

## DPC SyStem Over view

The DPC-System (Diagnostic Power Conditioner System) is a power supply system for the installation of **FOUNDATION™ fieldbus** H1 segments. It provides comprehensive diagnostic functions for monitoring FOUNDATION™ fieldbus segments, and supports asset management for the entire system. This includes asset management of the physical layer which is extremely valuable.

A DPC system consists of one or more module racks (**DPC-49-4RMB**) each with up to eight power supply modules (**DPC-49-IP51**) and one diagnostic module (**DPC-49-ADU**). Up to four H1 segments for each module rack can be operated and monitored redundantly. The diagnostic data from the H1 segments is transmitted via the HSE interface module (**DPC-49-HSEFD/24VDC**) to the higher level asset management system.

The diagnostic module (**DPC-49-ADU**) is used as a communication and diagnostic interface between the H1 segments and the power supply module. The diagnostics module monitors the electrical parameters and the communication parameters of the H1 segments. Operation without diagnostic module is possible. In this configuration, simple diagnostics are provided locally.

The diagnostic information is collected in the device and transmitted via the HSE interface module to the higher fieldbus level (e.g. to the host) as diagnostic and alarm data. The diagnostic module can be plugged and unplugged during operation (hot swappable).

The DPC system provides complete galvanic isolation; H1 to H1, H1 to 24 VDC power, ADU/DU to H1, and HSE to H1. The DPC system can also be used to supply devices in hazardous classified areas when Fisco power supplies/repeaters or multibarriers from TURCK are used.

TURCK extends its diagnostic power conditioner systems (DPC) with a new interface backplane for single **FOUNDATION fieldbus** segments. The new **DPC-49-1RMB** is specially suited for smaller fieldbus installations, and provides a handy alternative to the **DPC-49-4RMB** multi-segment backplanes.

Like the multi-segment backplanes, the new **DPC-49-1RMB** features a redundant power supply, as well as a built-in diagnostics via a system alarm relay contact. Based on the established 800 mA supply **DPC-49-IP51**, the new backplane supplies power to a single **FOUNDATION fieldbus** segment. Connections to the host system and to the field are provided via removable 3-pin screw terminals.

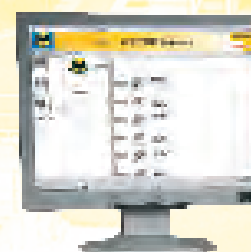
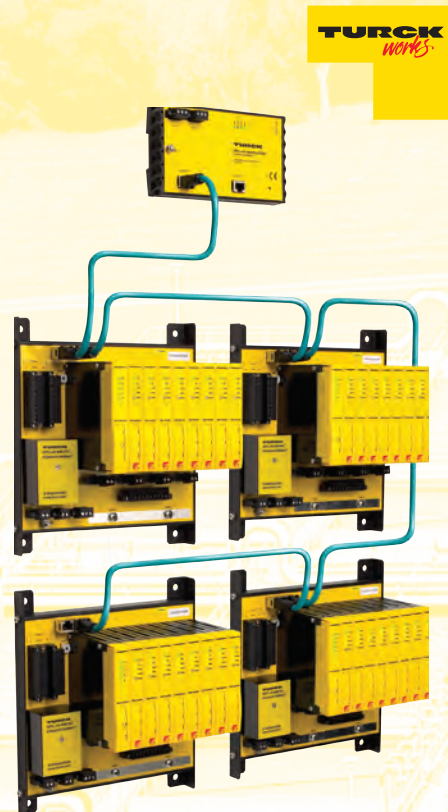
### Communication Signal

The **FOUNDATION fieldbus** H1 communication signal is a square waveform superimposed on a DC carrier. The frequency of the signal is 31.25 KHz. Although it is not a requirement, most devices derive their supply power from the fieldbus communications cable. The fieldbus specification states that devices must not be polarity sensitive. However, it is good electrical practice to have all devices wired with the same polarities. The voltage range allowed for proper operation is 9 to 32 VDC. A typical fieldbus device will consume 20 mA of current.

