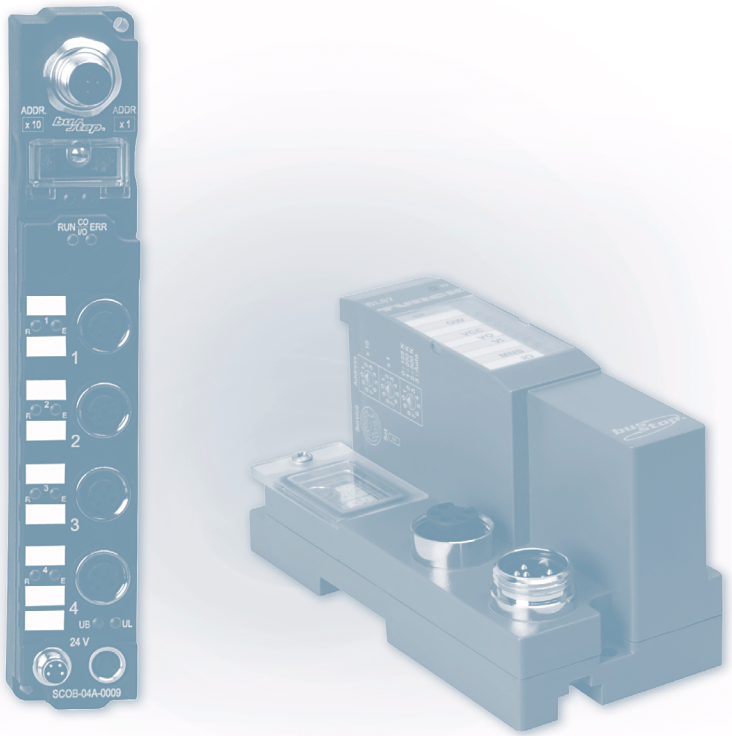
TURCK
Industrial I/O CANopen Products



System Description

CANopen is a higher-layer system based on the CAN (controller area network) specification that defines device and communication profiles. Device profiles standardize the data contents of the various supported device types, while communication profiles determine the method of data exchange between the devices. The basic communication methods are real time data (process data objects - PDO) and parameter data (service data objects - SDO).

CANopen defines different communication modes for the transmission of process data (PDOs):

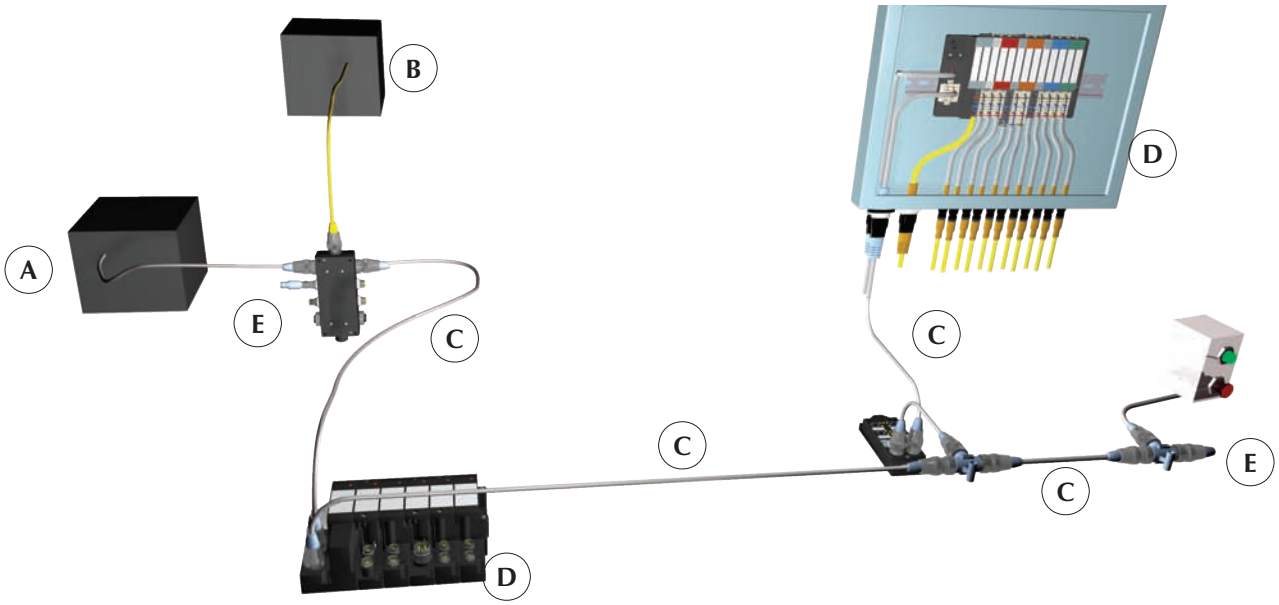
- Event-controlled: Messages are sent as soon as the contents change. Only the modifications are transmitted, therefore the process image/mapping is not transferred permanently.
- Cyclic synchronous mode: The modules accept the output data received and send new input data via a SYNC telegram.
- Request-controlled: The modules are triggered to send their input data via a CAN data request message.

CANopen devices are parameterized via SDOs, primarily to transfer parameters during device configuration and to transmit longer data fields. Due to effective usage of the bus bandwidth, CANopen offers short system response times at a relatively low transmission speed (max. 1 Mbps).

Configuration/Parameterization

CANopen allows node addresses from 1 to 126. **TURCK** stations are typically addressed via two or three decimally coded rotary switches. In situations where two switches are used, the node may only be addressed as high as 99. The system speed corresponds to the transmission rate set via the master, and is automatically detected by the ***piconet***® modules (auto baud). Manufacturer provided EDS (electronic data sheet) files configure the individual CANopen nodes. **TURCK** also offers I/O*assistant* software, a helpful tool for configuration, parameterization and set-up of the individual modules.

Typical System Configuration



Basic Parts List

A typical CANopen system consists of the following parts:

A = Controller
B = Power Supply
C = CAN Cable
D = CANopen I/O Modules (or Slaves)
E = Terminating Resistors

Cordsets & Media

CANopen follows the CAN specification, and requires cabling to carry CAN High, CAN Low and ground signals. Optional signals include Shield, V+ (device power) and V- (device power). **TURCK** CANopen cables include the required signals, as well as the shield and power supply signals, with a common reference on the ground wire.

There are several different standardized connectors for CANopen. **TURCK** normally offers cordsets with ***minifast***® (7/8-16 UN), ***eurofast***® (M12) and open style options. Cables are available in different physical sizes for more flexibility (thin cable) or longer trunk lengths (thick cable). **TURCK** cordsets for the CANopen system are available in standard lengths. Please contact your local sales representative to order custom lengths.

Addressing

CANopen systems allow up to 127 devices on the network. **TURCK** CANopen stations may be addressed between 1 and 99 via rotary decimal coded switches.

Maximum Ratings

CANopen can operate at data rates from 10 kbaud to 1 Mbaud, with trunk lengths ranging from 5000 m at the low speed to 25 m at the highest speed.

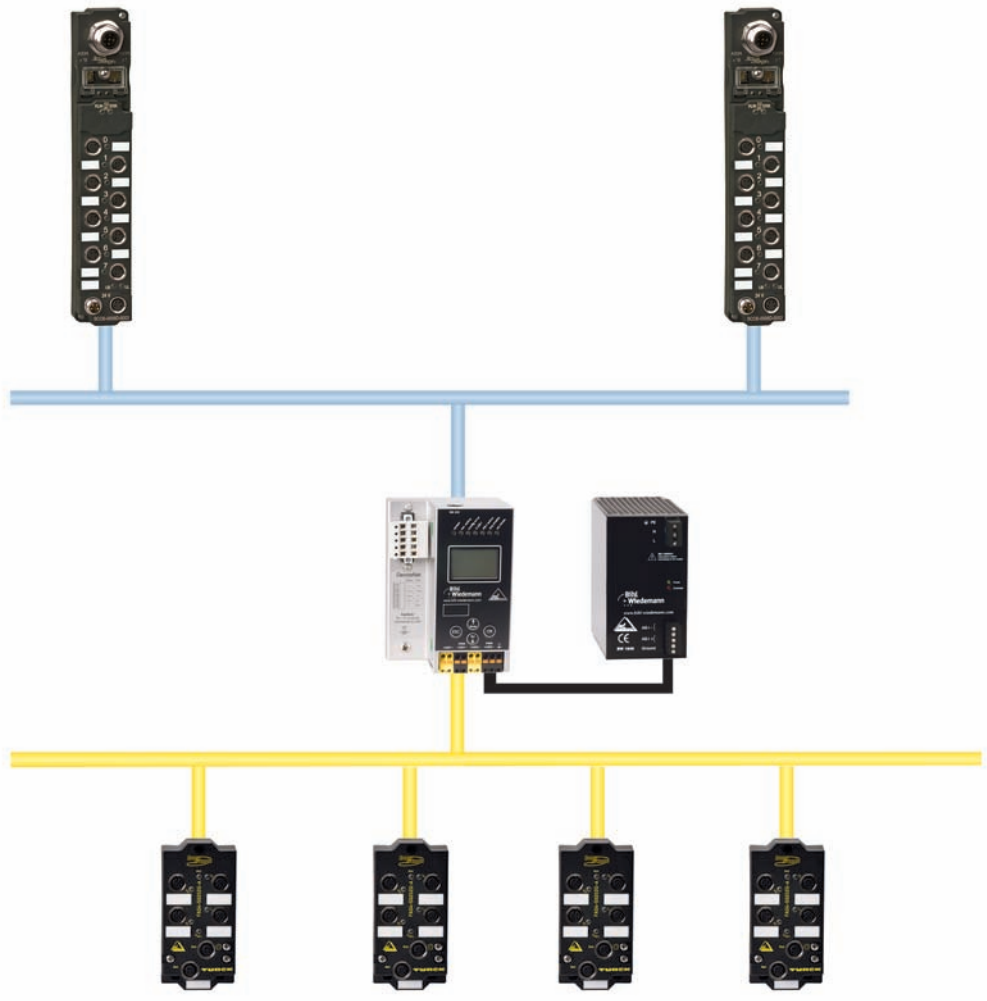
Communication Rate	Trunk Length
10 kbps	5000 m
20 kbps	2500 m
50 KBit/s	1000 m
125 kbps	500 m
250 kbps	250 m
500 KBit/s	100 m
800 kbps	50 m
1000 kbps	25 m

CANopen to AS-interface® Gateways

AS-I systems can easily be connected to a higher-level network, such as CANopen, through a gateway master. The gateway acts as a master to the AS-I system(s) and a slave to the CANopen system, mapping all of the AS-I data for CANopen in a single block.

