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*excom* Selection Guide



PROFIBUS-DP® Gateway
D4

Module Type	Pages
Discrete Input	D5
Discrete Output	D7
Discrete Input & Output	D9
Analog Input	D11, D17
Analog Output	D13
Frequency/Counter Input	D15

Accessories
D19 - D24

**Certification Table**

Housing	FM	CSA
DM80EX	X	X
D040EX	X	X
AIH40EX	X	X
AIH41EX		X
A040EX	X	X
AI41EX		
TI40EX	X	X
GDP 1.5	X	X
PSD24EX	X	X
MT 9	X	X
MT 18	X	X
SC12-EX	X	



## The *excom*® System

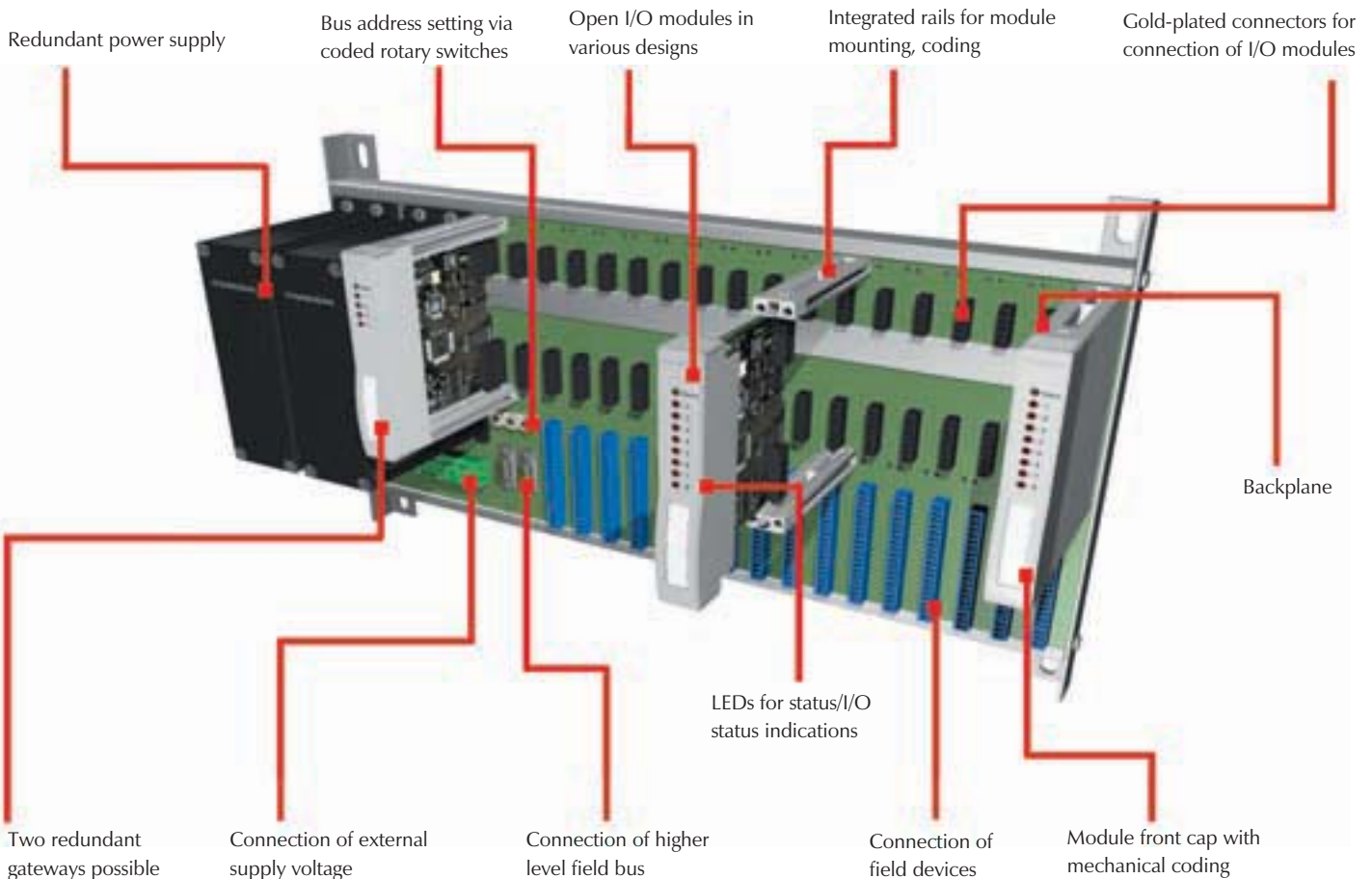
*excom* is a remote I/O system for use in hazardous locations. It provides PROFIBUS®-DP compatible I/O modules in an IP 20 protected solution for connecting discrete and analog intrinsically safe field devices. It is approved for use in Class I, Division 2 locations, and may be connected to field devices in Class I, Division 1 areas.

The modular system consists of power modules, PROFIBUS-DP communication gateways, I/O modules and a backplane rack. The backplane is available in two sizes, with support for 8 or 16 I/O modules. The larger rack (MT18...) also allows for redundant power supplies and PROFIBUS-DP gateway cards to be used. This allows a failsafe communication scheme to be used.

The I/O modules provide the interface to field devices. The backplane provides power for I/O from the mounted power supply, with no need for a separate field supply. The gateways, power supplies and I/O cards are simply plugged into the backplane rack, with all power, PROFIBUS-DP and I/O wiring separate from the removable modules. I/O modules may also be changed during operation (“hot-swapped”). The system automatically checks whether a newly inserted module matches the configuration.