### Fieldbus Cable Specifications

The specifications for fieldbus H1 physical media are defined by IEC 61158-2 and the ISA-550.02 Part 2 Physical Layer Standards. The same standard is also listed in the **FOUNDATION fieldbus** specifications under 31.25 Kbps Physical Layer Profile FF-816-1.4. There are essentially four types of cable designations for fieldbus (see table). Type A cable is preferred for new installations, because it allows for the most versatile lengths. The other cable types are for installations where cable already exists from 4-20 mA systems.

|                   | Type A                    | Type B                       | Type C                         | Type D                   |
|-------------------|---------------------------|------------------------------|--------------------------------|--------------------------|
| Cable Description | Shielded, Twisted Pair    | Shielded, Multi-Twisted Pair | Unshielded, Multi-Twisted Pair | Shielded, Untwisted Pair |
| Conductor Size    | 18 AWG                    | 22 AWG                       | 26 AWG                         | 16 AWG                   |
| Maximum Length    | 1,900 meters (6,232 feet) | 1,200 meters (3,936 feet)    | 400 meters (1,312 feet)        | 200 meters (656 feet)    |

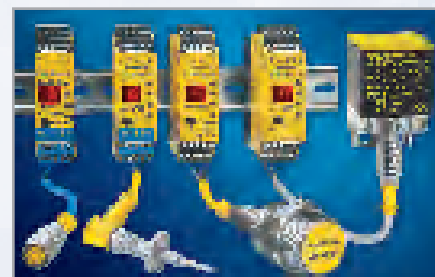


### interface modules with FDT/Dt m

To simplify device set-up and installation time, TURCK'S interface module (IM) family may now be programmed via a pc or on-board push buttons using FDT/DTM software, along with PACTware. This software allows multiple parameters to be set and saved in a matter of seconds. The ease of use and structure of this system allows asset management ability with trending and data logging of values.

TURCK'S IM modules may be used to monitor the speed of motors, shafts and conveyors, the temperature of RTD's and thermocouples, and to control or monitor analog signals for linear movement, temperature, pressure, level control or any other device using 4 to 20 mA signals. Intrinsically safe models to control devices in hazardous areas are also available.

All models are equipped with a two-line transfective LCD display, making it easy to read even in very bright light. The modules also incorporate a universal supply voltage and removable terminals, making them easy to install in new or existing systems.



### ZeNeR Diode Barriers

- Temperature monitoring and control of equipment and their surrounding areas with RTD's and thermocouples
- Load cells
- Control and monitor 4-20 mA transmitters
- Control or monitor all other analog signals for linear movement, temperature, pressure, level control or any other device using 4-20 mA signal feedback



Printed in USA

### NAMUr Sensors and Junctions

- Class I, Class II, Class III, Division 1 and Division 2 FM approved
- Full line of inductive, capacitive and magnet operated inductive sensors
- Numerous sizes and styles are available
- Eliminates multiple cable runs for wiring IS applications



### intrinsically Safe Pressure transmitters

- **PT4300** pressure transmitters are UL/cUL 1604 (CSA 213) Class I, Division 2, Groups A, B, C and D approved for hazardous area applications.
- **PT4400** pressure transmitters are UL/cUL 913 Class I, Division 1, Groups C and D approved when installed with an approved barrier, such as the IM33 isolation module.
- **PT4300** and **PT4400** sensors incorporate a 316 stainless steel measuring element that permits ranges from 0-10,000 psi, with high burst pressures up to 20,000 psi.
- **PT4500** submersible level transmitter is Class I, Division 1 approved when installed with an approved barrier, such as the IM33 isolation module.



### intrinsically Safe r 16 Level Probes

- Rated for FM Class I, Division 1 areas



**USA**  
TURCK Inc.  
3000 Campus Drive  
Minneapolis, MN 55441  
Phone: (763) 553-7300  
Fax: (763) 553-0708  
Application Support:  
1-800-544-7769



**mexi CO**  
TURCK MEXICO S. DE R.L. DE C.V.  
Carr. Saltillo-Zacatecas km 4.5 s/n  
Parque Industrial "La Angostura"  
Saltillo, COAH. C.P. 25070  
Mexico  
Phone: +52 (844) 411-6647/46  
Fax: +52 (844) 482-6926  
Local Toll Free: 01-800-01-88725  
E-mail: ventasmexico@turck.com



**CANADA**  
CHARTWELL ELECTRONICS, INC.  
140 Duffield Drive  
Markham, Ontario  
Canada, L6G 1B5  
Phone: (905) 513-7100  
Fax: (905) 513-7101  
Toll Free: 1-877-513-7769



**Germ ANY**  
Turck Headquarter 5  
Hans TURCK GmbH & Co. KG  
Witzlebenstrasse 7  
D-45472 Muelheim an der Ruhr  
Federal Republic of Germany  
Phone: (+49) 208-49 52-0  
Fax: (+49) 208-49 52 264



**AUstr ALIA**  
TURCK Australia Pty. Ltd.  
Unit 5, 6-7 Gilda Court  
Mulgrave, Victoria 3170  
Australia  
Phone: (+61) 3 9560 9066  
Fax: (+61) 3 9560 1620  
Local Toll Free: 1300 132566  
E-mail: turckaustralia@turck.com

[www.turck.us](http://www.turck.us)

©2011 by TURCK Inc. All rights reserved.  
No part of the publication may be reproduced without written permission.