For AS-I specifications and rating details see section E.

DeviceNet System
(Gateway is the Slave)



AS-I System
(Gateway is the Master)

Addressing

CANopen stations must have a network address for communication. The address for AS-i/CANopen gateways may be set via the on-unit display and push buttons. Please consult the manual for a particular gateway for instruction on the procedure.

Diagnostics

AS-i/CANopen gateways contain LEDs for diagnosing I/O and communication problems for CANopen and AS-I. For a detailed description of the LED states please see the Bihl+Wiedemann AS-i/CANopen Gateway User Manual available for download from www.bihl-wiedemann.com.

Power

Most of the AS-i/CANopen gateways available draw power from the AS-I power supply. The option to use a separate, non-AS-I power supply is also available. Consult the gateway documentation to ensure the gateway being selected meets the requirements of your system.

CANopen Selection Guide

Housing	I/O Type	I/O Direction	Pages
Piconet 	Discrete	Input	P19
		Output	P23
		Input & Output	P21, P25
	Analog	Input	P27
		Output	P31
	Special Function	Serial	P35
		Encoder	P33
Gateways 	BL67	N/A	P9
	BL20		P11
	AS-I		P7
	Piconet		P13

AS-I CANopen Gateways in Stainless Steel

ASI-COG-SS BW1821
ASI-COG-SS BW1822
ASI-COG-SS BW1823

- **AS-I v3.0 Supported**
- **Graphical Display**
- **Integrated Ground-Fault Detection**
- **Integrated AS-I Diagnostics**

Electrical

- Operating Current: 200 mA from VAS-$_i$ (Power Supply A)
  200 mA from VAS-$_{i1}$, 70mA from VAS-$_{i2}$ (Power Supply A2)
  250 mA from V_{AUX} (Power Supply E)

Power Distribution

- From AS-I supply for each network (Power Supply A, A2)
  From external supply (Power Supply E)

Mechanical

- Operating Temperature: 0 to +55°C (+32 to +131°F)
- Protection: IP 20

Material

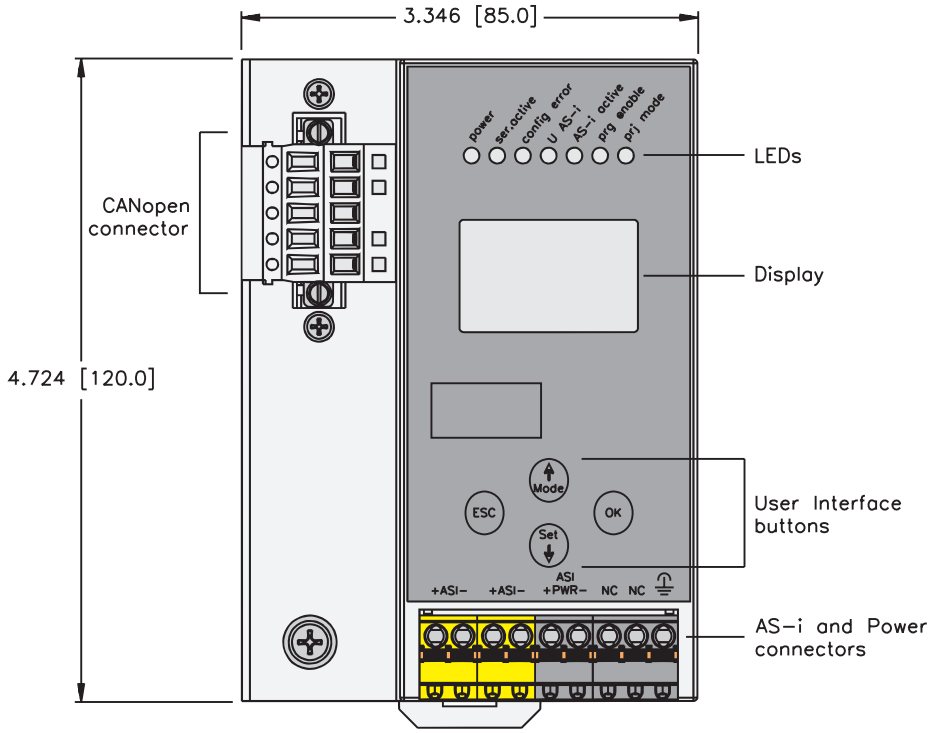
- Housing: Stainless Steel

Diagnostics (Logical)

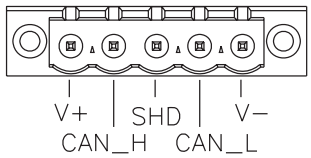
- Health of AS-I network is available via CANopen interface

Diagnostics (Physical)

- LED to indicate status of network and AS-I communication and power supply



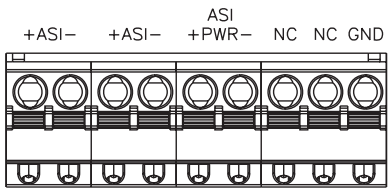
CANopen Connector



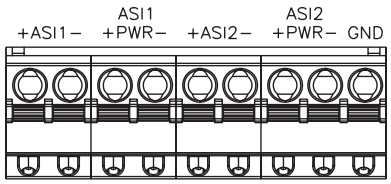
Part Number	Higher Level Network	Power Style	AS-I Version	# of AS-I Masters	Duplicate Address Detection	Programming Interface
ASI-COG-SS BW1821	CANopen	A	3.0	1	X	X
ASI-COG-SS BW1822	CANopen	A2	3.0	2	X	X
ASI-COG-SS BW1823	CANopen	E	3.0	2	X	X

Input/Output Connectors

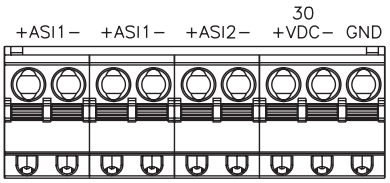
A



A2



E



A - Single AS-I network is powered by and AS-I power supply

A2 - Dual AS-I networks are each powered by their own AS-I power supply

E - Dual AS-I networks are both powered by a single 30 VDC supply, decoupled through the gateway

BL67 Gateway

- **Modular I/O**
- **Fieldbus Independent Configuration**
- **IP 67 Protection**
- **Various I/O Styles**

BL67-GW-CO

Electrical

- Operating Current: <600 mA from V_I
- Supply Current: <10 A to I/O (from V_I and V_O)
- Backplane Current: <1.5 A (from V_I)

Mechanical

- Operating Temperature: -25 to +55°C (+32 to +131°F)
- Protection: IP 67
- Vibration: 5 g @ 10 to 500 Hz

Material

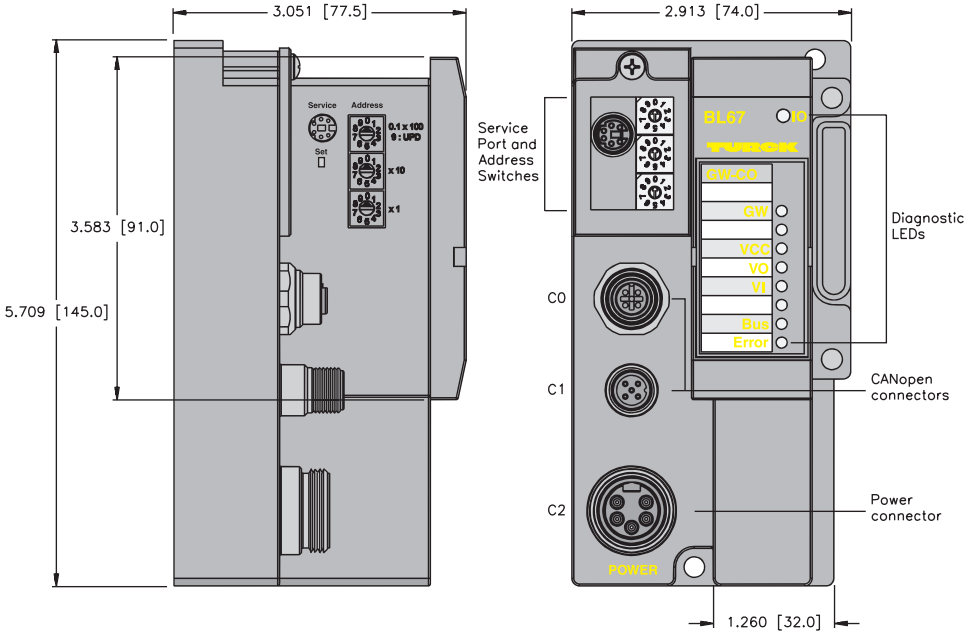
- Housing: PC-V0 (Lexan)

Diagnostics (Logical)

- Diagnostic information available through the CANopen interface

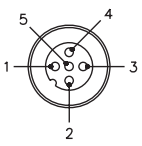
Diagnostics (Physical)

- LEDs to indicate status of CANopen and Module Bus communication



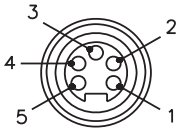
CANopen *eurofast*® Pinouts

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

Male	Female
	
5-Pin	5-Pin

minifast® Power Pinouts

1. = Gnd
2. = Gnd
3. = PE
4. = V_I
5. = V_O

Male

5-Pin

Note: Power feeding modules may be used for I/O current supply to prevent overloading the gateway power supply.