The internal cycle time of the *excom* system is less than 5 ms for discrete signals and less than 20 ms for analog signals. Total response time of the PROFIBUS-DP system depends on the cycle time of the controller and its program, as well as the data rate of the PROFIBUS-DP system. HART values may be exchanged with supported devices via PROFIBUS-DPV1 communication.

In order to use the *excom* system in a hazardous area, the PROFIBUS-DP communication must be conditioned through a segment coupler. Couplers are available for both wire and fiber-optic media.



## Diagnostics

The **excom** gateway provides extended PROFIBUS-DP diagnostic information, including channel-specific error indication. Each module also features LEDs for visual error indication as well as I/O status. Consult the user manual for the **excom** system for detailed information.

## Addressing

The I/O modules need no user configured address since the gateway recognizes them by which backplane slot they are inserted in. The **excom** system itself needs a PROFIBUS-DP address, which is set via three rotary switches. The maximum address of the system is 125.





PROFIBUS-DP Gateway

- Modular I/O
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- Various I/O Styles



Electrical

- Power Consumption: <3 W (from backplane)

Mechanical

- Operating Temperature: -20 to +60°C (-4 to +140°F)
- Protection: IP 20

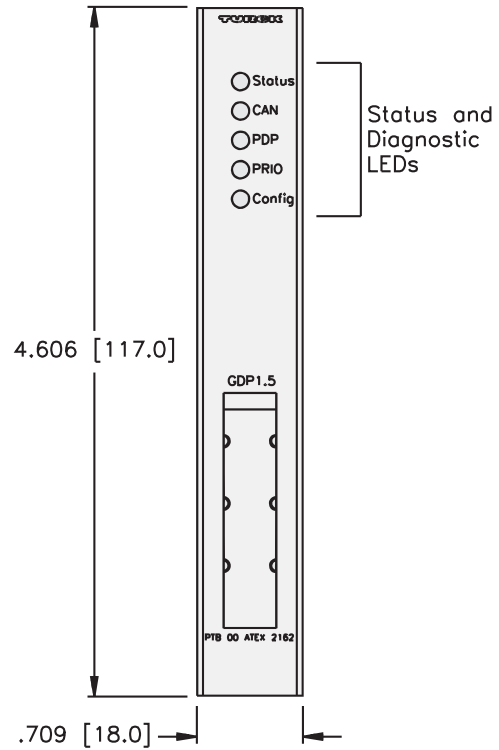
Diagnostics (Logical)

- I/O faults are mapped to the PROFIBUS-DP diagnostic area

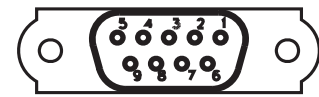
Diagnostics (Physical)

- LEDs to indicate status of PROFIBUS-DP and backplane communication

GDP1.5



PROFIBUS-DP Connector



- 1 = Shield
- 3 = BUS\_B
- 5 = DGnd
- 6 = +5 VDC
- 8 = BUS\_A

Note: Connector is mounted to the excom backplane rack.

**4 Channel  
 Discrete Input Module**

- Modular I/O
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- NAMUR Inputs



**Electrical**

- Power Consumption: <2 W (from backplane)
- Sensor Type: NAMUR

**Mechanical**

- Operating Temperature: -20 to +70°C (-4 to +158°F)
- Protection: IEC IP 20

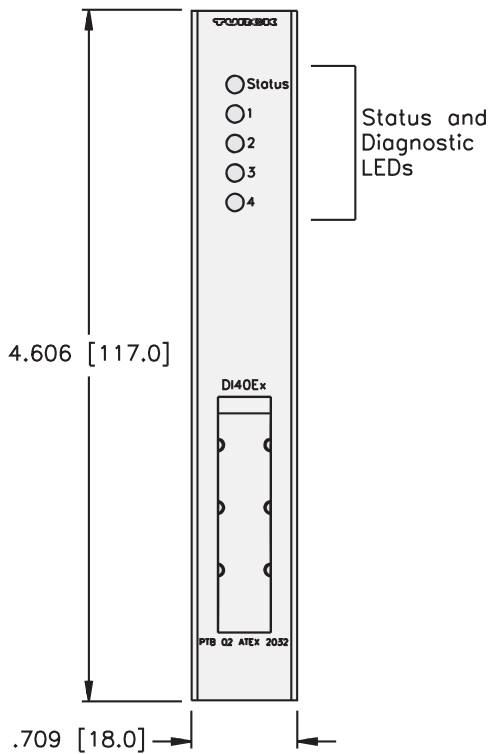
**Diagnostics (Logical)**

- I/O faults are mapped to the PROFIBUS-DP diagnostic area
- Open/short-circuit detection is configurable

**Diagnostics (Physical)**

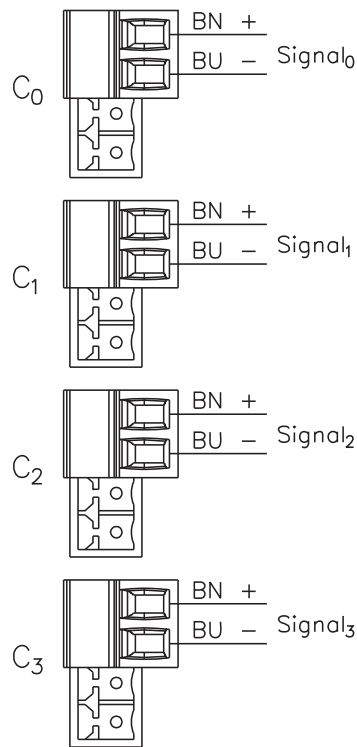
- LEDs indicate faults for each channel

**DI40EX**



Inputs									Data
Part Number	Input Count	Connectors	Pinout	Inputs per Connector	Sensor Style	Group Diagnostics	Individual Diagnostics	OCD	I/O Map
DI40EX	4	0-3	E-I	1	NAMUR		X	X	1