B4430 6/12

**TURCK**

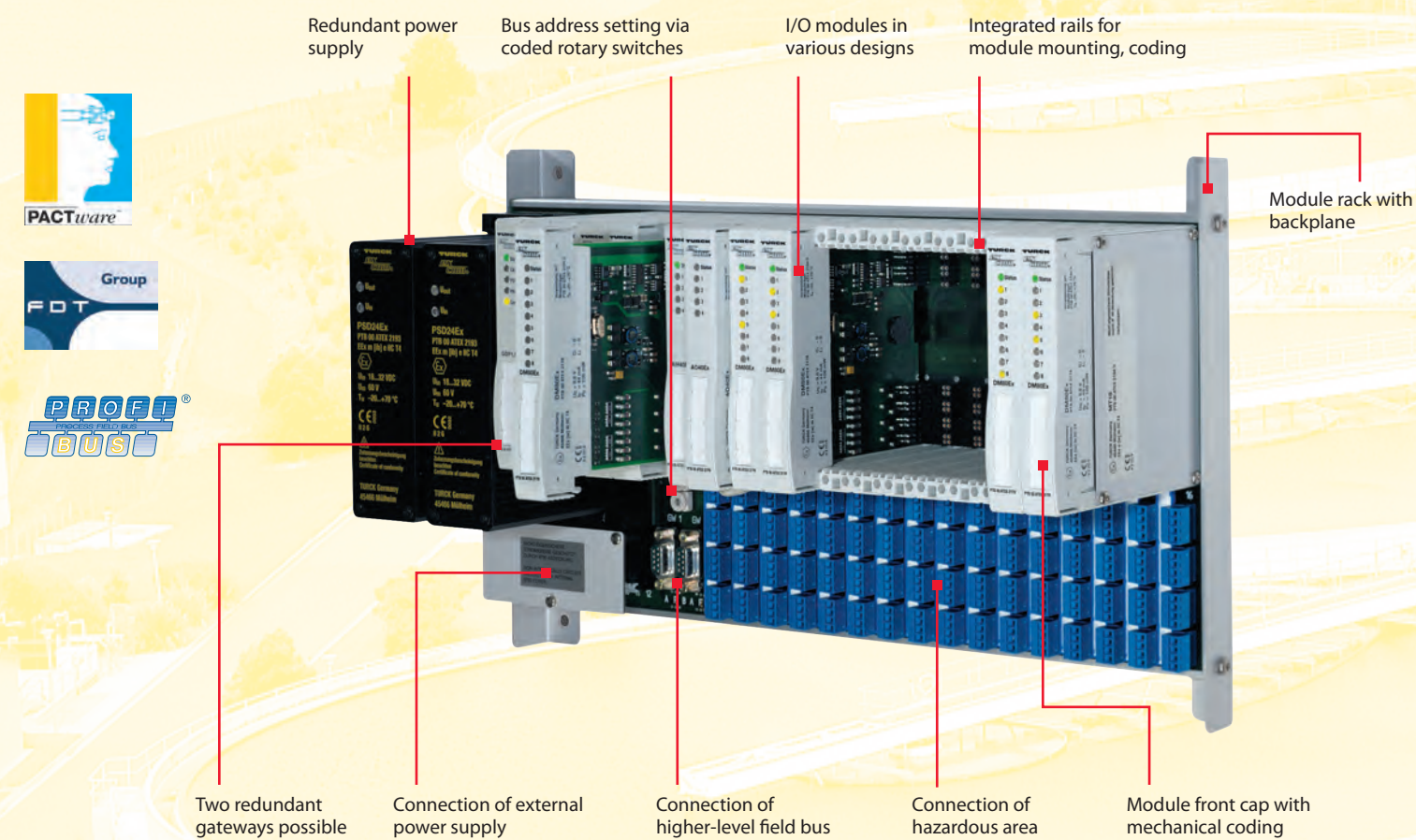
**PROCESS  
AUTOMATION**

**iNter FACe  
& iNtri NSiC  
SAFet y:  
Quick  
reference  
Guide**

[www.turck.us](http://www.turck.us)