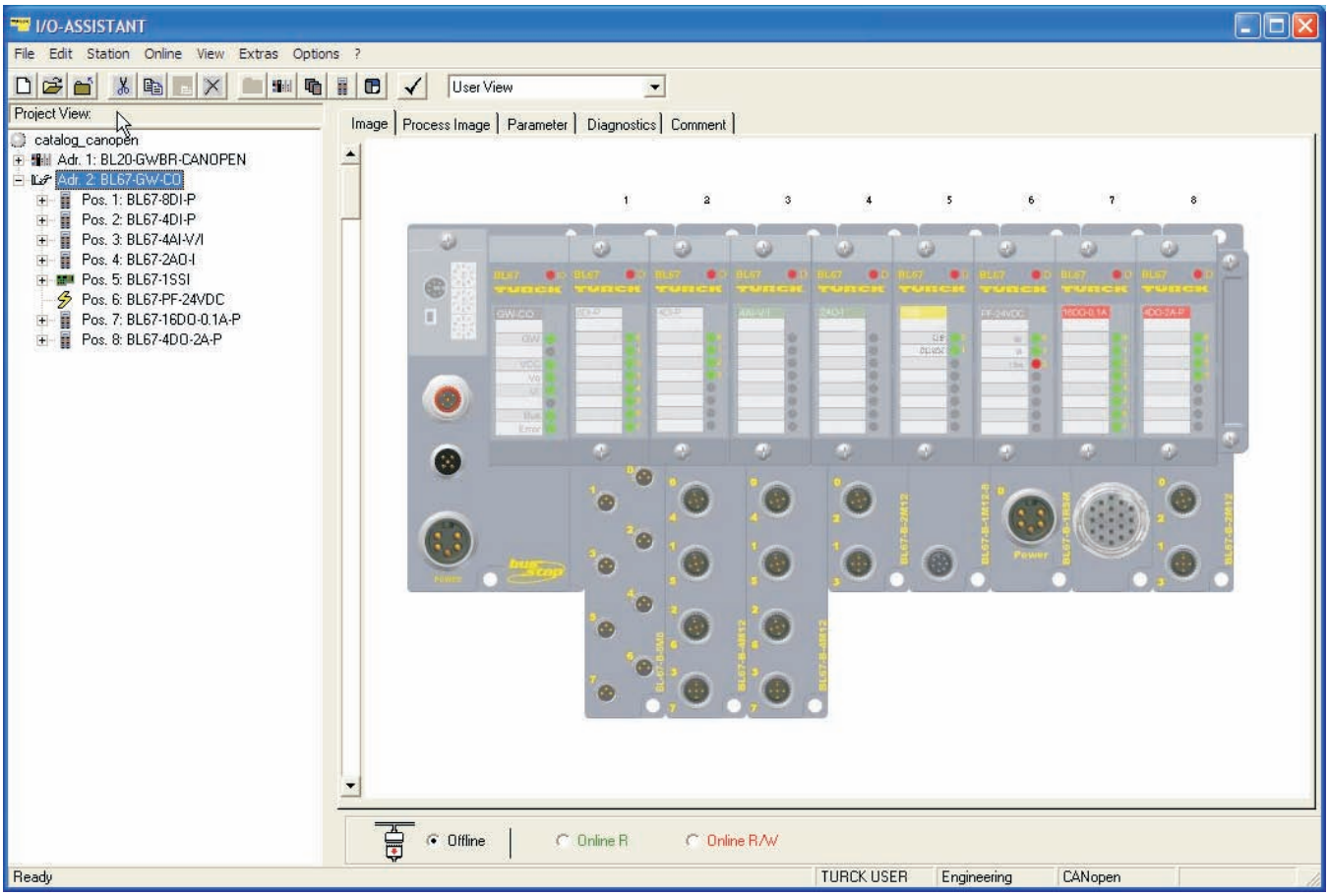
CANopen BL67 Stations

TURCK's BL67 is a modular, user configurable network I/O system designed to allow installation of nodes containing different types and sizes of I/O depending on the users needs for a particular area. Featuring IP 67 protection and metal threaded connectors, the BL67 can often be mounted in the physical process environment or directly on a machine without a separate enclosure for the I/O. This saves planning and installation time, as well as the cost of the enclosure itself.

The BL67 system supports several different network protocols, including CANopen. A BL67 station consists of a gateway module that interfaces to the CANopen system, and several I/O modules that interface with the physical I/O in the field. Different connector options are available to allow a greater level of customization to the user.

For more details on the BL67 system, please see section G of this catalog.

TURCK's I/O Assistant software package is used to configure the BL67 system.



BL20 Gateway

BL20-GWBR-CANOPEN

- **Modular I/O**
- **Fieldbus Independent Configuration**
- **IP 20 Protection**
- **Various I/O Styles**

Electrical

- Operating Current: <350 mA from BR power supply (U_{SYS})
- Supply Current: <10 A to I/O (from U_L)
  <1.5 A to backplane (from U_{SYS})

Mechanical

- Operating Temperature: 0 to +55°C (+32 to +131°F)
- Protection: IP 20
- Vibration: 1 g @ 5 to 100 Hz

Material

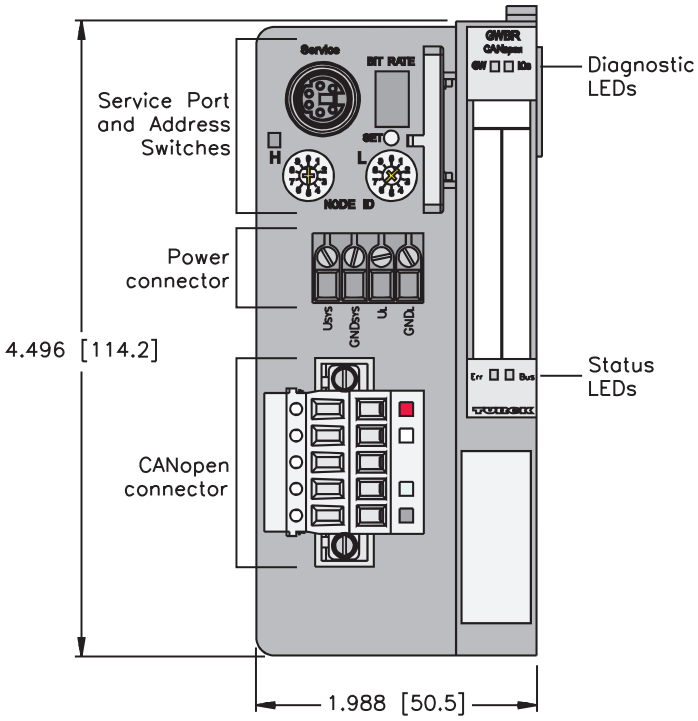
- Housing: PC-V0 (Lexan)

Diagnostics (Logical)

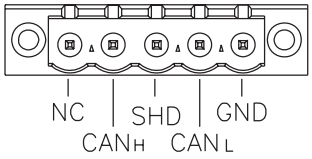
- Diagnostic information available through the CANopen interface

Diagnostics (Physical)

- LEDs to indicate status of CANopen and Module Bus communication

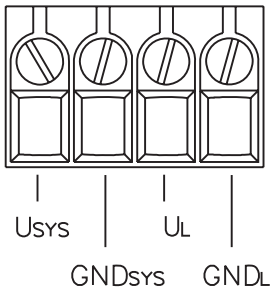


CANopen connector



Power connector

1 = U_L+
2 = V_L-
3 = U_{SYS}+
4 = U_{SYS}-



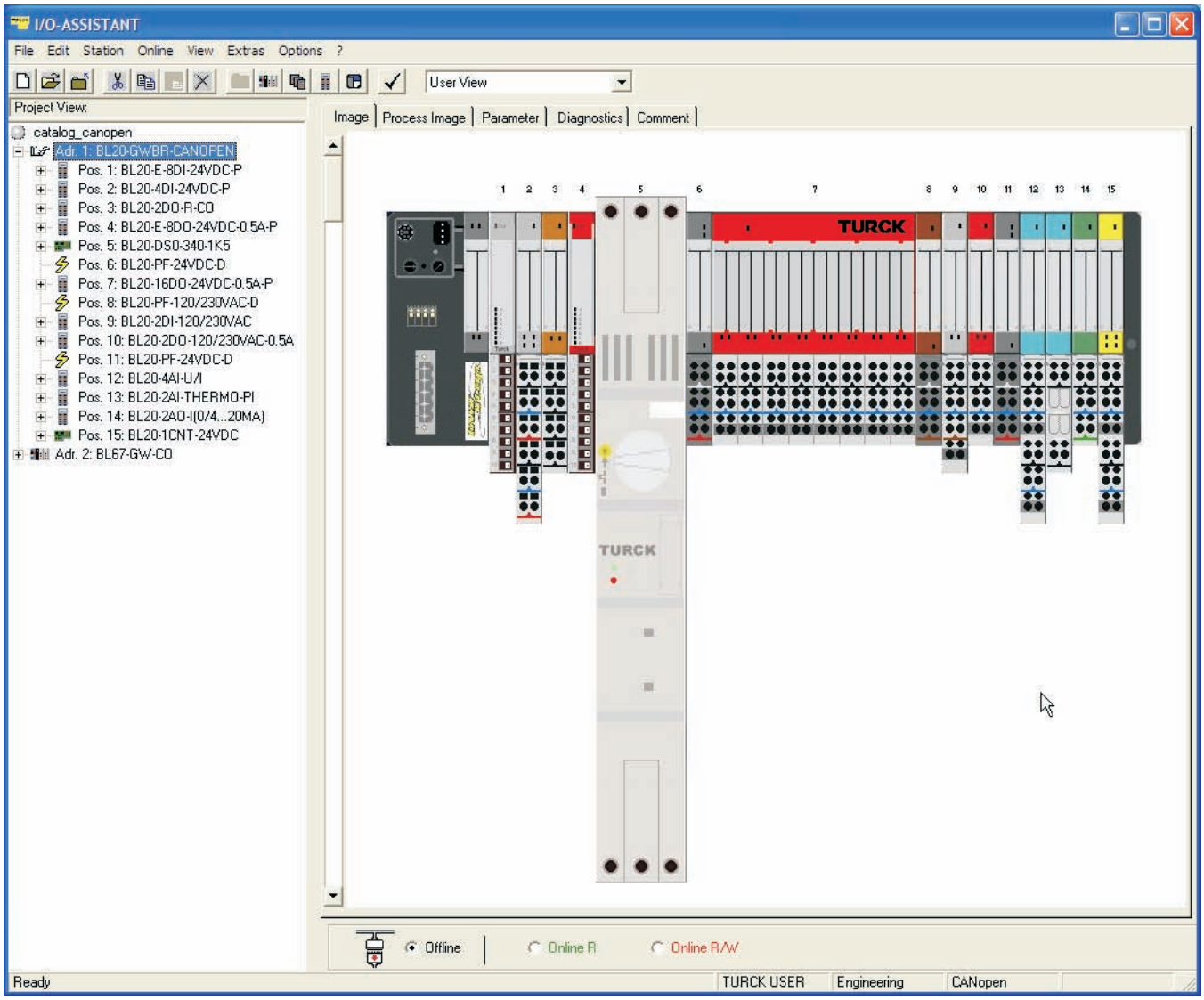
CANopen BL20 Stations

TURCK's BL20 is a modular, user configurable network I/O system designed to allow installation of nodes containing different types and sizes of I/O depending on the users needs for a particular area. Featuring IP 20 protection and terminal point connections, the BL20 is intended to be mounted in the control cabinet or in a field enclosure.