**E-I**



**I/O Data Map 1**

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
<b>In</b>	n-1	(Data from modules to the left)							
	n	Data from next discrete modules				I-3	I-2	I-1	I-0
	n+1	(Data from modules to the right)							

**4 Channel  
Discrete Output Module**

- Modular I/O
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- Selectable Output Power



**Electrical**

- Power Consumption: <4.5 W (from backplane)
- Output Voltage: 16 or 24 VDC (depending on terminals used)

**Mechanical**

- Operating Temperature: -20 to +60°C (-4 to +140°F)
- Protection: IEC IP 20

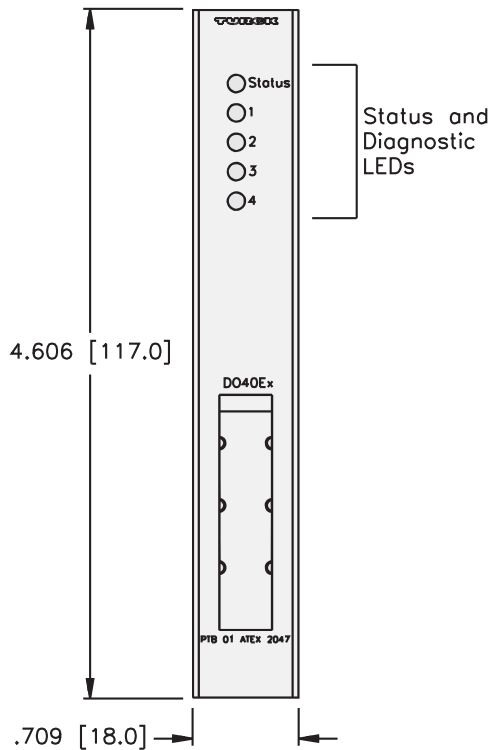
**Diagnostics (Logical)**

- I/O faults are mapped to the PROFIBUS-DP diagnostic area
- Open/short-circuit detection is configurable

**Diagnostics (Physical)**

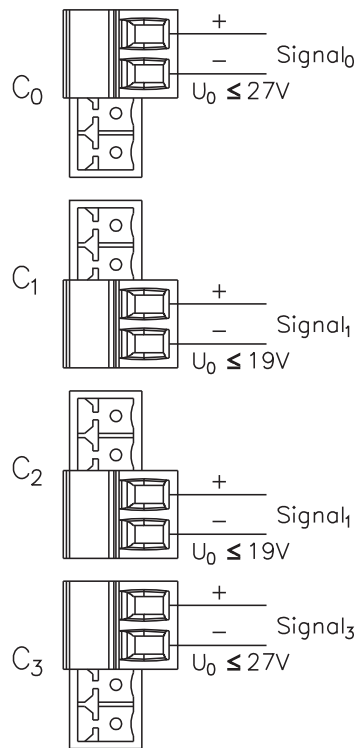
- LEDs indicate faults for each channel

**DO40EX**



Outputs								Data
Part Number	Output Count	Connectors	Pinout	Outputs per Connector	Current	Individual Diagnostics	Wire-Break Detection	I/O Map
D040EX	4	0-3	E-O	1	45 mA (@12 V)	X	X	1

E-O



Note: Each output can be used in either the 19 or 27 V mode

I/O Data Map 1

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Out	n-1	(Data for modules to the left)						
	n	Data for next discrete modules			0-3	0-2	0-1	0-0
	n+1	(Data for modules to the right)						

**8 Channel Discrete Input/Output Module**



- Modular I/O
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- Channels can be Input or Output

**Electrical**

- Power Consumption: <2 W (from backplane)
- Input Type: NAMUR or dry contact
- Output Voltage: 8 VDC

**Mechanical**

- Operating Temperature: -20 to +60°C (-4 to +140°F)
- Protection: IEC IP 20

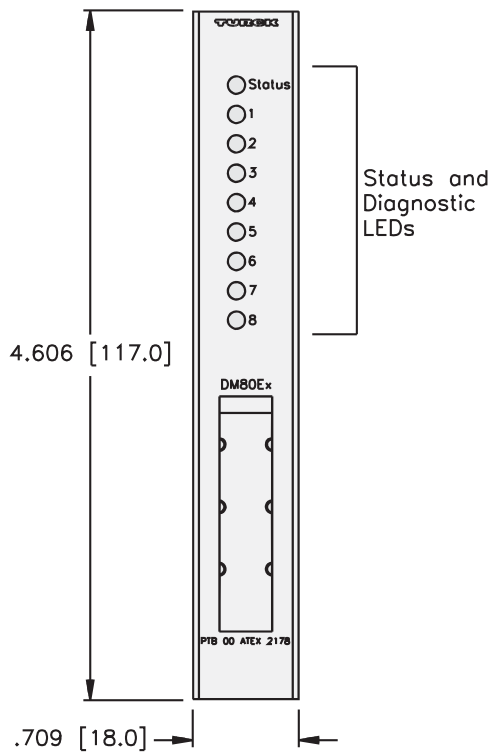
**Diagnostics (Logical)**

- I/O faults are mapped to the PROFIBUS-DP diagnostic area
- Open/short-circuit detection is configurable

