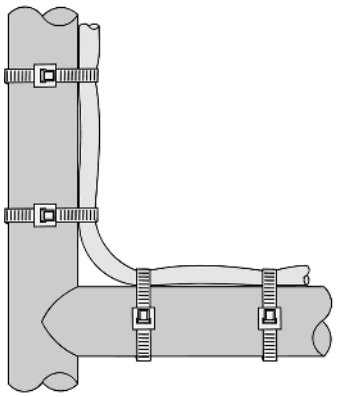


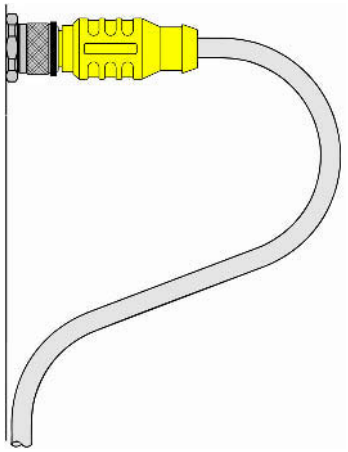
Cable Installation

Proper management of cabling systems can mean the difference between a dependable and smooth operating installation and costly recurring down time. The suggestions outlined below illustrate some of the common sources of problems and provide simple and effective solutions.

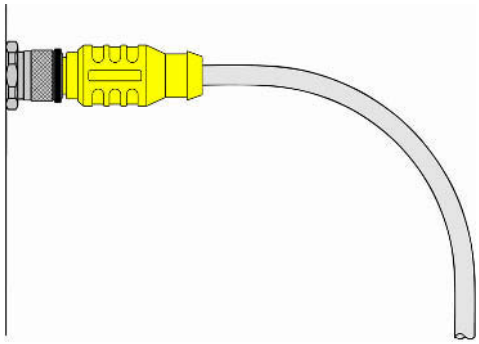
Proper Bend Radius for Fixed and Moving Applications

Providing sufficient bend radius will allow the cable to absorb the energy of bending over a greater portion of its length, increasing its effective working life. Small increases in the radius of the bend can produce substantial increases in cable life.

Fixed Applications
Minimum bend radius 5 x cable diameter



Moving Applications
Minimum bend radius 10 x cable diameter

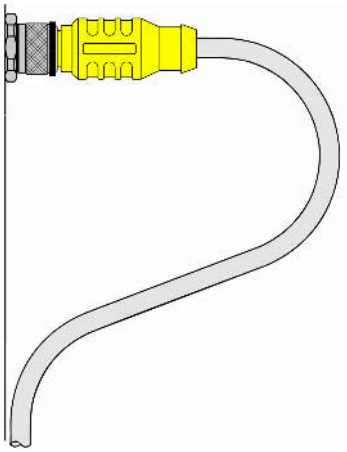


Eliminating Stress Points in Cable Dress

Installing cables to allow for adequate stress loops and freedom of motion increases the life of the cables. *Interlink*BT™ cordsets incorporate molded strain reliefs that will assist in preventing stress.

Strain Relief

Correct



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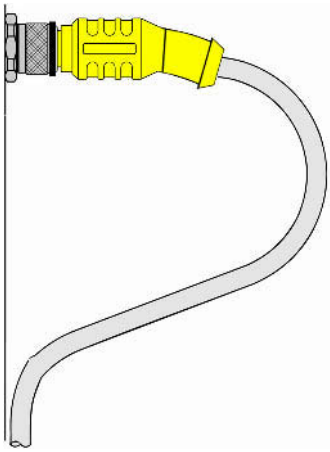

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Warranty

InterlinkBT, LLC (hereinafter "InterlinkBT") warrants the Products covered by this WARRANTY AGREEMENT to be free from defects in material and workmanship under normal and proper usage for 18 months from the date of shipment from InterlinkBT.

THE WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER REPRESENTATIONS MADE – BOTH EXPRESSED AND IMPLIED. THERE ARE NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE FOR PRODUCTS COVERED BY THESE TERMS AND CONDITIONS.