The BL20 system supports several different network protocols, including CANopen. A BL20 station consists of a gateway module that interfaces to the CANopen system, and several I/O modules that interface with the physical I/O in the field. The terminal bases are available with tension clamp or screw terminal connector types.

For more details on the BL20 system please see the section H of this catalog.

TURCK's I/O Assistant software package is used to configure the BL20 system.



piconet Gateway

SCOL-0404D-0003

- **Rugged, Fully Potted Stations**
- **IP 67 Protection**
- **Small Footprint**
- **Flexible I/O Subnetwork**

Electrical

- Operating Current: <75 mA plus sensor currents (from U_B)
- Sensor Current: <500 mA total of all sensors (from U_B)
- Output Current: <500 mA per output (from U_L)

Power Distribution

- Inputs: U_B Power supply
- Outputs: U_L Power supply

Mechanical

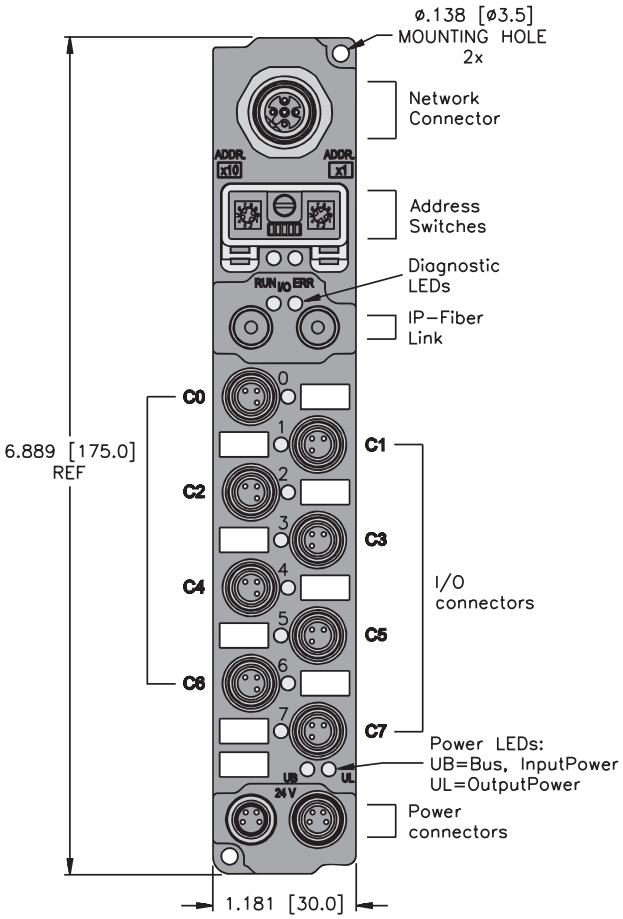
- Operating Temperature: 0 to +55°C (+32 to +131°F)
- Protection: IEC IP 67
- Vibration: IEC 68, part 2-6

Material

- Connectors: Nickel-plated brass
- Housing: Nylon

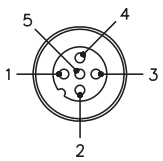
Diagnostics (Physical)

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



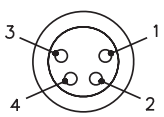
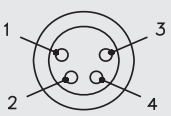
CANopen Pinout

1 = Shield
2 = NC
3 = NC
4 = CAN_H
5 = CAN_L

eurofast Male

5-Pin

Aux. Power

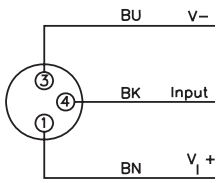
1 = U_B+
2 = U_L+
3 = Gnd
4 = Gnd

picofast® Male	*picofast*® Female
	
4-Pin	**4-Pin**

	Inputs								Outputs							Data
Part Number	Input Count	Connectors	Pinout	Inputs per Connector	Sensor Style	Group Diagnostics	Individual Diagnostics	Wire-Break Detection	Output Count	Connectors	Pinout	Outputs per Connector	Current	Individual Diagnostics	Wire-Break Detection	I/O Map
SCOL-0404D-0003	4	0-3	PI	1	PNP				4	4-7	PO	1	0.5 A			1

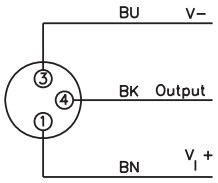
Input/Output Connectors

PI



Mating cordset:
PSG 3M-*

PO



Mating cordset:
PSG 3M-*

CANopen

I/O Data Map 1

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
In	0	Data from next input modules				I-3	I-2	I-1	I-0
Out	0	Data for next output modules				O-3	O-2	O-1	O-0

CANopen *piconet* Stations

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

piconet's small size sets them apart from other stations. ***piconet*** stations are the smallest rugged I/O modules available with a standard housing footprint of 30 x 175 mm. They are available with ***picofast*** ® (M8) connectors for I/O, making them ideally suited for small-space applications.

piconet stations are also able to create a small distributed subnetwork from the CANopen system, allowing the user to choose a gateway node (identified by the part number SDPL…) to connect to a CANopen system. A fiber-optic network connects the gateway to the chosen I/O modules creating a distributed system that is visible to CANopen as a single node.

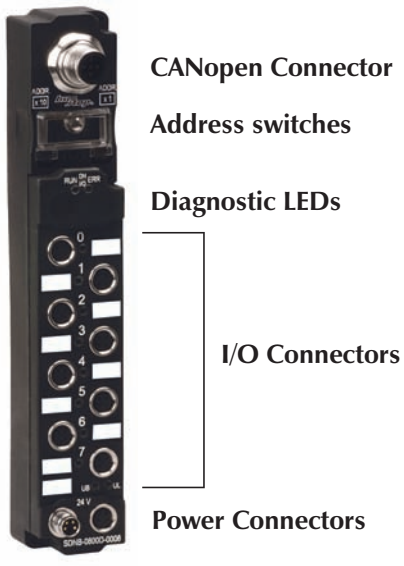
Specifications

Mechanical

TURCK CANopen ***piconet*** stations are designed to be mounted directly on machines and work cells with no separate enclosure or housing necessary. Epoxy-filled housing creates a durable station that allows it to be mounted in most industrial environments. Detailed environmental specifications are as follows:

- Housing material: Glass filled nylon
- Connector material: Nickel-plated brass
- Protection level: NEMA 1,3,4,12,13; IEC IP 67
- Operating temperature: 0 to 55°C

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



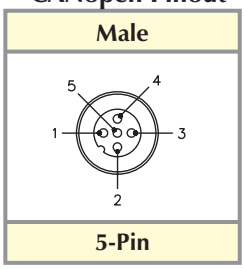
Connectors

CANopen ***piconet*** ® stations have connectors for bus and I/O power, in addition to subnetwork communication for gateways. ***piconet*** stations use auxiliary power for all I/O.

Bus Connector

1 = Shield
2 = NC
3 = NC
4 = CAN_H
5 = CAN_L

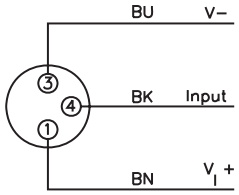
CANopen Pinout



Male *eurofast* ®

piconet stations with discrete I/O are available with ***picofast*** (M8) connectors.

PI



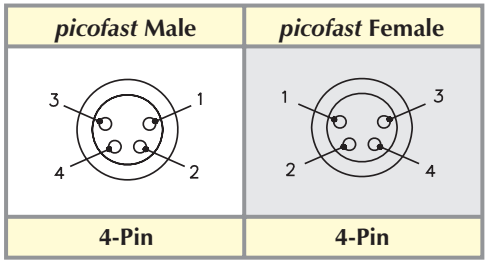
piconet stations with analog and special function I/O are available with ***eurofast*** connectors.

Auxiliary Power Connectors

piconet stations have two 4-pin ***picofast*** auxiliary power connectors, one male and one female, that allow the stations to be "daisy-chained" from one power supply to another without using a T-connector. Two power supplies are connected through the auxiliary supply; one for the station electronics and inputs and one for outputs.

Aux. Power

1 = U_B+
2 = U_L+
3 = Gnd
4 = Gnd



Subnetwork Connectors (Gateway modules only)

piconet ® subnetworks use a fiber-optic medium for communication. This is a ring network system, so it is important to connect the fiber-optic output from the last station back to the input on the gateway. The fiber used is plastic and features a simple snap-in connector.

Fiber-optic connectors

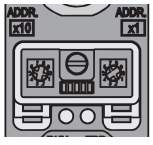
Stations may be available with different connector options than the standards mentioned here. Consult your local sales representative if you need different connector options.

Power

- Aux Power Voltage: 24 VDC (nominal)
- Input Voltage: 13-26 VDC (From Auxiliary supply, VB)
- Output Voltage: From Auxiliary supply, VL

Addressing

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



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

piconet stations provide LEDs for diagnosing communication problems.

Bus

- Green: Normal operation
- Red: No communication

Module Status

- Green: OK
- Red: Error

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

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

There is also an LED to indicate the status of each of the two auxiliary power supplies.