## exCOM® SyStem Over view

**ex  
com®**



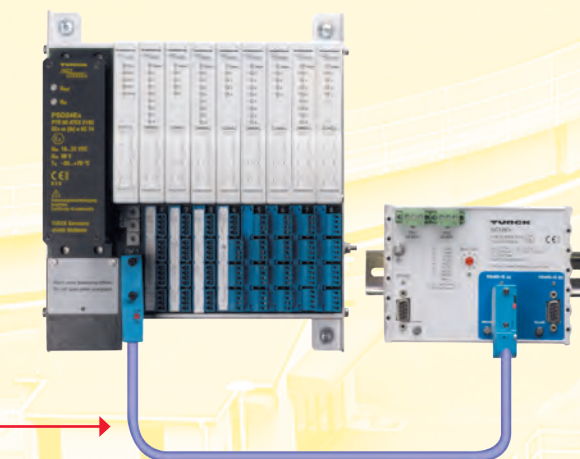
### the excom® System

excom is a remote I/O system for use in hazardous locations consisting 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/or PROFIBUS-DP gateway cards.

The I/O modules provide the interface to field devices. The backplane distributes power to the I/O from the 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-swappable"). The system automatically checks whether a newly inserted module matches the configuration.

When the excom system is used, the PROFIBUS-DP segment coupler **SC12Ex** must also be used for the interfacing. The coupler is equipped with one standard RS485 interface and two **RS485-IS** interfaces that allow redundancy. Optional fiber-optic couplers are also available.

The excom system, (including the **SC12-Ex** segment coupler) can be mounted in Division 2, Zone 1 or 2 and is FDT/DTM and HART compatible. The field circuits are approved for Division 1 and Zone 0.



Call for cable information →

.....Sense It!.....Connect It!.....Bus It!.....Solve It!™

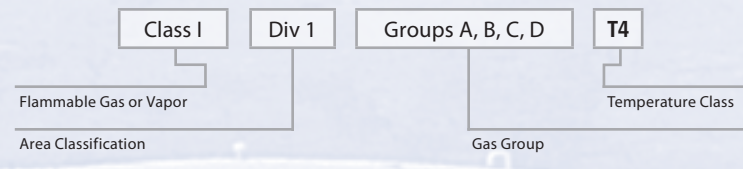
### Hazardous Area Descriptions

| Class and Groups   |            |       |                       |
|--------------------|------------|-------|-----------------------|
| Class              | Substance  | Group | Group                 |
| Class I (gas)      | Acetylene  | A     | NEC505/CENELEC/IEC    |
|                    | Hydrogen   | B     | IIC                   |
|                    | Ethylene   | C     | IB                    |
|                    | Propane    | D     | IIA                   |
| Mining             | Methane    | E     | I                     |
|                    | Metal dust | F     | Note: See Zones Below |
| Class II (dust)    | Coal dust  | F     |                       |
|                    | Grain dust | G     |                       |
| Class III (fibers) |            |       |                       |
| Fibers             |            |       |                       |

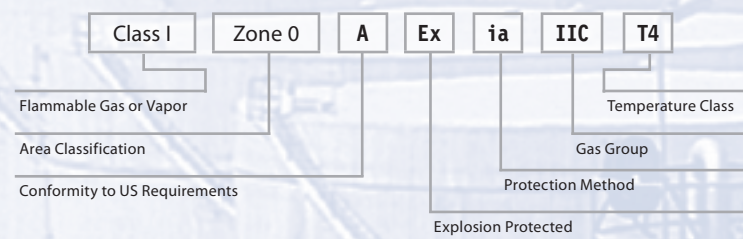
| Division / Zone                         |            |        |  |
|---|------------|--------|--|
| Flammable Material Continuously Present | NEC500     | NEC505 | CENELEC/IEC                                    |
| Likely to / Can be Present              | Division 1 | Zone 0 | Zone 0 (Zone 20-dust)                          |
| Not Normally Present                    | Division 2 | Zone 2 | Zone 1 (Zone 21-dust)<br>Zone 2 (Zone 22-dust) |

| Temperature                    |        |   |
|--------------------------------|--------|---|
| Maximum Surface Temperature °C | NEC500 | Temperature Class<br>NEC505/CENELEC/IEC |
| 450                            | T1     | T1                                      |
| 300                            | T2     |   |
| 280                            | T2A    |   |
| 260                            | T2B    | T2                                      |
| 230                            | T2C    |   |
| 215                            | T2D    |   |
| 200                            | T3     |   |
| 180                            | T3A    |   |
| 165                            | T3B    | T3                                      |
| 160                            | T3C    |   |
| 135                            | T4     |   |
| 120                            | T4A    |   |
| 100                            | T5     |   |
| 85                             | T6     | T6                                      |