**Diagnostics (Physical)**

- LEDs indicate faults for each channel

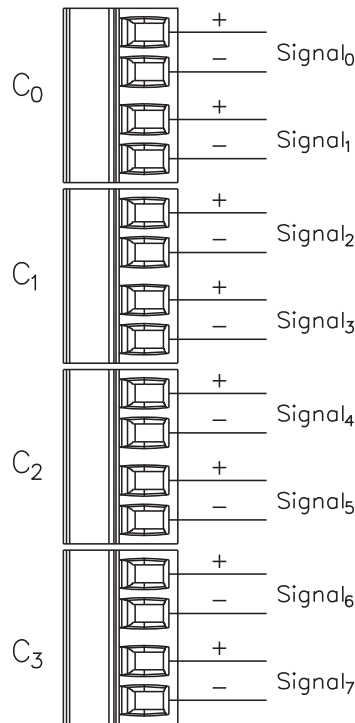
**DM80EX**





Part Number	Inputs								Outputs					Data		
	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
DM80EX	8	0-3	E-X	2	NAMUR		X	X	8	0-3	E-X	2	~4 mA	X	X	1

E-X



I/O Data Map 1

In	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	n-1	(Data from modules to the left)							
	n	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
	n+1	(Data from modules to the right)							

**4 Channel Analog Input Modules**



- Modular I/O
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- HART Capability

**Electrical**

- Power Consumption: <3.5 W (from backplane)
- Input Type: 2-wire (AI(H)40EX) or 4-wire (AI(H)41EX) sensors

**Mechanical**

- Operating Temperature: -20 to +70°C (-4 to +158°F)
- Protection: IEC IP 20

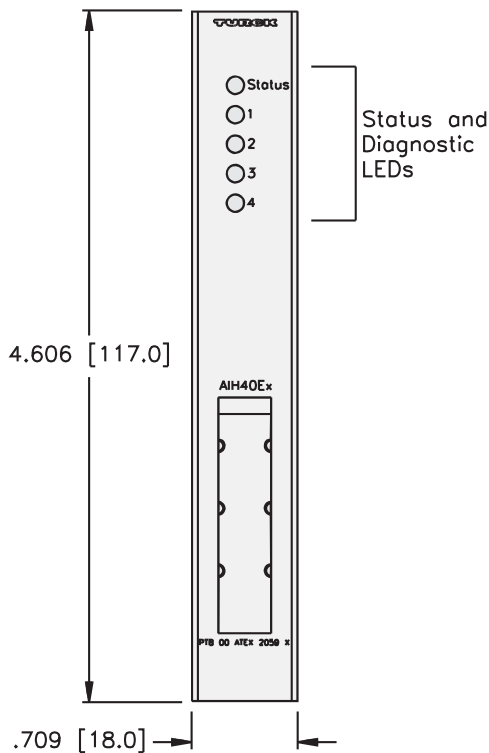
**Diagnostics (Logical)**

- I/O faults are mapped to the PROFIBUS-DP diagnostic area
- Open/short-circuit detection is configurable

**Diagnostics (Physical)**

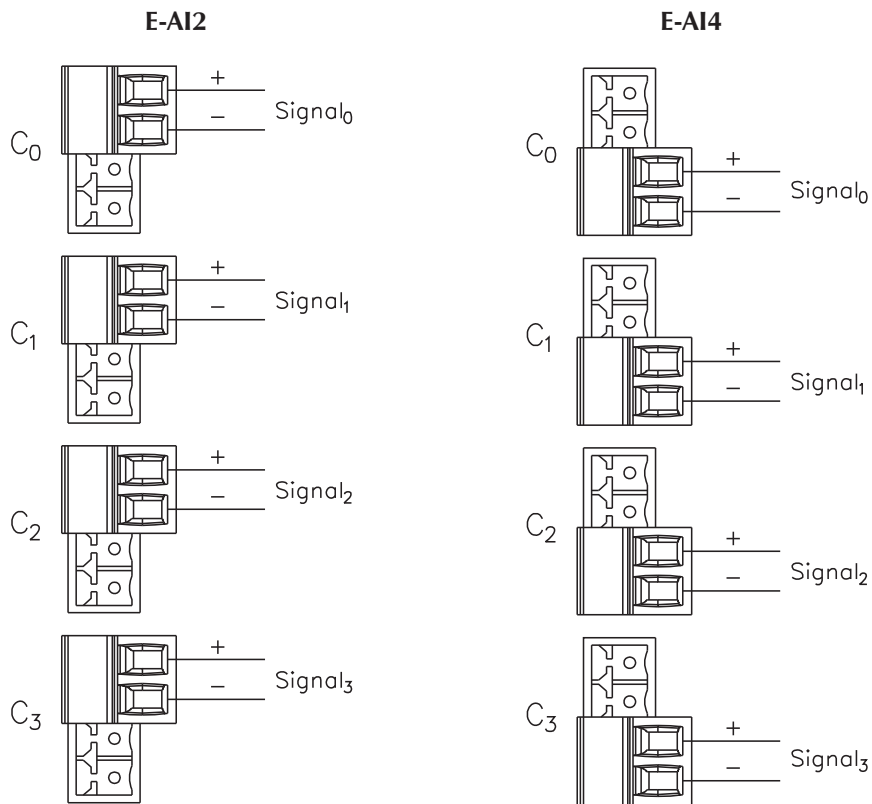
- LEDs indicate faults for each channel

- AI40EX**
- AIH40EX**
- AI41EX**
- AIH41EX**





Inputs									Data
Part Number	Input Count	Connectors	Pinout	Inputs Per Connector	Sensor Style	Individual Diagnostics	Wire-Break Detection	HART Compatible	I/O Map
AI40EX	4	0-3	E-AI2	1	0/4 to 20 mA	X	X		1
AI41EX	4	0-3	E-AI4	1	0/4 to 20 mA	X	X		1
AIH40EX	4	0-3	E-AI2	1	0/4 to 20 mA	X	X	X	1
AIH41EX	4	0-3	E-AI4	1	0/4 to 20 mA	X	X	X	1



I/O Data Map 1

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
In	n-1	(Data from modules to the left)							
	n	Channel 0, MSB							
	n+1	Channel 0, LSB							
	n+2	Channel 1, MSB							
	n+3	Channel 1, LSB							
	n+4	Channel 2, MSB							
	n+5	Channel 2, LSB							
	n+6	Channel 3, MSB							
	n+7	Channel 3, LSB							
	n+8	(Data from modules to the right)							

Note: Default data map shown. More data is returned if HART variables are used. Consult product user manual for details.