- Off: Power is missing
- On: Power is present

Input Station

SCOB-0800D-0008

- **Rugged, Fully Potted Stations**
- **IP 67 Protection**
- **Small Footprint**
- **Automatic Baud Rate Sensing**

Electrical

- Operating Current: <75 mA plus sensor currents (from U_B)
- Sensor Current: <500 mA total of all sensors (from U_B)

Power Distribution

- Inputs: U_B Power supply

Mechanical

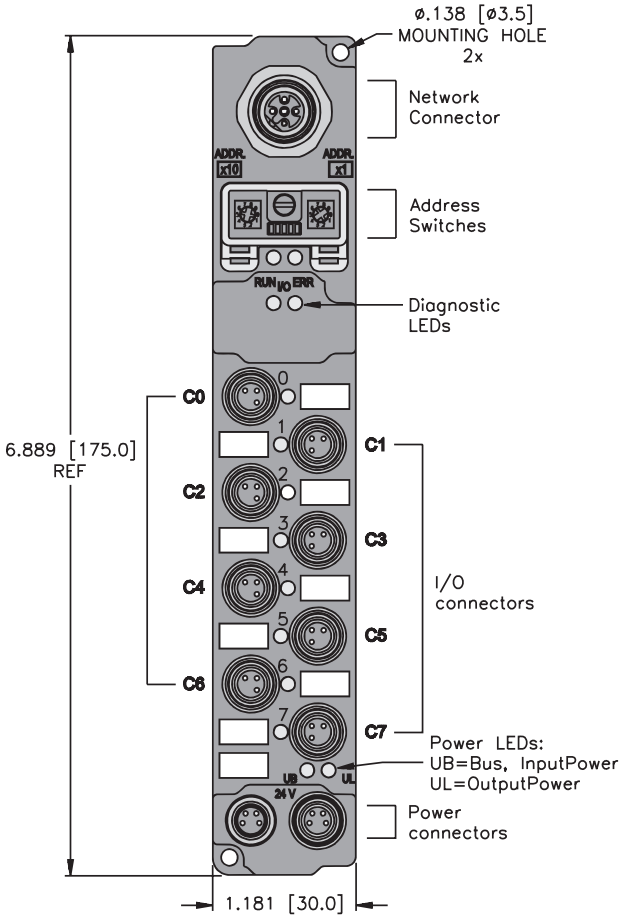
- Operating Temperature: 0 to +55°C (+32 to +131°F)
- Protection: IEC IP 67
- Vibration: IEC 68, part 2-6

Material

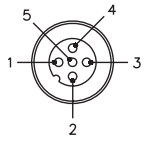
- Connectors: Nickel-plated brass
- Housing: Nylon

Diagnostics (Physical)

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

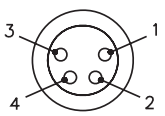
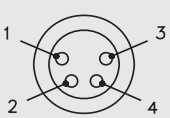


CANopen Pinout

eurofast Male

5-Pin

1 = Shield
2 = NC
3 = NC
4 = CAN_H
5 = CAN_L

Aux. Power

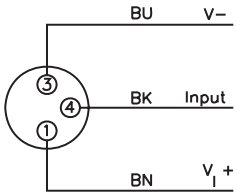
picofast Male	*picofast* Female
	
4-Pin	**4-Pin**

1 = U_B+
2 = U_L+
3 = Gnd
4 = Gnd

Part Number	Inputs								Data
	Input Count	Connectors	Pinout	Inputs per Connector	Sensor Style	Group Diagnostics	Individual Diagnostics	Wire-Break Detection	Map
SC0B-0800D-0008	8	0-7	PI	1	PNP				1

Input Connectors

PI



I/O Data Map 1

In	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0

Input/Output Stations

SCOB-0808D-0001

- **Rugged, Fully Potted Stations**
- **IP 67 Protection**
- **Small Footprint**
- **Automatic Baud Rate Sensing**

Electrical

- Operating Current: <75 mA plus sensor currents (from U_B)
- Sensor Current: <500 mA total of all sensors (from U_B)
- Output Current: <500 mA per output (from U_L)

Power Distribution

- Inputs: U_B Power supply
- Outputs: U_L Power supply

Mechanical

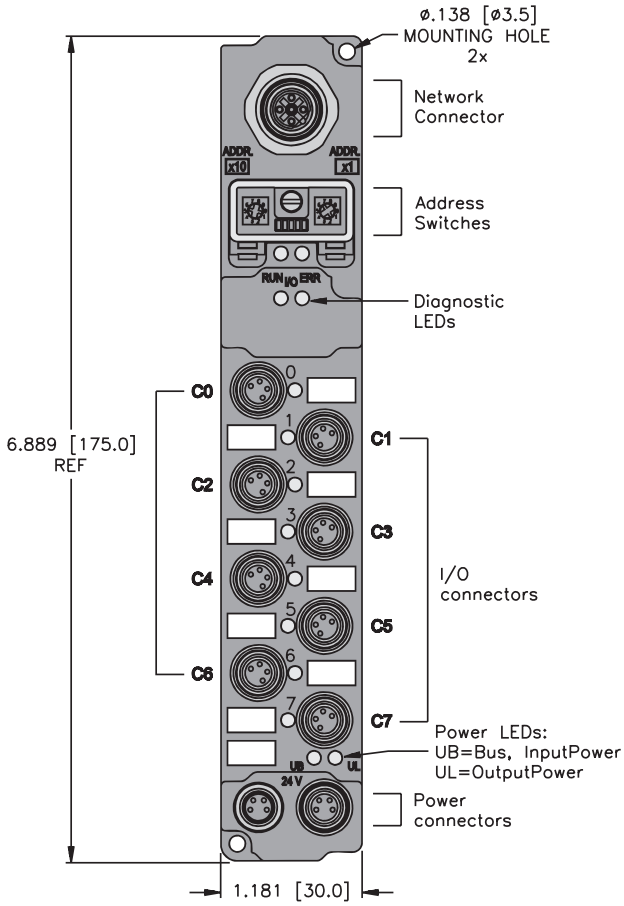
- Operating Temperature: 0 to +55°C (+32 to +131°F)
- Protection: IEC IP 67
- Vibration: IEC 68, part 2-6

Material

- Connectors: Nickel-plated brass
- Housing: Nylon

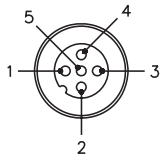
Diagnostics (Physical)

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



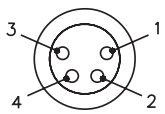
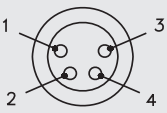
eurofast CANopen Pinout

1 = Shield
2 = NC
3 = NC
4 = CAN_H
5 = CAN_L

eurofast Male

5-Pin

Aux. Power

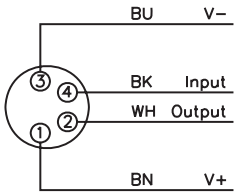
1 = U_B+
2 = U_L+
3 = Gnd
4 = Gnd

picofast Male	_picofast_ Female
	
4-Pin	**4-Pin**

	Inputs								Outputs							Data
Part Number	Input Count	Connectors	Pinout	Inputs per Connector	Sensor Style	Group Diagnostics	Individual Diagnostics	Wire-Break Detection	Output Count	Connectors	Pinout	Outputs per Connector	Current	Individual Diagnostics	Wire-Break Detection	I/O Map
SCOB-0808D-0001	8	0-7	PIO	1	PNP				8	0-7	PIO	1	0.5 A			1

Input/Output Connectors

PIO



Mating cordset:
PSG 4M-*

CANopen

I/O Data Map 1

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
In	0	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
Out	0	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0

Output Stations

SCOB-0008D-0006
SCOB-0008D-0002

- **Rugged, Fully Potted Stations**
- **IP 67 Protection**
- **Small Footprint**
- **Automatic Baud Rate Sensing**

Electrical

- Operating Current: <75 mA (from U_B)
- Output Current: see table on facing page (from U_L)

Power Distribution

- Outputs: U_L Power supply

Mechanical

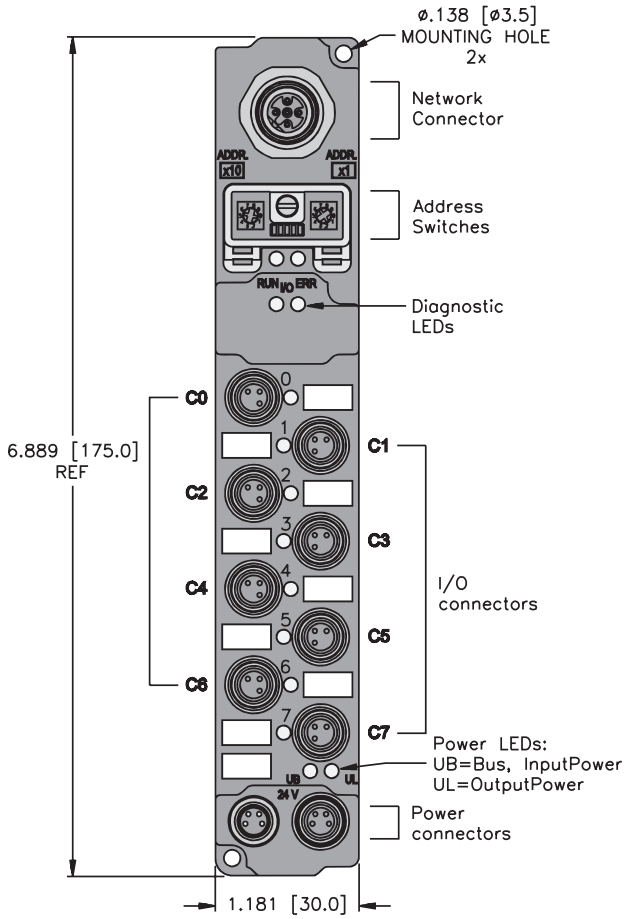
- Operating Temperature: 0 to +55°C (+32 to +131°F)
- Protection: IEC IP 67
- Vibration: IEC 68, part 2-6

Material

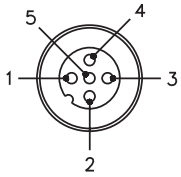
- Connectors: Nickel-plated brass
- Housing: Nylon

Diagnostics (Physical)

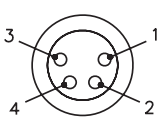
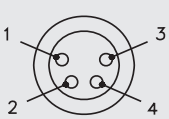
- One LED indicates an I/O fault for the entire station
- LEDs to indicate status of CANopen communication



CANopen Pinout

	Male
1 = Shield 2 = NC 3 = NC 4 = CAN_H 5 = CAN_L	
	5-Pin

Aux. Power

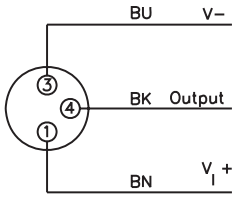
	picofast® Male	*picofast*® Female
1 = U_B+ 2 = U_L+ 3 = Gnd 4 = Gnd		
	4-Pin	**4-Pin**

	Outputs							Data
Part Number	Output Count	Connectors	Pinout	Outputs per Connector	Current	Individual Diagnostics	Wire-Break Detection	I/O Map
SCOB-0008D-0006	8	0-7	PO	1	0.5 A			1
SCOB-0008D-0002	8	0-7	PO	1	2 A*			1

*Note: Total output current for the station is 4 A.