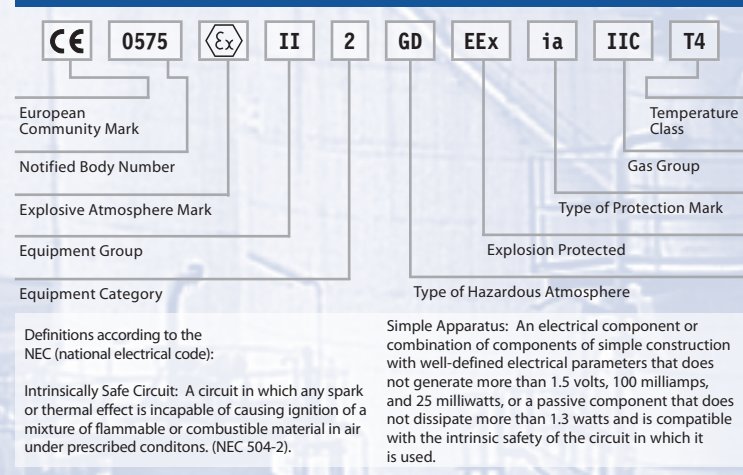
### NeC500 (Division method)



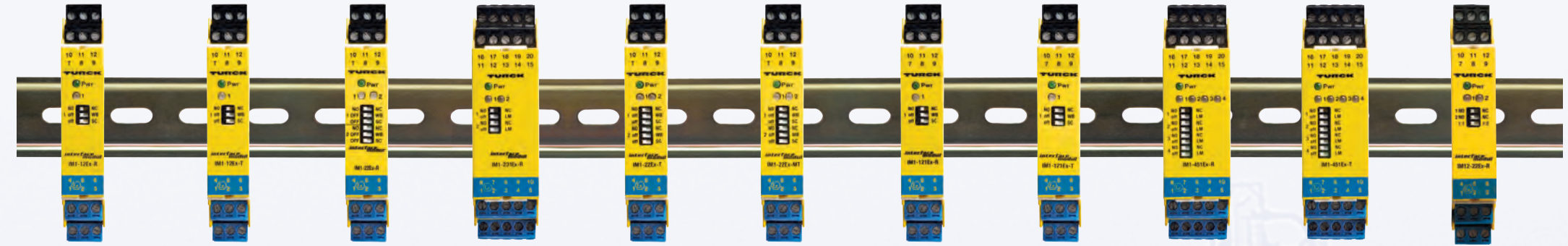
### NeC505 (Zone method)



### Atex



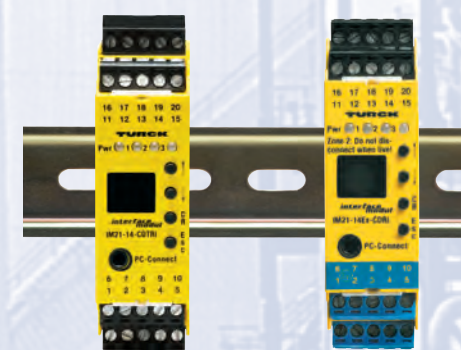
Note: For further assistance please call Application Support: 1-800-544-7769