**4 Channel Analog Output Modules**

- Modular I/O
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- HART Capability



**Electrical**

- Power Consumption: <3.5 W (from backplane)
- Output Type: 0/4...20 mA actuators

**Mechanical**

- Operating Temperature: -20 to +70°C (-4 to +158°F)
- Protection: IEC IP 20

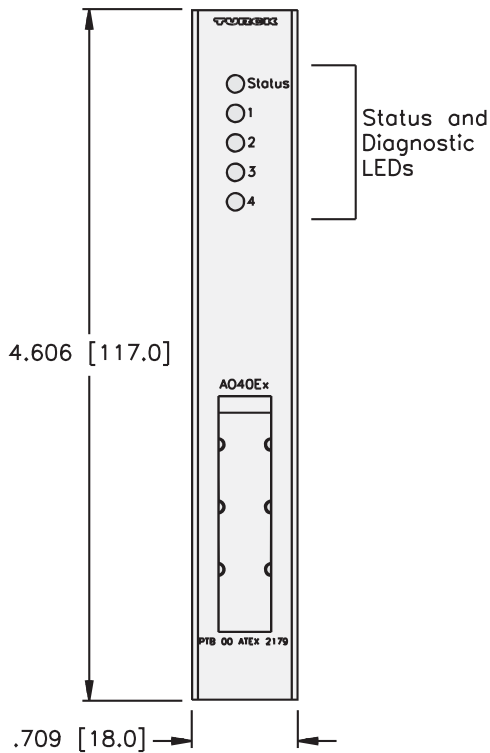
**Diagnostics (Logical)**

- I/O faults are mapped to the PROFIBUS-DP diagnostic area
- Open/short-circuit detection is configurable

**Diagnostics (Physical)**

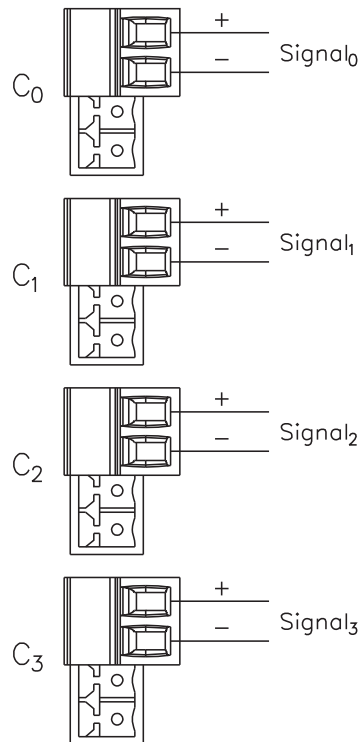
- LEDs indicate faults for each channel

**AO40EX**  
**AOH40EX**



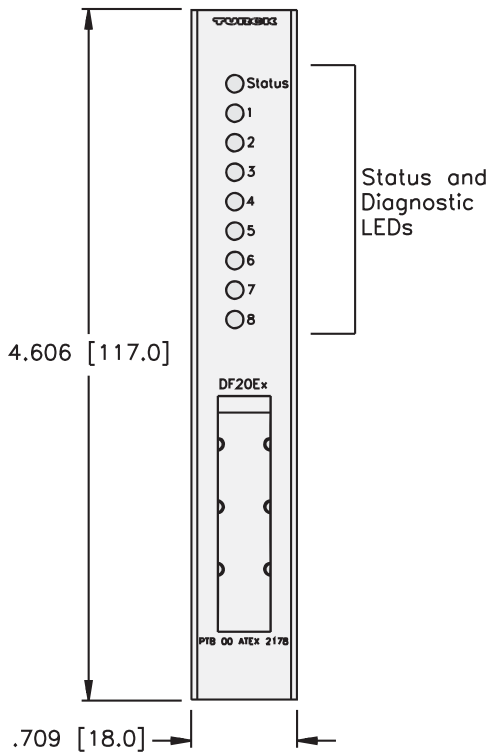
Outputs										Data
Part Number	Output Count	Connectors	Pinout	Outputs per Connector	Current	Individual Diagnostics	Wire-Break Detection	HART Compatible	I/O Map	
A040EX	4	0-3	E-AO	1	0/4 to 20 mA	X	X		1	
A0H40EX	4	0-3	E-AO	1	0/4 to 20 mA	X	X	X	1	

E-AO



I/O Data Map 1

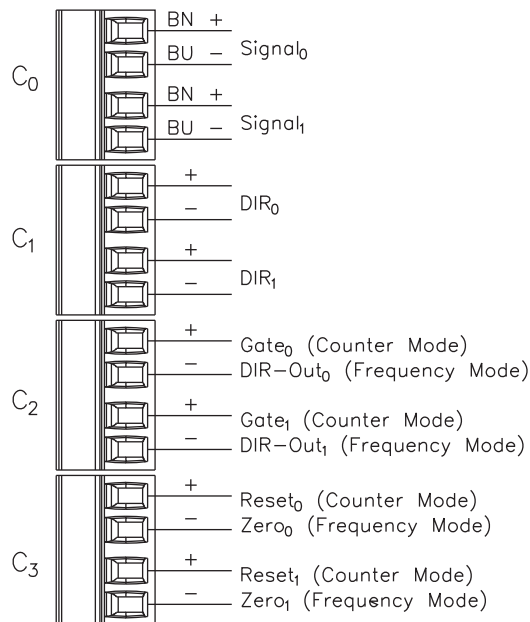
Out	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	n-1	(Data for modules to the left)							
n	Channel 0, MSB								
n+1	Channel 0, LSB								
n+2	Channel 1, MSB								
n+3	Channel 1, LSB								
n+4	Channel 2, MSB								
n+5	Channel 2, LSB								
n+6	Channel 3, MSB								
n+7	Channel 3, LSB								
n+8	(Data for modules to the right)								