Output Connectors

PO



I/O Data Map 1

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Out	0	0-7	0-6	0-5	0-4	0-3	0-2	0-1	0-0

Input/Output Stations

- **Rugged, Fully Potted Stations**
- **IP 67 Protection**
- **Small Footprint**
- **Automatic Baud Rate Sensing**

SCOB-0404D-0005
SCOB-0404D-0001

Electrical

- Operating Current: <75 mA plus sensor currents (from U_B)
- Sensor Current: <500 mA total of all sensors (from U_B)
- Output Current: See table on facing page (from U_L)

Power Distribution

- Inputs: U_B Power supply
- Outputs: U_L Power supply

Mechanical

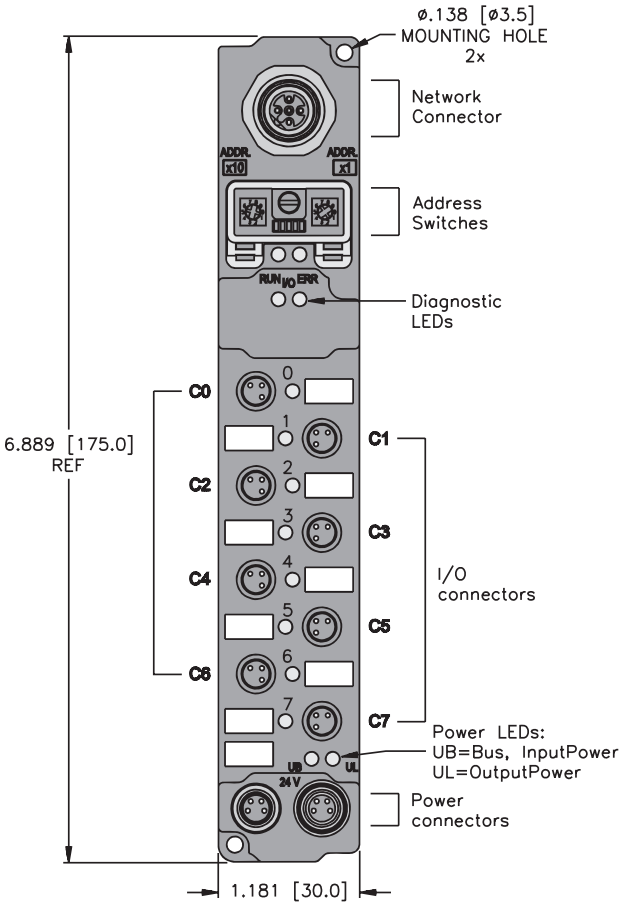
- Operating Temperature: 0 to +55°C (+32 to +131°F)
- Protection: IEC IP 67
- Vibration: IEC 68, part 2-6

Material

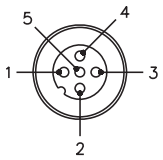
- Connectors: Nickel-plated brass
- Housing: Nylon

Diagnostics (Physical)

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

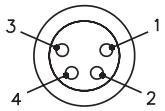
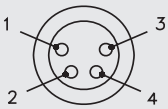


CANopen Pinout

eurofast Male

5-Pin

1 = Shield
2 = NC
3 = NC
4 = CAN_H
5 = CAN_L

Aux. Power

picofast ® Male	*picofast* ® Female
	
4-Pin	**4-Pin**

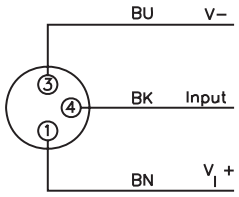
1 = U_B+
2 = U_L+
3 = Gnd
4 = Gnd

	Inputs								Outputs							Data
Part Number	Input Count	Connectors	Pinout	Inputs per Connector	Sensor Style	Group Diagnostics	Individual Diagnostics	Wire-Break Detection	Output Count	Connectors	Pinout	Outputs per Connector	Current	Individual Diagnostics	Wire-Break Detection	I/O Map
SCOB-0404D-0005	4	0-3	PI	1	PNP				4	4-7	PO	1	2 A*			1
SCOB-0404D-0001	4	0-3	PI	1	PNP				4	4-7	PO	1	0.5 A			1

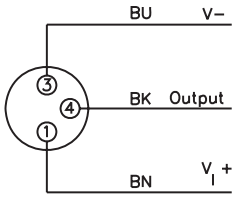
*Note: Total output current for the station is 4 A.

Input/Output Connectors

PI



PO



I/O Data Map 1

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
In	0	-	-	-	-	I-3	I-2	I-1	I-0
Out	0	-	-	-	-	O-3	O-2	O-1	O-0

Analog Input Stations

- **Rugged, Fully Potted Stations**
- **IP 67 Protection**
- **Small Footprint**
- **Automatic Baud Rate Sensing**

SCOB-40A-0005
SCOB-40A-0007

Electrical

- Operating Current: <75 mA plus sensor currents (from U_B)

Power Distribution

- Inputs: U_B Power supply

Mechanical

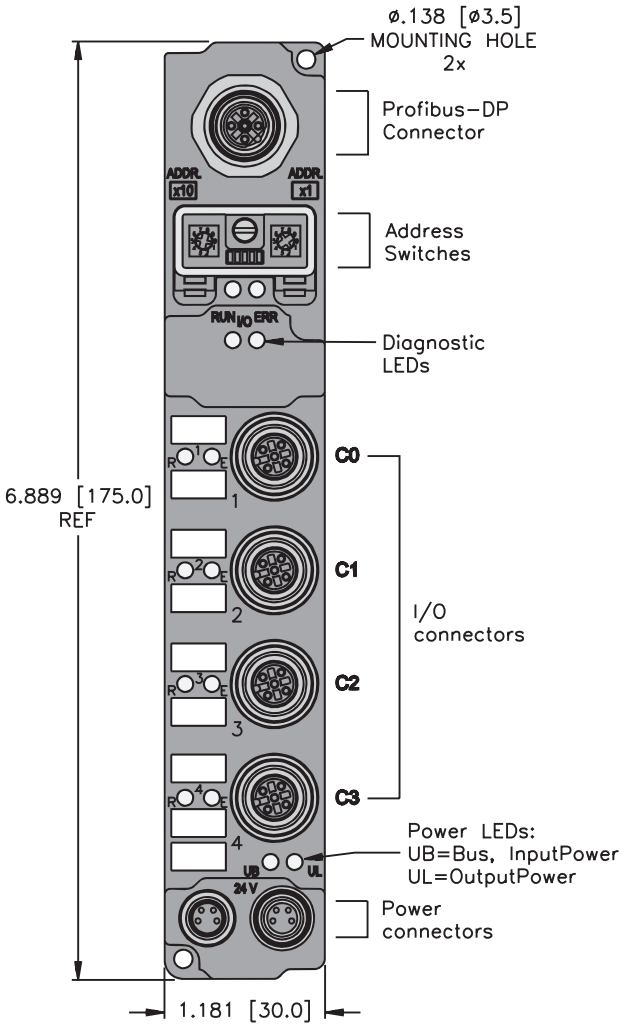
- Operating Temperature: 0 to +55°C (+32 to +131°F)
- Protection: IEC IP 67
- Vibration: IEC 68, part 2-6

Material

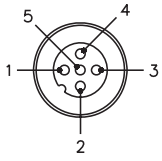
- Connectors: Nickel-plated brass
- Housing: Nylon

Diagnostics (Physical)

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

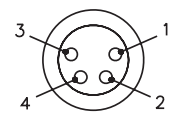
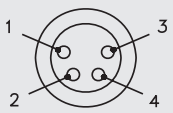


CANopen Pinout

eurofast Male

5-Pin

1 = Shield
2 = NC
3 = NC
4 = CAN_H
5 = CAN_L

Aux. Power

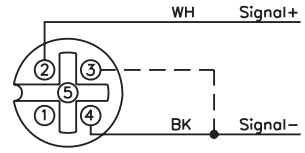
picofast Male	*picofast* Female
	
4-Pin	**4-Pin**

1 = U_B+
2 = U_L+
3 = Gnd
4 = Gnd

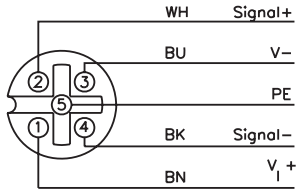
Part Number	Inputs: Input Count	Inputs: Connectors	Inputs: Pinout	Inputs: Inputs per Connector	Inputs: Sensor Style	Inputs: Group Diagnostics	Inputs: Individual Diagnostics	Inputs: Wire-Break Detection	Data: I/O Map
SCOB-40A-0005	4	0-3	AI	1	0 to 10V				1
SCOB-40A-0007	4	0-3	AI	1	0 to 20mA				1

Input/Output Connectors

AI



Loop Powered (Isolated)



DeviceNet Powered Transducer

Mating cordset:
RK 4.5T-*-RS 4.5T

I/O Data Map 1

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
In	0	Channel 0, MSB							
	1	Channel 0, LSB							
	2	Channel 1, MSB							
	3	Channel 1, LSB							
	4	Channel 2, MSB							
	5	Channel 2, LSB							
	6	Channel 3, MSB							
	7	Channel 3, LSB							

Temperature Input Stations

- **Rugged, Fully Potted Stations**
- **IP 67 Protection**
- **Small Footprint**
- **Automatic Baud Rate Sensing**

SCOB-40A-0004
SCOB-40A-0009

Electrical

- Operating Current: <75 mA plus sensor currents (from U_B)