InterlinkBT warrants that the goods sold are as described, but no promise, description, affirmation of fact, sample model or representation, oral or written shall be part of an order, unless set forth in these terms and conditions, or are in writing and signed by an authorized representative of InterlinkBT. This warranty does not apply to any Product which has been subject to misuse, negligence, or accident – or to any Product which has been modified or repaired, improperly installed, altered, or disassembled – except according to InterlinkBT's written instructions.

This WARRANTY is subject to the following conditions:

1. This WARRANTY is limited to the electronic and mechanical performance only, as expressly detailed in the Product specifications and NOT to cosmetic performance.
2. This WARRANTY shall not apply to any cables attached to, or integrated with the Product. However, the 18 month warranty shall apply to cables sold separately by InterlinkBT.
3. This WARRANTY shall not apply to any products which are stored, or utilized, in harsh environmental or electrical conditions outside written specifications.
4. The WARRANTY is applicable only to Products shipped from InterlinkBT subsequent to May 1, 1998.

Purchaser's Remedies

If an InterlinkBT Distributor desires to make a WARRANTY Claim, the Distributor shall, if requested by InterlinkBT, ship the Product to InterlinkBT's facility in Minneapolis, Minnesota, postage or freight prepaid. If the User desires to make a WARRANTY Claim, they shall notify the authorized InterlinkBT Distributor from whom it was purchased or, if such Distributor is unknown, shall notify InterlinkBT. InterlinkBT shall, at its option, take either of the following two courses of action for any products which InterlinkBT determines are defective in materials or workmanship.

1. Repair or replace the Product and ship the Product to the Original Purchaser or to the authorized InterlinkBT Distributor, postage or freight prepaid; or
2. Repay to the Original Purchaser that price paid by the Original Purchaser.

PURCHASER'S REMEDIES SHALL BE LIMITED EXCLUSIVELY TO THE RIGHT OF REPLACEMENT, REPAIR OR REPAYMENT AS PROVIDED AND DOES NOT INCLUDE ANY LABOR COST OR REPLACEMENT AT ORIGINAL PURCHASER'S SITE. INTERLINKBT SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF ANY WARRANTY, EXPRESSED OR IMPLIED, APPLICABLE TO THE PRODUCT, INCLUDING WITHOUT LIMITATION, ANY DAMAGES RESULTING FROM PROPERTY DAMAGE, PERSONAL INJURY OR BUSINESS INTERRUPTION.

Risk of Loss

Delivery of the equipment to a common carrier shall constitute delivery to the Purchaser and the risk of loss shall transfer at that time to Purchaser. Should delivery be delayed due to an act or omission on the part of the Purchaser, risk of loss shall transfer to the Purchaser upon notification by InterlinkBT that the order is complete and ready for shipment.

Consider Safety and Protection Precautions

InterlinkBT takes great care to design and build reliable and dependable products, however, some products can fail eventually. You must take precautions to design your equipment to prevent property damage and personal injury in the unlikely event of failure. As a matter of policy, InterlinkBT does NOT recommend the installation of electronic controls as a sole device FOR THE PROTECTION OF PERSONNEL in connection with power driven presses, brakes, shears and similar equipment and, therefore, the customer should build in redundancy or dual control using approved safety devices for these applications.

Governing Law

The sale and purchase of Products covered hereby and all terms and conditions hereof shall be governed by the law of the State of Minnesota.

Product Availability

InterlinkBT makes every effort to stock most of these part numbers in reasonable quantities. InterlinkBT also makes no guarantee of availability of any product represented. Some part numbers are available on a special order basis only and may require longer lead times. Please consult with InterlinkBT when you need a committed delivery date.

Special Order Items

Certain part numbers require minimum order quantities. As a general guideline, product not listed in this price list may be subject to 25 piece minimum order quantity. If there is any question on availability or minimum order quantities, please contact InterlinkBT before ordering.

Field Service

Please contact *Interlink*BT for details (1-888-546-5880).