Inputs										Data
Part Number	Input Count	Connectors	Pinout	Inputs Per Connector	Sensor Style	Group Diagnostics	Individual Diagnostics	Wire-Break Detection	I/O Map	
DF20EX	2	0-3	E-F	2	Frequency/Counter		X	X	1	

E-F



I/O Data Map 1

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
In	n-1	(Data from modules to the left)								
	n	S-0	OV-0*	SIGN-0	Channel 0 (MS bits)					
	n+1	Channel 0								
	n+2	Channel 0								
	n+3	Channel 0 (LSB)								
	n+4	S-1	OV-1*	SIGN-1	Channel 1 (MS bits)					
	n+5	Channel 1								
	n+6	Channel 1								
	n+7	Channel 1 (LSB)								
	n+8	(Data from modules to the right)								
	* OV is used in counter mode only									

**4 Channel Temperature Input Module**



- Modular I/O
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- Thermocouple or RTD Inputs

**Electrical**

- Power Consumption: <3 W (from backplane)
- Input Type: PT100, PT1000, NI100 2-, 3- or 4-wire RTDs  
Type B, E, J, K, L, N, R, S, T Thermocouples

**Mechanical**

- Operating Temperature: -20 to +70°C (-4 to +158°F)
- Protection: IEC IP 20

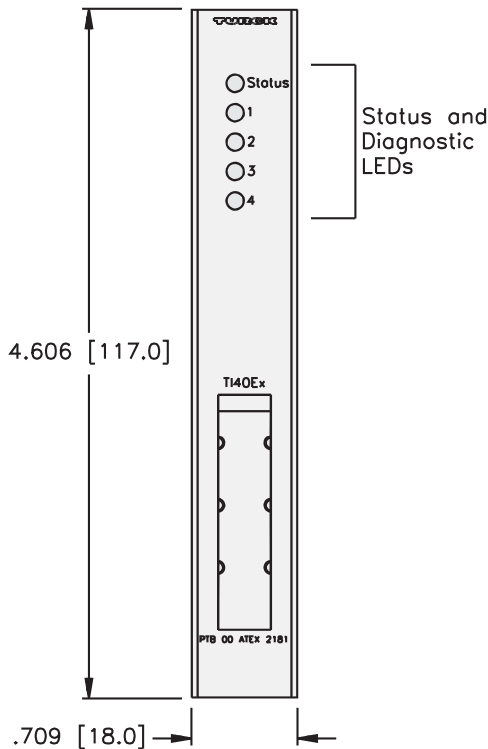
**Diagnostics (Logical)**

- I/O faults are mapped to the PROFIBUS-DP diagnostic area
- Open/short-circuit detection is configurable

**Diagnostics (Physical)**

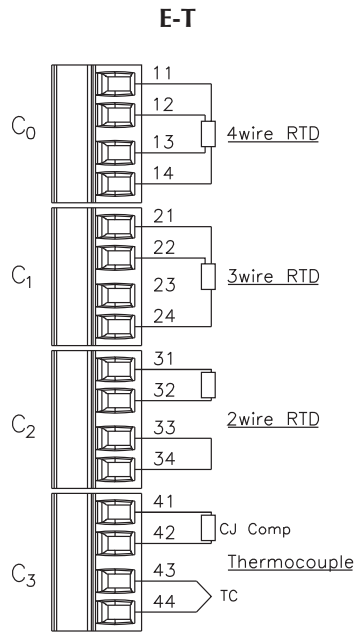
- LEDs indicate faults for each channel

**TI40EX**





Inputs										Data
Part Number	Input Count	Connectors	Pinout	Inputs per Connector	Sensor Style	Group Diagnostics	Individual Diagnostics	Wire-Break Detection	I/O Map	
TI40EX	4	0-3	E-T	1	TC / RTD		X	X	1	



Note: Each channel may be used in any of the four example forms shown.

**I/O Data Map 1**

	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
<b>In</b>	n-1	(Data from modules to the left)							
	n	S-0	Channel 0, MSB						
	n+1	Channel 0, LSB							
	n+2	S-1	Channel 1, MSB						
	n+3	Channel 1, LSB							
	n+4	S-2	Channel 2, MSB						
	n+5	Channel 2, LSB							
	n+6	S-3	Channel 3, MSB						
	n+7	Channel 3, LSB							
	n+8	(Data from modules to the right)							

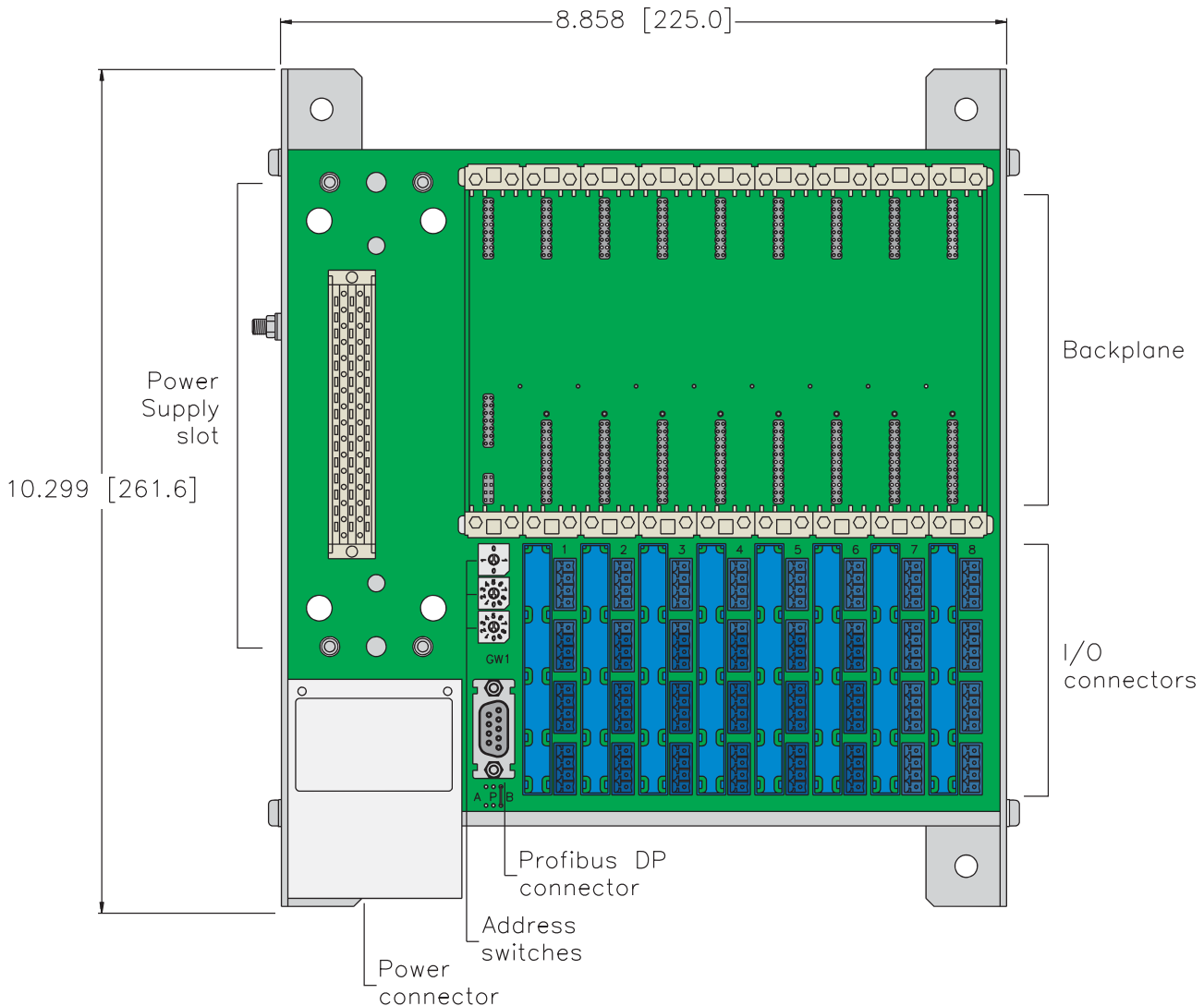
Backplane Racks



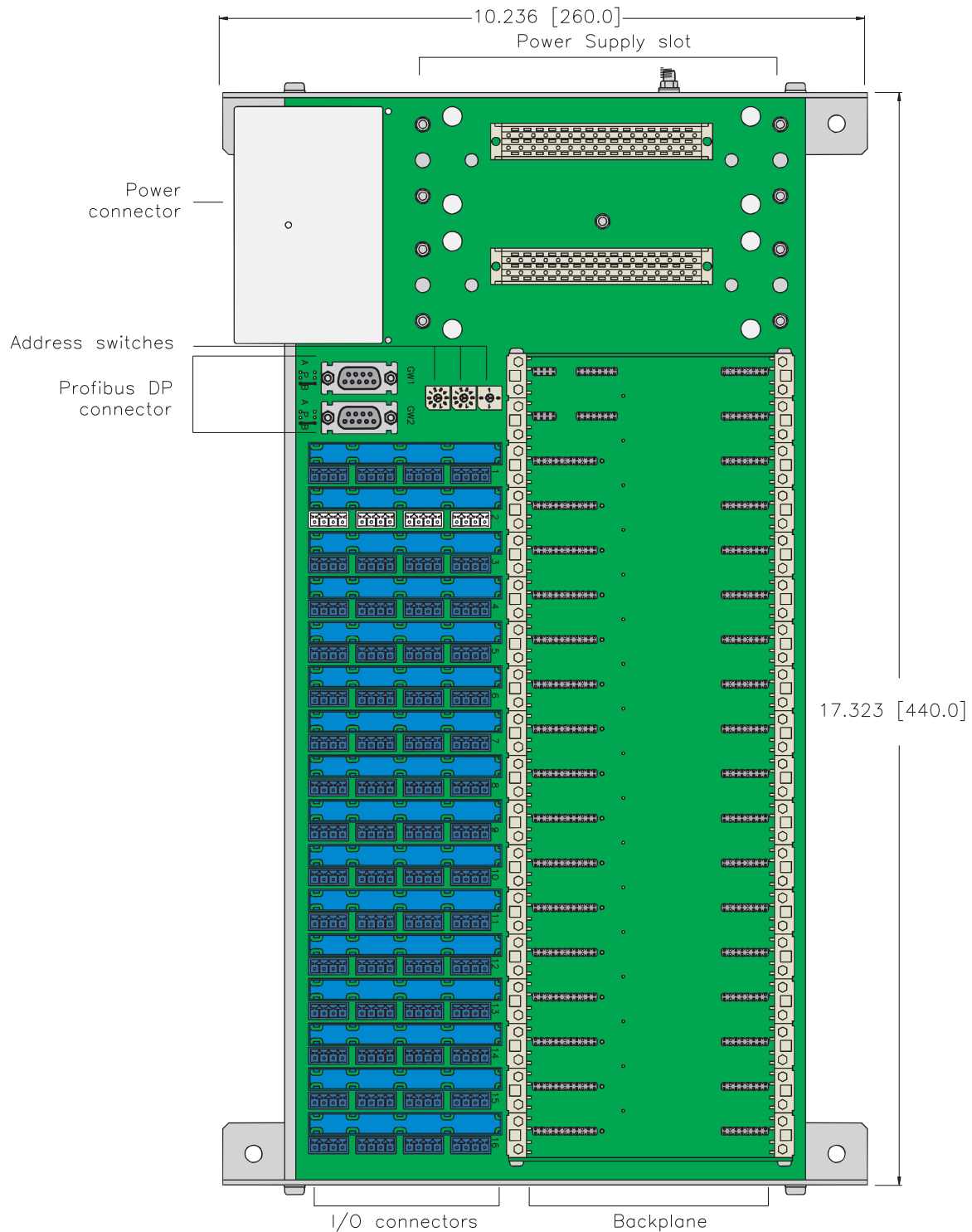
- Modular I/O
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- Redundant Communication Option

Excom Racks				
Part Number	I/O Slots	Redundancy	Connector Type	FM Approval
MT9/FM	8		Screw Terminal	X
MT9-R024	8		Screw Terminal	Pending
MT18-R024	16	X	Screw Terminal	Pending

MT9/FM  
MT18-R024



MT18..



**PSD24EX**



- Power Supply Module (24 VDC in) for Excom Rack

**Electrical**

- Power Consumption: 75 W
- Power Output: 60 W
- Voltage Input: 18...33 VDC

**Mechanical**

- Operating Temperature: -20 to +60°C (-4 to +140°F)
- Protection: IEC IP50

**Diagnostics (Physical)**

- LEDs indicate status of power supply



**BM1**



- Blank Cover for Unused *excom* Slots

**excom<sup>®</sup> Module Accessories**

Image	Part Number	Description
	D9T-RS485	D9 PROFIBUS <sup>®</sup> -DP connector for use in safe areas.
	D9T-RS485IS	D9 PROFIBUS-DP connector for use in hazardous (FM Div 2) areas.
	D9T-RS485PG	D9 PROFIBUS-DP connector with programming port for use in safe areas
	MODEX-FILTER	Capacitor to improve power up performance and operational safety of <b>excom</b>

**PROFIBUS-DP  
 IS Couplers**



- Redundant Communication
- PROFIBUS-DP Compatible
- Hazardous Area Usage
- Fiber Optic or Copper Media

**Electrical**

- Voltage In: 18 to 32 VDC
- Current Consumption: <100 mA (OC11...), <200 mA (SC12...)

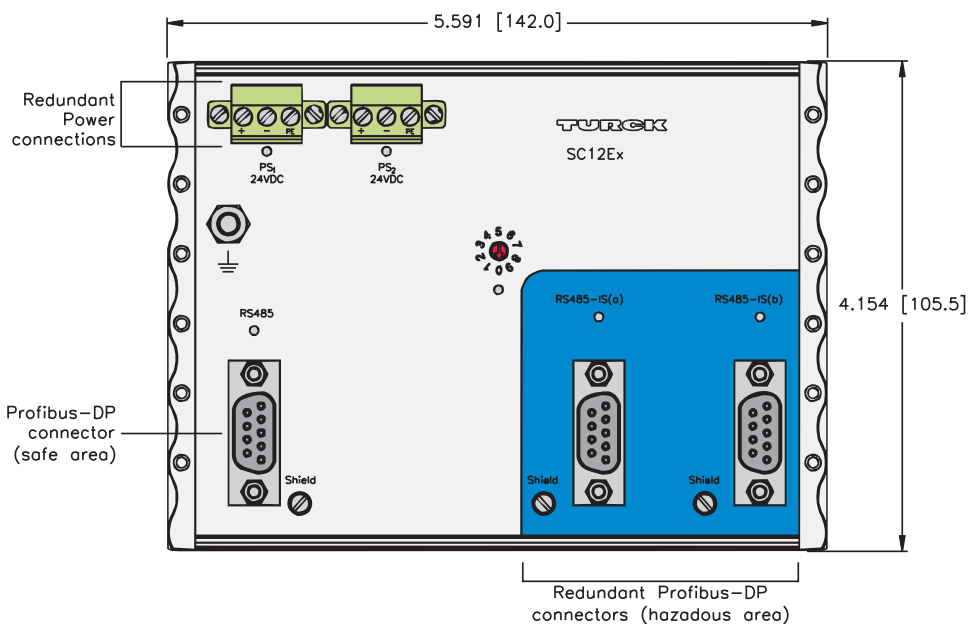
**Mechanical**

- Operating Temperature: -20 to +70°C (-4 to +158°F)
- Protection: IEC IP 20

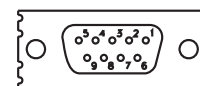
**Diagnostics (Physical)**

- LEDs indicate status of power and PROFIBUS-DP communication

**OC11EX/2G  
 OC11EX/3G  
 SC12-EX**



**SC12-EX shown**



- 1=Shield
- 3=BUS\_B
- 5=DGND
- 6=+VDC
- 8=BUS\_A

Note: For fiber optic communication the part number CABLE LWL-2ST/SY-\*M (where \* is the length in meters) must be used.



Part Number	Classification	Connection
OC11EX/2G	Zone 1	Fiber
OC11EX/3G	Zone 2	Fiber
SC12-EX		Copper

Note: For fiber-optic communication the part number CABLE LWL-2ST/SY-\*M (where \* is the length in meters) must be used.