Power Distribution

- Inputs: U_B Power supply

Mechanical

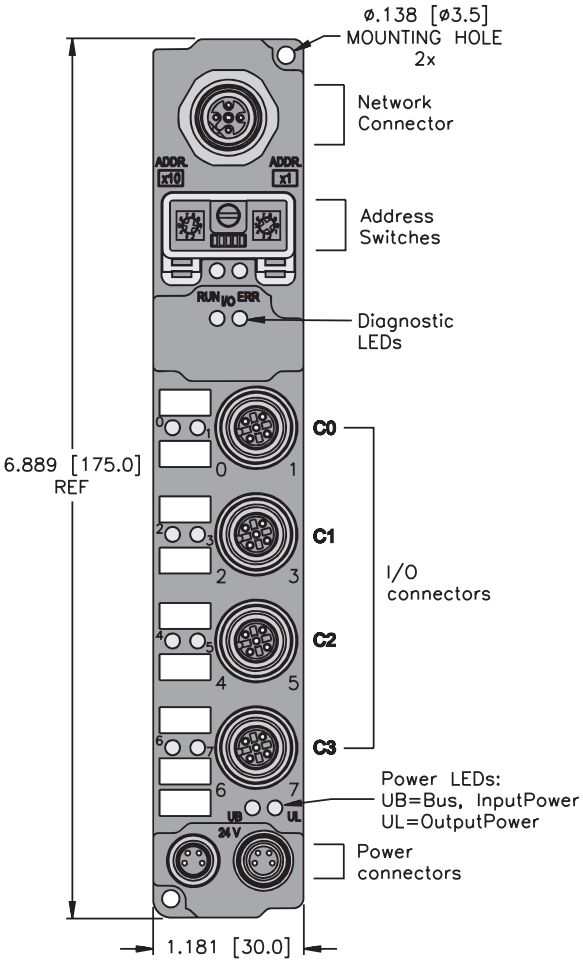
- Operating Temperature: 0 to +55°C (+32 to +131°F)
- Protection: IEC IP 67
- Vibration: IEC 68, part 2-6

Material

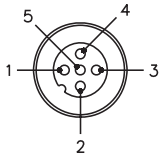
- Connectors: Nickel-plated brass
- Housing: Nylon

Diagnostics (Physical)

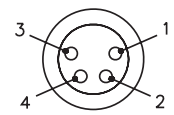
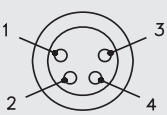
- One LED indicates an I/O fault for the entire station
- LEDs to indicate status of CANopen communication



CANopen Pinout

eurofast Male

5-Pin

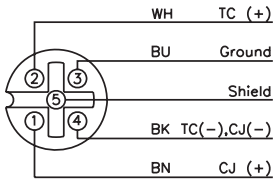
Aux. Power

picofast Male	*picofast* Female
	
4-Pin	**4-Pin**

	Inputs								Data
Part Number	Input Count	Connectors	Pinout	Inputs per Connector	Sensor Style	Group Diagnostics	Individual Diagnostics	Wire-Break Detection	I/O Map
SCOB-40A-0004	4	0-3	TC	1	TC				1
SCOB-40A-0009	4	0-3	RTD	1	RTD				1

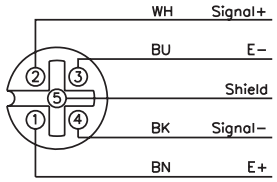
Input/Output Connectors

TC



Mating connector (field wireable):
WAS5-THERMO
(includes cold junction compensation)

RTD



Mating cordset:
RK 4.5T-*-RS 4.5T

CANopen

I/O Data Map 1

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
In	0	Channel 0, MSB							
	1	Channel 0, LSB							
	2	Channel 1, MSB							
	3	Channel 1, LSB							
	4	Channel 2, MSB							
	5	Channel 2, LSB							
	6	Channel 3, MSB							
	7	Channel 3, LSB							

Analog Output Stations

- **Rugged, Fully Potted Stations**
- **IP 67 Protection**
- **Small Footprint**
- **Automatic Baud Rate Sensing**

SCOB-04A-0009
SCOB-04A-0007

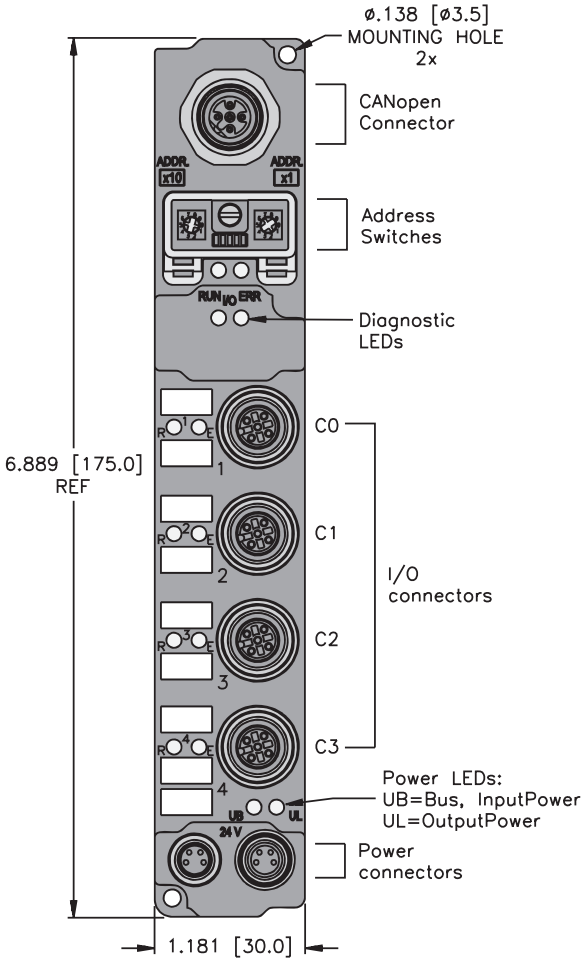
Electrical
- Operating Current: <75 mA (from U_B)

Power Distribution
- Outputs: U_L Power supply

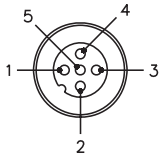
Mechanical
- Operating Temperature: 0 to +55°C (+32 to +131°F)
- Protection: IEC IP 67
- Vibration: IEC 68, part 2-6

Material
- Connectors: Nickel-plated brass
- Housing: Nylon

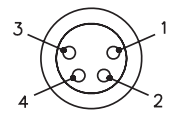
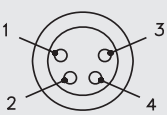
Diagnostics (Physical)
- One LED indicates an I/O fault for the entire station
- LEDs to indicate status of CANopen communication



CANopen Pinout

Male	
1 = Shield 2 = NC 3 = NC 4 = CAN_H 5 = CAN_L	
5-Pin	

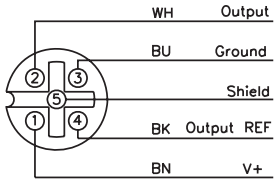
Aux. Power

	picofast® Male	*picofast*® Female
1 = U_B+ 2 = U_L+ 3 = Gnd 4 = Gnd		
	4-Pin	**4-Pin**

Part Number	Outputs: Output Count	Outputs: Connectors	Outputs: Pinout	Outputs: Outputs per Connector	Outputs: Output Type	Outputs: Individual Diagnostics	Outputs: Wire-Break Detection	Data: I/O Map
SCOB-04A-0009	4	0-3	AOI	1	0 to 20 mA			1
SCOB-04A-0007	4	0-3	AOV	1	-10/0 to 10 V			1

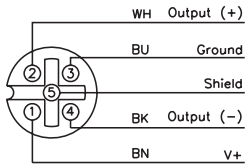
Output Connectors

AOV



Mating cordset:
RK 4.5T-*-RS 4.5T

AOI



DeviceNet Powered Transducer

Mating cordset:
RK 4.5T-*-RS 4.5T

I/O Data Map 1

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Out	0	Channel 0, MSB							
	1	Channel 0, LSB							
	2	Channel 1, MSB							
	3	Channel 1, LSB							
	4	Channel 2, MSB							
	5	Channel 2, LSB							
	6	Channel 3, MSB							
	7	Channel 3, LSB							

Incremental Encoder Station

SCOB-10S-0001

- **Rugged, Fully Potted Stations**
- **IP 67 Protection**
- **Small Footprint**
- **Automatic Baud Rate Sensing**

Electrical

- Operating Current: <75 mA plus device currents (from U_B)

Power Distribution

- Inputs: U_B Power supply

Mechanical

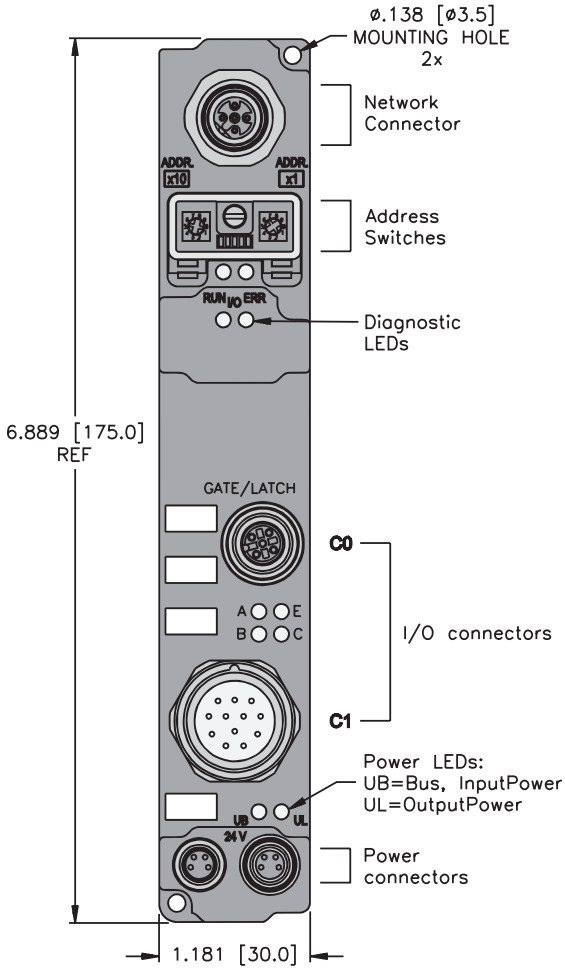
- Operating Temperature: 0 to +55°C (+32 to +131°F)
- Protection: IEC IP 67
- Vibration: IEC 68, part 2-6

Material

- Connectors: Nickel-plated brass
- Housing: Nylon

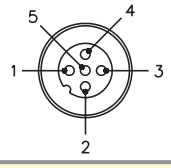
Diagnostics (Physical)

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



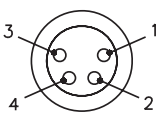
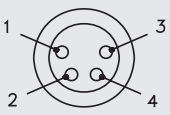
CANopen Pinout