|                | IM1-12Ex-R                 | IM1-22Ex-T                 | IM1-22Ex-R                  | IM1-231Ex-R                           | IM1-22Ex-T                  | IM1-22Ex-MT                 | IM1-121Ex-R                         | IM1-121Ex-T                        | IM1-451Ex-R                         | IM1-451Ex-T                        | IM12-22Ex-R                 |
|----------------|----------------------------|----------------------------|-----------------------------|---------------------------------------|-----------------------------|-----------------------------|-------------------------------------|------------------------------------|-------------------------------------|------------------------------------|-----------------------------|
| Voltage Supply | 20-250 VAC<br>20-125 VDC   | 20-250 VAC<br>20-125 VDC   | 20-250 VAC<br>20-125 VDC    | 20-250 VAC<br>20-125 VDC              | 20-250 VAC<br>20-125 VDC    | 20-250 VAC<br>20-125 VDC    | 20-250 VAC<br>20-125 VDC            | 20-250 VAC<br>20-125 VDC           | 20-250 VAC<br>20-125 VDC            | 20-250 VAC<br>20-125 VDC           | 20-250 VAC<br>20-125 VDC    |
| Inputs         | 1 NAMUR sensor or contact  | 1 NAMUR sensor or contact  | 2 NAMUR sensors or contacts | 2 NAMUR sensors or contacts           | 2 NAMUR sensors or contacts | 2 NAMUR sensors or contacts | 1 NAMUR sensor or contact           | 1 NAMUR sensor or contact          | 4 NAMUR sensors or contacts         | 4 NAMUR sensors or contacts        | 2 NAMUR sensors or contacts |
| Outputs        | 2 SPST Relays              | 2 transistors              | 2 SPST Relays               | 2 SPDT Relays and 1 SPST alarm output | 2 transistors               | 2 MOSFET                    | 2 SPST Relays, incl. 1 alarm output | 2 transistors incl. 1 alarm output | 5 SPST Relays, incl. 1 alarm output | 4 transistors incl. 1 alarm output | 2 SPST Relays               |
| Approvals      | IECEX<br>ATEX, FM C/US, UL | IECEX<br>ATEX, FM C/US, UL | IECEX<br>ATEX, FM C/US, UL  | IECEX<br>ATEX, FMC/US                 | IECEX<br>ATEX, FM C/US, UL  | IECEX<br>ATEX, FM C/US, UL  | IECEX<br>ATEX, FM C/US, UL          | IECEX<br>ATEX, FM C/US, UL         | IECEX<br>ATEX, FM C/US, UL          | IECEX<br>ATEX, FM C/US, UL         | IECEX<br>ATEX, FM C/US, UL  |



|                | IM31-11Ex-i                 | IM31-12Ex-i                 | IM31-22Ex-U<br>IM31-22Ex-i    | IM33-11Ex-H/24VDC          | IM33-12Ex-H/24VDC          | IM33-22Ex-H/24VDC          | IM33-11Ex-H              | IM33-12Ex-H              | IM33-22Ex-H              | IM33-14Ex-CDR1             | IM33-FSD-Ex/L            | IM34-11Ex-i<br>IM34-11Ex-C1             | IM34-12Ex-R1                            | IM34-12Ex-CR1                                     | IM34-14Ex-CDR1                                    | IM35-11Ex-H/24VDC           | IM35-22Ex-H/24VDC           | IM36-11Ex-U/24VDC | IM36-11Ex-i/24VDC |
|----------------|-----------------------------|-----------------------------|-------------------------------|----------------------------|----------------------------|----------------------------|--------------------------|--------------------------|--------------------------|----------------------------|--------------------------|---|---|---|---|-----------------------------|-----------------------------|-------------------|-------------------|
| Voltage Supply | 20-250 VAC<br>20-125 VDC    | 20-250 VAC<br>20-125 VDC    | 20-250 VAC<br>20-125 VDC      | 24 VDC                     | 24 VDC                     | 24 VDC                     | 20-250 VAC<br>20-125 VDC | 20-250 VAC<br>20-125 VDC | 20-250 VAC<br>20-125 VDC | 20-250 VAC<br>20-125 VDC   | without auxiliary energy | 20-250 VAC<br>20-125 VDC                | 20-250 VAC<br>20-125 VDC                | 20-250 VAC<br>20-125 VDC                          | 20-250 VAC<br>20-125 VDC                          | 24 VDC                      | 10-30 VDC                   | 24 VDC            | 24 VDC            |
| Inputs         | 0/2-10 V<br>0/4-20 mA       | 0/2-10 V<br>0/4-20 mA       | 2 x 0/2-10 V<br>2 x 0/4-20 mA | 0/4-20 mA                  | 1 x 0/4-20 mA              | 2 x 0/4-20 mA              | 1 x 0/4-20 mA            | 1 x 0/4-20 mA            | 2 x 0/4-20 mA            | 1 x 0/4-20 mA<br>FDT/DTM   | 2 x 0-20 mA              | NI/Pt100 or thermo-elements or mV-input | NI/Pt100 or thermo-elements or mV-input | NI/Pt100 or thermo-elements or mV-input - FDT/DTM | NI/Pt100 or thermo-elements or mV-input - FDT/DTM | 0/4-20 mA                   | 2 x 0/4-20 mA               | ≥ 800 to 20 kΩ    | ≥ 800 to 20 kΩ    |
| Outputs        | 0/4-20 mA                   | 2 x 0/4-20 mA               | 2 x 0/4-20 mA<br>2 x 0/2-10 V | 0/4-20 mA                  | 2 x 0/4-20 mA              | 2 x 0/4-20 mA              | 1 x 0/4-20 mA            | 2 x 0/4-20 mA            | 2 x 0/4-20 mA            | 1 x 0/4-20 mA<br>3 x relay | 2 x 0-20 mA              | 1 x 0/4-20 mA                           | 1 x 0/4-20 mA<br>1 relay                | 1 x 0/4-20 mA<br>1 relay                          | PACTware, IECEX<br>ATEX, FM C/US, UL              | 0/4-20 mA                   | 2 x 0/4-20 mA               | 0-10 V            | 0/4-20 mA         |
| Approvals      | IECEX, ATEX,<br>FM C/US, UL | IECEX, ATEX,<br>FM C/US, UL | IECEX, ATEX,<br>FM C/US, UL   | IECEX<br>ATEX, FM C/US, UL | IECEX<br>ATEX, FM C/US, UL | IECEX<br>ATEX, FM C/US, UL | IECEX<br>ATEX, FMC/US    | IECEX<br>ATEX, FMC/US    | IECEX<br>ATEX, FMC/US    | ATEX, FMC/US,<br>PACTware  | IECEX, ATEX,<br>FM C/US  | IECEX, ATEX,<br>FM C/US, UL             | IECEX, ATEX,<br>FM C/US, UL             | IECEX, ATEX,<br>FM C/US, UL                       | PACTware, IECEX<br>ATEX, FM C/US, UL              | IECEX, ATEX,<br>FM C/US, UL | IECEX, ATEX,<br>FM C/US, UL | ATEX, FMC/US      | ATEX, FMC/US      |



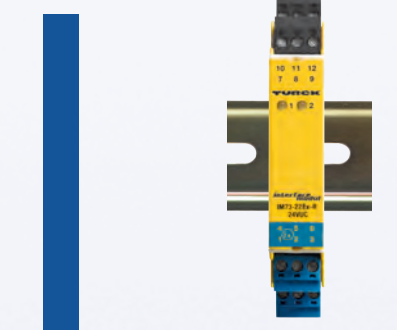
|                | IM21-14-CDTR1                         | IM21-14Ex-CDR1                   |
|----------------|---------------------------------------|----------------------------------|
| Voltage Supply | 20-250 VAC / 20-125 VDC               | 20-250 VAC / 20-125 VDC          |
| Inputs         | NAMUR input, 3-wire or external input | 1 intrinsically safe NAMUR input |
| Outputs        | relay and analog outputs              | relay and analog outputs         |
| Approvals      | PACTware                              | FM C/US, ATEX, PACTware          |



|                | IM43-13-R                            | IM43-13-SR                           | IM43-14-SR1                          | IM43-14-R1                           | IM43-14-CDR1                         |
|----------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| Voltage Supply | 20-250 VDC                           | 20-250 VDC                           | 20-250 VDC                           | 20-250 VDC                           | 20-250 VDC                           |
| Inputs         | 0/4-20 mA or 0/2-10 V or transmitter | 0/4-20 mA or 0/2-10 V or transmitter | 0/4-20 mA or 0/2-10 V or transmitter | 0/4-20 mA or 0/2-10 V or transmitter | 0/4-20 mA or 0/2-10 V or transmitter |
| Outputs        | 3 relays (N.O.)                      | 3 relays (N.O.)                      | 1 x 0/4-20 mA                        | 1 x 0/4-20 mA                        | 3 relays<br>1 x 0/4-20 mA            |
| Approvals      | FM, CI, D2                           | FM, CI, D2                           | FM, CI, D2                           | FM, CI, D2                           | PACTware                             |



|                | IM82-24-2,5  | IM82-24-5,0 | IM82-24-10  | IM82-24-20  |
|----------------|--------------|-------------|-------------|-------------|
| Voltage Supply | 100-240 VAC  | 115-230 VAC | 115-230 VAC | 115-230 VAC |
| Voltage Output | 24 VDC/2.5 A | 24 VDC/5 A  | 24 VDC/10 A | 24 VDC/20 A |
| Approvals      | UL           | UL CID2     | UL CID2     | UL CID2     |



|                | IM73-22Ex-R/24VDC |
|----------------|-------------------|
| Voltage Supply | 10-30 VDC         |
| Inputs         | 2 Inputs          |
| Outputs        | 2 SPDT Relays     |
| Approvals      | ATEX, FMC/US      |



|                | IM72-11Ex/L                | IM72-22Ex/L                |
|----------------|----------------------------|----------------------------|
| Voltage Supply | 19-30 VDC                  | 19-30 VDC                  |
| Inputs         | 1                          | 2                          |
| Outputs        | 1 x 45 mA                  | 2 x 45 mA                  |
| Approvals      | IECEX<br>ATEX, FM C/US, UL | IECEX<br>ATEX, FM C/US, UL |

Switch Amplifier S

ANALOG INPUT / OUTPUT

ANALOG SPEED MONITOR

RELAY COUPLER

SOLENOID DRIVER S

POWER SUPPLIES

## imC iNter FACe mODULe CARtri DGeS

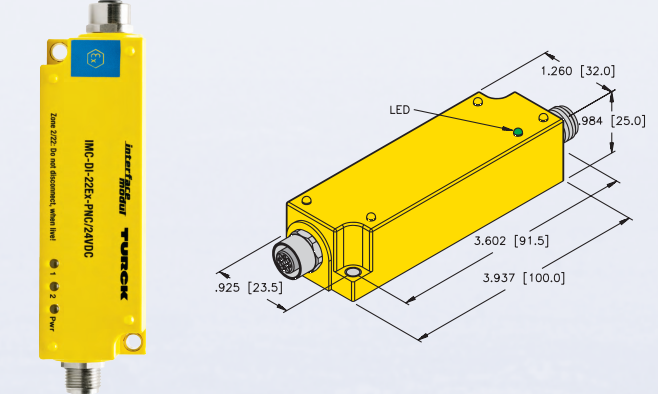


TURCK's new interface module cartridge (IMC) series is another innovative breakthrough in process automation: The I.S. barrier is moved from the mounting cabinet directly to the installation, thus making it possible to create further decentralized structures in the installation.

| Part Number                                  | Description                                     |
|--|---|
| IMC-D1-22Ex-PNO/24 VDC (NO = normally open)  | NAMUR sensor, contact with resistor circuitry   |
| IMC-D1-22Ex-PNC/24VDC (NC = normally closed) | NAMUR sensor, contact with resistor circuitry   |
| IMC-A1-11Ex-1/24VDC                          | Active transmitter; Current source              |
| IMC-A1A-11Ex-1/24VDC                         | Passive 2-wire transmitter; Current sink        |
| IMC-A0-11Ex-1/24VDC                          | Analog actuator, positioner, display            |
| IMC-D0-11Ex/L                                | Pilot light, solenoid valve, 4-wire transmitter |
| IMC-SG                                       | Cover guard                                     |

The exceptional compact and rugged device series creates new options and possibilities for the user: In addition to your standard mounting cabinet solution, increase the flexibility of your system by using TURCK interface module cartridges.

- IP 67 protection with screw on connectors
- Mounting in Zone 2 - Application area in accordance with ATEX: II (1) GD, II (3) GD
- Ambient temperature -25° to +70°C
- Standard signals
- Plug & play connection technology, M12 connectors



## ims SiGNAL CONDiti ONer S



TURCK introduces the new IMS interface module measuring merely 6.2 mm wide. The module may be configured with a laterally mounted DIP switch for added convenience. This extremely compact module provides complete galvanic isolation, up to 2.5 kV between the input, output and power supply. Galvanically isolated IMS modules

| Part Number         | Description                            |
|---------------------|--|
| IMS-A1-DLI-22-DLI/L | 0/4 to 20 mA loop powered dual channel |
| IMS-A1-UNI/24VDC    | Universal mA/V selectable              |
| IMS-T1-PT100/24VDC  | Pt-100 RTD to mA/V                     |

are available with dead-zero to live-zero signal conditioning, or one and two channel modules are available without signal conditioning.

Modules are also available for temperature detection using Pt-100 technology or other thermo-elements. Those that use Pt-100 technology achieve 0.3 percent of the full scale, and are available with 2-, 3- or 4-wire connections. An analog signal transmitter that achieves 0.1 percent of the full scale completes the IMS line.

Applications:

- Signal conditioning
- Analog conversion
- Temperature measurement
- UL, Division 2 approved