1 = Shield
2 = NC
3 = NC
4 = CAN_H
5 = CAN_L

eurofast Male

5-Pin

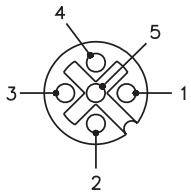
Aux. Power

1 = U_B+
2 = U_L+
3 = Gnd
4 = Gnd

picofast Male	*picofast* Female
	
4-Pin	**4-Pin**

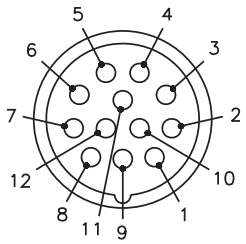
Part Number	Inputs: Input Count	Inputs: Connectors	Inputs: Pinout	Inputs: Inputs per Connector	Inputs: Sensor Style	Inputs: Group Diagnostics	Inputs: Individual Diagnostics	Inputs: Wire-Break Detection	Data: I/O Map
SCOB-10S-0001	1	0-1	ENC	1	Encoder				1

Input/Output Connectors



C_0

1 = V+
2 = Gate
3 = Gnd
4 = Latch
5 = Shield



C_1

1 = $\overline{B}$
2 = +5 VDC
3 = Zero
4 = $\overline{Zero}$
5 = A
6 = $\overline{A}$
7 = $\overline{Status}$
8 = B
9 = NC
10 = Gnd
11 = Gnd
12 = V+

I/O Data Map 1

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
In	0	Counter - Status							
	1	Count Value - High (MSB)							
	2	Count Value - Low (LSB)							
Out	0	Counter - Control							
	1	Set Value - High (MSB)							
	2	Set Value - Low (LSB)							

Serial Interface Stations

- **Rugged, Fully Potted Stations**
- **IP 67 Protection**
- **Small Footprint**
- **Automatic Baud Rate Sensing**

Electrical

- Operating Current: <75 mA (from U_B)

Mechanical

- Operating Temperature: 0 to +55°C (+32 to +131°F)
- Protection: IEC IP 67
- Vibration: IEC 68, part 2-6

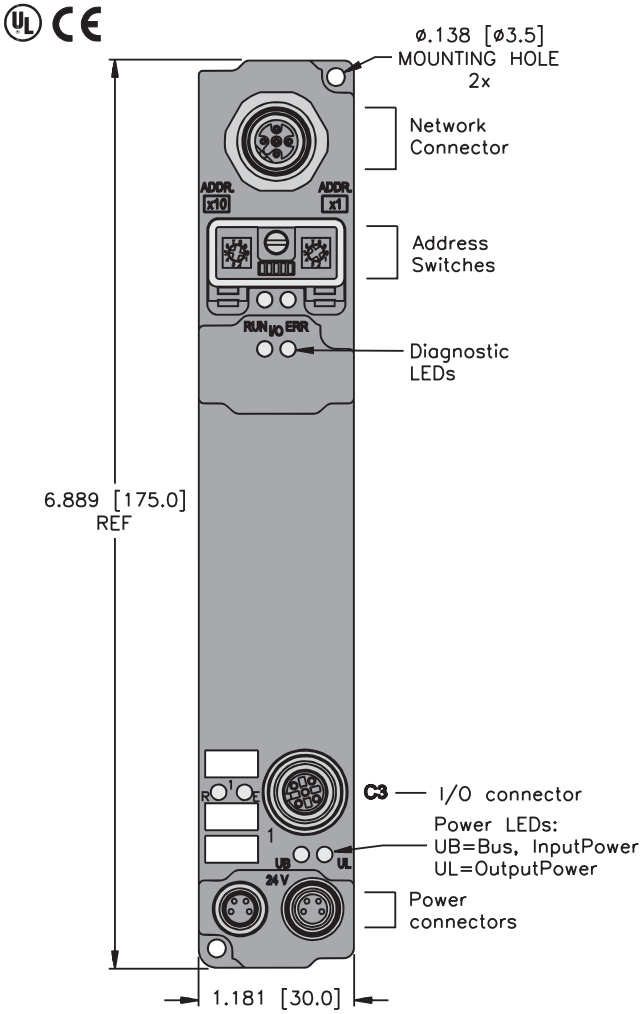
Material

- Connectors: Nickel-plated brass
- Housing: Nylon

Diagnostics (Physical)

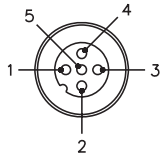
- One LED indicates an I/O fault for the entire station
- LEDs to indicate status of CANopen communication

SCOB-10S-0002
SCOB-10S-0004



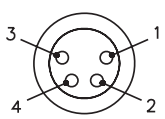
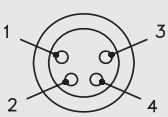
CANopen Pinout

1 = Shield
2 = NC
3 = NC
4 = CAN_H
5 = CAN_L

eurofast Male

5-Pin

Aux. Power

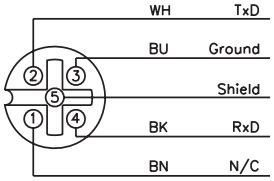
1 = U_B+
2 = U_L+
3 = Gnd
4 = Gnd

picofast ® Male	*picofast* ® Female
	
4-Pin	**4-Pin**

	Inputs								Outputs							Data
Part Number	Channel Count	Connectors	Pinout	Channels per Connector	Interface Type	Data bytes per transaction	Individual Diagnostics	Wire-Break Detection	Output Count	Connectors	Pinout	Outputs per Connector	Individual Diagnostics	Wire-Break Detection	I/O Map	
SCOB-10S-0002	1	0	232	1	RS232	3 to 5			1	0	232	1			1	
SCOB-10S-0004	1	0	485	1	RS485/422	3 to 5			1	0	485	1			1	

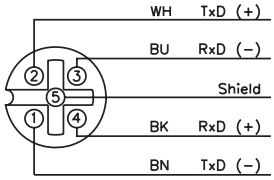
Input/Output Connectors

232



Mating cordset:
RK 4.5T-*-RS 4.5T

485



Mating cordset:
RK 4.5T-*-RS 4.5T

I/O Data Map 1

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
In	0	Data Byte 0							
	1	Status							
	2	Data Byte 2							
	3	Data Byte 1							
Out	0	Data Byte 0							
	1	Control							
	2	Data Byte 2							
	3	Data Byte 1							

Note: Default configuration for 3 byte per message transfer shown. Up to 5 bytes may be transferred per message.

SSI Station

- **Rugged, Fully Potted Stations**
- **IP 67 Protection**
- **Small Footprint**
- **Automatic Baud Rate Sensing**

Electrical

- Operating Current: <75 mA plus sensor currents (from U_B)

Mechanical

- Operating Temperature: 0 to +55°C (+32 to +131°F)
- Protection: IEC IP 67
- Vibration: IEC 68, part 2-6

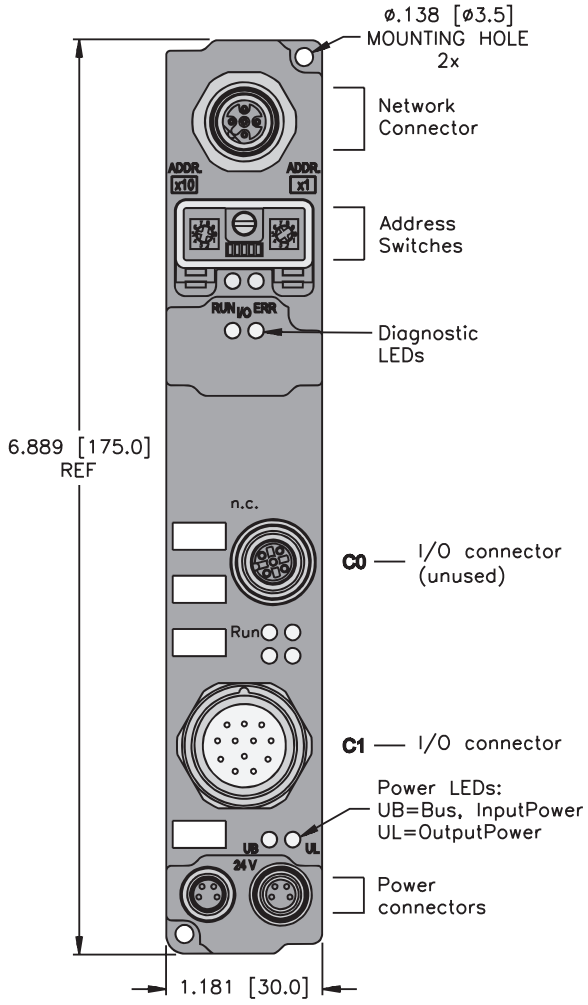
Material

- Connectors: Nickel-plated brass
- Housing: Nylon

Diagnostics (Physical)

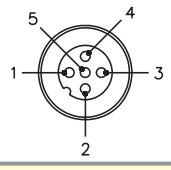
- One LED indicates an I/O fault for the entire station
- LEDs to indicate status of CANopen communication

SCOB-10S-0005



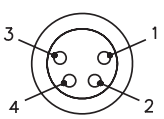
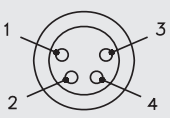
CANopen Pinout

1 = Shield
2 = NC
3 = NC
4 = CAN_H
5 = CAN_L

eurofast Male

5-Pin

Aux. Power

1 = U_B+
2 = U_L+
3 = Gnd
4 = Gnd

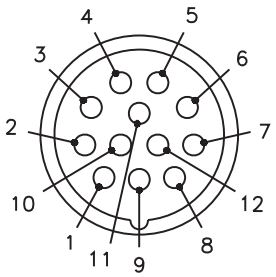
picofast Male	*picofast* Female
	
4-Pin	**4-Pin**

Part Number	Inputs: Channel Count	Connectors	Pinout	Channels per Connector	Interface Type	Data bytes per transaction	Individual Diagnostics	Wire-Break Detection	Data: I/O Map
SCOB-10S-0005	1	0		1	SSI	4			1

Input/Output Connectors

1 = Clock-
2 = Clock+
3 = Data+
4 = Data-
5 = NC
6 = NC
7 = NC
8 = NC
9 = NC
10 = NC
11 = V+
12 = Ground

SSI



Mating cordset:
CKM 12-12-*/S817

I/O Data Map 1

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
In	0	Data Byte 1							
	1	Data Byte 0 (LSB)							
	2	Data Byte 3 (MSB)							
	3	Data Byte 2							

* Note: One additional status byte (in) and control byte (out) may be configured.

Notes: