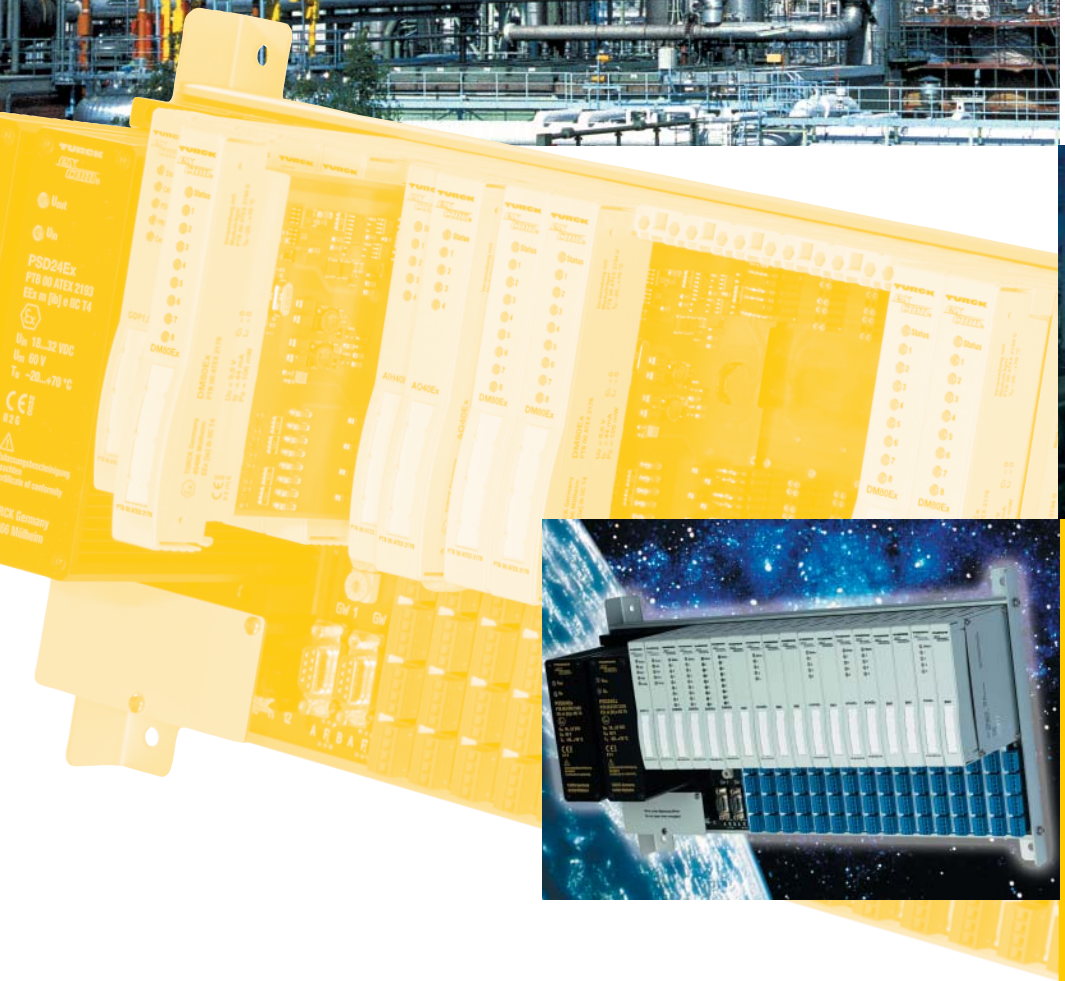
TURCK

Industrial
Automation

REMOTE I/O

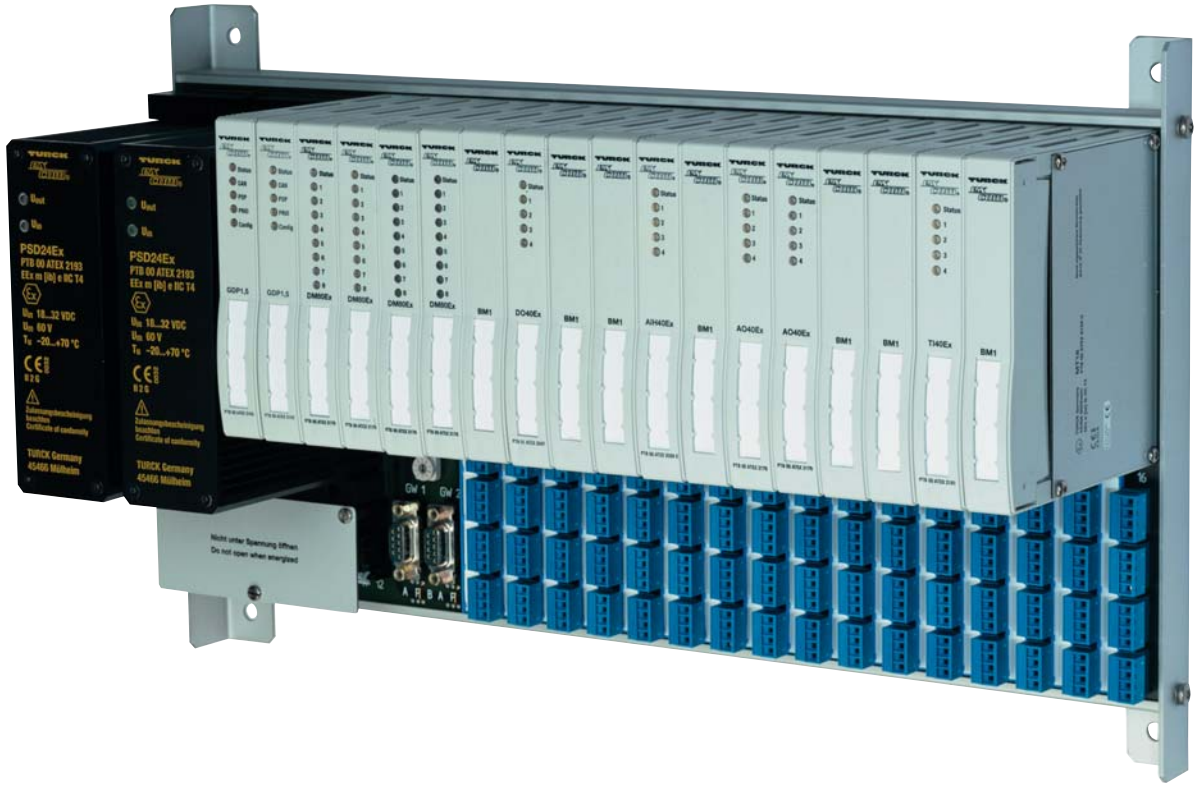
excom®



Sense it! Connect it! Bus it! Solve it!

Remote I/O System *excom*®

- Intrinsically safe remote I/O system for use in zone 1 and zone 2
- Redundant power supplies and gateways
- Intrinsically safe connection to PROFIBUS-DP with V1 functionality
- Online programming and configuration of all parameters
- Consistent HART® parameterization from the process control system to the field device
- Temperature range from -20…+60 °C
- Exchange and extension of all components during operation
- Simple manual insertion and removal of modules without tools
- 128 binary or 64 analog intrinsically safe channels via a single bus address
- "Forcing" and substitute value programming of analog and binary I/O



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excom® – General

excom® – Components

Coupler

Ex e stainless steel enclosure for use of *excom*® in zone 1

PROFIBUS-DP bus connector RS485

Accessories

excom® – System Components

Type	Page	Input type	Output type	Number of inputs/outputs	Galvanically sep. channels	Description
GDP-IS	12	–	–	–	–	Gateway – PROFIBUS-DP interface
DM80Ex	14	NAMUR	binary	8 I/O	–	8-channel digital input/output module
DF20Ex	16	NAMUR	–	2I	–	2-channel frequency module
DI40Ex	18	NAMUR	–	4I	✓	4-channel digital input module
DO40Ex	20	–	binary	4O	✓	4-channel digital output module
AI40Ex	22	analog[1)]	–	4I	✓	4-channel analog input module
AI41Ex	24	analog[2)]	–	4I	✓	4-channel analog input module
AI43Ex	26	analog		4I	✓	4-channel potentiometer module
AO40Ex	28	–	analog	4O	✓	4-channel analog output module
AIH40Ex	30	analog[1)]	–	4I	–	4-channel analog input module, HART®
AIH41Ex	32	analog[2)]	–	4I	–	4-channel analog input module, HART®
AOH40Ex	34	–	analog	4O	–	4-channel analog output module, HART®
TI40Ex	36	analog	–	4I	✓	4-channel input module for temperature sensors
MT9-RO24	38	–	–	–	–	module rack for 8 modules
MT18-RO24	40	–	–	–	–	module rack for 16 modules
MT9-CO24	42	–	–	–	–	module rack for 8 modules
MT18-CO24	44	–	–	–	–	module rack for 16 modules
MT18-C230	46	–	–	–	–	module rack for 16 modules
PSD24Ex	48	–	–	–	–	24 VDC power supply unit
PPSA230Ex	50	–	–	–	–	230 VAC/DC converter
PPSA115Ex	52	–	–	–	–	115 VAC/DC converter

[1)] 2-wire transducers

[2)] 4-wire transducers

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System Overview

excom® is a remote I/O system for use in potentially explosion hazardous locations. It provides bus-compatible, decentralized input and output modules in protection degree IP20 for connection of binary and analog intrinsically safe field devices. The explosion protection type of the systems allows use in zones 1 and 2. The fieldbus circuits are approved for use in zone 0.

The system consists of power supplies, gateways, I/O modules and a module rack to accommodate all components. The backplane is integrated into the module rack. The backplane serves to distribute energy, to transmit data and to connect field devices. The power supply units ensure reliable supply of the entire system. A single power supply is sufficient for correct system operation. In order to enhance system availability, it is possible to connect a second supply unit (redundancy) when using the module rack type MT18...

The gateways fulfill both master and slave functions: as a master they control the internal data bus and as a slave they communicate with the higher level fieldbus. The gateways control the entire data communication between an I/O module and the process control system (PLC). Redundancy of gateways is also possible when using the module rack MT18-...024, thus increasing availability and fail-safety of the system.

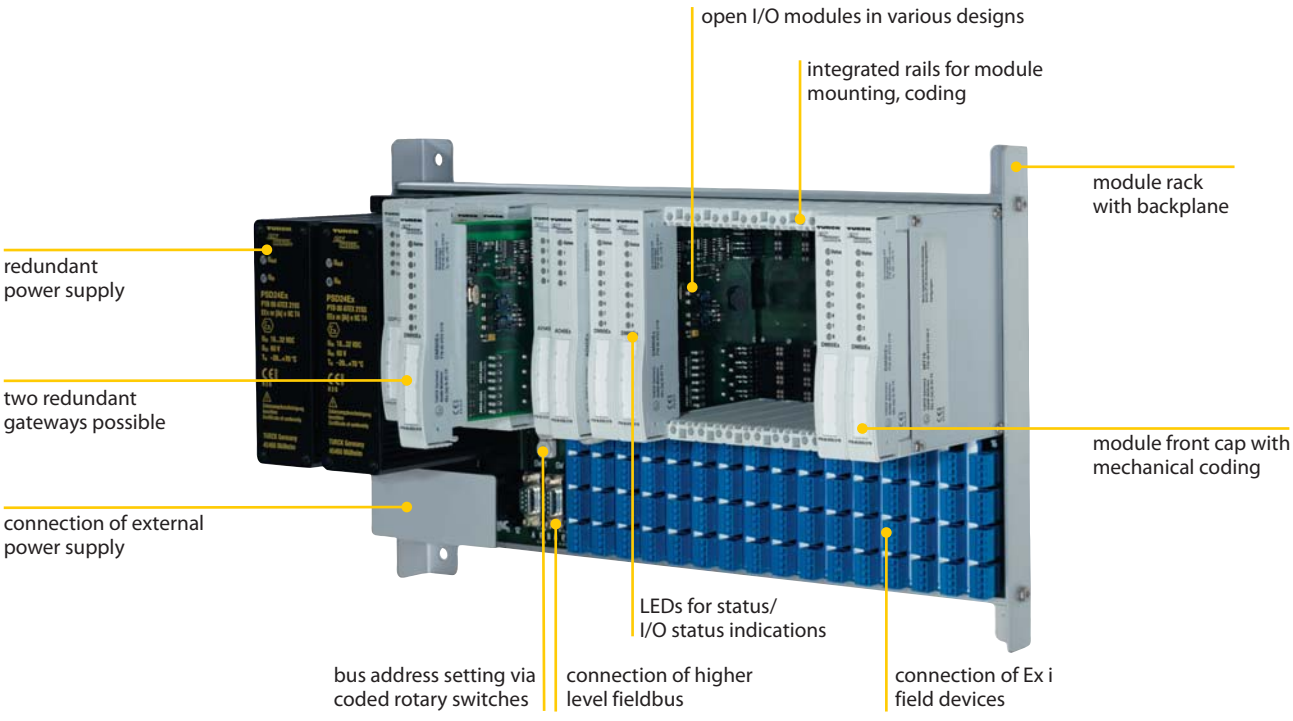
The I/O modules are the interface to the periphery. The inputs and outputs serve to connect field devices in protection type Ex ia IIC. Up to 16 I/O modules may be operated in conjunction with a single module rack. The backplane provides the intrinsically safe supply of the I/O modules - an additional power supply is not needed. Connection of modules is easily accomplished: Gateways, power supplies and I/O modules are simply plugged into the rack.

After establishing the internal connections, the field components are connected.

Modules can be plugged into and removed from the rack during operation (hot swapping). Defective devices can be exchanged during operation. The system automatically checks whether the new module accords to the defined slot assignment. The system supports substitute value programming.

The internal cycle time of a fully assembled system is below 5 ms for binary processing and below 20 ms for analog signals. The response time also depends on the type of PLC and fieldbus used in the application. The system supports connection of HART®-compatible field devices. Consistent HART® communication up to the PLC is possible via the PROFIBUS-DPV1.

System Configuration



Required components for system assembly

In order to assemble a system, it is required to use at least the following components:

1 × MT9	module rack without redundancy function
or MT18	module rack with redundancy function
1 × PSD24Ex	24 VDC power supply unit
1 × GDP-IS	PROFIBUS-DP gateway 1.5 MBaud
1 × RS485 IS coupler	IS coupler for PROFIBUS

Binary or analog input and output modules (depending on the kind of application) from our selection of *excom*® devices:

DM80Ex	binary input/output module for connection of NAMUR sensors and low voltage actuators
DF20Ex	binary input module for frequency measurements or as a counter module
DI40Ex	binary input module for connection of NAMUR sensors
DO40Ex	binary output module for connection of Ex i magnetic valves < 0.5 W
AI40Ex	analog input module for connection of 2-wire transmitters
AI41Ex	analog input module for connection of 4-wire transmitters
AI43Ex	analog input potentiometer module
AO40Ex	analog output module for connection of analog actuators
AIH40Ex	analog input module for connection of 2-wire transmitters with HART® functionality
AIH41Ex	analog input module for connection of 4-wire transmitters with HART® functionality
AOH40Ex	analog output module for connection of analog actuators with HART® functionality
TI40Ex	analog input module for connection of temperature detectors

PLC/SPC connection

***excom*® may be connected to all systems with PROFIBUS-DP interface (master functionality).**

In order to obtain access to the full function range it is required to use a master with PROFIBUS-DPV1 functionality.

Connections

Bus:

Depending on the kind of module rack used, there are either one or two 9-pole D-SUB connectors (redundancy) for bus connection. An explosion proof bus connector (D-SUB connector) must be used, e.g. TURCK type D9T-RS485IS (see page 61). It is permitted to use copper cables conform to PROFIBUS-DP or fiber optics (with matching transducers, see pages 56 to 59). Due to the RS485-IS layer, it is required to use a segment coupler (RS485 IS coupler see page 54) for mounting.

Power supply:

The module rack contains Ex e terminals for connection of the power supply.

Modules:

The modules are connected via two connectors (16 poles/12 poles) with the backplane.

Inputs/outputs:

The module rack contains four 4-pole connectors or cage clamp terminals for connection of field devices.

⚠ Attention:

It is indispensable to observe and follow the respective regulations of the various protection classes. The components may only be used in combination with the *excom*® system.

Diagnostics

The gateway provides extended PROFIBUS-DP diagnostics, i.e. the user is provided with the full range of diagnostics data including channel-specific error indications. Additionally, each module is equipped with LEDs for error indications directly in the field. Moreover, all I/O modules feature LEDs for input/output diagnostics and status indications. All LED indications accord to NAMUR NE 44 or DIN EN 60073, i.e.

green	=	operational readiness (power on/module function)
red	=	error
yellow	=	switching status of binary inputs/outputs

Further details are contained in the operation manual.

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Addressing

The modules are addressed in accordance to the slot they are inserted in. Thus it is not necessary to carry out address settings on the modules. A module inserted into slot 0 has the internal address 0, a module in slot 1 is assigned to address 1, … a module in slot 16 has address 16.

Setting of the PROFIBUS-DP address is carried out via three coded rotary switches. The maximum address of a rack is therefore address 125. According to PROFIBUS-DP, the system is configured as a modular slave and therefore only the actually present I/O modules are assigned to addresses of the programmable logic control or the process control system.

Transmission rates/Cycle times

The PROFIBUS-DP master determines the system-specific transmission rate. Admissible baud rates range from 9.6 to 1500 kBaud.
The internal cycle time for processing of 128 binary signals is below 5 ms and for 64 analog signals below 20 ms. The cycle time of the higher-level bus and the process control system must be added to the response time of the entire system.

The general formula is:

$T_R = 2 \times (T_I + T_B + T_{PLS})$

T_R = response time
T_I = internal cycle time Ex link
T_B = cycle time of higher level bus
T_{PLS} = cycle time of the process control system.

Software/System files

Included in delivery

Device data base file (GSD-File)

Download from: www.turck.com

- Headquarters
- Download
- Configuration

PROFIBUS-DP (structure)

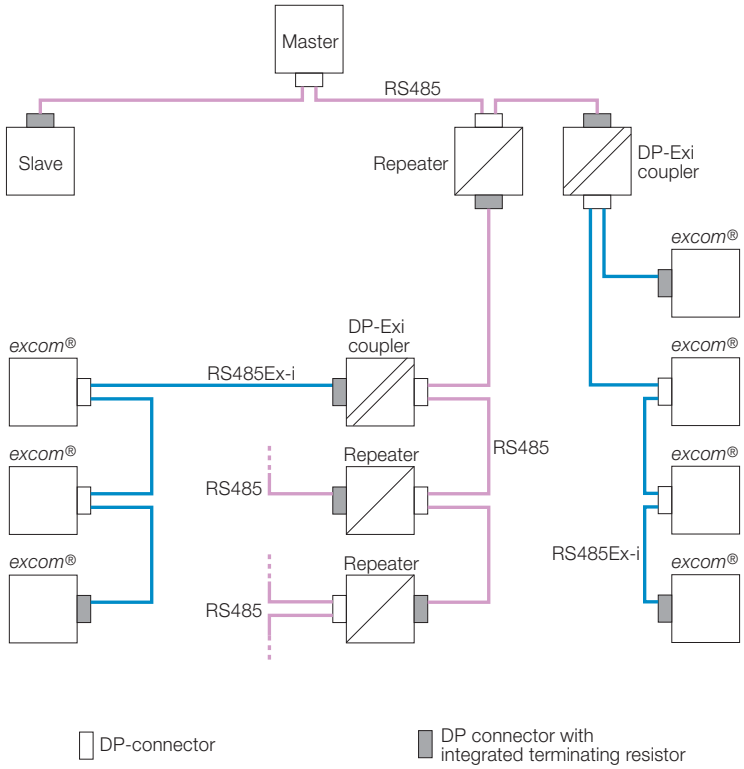
Up to 126 stations with user data can be operated within a PROFIBUS network. However, the specific transmission characteristics limit the number of stations to 32. If more than 32 stations are to be operated within the network, it must be divided into several segments by installing repeaters and/or segment couplers. The specific task of a repeater is to segment the network, but it can also be used to extend the network by connecting several repeaters in series. The maximum number of series-connected repeaters depends on the manufacturer's technical specifications. When using a segment coupler, the physical bus characteristics are limited to intrinsically safe electrical values.
The maximum number of stations in an RS485-IS segment is 16. The network expansion accords to that of a non-safe network. Since it is permitted to operate the *excom*® system in zone 1 and to disconnect the gateway from the bus during operation, the RS485-IS layer is applied.

Due to the special characteristics of the RS485-IS layer, *excom*® may only be operated with this type of segment coupler.
Segment couplers and repeaters apply load to the bus through their emitter/receiver circuitry. Therefore they have to be considered always as bus subscribers of the segments.

Baud rate	Bus Segment (Length of bus line)
9,6 kbps	1200 m
19.2 kbps	1200 m
93.75 kbps	1200 m
187.5 kbps	1000 m
500 kbps	400 m
1.5 Mbps	200 m

Tab.: Maximum line lengths and various transmission speeds according to IEC 61158 when using type A cables.

Model system structure



Installation guidelines

excom® is a remote I/O system for installation in explosion hazardous areas, zone 1.

The connection to the SPC or PLC is carried out via PROFIBUS-DP. When using copper cables it is required to use an approved segment coupler. The use of fiberoptics (together with a corresponding transformer) is also permitted. If redundancy is needed, it is possible to install two gateways (module rack MT18... only). These may be exchanged during operation.

The external power supply is connected via Ex e terminals (increased safety) located on the module rack and fed to the 24 VDC power supply modules. Please observe the standard safety regulations for all terminal connections. It is permitted to exchange the power supply modules in zone 1 during operation. If redundancy is required, two power supply units may be employed, provided module rack MT18... is used.

The field components, i.e. sensors and actuators located in the explosion hazardous area, are connected via terminals on the module rack. The modules feature protection type "intrinsic safety" and provide secure galvanic separation. As a result, the modules, sensors and actuators may be exchanged during operation (hot-swapping).

If the system is to be installed in zone 1, appropriate field enclosures must be used (see page 60). The customer is responsible for safe field enclosure in accordance to the requirements of EN 60079-0 and in compliance with the respective operation manuals. Alternatively, factory-assembled systems in special field housing can be ordered from the manufacturer to ensure that protection type IP54 is fulfilled.

All modules, the gateway to the higher level fieldbus, and the power supply feature separate approvals. They may only be used in conjunction with the module rack.

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Configuration and parameterization via DTM

The *excom*® DTM is both device driver and commissioning tool. If the DTM is used in the engineering tool, it can be used for the configuration and parameterization of the *excom*® systems. In stand-alone tools such as PACTware™ it is used for commissioning and monitoring. It is based on FDT specification 1.2.1.

Structure of the *excom*® DTM

The *excom*® DTM has a modular design. Every *excom*® module is assigned to a separate DTM. The PACTware™ project in Fig. 1 shows the essential components.

The *excom*® DTM Setup contains all the necessary DTMs for configuration and operation. After installation, these DTMs can be accessed via the frame application. In the configuration, access to PROFIBUS-DP is provided via the communication DTM "*excom* DP". This also has a gateway function for the integration of the *excom*® modules. The module DTMs are available in two categories: device DTMs and gateway DTMs. All modules that do not implement any other communication to the connected field devices are declared as device DTMs. Modules can also contain a gateway function. These are *excom*® modules with integrated HART® functionality. They feature a HART® master functionality that enables the establishment of bidirectional HART® communication between the module and the connected field devices. This therefore enables HART® instrumentation to be parameterized via *excom*® from a central location.

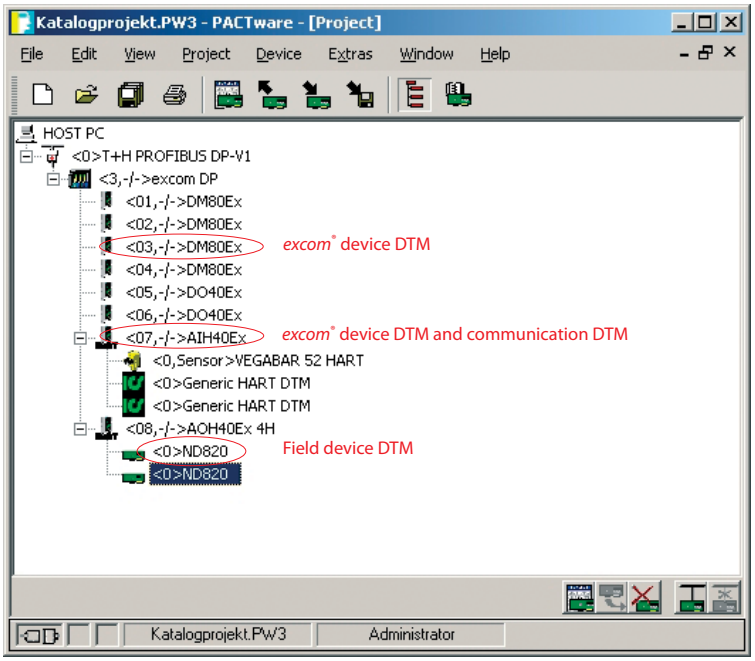

Fig. 1: *excom*® DTM – Elements of a PACTware™ project

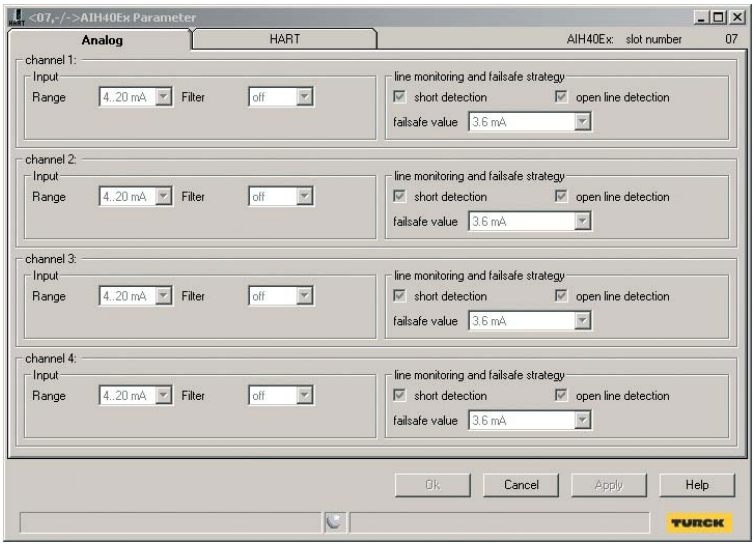

Fig. 2: Dialog window – Parameter view

Operation

A parameter view is provided for every *excom*® module. Each view shows the module-specific settings for each channel. An incorrect parameter setting (as possible with the GSD file based configuration) is not possible here since a plausibility check is directly performed on each entry (see Fig. 2).

Monitoring

Each DTM provides a view of the I/O level for visualising the peripheral devices and for displaying the actual process data. The status also provides information on the validity of the data. The data is shown as a bar display, value window or illuminated display (see Fig. 3).

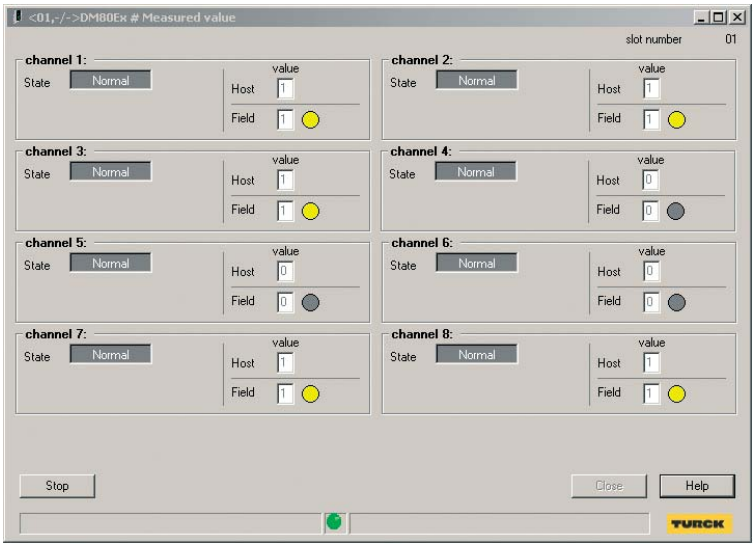

Fig. 3: View of the I/O level – Status and process data

Simulation

The Simulation dialog window considerably simplifies commissioning of *excom*®, including the peripheral devices used. Input data can be overwritten to simulate benchmark values for the field instrumentation, for example. The actuators can be switched to the required status by means of the output data. Analog values as shown in Fig. 4 are displayed as a percentage value or in mA. The simulation value for display can be set by means of a slider or as a numerical value.

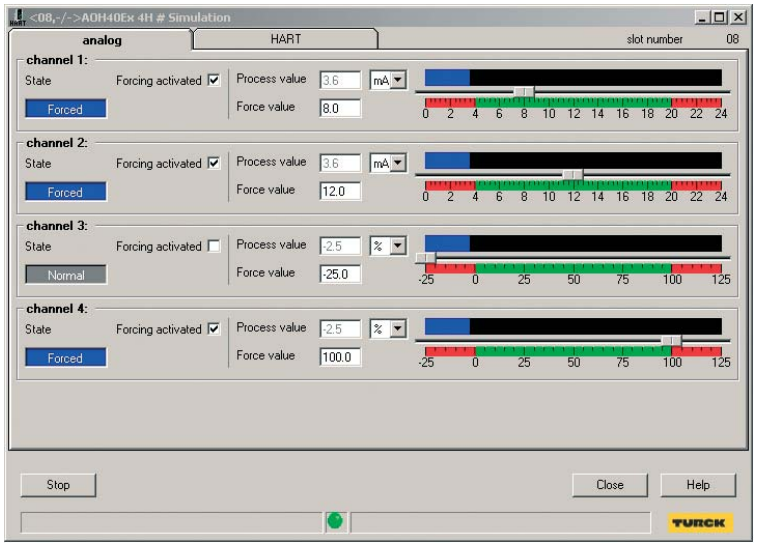

Fig. 4: Dialog window – Simulation of analog values

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Diagnostics and identification

Two other useful views are provided for diagnostics and identification. The diagnostics view shows the channel errors of the peripheral devices. In the event of a fault, this is indicated in plain text with the channel number. The associated terminals are marked in red (see Fig. 5). The identification view (see Fig. 6) supplies the data required for managing the system such as:

- Device type
- Order number
- Lot code
- Revision levels
- And other device information.

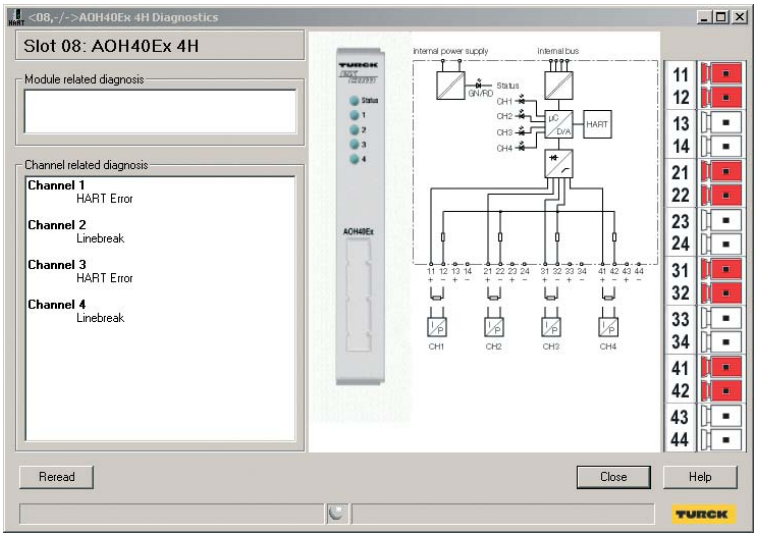


Fig. 5: Diagnostics view

Licensing

The *excom*® DTM is available in three license versions: **Demo mode**, **Standard** and **Professional**.

The **Demo mode** is available free of charge and can be downloaded from www.turck.com. The DTM is fully functional, including the HART® communication. It is permanently assigned to a PROFIBUS address defined during the installation. Only one demo DTM can therefore be implemented in a project.

The **Standard** DTM should be used for applications in which individual components of the installation have to be modified or reconfigured occasionally. Like the Demo DTM, the Standard DTM is also restricted to one station address, however, this can be selected in a project as required.

The **Professional** license version is the full version and therefore allows an unrestricted number of station addresses. Both the Standard version and the Professional version are restricted to one computer.

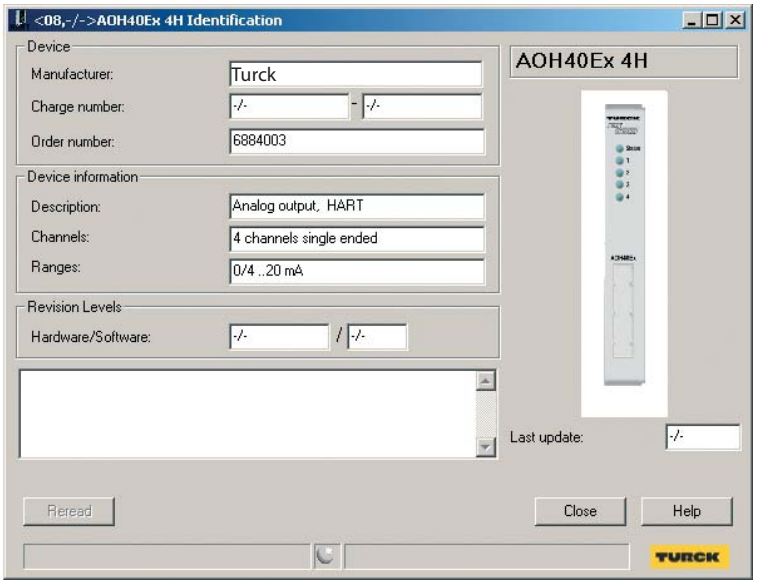
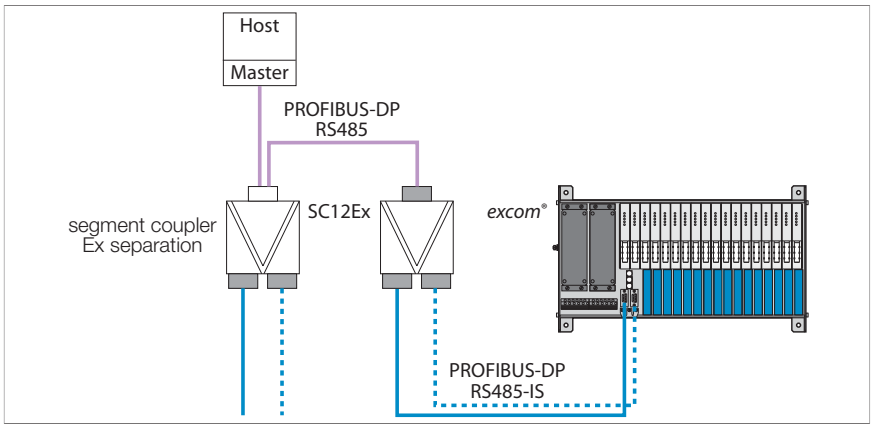


Fig. 6: Identification view

PROFIBUS-DP Interface
GDP-IS/FW2.1



The GDP-IS gateway serves to connect the *excom*® system to PROFIBUS-DP networks. Connections to the PROFIBUS-DP can be established via fiber optics or with copper cables. The use of fiber optics requires the connection of a coupler pair between wired and optical PROFIBUS for data transfer and also for level adjustment to the IS layer. When using copper cables it is required to use a segment coupler (RS485-IS coupler) to ensure explosion protection.

The gateway may be configured for a maximum transmission rate of 1500 kBaud. The bus is connected via a standard miniature SUB-D connector on the module rack.

A GSD file containing all configuration files and parameter sets is available for system configuration. When connected to certain host systems, it is possible to alter the system configuration during operation.

The gateway provides the entire range of PROFIBUS diagnostic functions including port-related diagnostics. Additionally, manufacturer-specific error codes are generated. For example HART® communication errors, power supply errors, planning errors as well as information on simulators, internal communication and redundancy status.

Redundancy:

The use of two gateways and two bus lines ensures error-free communication, in case one gateway or one bus line may fail. If one of the components fails, the other immediately takes over (module racks MT18… only), this is called line redundancy. System redundancy (two masters, each with their own segment coupler connected to a gateway) is also supported.

Recommended wiring components:

- PROFIBUS-DP cable, type 451B
- D9T-RS485IS connector
- Segment coupler SC12Ex
- LWL coupler OC11Ex/…

- **Intrinsically safe gateway for PROFIBUS-DPV1**
- **Connection of the *excom*® station to PROFIBUS-DP networks**
- **Baud rate max. 1.5 Mbaud**
- **PROFIBUS interface acc. to PROFIBUS user organization (PNO) with RS485-IS layer**

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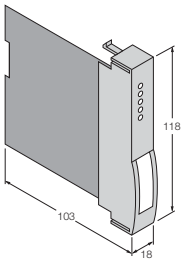
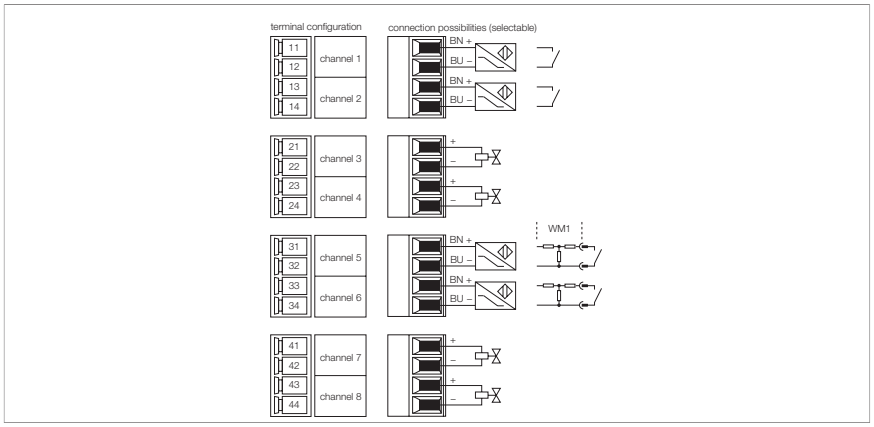
Type	GDP-IS/FW2.1
Ident-No.	6884202
Supply voltage	via module rack, central power supply
Power consumption	≤ 1 W
Galvanic separation	all-round galvanic separation acc. to EN 60079-11
Transmission rate	9.6 kbps up to 1.5 Mbps
Addressing range	1 … 125
Ex approval acc. to conformity certificate	PTB 09 ATEX 2013
Device designation	⟨Ex⟩ II 2 G Ex ib IIC T4
Max. values	RS485-IS fieldbus connection
Max. output voltage U_o	≤ 3.6 V
Max. output current I_o	≤ 125 mA
Max. output power P_o	≤ 112.5 mW
Characteristic	linear
Max. input voltage U_i	≤ 4.2 V
Indication	
Operational readiness	1 x green / red
Int. communication (CAN)	1 x yellow / red
Ext. Communication (PDP)	1 x yellow / red
Redundancy readiness (PRIO)	1 x yellow / red
Error indication	1 x red
Protection class	IP20
Ambient temperature	-20…+70 °C
Relative humidity	≤ 93% at 40 °C acc. to EN 60068-2-3 Test Ca
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	18 x 118 x 103 mm
Weight	125 g
Comments	**External RS485 fieldbus system:** Protection type Ex ib IIC Highest value of each terminal pair: U_i = 4.2 V Highest value of the terminal pairs: ΣI_i = 4.8 A **Cables type A resp. B** acc. to EN 60079-25 with the following assignments: L'/R' ≤ 15 µH/Ω C' ≤ 250 nF/km Ø litz wire ≥ 0.2 mm massed inductances and capacitances in the external fieldbus system are **not** permitted

Dimensions



8-channel digital input/output module DM80Ex



- **Input/output module for NAMUR sensors and actuators**

The input/output module DM80Ex is used for the connection of NAMUR sensors (DIN EN 60 947-5-6) and actuators. If mechanical contacts are connected, it is required to implement a resistor circuitry (WM1, Ident no. 0912101) when the wire-break and short-circuit monitoring function is activated.

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with the *excom*® system. Inputs and outputs are Ex ia IIC protected.

When connecting the fieldbus devices, care has to be taken that all inputs and outputs are connected to the same supply potential.

Input and output mode can be adjusted via PROFIBUS-DP master. The following paramterers can be adjusted: switching performance, switch-on delay, default value, wire-break and short circuit monitoring.

The user can furthermore determine whether an input or an output should be provided at the connecting point. The following configurations are possible: 8 inputs/0 outputs; 6 inputs/2 outputs up to 0 inputs/8 outputs (GSD-file, Mode 2). This way, optimal adaption to the corresponding application environment is guaranteed.

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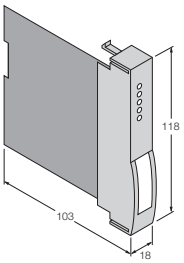
Type	DM80EX
Ident-No.	6884006
Supply voltage	via the backplanes, central power supply
Power consumption	≤ 1 W
Galvanic separation	to int. bus and supply circuit
Number of channels	8-channel
Input circuits	acc. to EN 60947-5-6 (NAMUR), intrinsically safe acc. to EN 60079-11
No-load voltage	8 VDC
Short-circuit current	4 mA
Switching threshold on/off	type 1.8 / type 1.4 mA
Switching frequency	≤ 100 Hz
Short circuit	< 367 Ω
Wire-break	< 0.2 mA
Output circuits	for intrinsically safe actuators
No-load voltage	8 VDC
Rated current	4 mA
Internal resistance R_i	320 Ω
Switching frequency	≤ 100 Hz
Short circuit	< 367 Ω
Wire-break	< 0.2 mA
Ex approval acc. to conformity certificate	PTB 00 ATEX 2178
Device designation	⟨Ex⟩ II 2 (1G/D) G Ex ib [ia] IIC T4
Max. values	terminal connection 1+2 / 3+4
Max. output voltage U_o	≤ 9.6 V
Max. output current I_o	≤ 44 mA
Max. output power P_o	≤ 106 mW
Characteristic	linear
External inductance/capacitance L_i/C_i	L_i negligibly small
	C_i negligibly small

External inductance/capacitance L_o/C_o

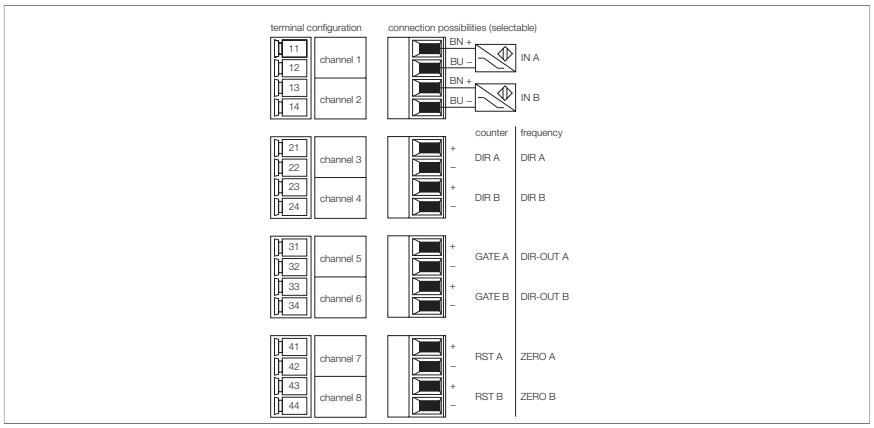
	IIC	IIB
L_o [mH]	C_o [µF]	C_o [µF]
2.0	0.9	5.1
1.0	1.1	6.1
0.5	1.3	7.3
0.2	1.7	8.6

Indication	
Operational readiness	1 x green / red
State/ Fault	8 x yellow / red
Protection class	IP20
Ambient temperature	-20…+70 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	18 x 118 x 103 mm
Weight	114 g

Dimensions



2-channel frequency module DF20Ex



The input module DF20EX is equipped with 8 channels according to NAMUR, which are divided into two blocks. There are one frequency input per block and three control inputs/outputs.

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with the *excom*® system. If the fieldbus devices are connected, care has to be taken that all inputs and outputs have a common potential. Inputs and outputs are Ex ia IIC protected.

The module can be used as counter or frequency input module: It is thus suited for pulse counting of binary input signals or frequency measurements of binary pulse sequences of NAMUR sensors.

The counting direction can either be set externally via the control input or internally by setting a parameter. The maximum frequency of one block is 4 kHz; with 2 blocks the frequency is reduced to 2 kHz.

Input and output mode can be adjusted via PROFIBUS-DP master. Each channel can be configured according to wire-break and short-circuit monitoring.

- **Frequency module for the connection of intrinsically safe sensors (according to NAMUR)**

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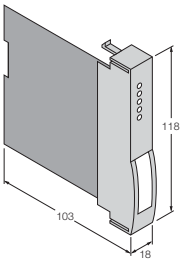
Type	DF20EX
Ident-No.	6884061
Supply voltage	via the backplanes, central power supply
Power consumption	≤ 1 W
Galvanic separation	to int. bus and supply circuit
Number of channels	2-channel
Input circuits	acc. to EN 60947-5-6 (NAMUR), intrinsically safe acc. to EN 60079-11
No-load voltage	8 VDC
Short-circuit current	4 mA
Switching threshold on/off	type 1.8 / type 1.4 mA
Switching frequency	≤ 4000 Hz
Short circuit	< 367 Ω
Wire-break	< 0.2 mA
Measuring accuracy	≤ 1 % of full scale
Ex approval acc. to conformity certificate	PTB 00 ATEX 2178
Device designation	⟨Ex⟩ II 2 (1G/D) G Ex ib [ia] IIC T4
Max. values	terminal connection 1+2 / 3+4
Max. output voltage U_o	≤ 9.6 V
Max. output current I_o	≤ 44 mA
Max. output power P_o	≤ 106 mW
Characteristic	linear
External inductance/capacitance L_i/C_i	L_i negligibly small
	C_i negligibly small

External inductance/capacitance L_o/C_o

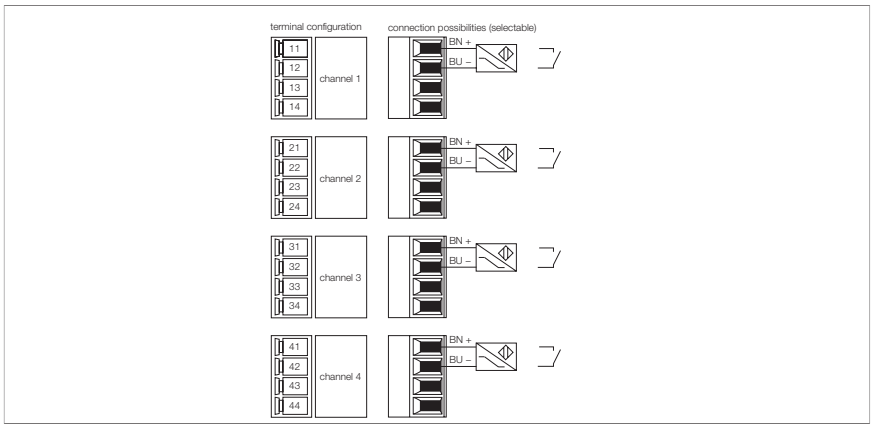
	IIC	IIB
L_o [mH]	C_o [µF]	C_o [µF]
2.0	0.9	5.1
1.0	1.1	6.1
0.5	1.3	7.3
0.2	1.7	8.6

Indication	
Operational readiness	1 x green / red
State/ Fault	8 x yellow / red
Protection class	IP20
Ambient temperature	-20…+60 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	18 x 118 x 103 mm
Weight	118 g

Dimensions



4-channel digital input/output module DI40Ex



The input module DI40Ex is used for the connection of NAMUR sensors (DIN EN 60947-5-6) or mechanical contacts.

If mechanical contacts are connected, it is required to implement a resistor circuitry (WM1, Ident no. 0912101) when the wire-break and short-circuit monitoring function is activated.

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with the *excom*® system. The inputs feature protection class Ex ia IIC. The inputs are galvanically separated.

The input mode can be adjusted via PROFIBUS-DP master. The following paramterers can be adjusted: switching performance, switch-on delay, default value, wire-break and short circuit monitoring.

- **Input module for intrinsically safe sensors**
- **All-round galvanic separation**

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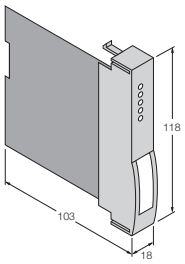
Type	DI40EX
Ident-No.	6884004
Supply voltage	via the backplanes, central power supply
Power consumption	≤ 1 W
Galvanic separation	all-round galvanic separation acc. to EN 60079-11
Number of channels	4-channel
Input circuits	acc. to EN 60947-5-6 (NAMUR), intrinsically safe acc. to EN 60079-11
No-load voltage	8 VDC
Short-circuit current	4 mA
Switching threshold on/off	type 1.8 / type 1.3 mA
Switching frequency	≤ 50 Hz
Short circuit	< 367 Ω
Wire-break	< 0.1 mA
Ex approval acc. to conformity certificate	PTB 02 ATEX 2032
Device designation	⟨Ex⟩ II 2 (1G/D) G Ex ib [ia] IIC T4
Max. values:	terminal connection 1+2
Max. output voltage U_o	≤ 8.7 V
Max. output current I_o	≤ 9.6 mA
Max. output power P_o	≤ 21 mW
Characteristic	linear
External inductance/capacitance L_i/C_i	L_i negligibly small C_i ≤ 10.0 nF

External inductance/capacitance L_o/C_o

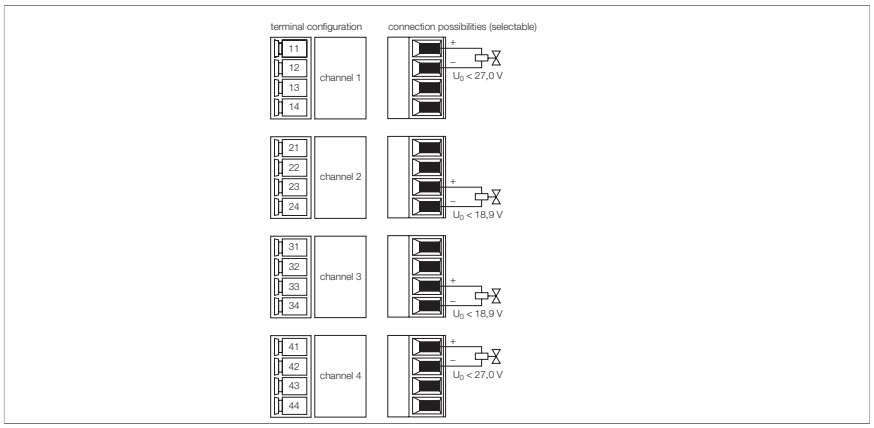
	IIC	IIB
L_o [mH]	2.0	5.0
C_o [µF]	1.2	5.2

Indication	
Operational readiness	1 x green / red
State/ Fault	4 x yellow / red
Protection class	IP20
Ambient temperature	-20…+70 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	18 x 118 x 103 mm
Weight	123 g

Dimensions



4-channel digital output module DO40Ex



The output module DO40Ex is designed for connection of intrinsically safe actuators such as valves or process indicators.

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with the *excom*® system. The outputs feature protection class Ex ia IIC. The inputs are galvanically separated.

One actuator per channel can be connected. The choice of connection enables two intrinsically safe circuits with different Ex-data per channel.

Please see the load curve for the valve control values. Please refer to the Ex-approval of the valve manufacturer for the admissible limit values. The following error states are possible:

- 24 V/6 mA
- 18 V/25 mA
- 15 V/35 mA
- 12 V/45 mA

- **Output module for intrinsically safe actuators**
- **All-round galvanic separation**

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Type	DO40EX
Ident-No.	6884007
Supply voltage	via the backplanes, central power supply
Power consumption	≤ 4.5 W
Galvanic separation	all-round galvanic separation acc. to EN 60079-11
Number of channels	4-channel
Output circuits	for intrinsically safe actuators
No-load voltage	24 VDC
Internal resistance R_i	300 Ω
Switching frequency	≤ 100 Hz
Short circuit	< 180 Ω
Wire-break	< 1 mA
Ex approval acc. to conformity certificate	PTB 01 ATEX 2047
Device designation	⟨Ex⟩ II 2 (1G/D) G Ex ib [ia] IIC T4
Max. values	terminal connection 1+2
Max. output voltage U_o	≤ 27 V
Max. output current I_o	≤ 100 mA
Max. output power P_o	≤ 675 mW
Characteristic	linear
External inductance/capacitance L_i/C_i	L_i negligibly small
	C_i ≤ 24.0 nF

External inductance/capacitance L_o/C_o

	IIC	IIB
L_o [mH]	C_o [nF]	C_o [nF]
2.0	—	286
0.99	30	346
0.5	46	426
0.2	66	576

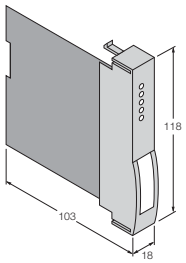
Max. values	terminal connection 3+4
Max. output voltage U_o	≤ 18.9 V
Max. output current I_o	≤ 100 mA
Max. output power P_o	≤ 675 mW
Characteristic	trapezoidal
External inductance/capacitance L_i/C_i	L_i negligibly small
	C_i ≤ 24.0 nF

External inductance/capacitance L_o/C_o

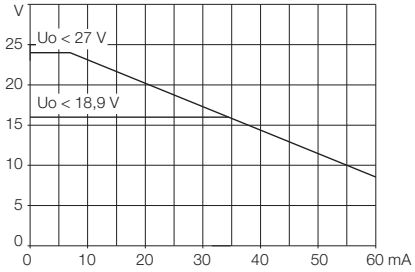
	IIC	IIB
L_o [mH]	C_o [nF]	C_o [nF]
2.0	—	976
1.0	86	976
0.5	106	976
0.2	156	1176

Indication	
Operational readiness	1 x green / red
State/ Fault	4 x yellow / red
Protection class	IP20
Ambient temperature	-20…+60 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	18 x 118 x 103 mm
Weight	136 g

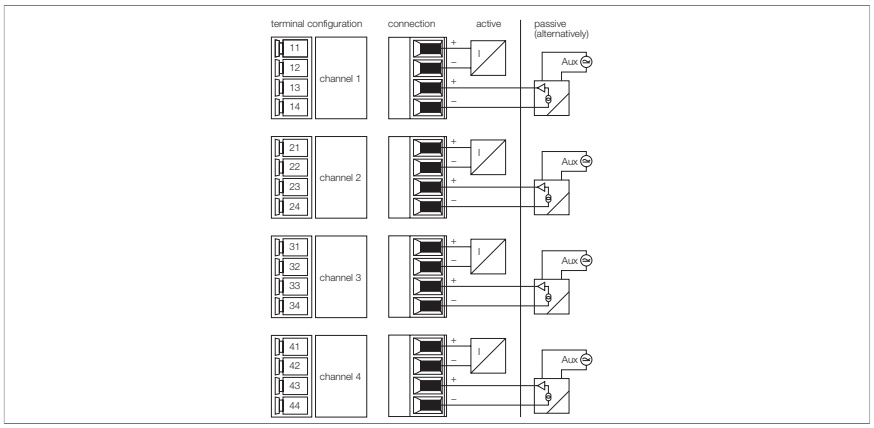
Dimensions



Load curve



4-channel analog input module AI40Ex



The input module AI40Ex is designed to connect 2-wire transducers (active input = source mode / transducer passive) or 4-wire transducers (passive input = sink mode / transducer active).

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with the *excom*® system. The inputs feature protection class Ex ia IIC.

Galvanically separated inputs.

The resolution is 14 bits, i.e. the analog value of 0…21 mA is converted in a digitized value between 0 and 16383. To simplify the data presentation, the host system operates with a value range between 0 … 21000.

- **Input module for the connection of analog measuring transducers**
- **Connection of 2/4-wire measuring transducers**
- **All-round galvanic separation**

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Type	AI40EX
Ident-No.	6884009
Supply voltage	via the backplanes, central power supply
Power consumption	≤ 3.5 W
Galvanic separation	all-round galvanic separation acc. to EN 60079-11
Number of channels	4-channel
Input circuits	intrinsically safe acc. to EN 60079-11 0/4…20 mA
Supply voltage	15 VDC at 22 mA
Overload capability	> 22 mA
Low level control	< 3.6 mA
Short circuit	< 5 V (only with „live zero“)
Wire-break	< 2 mA (only with „live zero“)
Resolution	14 Bit
Linearity deviation	≤ 0.1 % of full scale
Temperature drift	≤ 0.005 % / K
Rise time/fall time	≤ 50 ms (10 … 90 %)
Ex approval acc. to conformity certificate	PTB 03 ATEX 2217
Device designation	⟨Ex⟩ II 2 (1G/D) G Ex ib [ia] IIC T4
Max. values	terminal connection 1+2
Max. output voltage U_o	≤ 19.1 V
Max. output current I_o	≤ 90 mA
Max. output power P_o	≤ 800 mW
Characteristic	trapezoidal
External inductance/capacitance L_i/C_i	L_i negligibly small C_i ≤ 24.2 nF

External inductance/capacitance L_o/C_o

	IIC	IIB
L_o [mH]	0.20	1.0
C_o [nF]	125	870

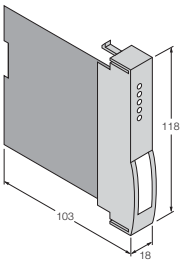
Max. values	Terminal connection 3+4
Max. output voltage U_o	≤ 6 V
Max. output current I_o	≤ 45 mA
Max. output power P_o	≤ 68 mW
Characteristic	linear
External inductance/capacitance L_i/C_i	L_i negligibly small C_i ≤ 24.2 nF

External inductance/capacitance L_o/C_o

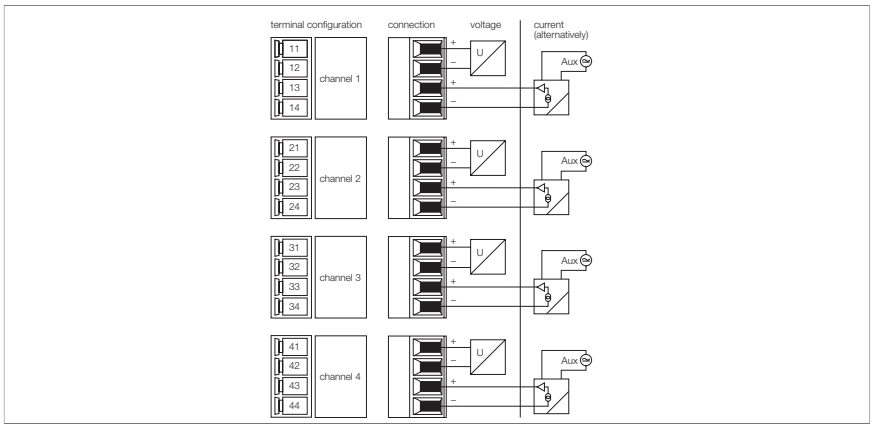
	IIC	IIB
L_o [mH]	10	20
C_o [nF]	1400	7300

Indication	
Operational readiness	1 x green / red
State/ Fault	4 x yellow / red
Protection class	IP20
Ambient temperature	-20…+60 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	18 x 118 x 103 mm
Weight	133 g

Dimensions



4-channel analog input module, passive
AI41Ex



The input module AI41Ex is designed to connect 4-wire transducers (active input = sink mode / transducer active).

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with the *excom*® system. The inputs feature protection class Ex ia IIC.

Galvanically separated inputs.

The resolution is 14 bits, i.e. the analog value of 0…21 mA is converted in a digitized value between 0 and 16383. To simplify the data presentation, the host system operates with a value range between 0 … 21000.

- **Input module for the connection of active transmitters (passive inputs)**
- **All-round galvanic separation**

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Type	AI41EX
Ident-No.	6884020
Supply voltage	via the backplanes, central power supply
Power consumption	≤ 1 W
Galvanic separation	all-round galvanic separation acc. to EN 60079-11
Number of channels	4-channel
Input circuits	intrinsically safe acc. to EN 60079-11
	0/4…20 mA
Overload capability	> 22 mA
Low level control	< 3.6 mA
Short circuit	< 5 V (only with „live zero“)
Wire-break	< 2 mA (only with „live zero“)
Resolution	14 Bit
Linearity deviation	≤ 0.1 % of full scale
Temperature drift	≤ 0.005 % / K
Rise time/fall time	≤ 50 ms (10 … 90 %)
Ex approval acc. to conformity certificate	PTB 03 ATEX 2023
Device designation	Ⓔx II 2 (1G/D) G Ex ib [ia] IIC T4
Max. values	terminal connection 1+2
Max. output voltage U_o	≤ 6.6 V
Max. output current I_o	≤ 2.1 mA
Max. output power P_o	≤ 3.5 mW
Characteristic	linear
External inductance/capacitance L_i/C_i	L_i negligibly small
	C_i negligibly small

External inductance/capacitance L_o/C_o

	IIC	IIB
L_o [mH]	C_o [µF]	C_o [µF]
2.0	2.0	11
1.0	2.3	12
0.5	2.7	15
0.2	3.3	19

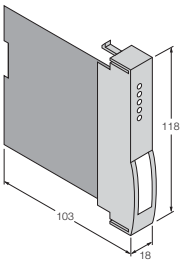
Max. values	terminal connection 3+4
Max. output voltage U_o	≤ 6.6 V
Max. output current I_o	≤ 2.1 mA
Max. output power P_o	≤ 3.5 mW
Characteristic	linear
External inductance/capacitance L_i/C_i	L_i negligibly small
	C_i negligibly small

External inductance/capacitance L_o/C_o

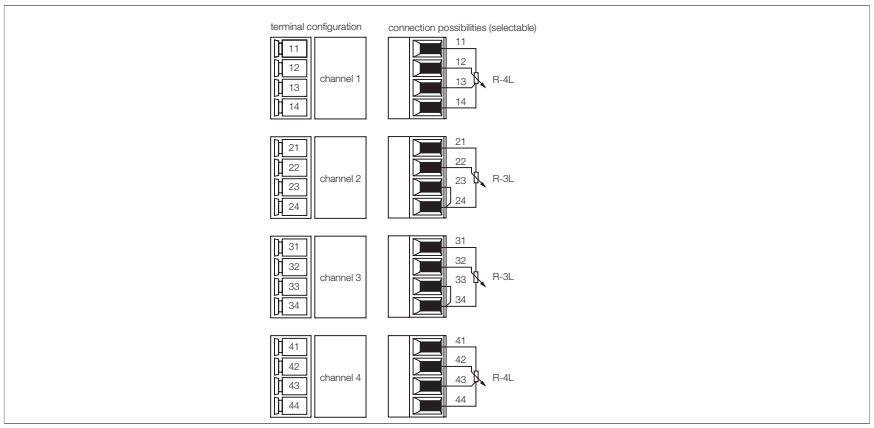
	IIC	IIB
L_o [mH]	C_o [µF]	C_o [µF]
2.0	2.0	11
1.0	2.3	12
0.5	2.7	15
0.2	3.3	19

Indication	
Operational readiness	1 x green / red
State/ Fault	4 x yellow / red
Protection class	IP20
Ambient temperature	-20…+60 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	18 x 118 x 103 mm
Weight	126 g

Dimensions



4-channel potentiometer module AI43Ex



The analog input module AI43Ex is designed for the connection of potentiometers in 3 or 4-wire technology. If 3-wire potentiometers are used, the terminals at the module rack have to be bridged. Resistance measurements, i.e. the analysis of potentiometers with 2-wire connection, are not possible.

The module has 4 field circuits to control 3 or 4-wire potentiometers. The field circuits are galvanically separated from the power supply, from the internal bus and from each other. The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with the *excom*® system. The inputs feature protection class Ex ia IIC.

Each potentiometer input is monitored for wire-break and short circuit. The interruption of a single connection line as well as any combination of interruptions of the four connection lines related to one input are securely detected. No short-circuit monitoring. In case of a line error the adjusted substitute value is immediately output and the 'invalid-bit' of the output value is set. This state is maintained until valid measured values are provided again.

The resolution is 14 bits. To simplify the data presentation 0 … 100 % is converted to a digitized value between 0 … 10000 (independent of the adjusted measuring range) and transmitted to the host system.

- **Input module for the connection of potentiometers**
- **All-round galvanic separation**

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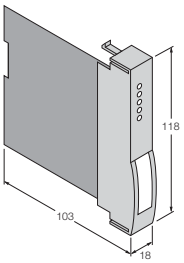
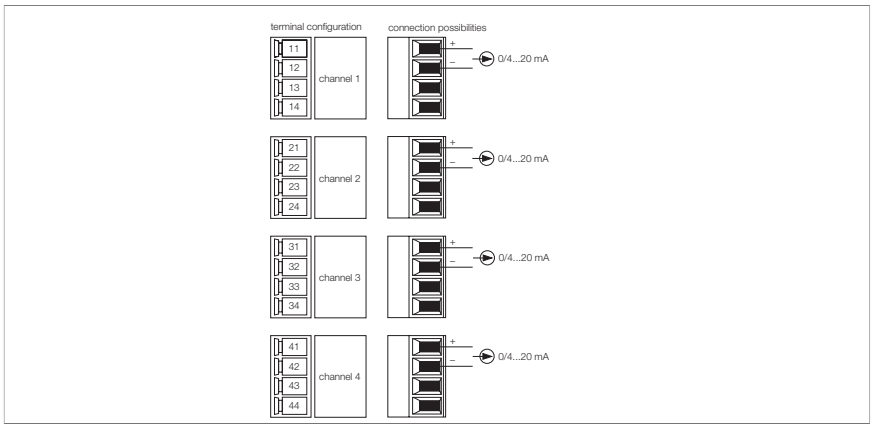
Type	AI43EX
Ident-No.	6884137
Supply voltage	via the backplanes, central power supply
Power consumption	≤ 1.5 W
Galvanic separation	all-round galvanic separation acc. to EN 60079-11
Number of channels	4-channel
Input circuits	intrinsically safe acc. to EN 60079-11 Potentiometer
Nominal resistance	400 Ω …12 kΩ
Resolution	14 Bit
Linearity deviation	≤ 0.1 % of full scale
Temperature drift	≤ 0.005 % / K
Rise time/fall time	≤ 50 ms (10 … 90 %)
Ex approval acc. to conformity certificate	PTB 06 ATEX 2026
Device designation	Ⓔx II 2 (1G/D) G Ex ib [ia] IIC T4
Max. values	terminal connection 1-4
Max. output voltage U_o	≤ 6.6 V
Max. output current I_o	≤ 25 mA
Max. output power P_o	≤ 42 mW
Characteristic	linear
External inductance/capacitance L_i/C_i	L_i negligibly small C_i ≤ 150 nF
External inductance/capacitance L_o/C_o	see table below
Indication	
Operational readiness	1 x green / red
State/ Fault	4 x yellow / red
Protection class	IP20
Ambient temperature	-20…+60 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	18 x 118 x 103 mm
Weight	126 g

	IIC	IIB
L_o [mH]	C_o [µF]	C_o [µF]
5.0	1.6	8.5
1.0	2.2	12

Dimensions



4-channel analog output module AO40Ex



The output module AO40Ex is designed for connection of intrinsically safe analog actuators such as control valves or process indicators.

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with the *excom*® system. The outputs feature protection class EEx ia IIC.

Galvanically separated outputs.

The resolution is 13 bits, i.e. the analog value of 0…21 mA is reproduced as a figure between 0 and 8191. To simplify the data presentation, the host system operates with a value range between 0 … 21000. This non-linearized value is reduced by the AO40EX to a resolution of 13 bits.

- **Output module for the connection of analog actuators**
- **All-round galvanic separation**

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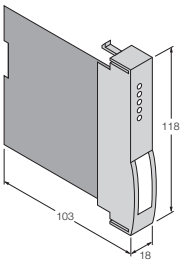
Type	AO40EX
Ident-No.	6884002
Supply voltage	via the backplanes, central power supply
Power consumption	≤ 3.5 W
Galvanic separation	all-round galvanic separation acc. to EN 60079-11
Number of channels	4-channel
Output circuits	intrinsically safe acc. to EN 60079-11 0/4…20 mA
No-load voltage	16 VDC
External load	≤ 600 Ω
Short circuit	< 100 Ω (only with „live zero“)
Wire-break	> 15 V (only with „live zero“)
Resolution	13 Bit
Linearity deviation	≤ 0.1 % of full scale
Temperature drift	≤ 0.005 % / K
Rise time/fall time	≤ 50 ms (10 … 90 %)
Ex approval acc. to conformity certificate	PTB 00 ATEX 2179
Device designation	Ⓔx II 2 (1G/D) G Ex ib [ia] IIC T4
Max. values	terminal connection 1+2
Max. output voltage U_o	≤ 18.9 V
Max. output current I_o	≤ 80 mA
Max. output power P_o	≤ 510 mW
Characteristic	trapezoidal
External inductance/capacitance L_i/C_i	L_i negligibly small C_i ≤ 25.0 nF

External inductance/capacitance L_o/C_o

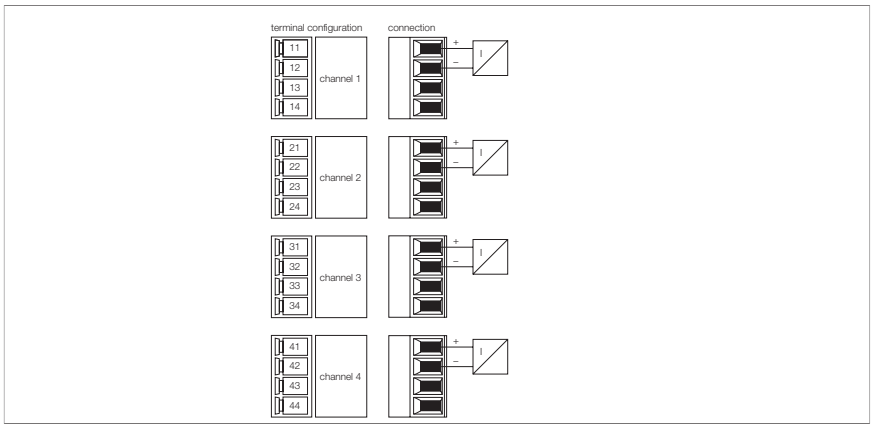
	IIC	IIB
L_o [mH]	C_o [µF]	C_o [µF]
2.0	0.10	1.00
1.0	0.10	1.00
0.5	0.12	1.00
0.2	0.15	1.17

Indication	
Operational readiness	1 x green / red
State/ Fault	4 x yellow / red
Protection class	IP20
Ambient temperature	-20…+60 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	18 x 118 x 103 mm
Weight	132 g

Dimensions



4-channel analog input module, active, HART®
AIH40Ex



The input module AIH40Ex is designed to connect 2-wire transducers (active input = source mode / transducer passive).

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with the *excom*® system. The inputs feature protection class Ex ia IIC.

The inputs are not galvanically separated. When connecting the fieldbus devices, care has to be taken that all inputs are connected to the same supply potential.

HART® compatible sensors may be connected to the module which can communicate with the integrated HART® controller.

The resolution is 14 bits, i.e. the analog value of 0…21 mA is converted in a digitized value between 0 and 16383. To simplify the data presentation, the host system operates with a value range between 0 … 21000.

Up to 8 HART® variables (max. 4 for each channel) can be read via the cyclic PROFIBUS data transmission. The bidirectional variable exchange between host system and HART® transmitter is implemented via PROFIBUS-DPV1.

Parameters like wire-break or short-circuit monitoring, measuring range, HART® communication etc. can be adjusted for each channel separately and are initialized by the PROFIBUS master only.

- **Input module for the connection of 2-wire transmitters**
- **Transmission of HART® data**

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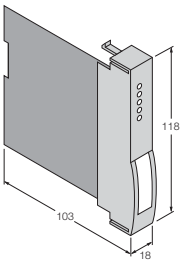
Type	AIH40EX
Ident-No.	6884001
Supply voltage	via the backplanes, central power supply
Power consumption	≤ 3 W
Galvanic separation	to int. bus and supply circuit
Number of channels	4-channel
Input circuits	intrinsically safe acc. to EN 60079-11
	0/4…20 mA
Supply voltage	15 VDC at 22 mA
HART® Impedance	> 240 Ω
Overload capability	> 22 mA
Low level control	< 3.6 mA
Short circuit	< 5 V (only with „live zero“)
Wire-break	< 2 mA (only with „live zero“)
Resolution	14 Bit
Linearity deviation	≤ 0.1 % of full scale
Temperature drift	≤ 0.005 % / K
Rise time/fall time	≤ 50 ms (10 … 90 %)
Ex approval acc. to conformity certificate	PTB 00 ATEX 2059 X
Device designation	Ⓔx II 2 (1G/D) G Ex ib [ia] IIC T4
Max. values:	terminal connection 1+2
Max. output voltage U_o	≤ 22.1 V
Max. output current I_o	≤ 93 mA
Max. output power P_o	≤ 640 mW
Characteristic	trapezoidal
External inductance/capacitance L_i/C_i	L_i ≤ 0.22 mH
	C_i ≤ 1.1 nF

External inductance/capacitance L_o/C_o

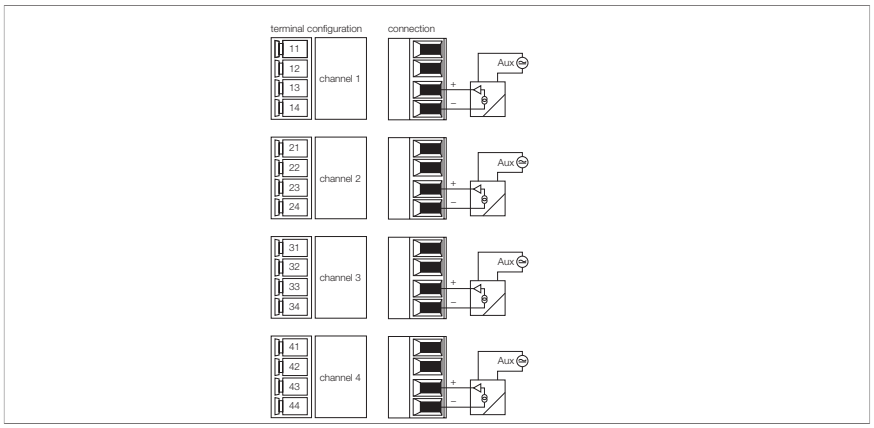
	IIC	IIB
L_o [mH]	1.78	1.78
C_o [nF]	100	500

Indication	
Operational readiness	1 x green / red
State/ Fault	4 x yellow / red
Protection class	IP20
Ambient temperature	-20…+60 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	18 x 118 x 103 mm
Weight	138 g

Dimensions



4-channel analog input module, passive, HART®
AIH41Ex



The input module AIH41Ex is designed to connect 4-wire transducers (active input = sink mode / transducer active).

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with the *excom*® system. The inputs feature protection class Ex ia IIC.

The inputs are not galvanically isolated. When connecting the fieldbus devices, care has to be taken that all inputs are connected to the same supply potential.

HART® compatible sensors may be connected to the module which can communicate with the HART® controller.

The resolution is 14 bits, i.e. the analog value of 0…21 mA is converted in a digitized value between 0 and 16383. To simplify the data presentation, the host system operates with a value range between 0 … 21000.

Up to 8 HART® variables (max. 4 for each channel) can be read via the cyclic PROFIBUS data transmission. The bidirectional variable exchange between host system and HART® transmitter is implemented via PROFIBUS-DPV1.

Parameters like wire-break or short-circuit monitoring, measuring range, HART® communication etc. can be adjusted for each channel separately and are initialized by the PROFIBUS master only.

- **Input module for the connection of 4-wire transmitters**
- **Transmission of HART® data**

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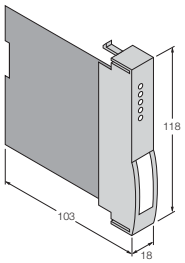
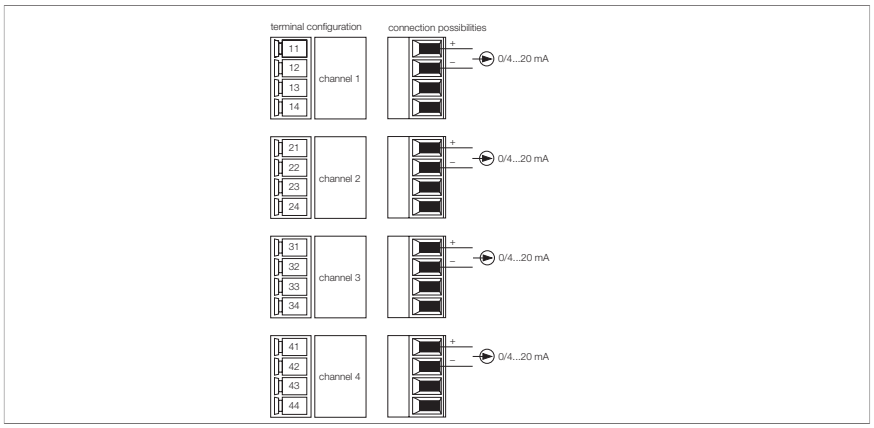
Type	AIH41EX
Ident-No.	6884005
Supply voltage	via the backplanes, central power supply
Power consumption	≤ 1 W
Galvanic separation	to int. bus and supply circuit
Number of channels	4-channel
Input circuits	intrinsically safe acc. to EN 60079-11 0/4…20 mA
HART® Impedance	> 240 Ω
Overload capability	> 22 mA
Low level control	< 3.6 mA
Short circuit	< 5 V (only with „live zero“)
Wire-break	< 2 mA (only with „live zero“)
Resolution	14 Bit
Linearity deviation	≤ 0.1 % of full scale
Temperature drift	≤ 0.005 % / K
Rise time/fall time	≤ 50 ms (10 … 90 %)
Ex approval acc. to conformity certificate	PTB 00 ATEX 2059 X
Device designation	⟨Ex⟩ II 2 (1G/D) G Ex ib [ia] IIC T4
Max. values	terminal connection 3+4
Max. output voltage U_o	≤ 7.2 V
Max. output current I_o	≤ 16 mA
Max. output power P_o	≤ 29 mW
Characteristic	linear
External inductance/capacitance L_i/C_i	L_i ≤ 0.11 mH C_i ≤ 1.1 nF
External inductance/capacitance L_o/C_o	see table below
Indication	
Operational readiness	1 x green / red
State/ Fault	4 x yellow / red
Protection class	IP20
Ambient temperature	-20…+60 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	18 x 118 x 103 mm
Weight	125 g

	IIC	IIB
L_o [mH]	0.50	2.00
C_o [nF]	60	250

Dimensions



4-channel analog output module, HART®
AOH40Ex



The output module AOH40Ex is designed for connection of intrinsically safe analog actuators such as control valves or process indicators.

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with the *excom*® system. The outputs feature protection class EEx ia IIC.

The outputs are not galvanically separated. When connecting the fieldbus devices, care has to be taken that all outputs are connected to the same supply potential.

HART® compatible actuators may be connected to the module which can communicate directly with the HART® controller.

The resolution is 13 bits, i.e. the analog value of 0…21 mA is reproduced as a figure between 0 and 8191. To simplify the data presentation, the host system operates with a value range between 0 … 21000. This non-linearized value is reduced by the AOH40EX to a resolution of 13 bits.

Parameters such as line monitoring, substitute value, etc. can be adjusted for each channel separately and are initialized by the master only.

- **Output module for the connection of analog actuators**
- **Transmission of HART® data**

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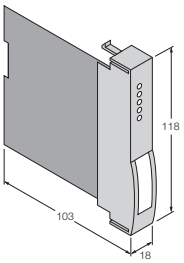
Type	AOH40EX
Ident-No.	6884003
Supply voltage	via the backplanes, central power supply
Power consumption	≤ 3 W
Galvanic separation	to int. bus and supply circuit
Number of channels	4-channel
Output circuits	intrinsically safe acc. to EN 60079-11 0/4…20 mA
No-load voltage	16 VDC
HART® Impedance	> 240 Ω
External load	≤ 600 Ω
Short circuit	< 50 Ω (only with „live zero“)
Wire-break	> 15 V (only with „live zero“)
Resolution	13 Bit
Linearity deviation	≤ 0.1 % of full scale
Temperature drift	≤ 0.005 % / K
Rise time/fall time	≤ 50 ms (10 … 90 %)
Ex approval acc. to conformity certificate	PTB 02 ATEX 2051
Device designation	Ⓔx II 2 (1G/D) G Ex ib [ia] IIC T4
Max. values	terminal connection 1+2
Max. output voltage U_o	≤ 22.1 V
Max. output current I_o	≤ 93 mA
Max. output power P_o	≤ 640 mW
Characteristic	trapezoidal
External inductance/capacitance L_i/C_i	L_i ≤ 0.22 mH C_i ≤ 1.1 nF

External inductance/capacitance L_o/C_o

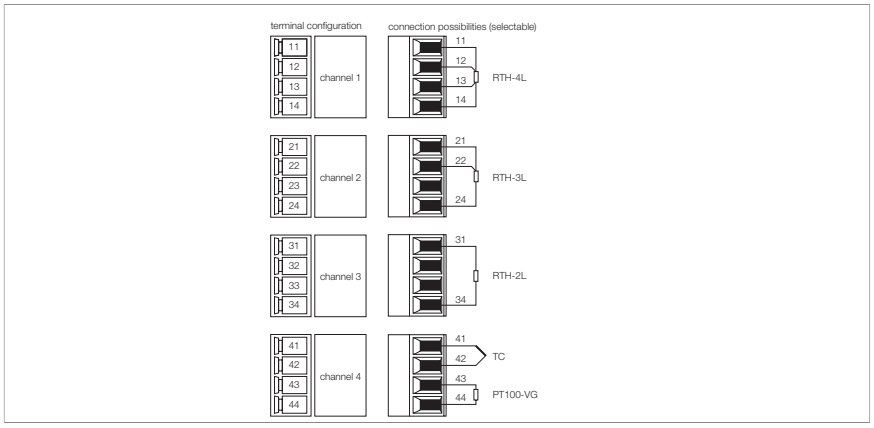
	IIC	IIB
L_o [mH]	1.78	1.78
C_o [nF]	100	500

Indication	
Operational readiness	1 x green / red
State/ Fault	4 x yellow / red
Protection class	IP20
Ambient temperature	-20…+60 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	18 x 118 x 103 mm
Weight	128 g

Dimensions



4-channel temperature input module TI40Ex



The input module TI40Ex is used for the connection of 2, 3 and 4-wire temperature probes of the types Pt100, Pt200, Pt400, Pt1000, Ni100 and CU100, as well as for the connection of thermoelements of the types B, E, D, J, K, L, N, R, S, T and U. The module can also be used for measuring low voltage signals (75…+75 mV, 1.2…+1,2 V) and for resistance measurements (0…30 Ω, 0…300 Ω, 0…3 kΩ).

The module features protection class Ex ib IIC and can be mounted in zone 1 in combination with the *excom*® system. The inputs feature protection class Ex ia IIC.

When connecting 2-wire temperature probes, compensation is accomplished via online parameterization. For this purpose, the meauring circuit and the two additional terminals are short-circuited and compensation is carried out automatically.

When using thermoelements, external cold junction compensation can be accomplished separately for each channel by connecting resistors such as Pt100 to the two unused terminals. Internal compensation instead is parameterized for all channels via integrated Pt100 resistor.

The resolution is 16 bits, i.e. the analog value is reproduced as a figure between 0 and 65535. The termperature value is indicated in Kalvin. For conversion to °C, please observe an offset of 273.2.

Parameters such as line monitoring, substitute values etc. can be adjusted for each channel separately and are initialized by the master only.

- **Input module for the connection of temperature probes**
- **All-round galvanic separation**

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Type	TI40EX
Ident-No.	6884000
Supply voltage	via the backplanes, central power supply
Power consumption	≤ 1 W
Galvanic separation	all-round galvanic separation acc. to EN 60079-11
Number of channels	4-channel
Input circuits	intrinsically safe acc. to EN 60079-11 Pt100 Pt200 Pt400 Pt1000 Ni 100 Cu100 Thermoelement
Resolution	16 Bit
Linearity deviation	≤ 0.05 % of full scale
Temperature drift	≤ 0.005 % / K
Rise time/fall time	≤ 1.3 s (10 … 90 %)
Ex approval acc. to conformity certificate	PTB 00 ATEX 2181
Device designation	Ⓔx II 2 (1G/D) G Ex ib [ia] IIC T4
Max. values	passive transducer connection
Max. output voltage U_o	≤ 5.5 V
Max. output current I_o	≤ 25 mA
Max. output power P_o	≤ 35 mW
Characteristic	linear
External inductance/capacitance L_i/C_i	L_i negligibly small C_i ≤ 60.0 nF

External inductance/capacitance L_o/C_o

	IIC	IIB
L_o [mH]	C_o [µF]	C_o [µF]
2.0	2.6	15
1.0	2.9	17
0.5	3.6	21
0.2	4.5	27

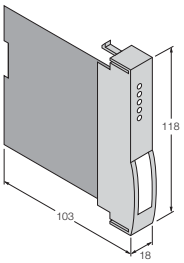
Max. values	active transducer connection
Max. output voltage U_o	≤ 1.2 V
Max. output current I_o	≤ 50 mA
Max. output power P_o	≤ 60 mW
Characteristic	rectangular
External inductance/capacitance L_i/C_i	L_i negligibly small C_i negligibly small

External inductance/capacitance L_o/C_o

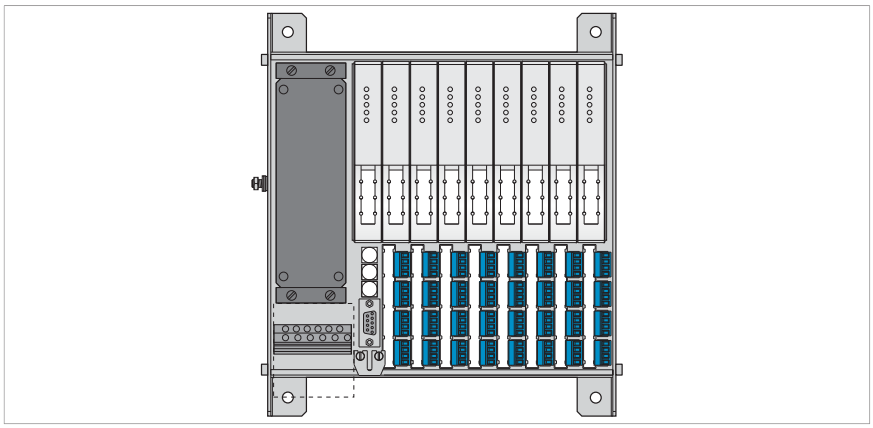
	IIC	IIB
L_o [mH]	C_o [µF]	C_o [µF]
2.0	1.6	9.8
1.0	1.9	12
0.5	2.3	14
0.2	3.0	19

Indication	
Operational readiness	1 x green / red
State/ Fault	4 x yellow / red

Dimensions



24 VDC module rack for 8 modules
MT9-R024



The module rack MT9-R024 consists of a backplane and the actual rack system. It can accommodate a gateway, a power supply unit as well as 8 I/O modules. Up to 64 binary in/outputs or 32 analog in/outputs resp. a mix of both can be connected to it. Unlike the MT18, neither gateways or power supply units can be connected redundantly to the MT9.

All modules can be plugged and unplugged in energized state without interrupting the data transfer.

A combined protection rating of Ex e and Ex i enables application in zone 1.

The power supply of modules on the backplane is limited to prevent sparking. Therefore, when using *excom*® in zone 1, modules can be plugged and unplugged in energized state.

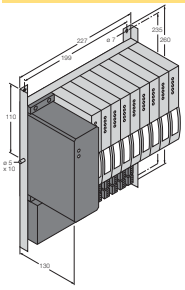
The rack system is made of aluminium strand cast providing better stability and shielding. The module rack is suited for wall and 19" rack mounting.

- **Module rack for up to 8 I/O modules, 1 gateway and 1 power supply**
- **Mini-Combicon terminals for the signal connection plane**

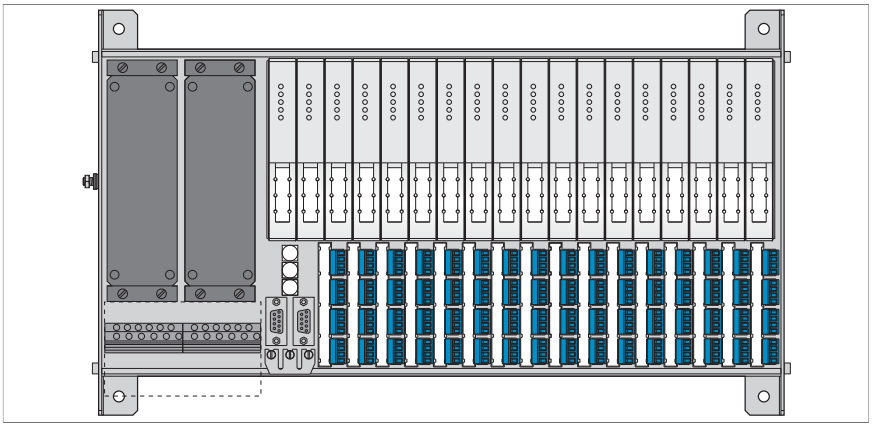
Hans Turck GmbH & Co. KG • Tel. +49 (0) 208/4952-0 • Fax +49 (0) 208/4952-264

Type	MT9-R024
Ident-No.	9100444
Ex approval acc. to conformity certificate	PTB 00 ATEX 2194 U
Device designation	Ⓔx II 2(1) G Ex e ib [ia] IIC
Slots	
AC converter	0
DC power supply	1
Gateway	1
I/O modules	8
Electrical connection	4 x 4 clamps per module
Terminal cross-section	1.5 mm^2
Bus connection	1 x 9-pol. D-SUB
Bus address	3 x decimally coded rotary switches
Housing material	aluminium strand cast profile
Protection class	IP20
Ambient temperature	-20…+70 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	227 x 260 x 130 mm
Weight	2415 g

Dimensions



24 VDC module rack for 16 modules
MT18-R024



The MT18-R024 module rack consists of a backplane and the actual rack system. It can accommodate 2 gateways, 2 power supply units as well as 16 I/O modules. Up to 128 binary in/outputs or 64 analog in/outputs resp. a mix of both can be connected to it.

All modules can be plugged and unplugged in energized state without interrupting the data transfer. The same applies to redundant gateways and power supply units.

A combined protection rating of Ex e and Ex i enables application in zone 1.

The power supply of modules on the backplane is limited to prevent sparking. Therefore, when using *excom*® in zone 1, modules can be plugged and unplugged in energized state.

The rack system is made of aluminium strand cast providing better stability and shielding. The module rack is suited for wall and 19" rack mounting.

- **Module rack to accommodate up to 16 I/O modules, 2 gateways and 2 power supplies**
- **Mini-Combicon terminals for the signal connection plane**

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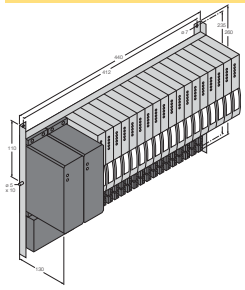
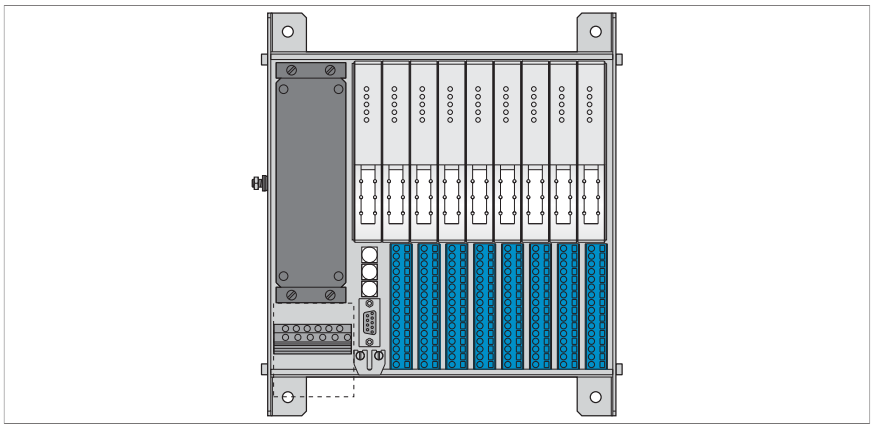
Type	MT18-R024
Ident-No.	9100438
Ex approval acc. to conformity certificate	PTB 00 ATEX 2194 U
Device designation	Ⓔx II 2(1) G Ex e ib [ia] IIC
Slots	
AC converter	0
DC power supply	2
Gateway	2
I/O modules	16
Electrical connection	4 x 4 clamps per module
Terminal cross-section	1.5 mm^2
Bus connection	2 x 9-pol. D-SUB
Bus address	3 x decimally coded rotary switches
Housing material	aluminium strand cast profile
Protection class	IP20
Ambient temperature	-20…+70 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	440 x 260 x 130 mm
Weight	3482 g

Dimensions



24 VDC module rack for 8 modules
MT9-C024



The module rack MT9-C024 consists of a backplane and the actual rack system. It can accommodate a gateway, a power supply unit as well as 8 I/O modules. Up to 64 binary in/outputs or 32 analog in/outputs resp. a mix of both can be connected to it. Unlike the MT18, neither gateways or power supply units can be connected redundantly to the MT9.

All modules can be plugged and unplugged in energized state without interrupting the data transfer.

A combined protection rating of Ex e and Ex i enables application in zone 1.

The power supply of modules on the backplane is limited to prevent sparking. Therefore, when using *excom*® in zone 1, modules can be plugged and unplugged in energized state.

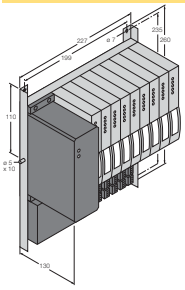
The rack system is made of aluminium strand cast providing better stability and shielding. The module rack is suited for wall and 19" rack mounting.

- **Module rack for up to 8 I/O modules, 1 gateway and 1 power supply**
- **Cage clamps for the signal connection plane**

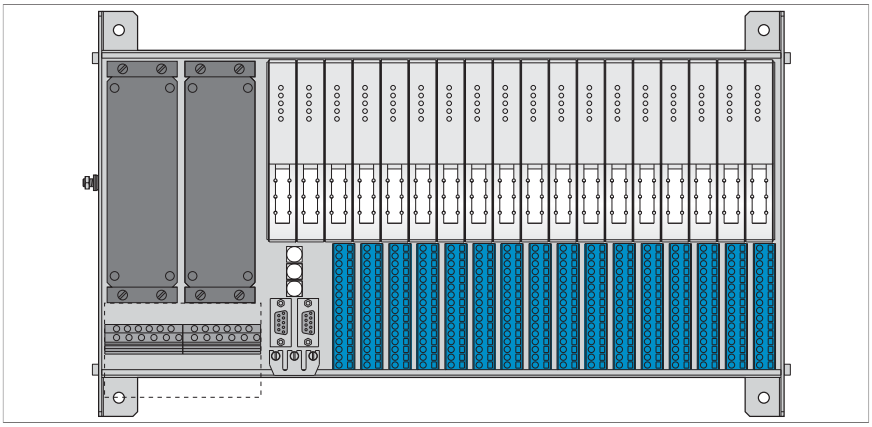
Hans Turck GmbH & Co. KG • Tel. +49 (0) 208/4952-0 • Fax +49 (0) 208/4952-264

Type	MT9-C024
Ident-No.	9100446
Ex approval acc. to conformity certificate	PTB 00 ATEX 2194 U
Device designation	Ⓔx II 2(1) G Ex e ib [ia] IIC
Slots	
AC converter	0
DC power supply	1
Gateway	1
I/O modules	8
Electrical connection	4 x 4 clamps per module
Terminal cross-section	1.5 mm^2
Bus connection	1 x 9-pol. D-SUB
Bus address	3 x decimally coded rotary switches
Housing material	aluminium strand cast profile
Protection class	IP20
Ambient temperature	-20…+70 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	227 x 260 x 130 mm
Weight	2483 g

Dimensions



24 VDC module rack for 16 modules
MT18-C024



The MT18-C024 module rack consists of a backplane and the actual rack system. It can accommodate 2 gateways, 2 power supply units as well as 16 I/O modules. Up to 128 binary in/outputs or 64 analog in/outputs resp. a mix of both can be connected to it.

All modules can be plugged and unplugged in energized state without interrupting the data transfer. The same applies to redundant gateways and power supply units.

A combined protection rating of Ex e and Ex i enables application in zone 1.

The power supply of modules on the backplane is limited to prevent sparking. Therefore, when using *excom*® in zone 1, modules can be plugged and unplugged in energized state.

The rack system is made of aluminium strand cast providing better stability and shielding. The module rack is suited for wall and 19" rack mounting.

- **Module rack for up to16 I/O modules, 2 gateways and 2 power supplies**
- **Cage clamps for the signal connection plane**

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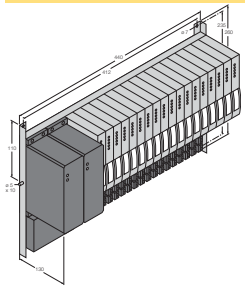
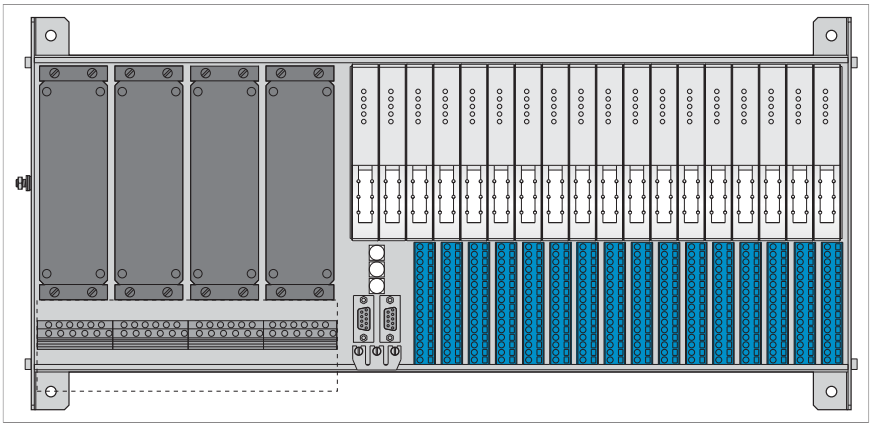
Type	MT18-C024
Ident-No.	9100440
Ex approval acc. to conformity certificate	PTB 00 ATEX 2194 U
Device designation	Ⓔx II 2(1) G Ex e ib [ia] IIC
Slots	
AC converter	0
DC power supply	2
Gateway	2
I/O modules	16
Electrical connection	4 x 4 clamps per module
Terminal cross-section	1.5 mm^2
Bus connection	2 x 9-pol. D-SUB
Bus address	3 x decimally coded rotary switches
Housing material	aluminium strand cast profile
Protection class	IP20
Ambient temperature	-20…+70 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	440 x 260 x 130 mm
Weight	3730 g

Dimensions



Universal module rack for 16 modules
MT18-C230



The MT18-C230 module rack consists of a backplane and the actual rack system. It can accommodate 2 gateways, 2 power supply units resp. AC converters as well as 16 I/O modules. Up to 128 binary in/outputs or 64 analog in/outputs resp. a mix of both can be connected to it.

All modules can be plugged and unplugged in energized state without interrupting the data transfer. The same applies to redundant gateways and power supply units. AC converters should only be connected in de-energized state.

A combined protection rating of Ex e and Ex i enables application in zone 1.

The power supply of modules on the backplane is limited to prevent sparking. Therefore, when using *excom*® in zone 1, modules can be plugged and unplugged in energized state.

The rack system is made of aluminium strand cast providing better stability and shielding. The module rack is suited for wall and 19" rack mounting.

- **Module rack (univ.) for up to 16 I/O modules, 2 gateways, 2 power supplies and 2 AC/DC converters**
- **Cage clamps for the signal connection plane**

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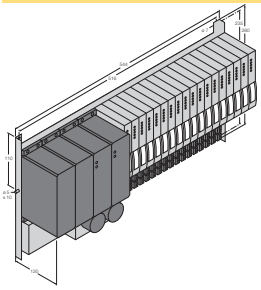
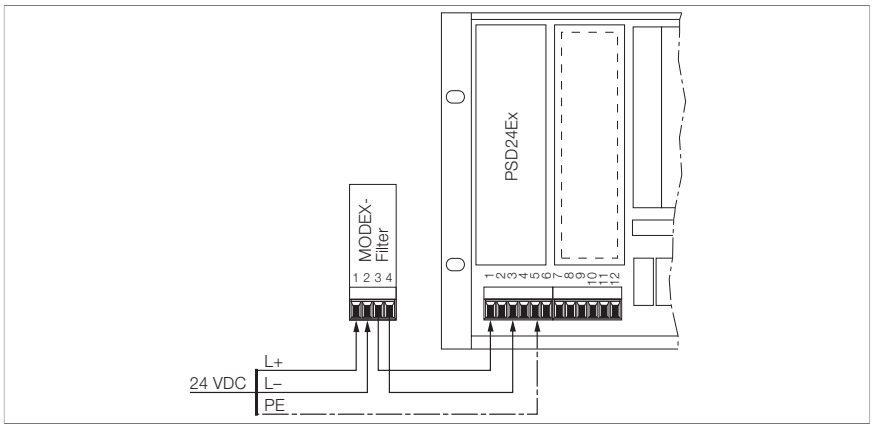
Type	MT18-C230
Ident-No.	9100443
Ex approval acc. to conformity certificate	PTB 00 ATEX 2194 U
Device designation	Ⓔx II 2(1) G Ex e ib [ia] IIC
Slots	
AC converter	2
DC power supply	2
Gateway	2
I/O modules	16
Electrical connection	4 x 4 clamps per module
Terminal cross-section	1.5 mm^2
Bus connection	2 x 9-pol. D-SUB
Bus address	3 x decimally coded rotary switches
Housing material	aluminium strand cast profile
Protection class	IP20
Ambient temperature	-20…+70 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	545 x 260 x 130 mm
Weight	4158 g

Dimensions



24 VDC power supply
PSD24EX



■ **DC power supply unit for a fully assembled module rack**

The PSD24Ex unit supplies the excom® system with power to the full extension. A combined protection rating of Ex m, Ex e and Ex i enables application in zone 1. The PSD24Ex is fully encapsulated in a cast aluminium housing.

The input voltage is 19.5…32 VDC for the PSD24Ex.

The external power supply is plugged on the module rack via Ex-e clamps. Any contact with the clamps in energized state should be avoided. They are located below the protective cap. Power has to be switched off before contact.

Redundancy:
Two power supply units can be installed in combination with the module rack MT18-.024. In case of power cut or failure of one device, the second unit provides the power supply for the whole system. Different potentials can be used for power supply.

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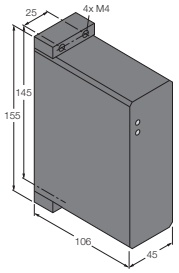
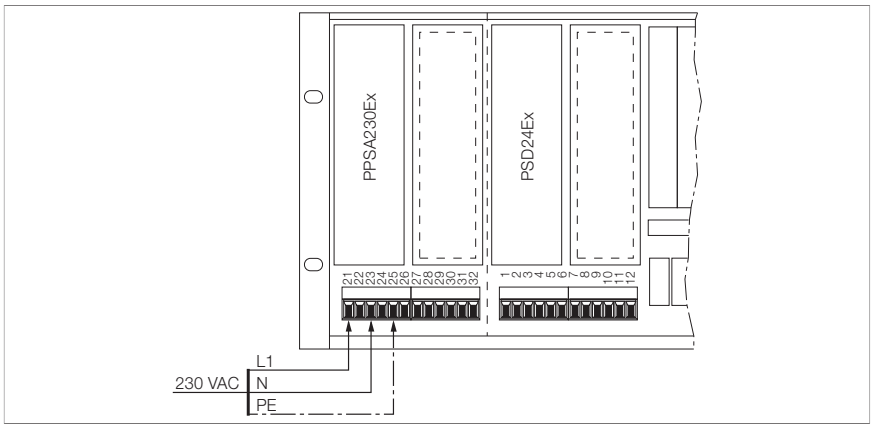
Type	PSD24EX
Ident-No.	6881721
Supply voltage	
Operational voltage range	19.5…32 VDC
Power consumption	≤ 66.5 W
Power supply output	≤ 60 W
Galvanic separation	galvanically separated input and output circuits, rated voltage 60 V
Ex approval acc. to conformity certificate	PTB 00 ATEX 2193
Device designation	Ⓔx II 2 G Ex e m [ib] IIC T4
Indication	
Operational readiness	1 x green
Supply voltage	1 x green
Electrical connection	via module rack
Terminal cross-section	2.5 mm^2 flexible / 4.0 mm^2 non-rotatable
Housing material	aluminium
Connection mode	flange, 4 x M4 screws
Protection class	IP50
Ambient temperature	-20…+70 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	45 x 155 x 106 mm
Weight	1275 g

Dimensions



230 VAC converter
PPSA230EX



■ **AC/DC converter feeding the DC power supply unit with AC voltage**

The AC/DC converter PPSA230Ex supplies the excom® system with power to the full extension. A combined protection rating of Ex m and Ex e enables application in zone 1. The device is also fully encapsulated in a cast aluminium housing.

The input voltage is 230 VAC for the PPSA230Ex.

The external power supply is plugged on the module rack via Ex-e clamps. Any contact with the clamps in energized state should be avoided. They are located below the protective cap. Power has to be switched off before contact.

Redundancy:
Two converters can be installed in combination with the module rack MT18-C230. In case of power cut or failure of one device, the second converter provides the power supply for the whole system. Different potentials can be used for power supply.

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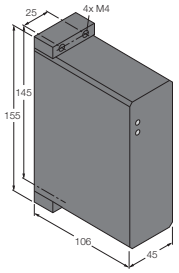
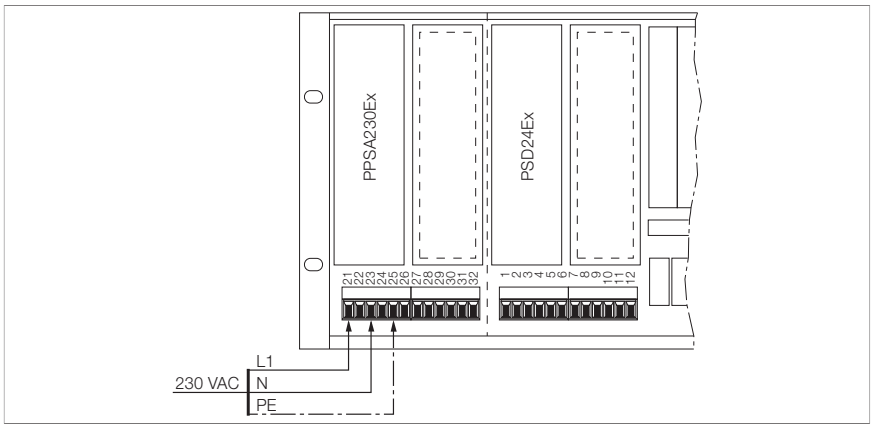
Type	PPSA230EX
Ident-No.	6900293
Supply voltage	
Operational voltage range	200…250 VAC
Power consumption	≤ 75 VA
Power supply output	≤ 66.5 W
Galvanic separation	galvanically separated input and output circuit, rated voltage 250 V
Ex approval acc. to conformity certificate	PTB 04 ATEX 2047
Device designation	Ⓔx II 2 G Ex e m IIC T4
Electrical connection	via module rack
Terminal cross-section	2.5 mm^2 flexible / 4.0 mm^2 non-rotatable
Housing material	aluminium
Connection mode	flange, 4 x M4 screws (Torx)
Protection class	IP50
Ambient temperature	-20…+70 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	45 x 155 x 106 mm
Weight	1975 g

Dimensions



115 VAC converter
PPSA115EX



■ **AC/DC converter feeding the DC power supply unit with AC voltage**

The AC/DC converter PPSA115Ex supplies the excom® system with power to the full extension. A combined rating of Ex m and Ex e enables application in zone 1. The device is also fully encapsulated in a cast aluminium housing.

The input voltage is 115 VAC for the PPSA115Ex.

The external power supply is plugged on the module rack via Ex-e clamps. Any contact with the clamps in energized state should be avoided. They are located below the protective cap. Power has to be switched off before contact.

Redundancy:
Two converters can be installed in combination with the module rack MT18-C230. In case of power cut or failure of one device, the second converter provides the power supply for the whole system. Different potentials can be used for power supply.

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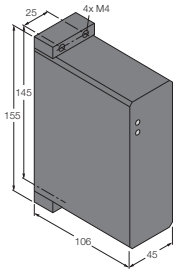
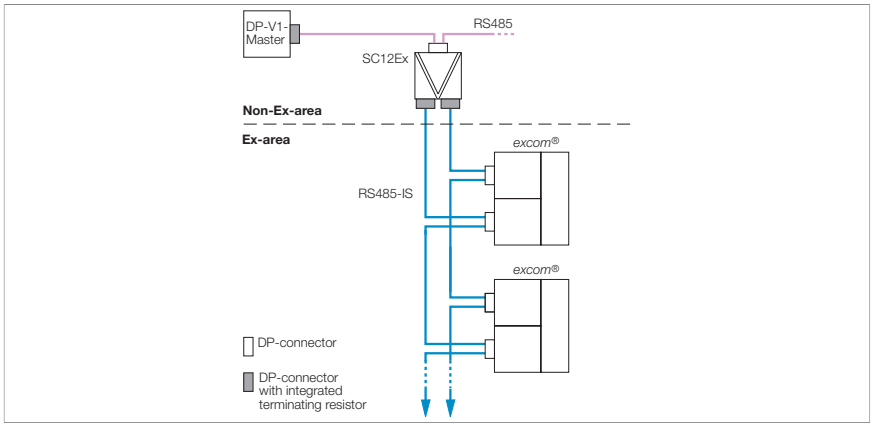
Type	PPSA115EX
Ident-No.	6900294
Supply voltage	
Operational voltage range	100…125 VAC
Power consumption	≤ 75 VA
Power supply output	≤ 66.5 W
Galvanic separation	galvanically separated input and output circuit, rated voltage 250 V
Ex approval acc. to conformity certificate	PTB 04 ATEX 2047
Device designation	Ⓔx II 2 G Ex e m IIC T4
Electrical connection	via module rack
Terminal cross-section	2.5 mm^2 flexible / 4.0 mm^2 non-rotatable
Housing material	aluminium
Connection mode	flange, 4 x M4 screws (Torx)
Protection class	IP50
Ambient temperature	-20…+70 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	45 x 155 x 106 mm
Weight	1975 g

Dimensions



PROFIBUS-DP segment coupler (RS485-IS) SC12EX



The PROFIBUS-DP segment coupler SC12Ex from TURCK has been developed for intrinsically safe PROFIBUS connection.

Equipped with one RS485 and two RS485-IS interfaces, this coupler is suited for many Ex-area applications. The RS485-IS interface is entirely realized according to the PNO PROFIBUS guideline. The coupler can thus supply both lines of the TURCK Ex-Remote-I/O system *excom*® simultaneously (line redundancy). Just one device is required for Ex-separation and line redundancy.

The segment coupler SC12Ex is IP20 rated, not suited for mounting in the Ex-area and can be supplied redundantly. Both power supply inputs are decoupled by diods. The load distribution depends on the level of operating voltage. Operating voltage 18… 32 VDC.

In switch position 0, the coupler identifies the baud rate automatically. Additionally, the start-delimiter occurences of the PROFIBUS telegrams are evaluated. Three consecutive and valid start-delimiter occurences have to be received before identification locks in.

All received telegrams are checked for plausibility by means of start-delimiter sequences. Baud rate detection is started after reset. If telegrams are not received within 1.7 seconds, baud rate search is activated. Alternatively, the baud rate can be adjusted via rotary switch.

In order not to limit the number of subscribers and cable length of a PROFIBUS-DP segment, amplitude and phase are reproduced in the coupler. The user can choose between capacitive and direct earthing.

- **Device for intrinsically safe separation of RS485 and RS485-IS**
- **Connection of max. 62 bus nodes (31 in redundant mode)**
- **Redundant power supply**
- **Automatic baud rate detection**

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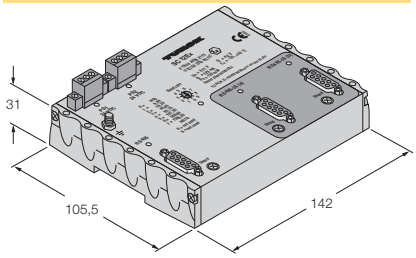
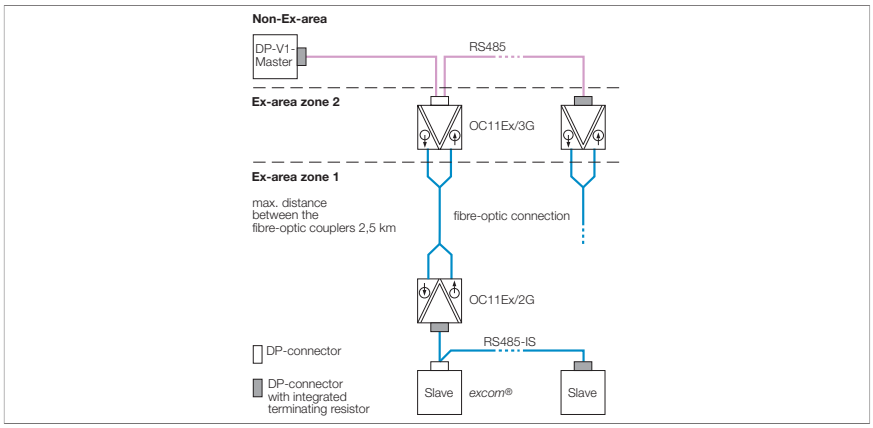
Type	SC12EX
Ident-No.	6884047
Operational voltage range	18…32 VDC
Current consumption	≤ 200 mA
Galvanic separation	all-round galvanic separation acc. to EN 60079-11
Number of channels	2-channel
Transmission rate	9.6 kbps up to 1.5 Mbps
Ex approval acc. to conformity certificate	PTB 03 ATEX 2115
Device designation	Ⓔx II (2) GD [Ex ib] IIC
Max. values	RS485-IS Sub-D connection
Max. output voltage U_o	≤ 3.71 V
Max. output current I_o	≤ 129 mA
Max. output power P_o	≤ 120 mW
Characteristic	linear
Max. input voltage U_i	≤ 4.2 V
Indication	
Operational readiness	2 x green
State/ Fault	3 x yellow / red
Baude rate detection	1 x yellow
Housing material	anodized aluminium
Front plate	FR4, grey / blue
Connection mode	snap-fit on DIN rail (DIN 60715)
Protection class	IP20
Ambient temperature	-20…+70 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	142 x 105.5 x 31 mm
Weight	488 g

Dimensions



PROFIBUS-DP fiber-optic coupler for zone 1
OC11EX/2G



The optocoupler OC11Ex/3G converts the PROFIBUS-DP signals of copper cables for transmission to plastic fibers. Bus signals are thus transmitted over a long range potential and interference-free from the safe to the Ex-area.

The OC11Ex/3G transmits the signals from zone 2 to zone 1 via the fiber-optic interface and the OC11Ex/2G converts them. The signals are then output intrinsically safe at the RS485 interface.

The RS485-IS interface is entirely realized according to the PNO PROFIBUS guideline. The optocoupler OC11Ex/2G is equipped with

- Intrinsically safe RS485-IS PROFIBUS interface (acc. to the RS485-IS draft worked out by the PNO work group)
- Intrinsically safe, optical interface with ST connectors for emitter and receiver.

Up to 31 bus subscribers can be connected to the optocoupler. Baud rates of 9.6 kbps up to 1.5 Mbps are possible rep. automatically detected.

Four status LEDs for diagnostics are available, indicating power supply, fiber-optic segment, RS485 interface and baud rate. The device features an M8 communication interface. Two OC11Ex devices can be coupled together via the M8 interface. Wire-break and short-circuit are not transmitted from one segment to the next one. All segments can thus be operated trouble-free and independently of one another.

In order not to limit the number of subscribers and cable length of a PROFIBUS-DP segment, amplitude and phase are reproduced in the coupler. The OC11Ex/2G shield is always capacitively coupled to PA.

- **Device for data transfer between electrical and optical fieldbus circuits**
- **Connection of max. 31 nodes to the power supply**
- **Mounting in zone 1 possible**
- **Automatic baud rate detection**

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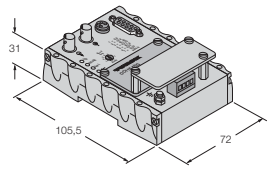
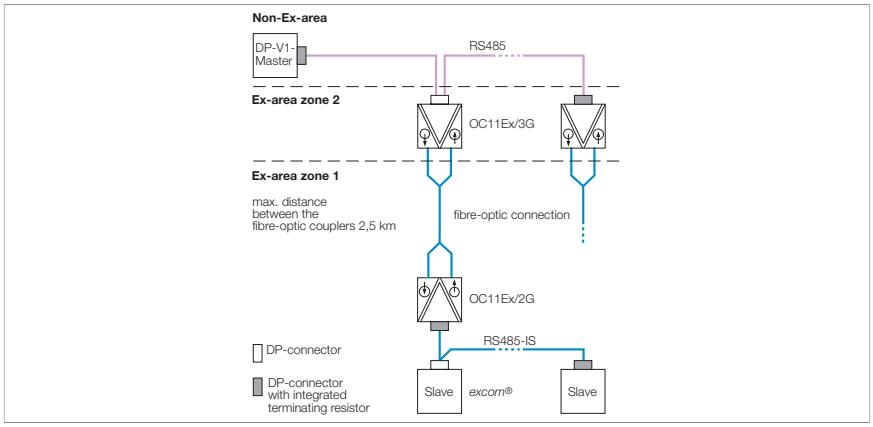
Type	OC11EX/2G
Ident-No.	6890423
Operational voltage range	18…32 VDC
Current consumption	≤ 100 mA
Galvanic separation	all-round galvanic separation acc. to EN 60079-11
Number of channels	1-channel
Transmission rate	9.6 kbps up to 1.5 Mbps
Ex approval acc. to conformity certificate	PTB 05 ATEX 2051 X
Device designation	Ⓔx II 2 G Ex e mb ib [ib op is] IIC T4
Max. values	RS485-IS Sub-D connection
Max. output voltage U_o	≤ 3.64 V
Max. output current I_o	≤ 127 mA
Max. output power P_o	≤ 116 mW
Characteristic	linear
Max. input voltage U_i	≤ 4.2 V
Indication	
Operational readiness	1 x green
State/ Fault	2 x yellow / red
Baude rate detection	1 x yellow
Housing material	anodized aluminium
Front plate	FR4, grey
Connection mode	snap-fit on DIN rail (DIN 60715)
Protection class	IP20
Ambient temperature	-20…+70 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	75 x 105.5 x 31 mm
Weight	364 g

Dimensions



PROFIBUS-DP fiber-optic coupler for zone 2
OC11EX/3G



The optocoupler OC11Ex/3G converts the PROFIBUS-DP signals of copper cables for transmission to plastic fibers. Bus signals are thus transmitted over a long range potential and interference-free from the safe to the Ex-area.

The optocoupler is installed in the safe area or in zone 2. The optocoupler OC11Ex/3G receives the PROFIBUS-DP signals at the standard interface RS485 and transmits them via the fiber-optic interface to the TURCK zone 1 coupler OC11Ex/2G.

The optocoupler OC11Ex/3G is equipped with

- RS485 interface – standard PROFIBUS-DP interface with RS485 level acc. to EIA 485 (the control cable for direction control is not connected)
- Intrinsically safe, optical interface with ST connectors for emitter and receiver.

Up to 31 bus subscribers can be connected to the optocoupler. Baud rates of 9.6 kbps up to 1.5 Mbps are possible rep. automatically detected.

Four status LEDs for diagnostics are available, indicating power supply, fiber-optic segment, RS485 interface and baud rate. The device features an M8 communication interface. Two OC11Ex devices can be coupled together via the M8 interface. Wire-break and short-circuit are not transmitted from one segment to the next one. All segments can thus be operated trouble-free and independently of one another.

In order not to limit the number of subscribers and cable length of a PROFIBUS-DP segment, amplitude and phase are reproduced in the coupler. The user can choose between capacitive and direct earthing.

- **Device for data transfer between electrical and optical fieldbus circuits**
- **Connection of max. 31 nodes to the power supply**
- **Mounting in zone 2 possible**
- **Automatic baud rate detection**

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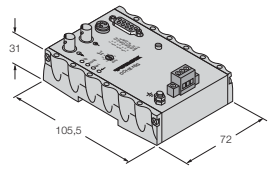
Type	OC11EX/3G
Ident-No.	6890424
Operational voltage range	18…32 VDC
Current consumption	≤ 100 mA
Galvanic separation	all-round galvanic separation acc. to EN 60079-11
Number of channels	1-channel
Transmission rate	9.6 kbps up to 1.5 Mbps
Ex approval acc. to conformity certificate	PTB 05 ATEX 2052 X // PTB 05 ATEX 2053 X
Device designation	⟨Ex⟩ II (2) G [Ex ib op is] IIC ⟨Ex⟩ II 3 G Ex nA II T4
Indication	
Operational readiness	1 x green
State/ Fault	2 x yellow / red
Baude rate detection	1 x yellow
Housing material	anodized aluminium
Front plate	FR4, grey
Connection mode	snap-fit on DIN rail (DIN 60715)
Protection class	IP20
Ambient temperature	-20…+70 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	75 x 105.5 x 31 mm
Weight	293 g

Dimensions



Ex e stainless steel enclosure for use of *excom*® in zone 1
EG-VA6555/...
EG-VA6555/BV67...
EG-VA6555/BV68...

EGVA6555/... enclosures are made of rugged stainless steel. They are designed to be mounted in zone 1 as well as in hostile and corrosive environments.

The enclosures are adaptable to individual solutions offered by TURCK.
With a size of 400 × 550 × 210 mm, they also fit on the MT9... module rack.

- Ex e stainless steel housing with a hinged cover, inspection window (EG-VA6555/... and EG-VA6555/BV68...) and flange plate is designed for insertion of the *excom*® module rack
- Base part with drain, 4 welded clips on the outside
- 2 mounting rails (C-rails) on rubber padding for mounting the module racks
- 2 CU rails (nickel-plated) as shielding bus for termination of cable shields
- M6 earthing studs welded to the inside,
- M8 earthing studs welded to the outside
- EG-VA6555/...: The flange plate and front cover delivered with the base housing
- EG-VA6555/BV67...: The front cover delivered with the base housing, factory-mounted module rack and filter
- EG-VA6555/BV68...: The flange plate and front cover delivered with the base housing, factory-mounted module rack and filter

Type Ident-no.	EG-VA6555/... on request	EG-VA6555/BV67... on request	EG-VA6555/BV68... on request
Ex-Approval acc. to CE examination Marking	PTB 00 ATEX 1101 U II 2 G Ex e II	PTB 03 ATEX 1028 II 2 G Ex em ib [ia] IIC T4	PTB 03 ATEX 1028 II 2 G Ex em ib [ia] IIC T4
Housing material Thickness Surface Seal materials Inspection window	stainless steel 1.4404/AISI 316L 1.5 mm grinded (grain 240) Acrylic, Silicone, CR cellular, caoutchouc ESG safety glass with seal	stainless steel 1.4301/AISI 304 1.5 mm grinded (grain 240) Acrylic, Silicone, CR cellular, caoutchouc –	stainless steel 1.4404/AISI 316L 1.5 mm grinded (grain 240) Acrylic, Silicone, CR cellular, caoutchouc ESG safety glass with seal
Degree of protection (IEC/EN 60529) Inpact strength (EN 50014) Vibration test Shock testing Operating temperature Dimensions	IP65 > 7 Joule acc. to IEC 60068-2-6 acc. to IEC 60068-2-27 -20...+80 °C 650 × 550 × 210 mm	IP54 > 7 Joule acc. to IEC 60068-2-6 acc. to IEC 60068-2-27 -20...+53 °C 650 × 550 × 210 mm	IP54 > 7 Joule acc. to IEC 60068-2-6 acc. to IEC 60068-2-27 -20...+53 °C 650 × 550 × 210 mm
Flange plate	2.0 mm stainless steel with mounting holes and drillings for cable glands	Cable glands used in the housing floor (fixed M20 hole pattern)	2.0 mm stainless steel with mounting holes and factory-mounted cable glands

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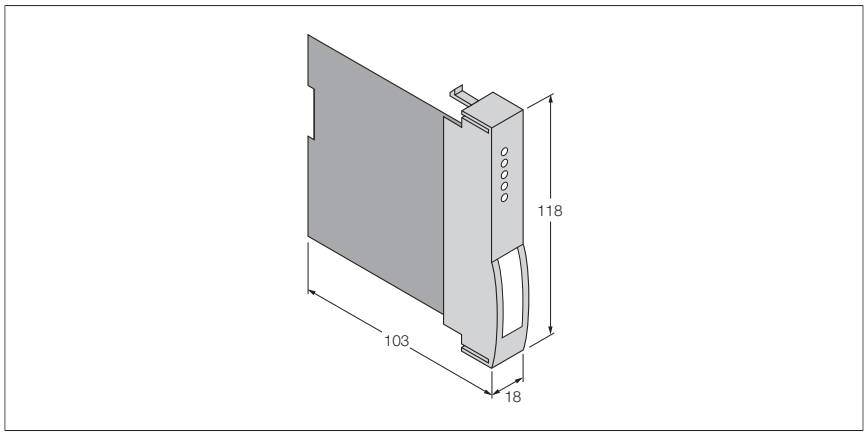
PROFIBUS-DP Bus connectors RS485

				
Type Ident-no.	D9T-RS485 6890942	D9T-RS485PG 6890943	D9T-RS485IS 6890944	D9S-RS485 6780103
Manufacturer Manufacturer designation	Siemens 6ES7 972-0BA60-0XA0	Siemens 6ES7 972-0BB60-0XA0	Siemens 6ES7 972-0DA60-0XA0	Siemens 6ES7 972-0BA30-0XA0
Cable exit Transmission rate Interface type Node connector Bus cable connection	35° for soldering 9.6 kbps...12 Mbps RS485 9-pole SUB-D connector 4 insulation piercing connections (FastConnect® technology) for wires Ø 0.644 ± 0.040 mm	35° for soldering 9.6 kbps...12 Mbps RS485 9-pole SUB-D connector 4 insulation piercing connections (FastConnect® technology) for wires Ø 0.644 ± 0.040 mm	35° for soldering 9.6 kbps...12 Mbps RS485-IS 9-pole SUB-D connector 4 insulation piercing connections (FastConnect® technology) for wires Ø 0.644 ± 0.040 mm	30° for soldering 9.6 kbps...12 Mbps RS485/RS485-IS 9-pole SUB-D connector 4 insulation piercing connections (FastConnect® technology) for wires Ø 0.644 ± 0.040 mm
Terminating resistor	Integrated termination combination can be switched-in via slide switch	Integrated termination combination can be switched-in via slide switch	Integrated termination combination can be switched-in via slide switch	No integrated termination resistor
Disconnection function	The outgoing bus is disconnected when the resistor is activated	The outgoing bus is disconnected when the resistor is activated	No disconnection function	No disconnection function
Power supply U_N Ambient temperature T_A Storage temperature Relative humidity Dimensions (W x H x D) in mm Weight Degree of protection	5.0 VDC 0…+60 °C -25…+80 °C max. 75 % at +25 °C 16 × 54 × 38 ca. 40 g IP20	5.0 VDC 0…+60 °C -25…+80 °C max. 75 % at +25 °C 16 × 54 × 38 ca. 40 g IP20	3.3 VDC -25…+70 °C -25…+80 °C max. 75 % at +25 °C 16 × 54 × 38 ca. 40 g IP20	– 0…+60 °C -25…+80 °C max. 75 % at +25 °C 15 × 58 × 34 ca. 30 g IP20
PG connection socket Ex marking Notes	no – Connector can be used on the non-intrinsically safe side of the SC12Ex and OC11Ex/3G segment coupler!	yes – Connector can be used, instead of the D9T-RS485, on the non-intrinsically safe side of the SC12Ex and OC11Ex/G segment coupler	no II 2 G Ex ib IIC T4 Only use on devices with an RS485-IS interface! Connector must be used on the intrinsically safe side of the SC12Ex and OC11Ex/2G segment coupler!	no – Connector can be used, on the intrinsically safe terminal of the GDP-IS!

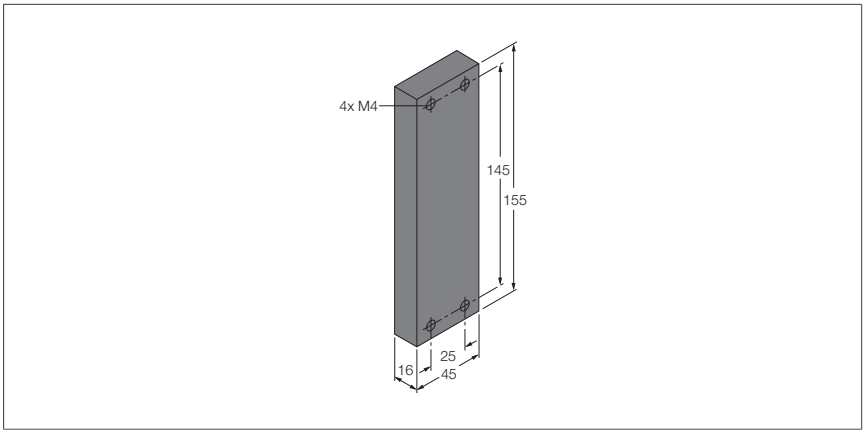
Dummy modules for empty slots
BM1



- **Dummy module for unused slots on the module rack**

Type	BM1
Ident-No.	6884036
Protection class	IP20
Ambient temperature	-20…+70 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	18 x 118 x 103 mm
Weight	97 g

Power supply cover (MT18)
BM-PS



- **Cover for the unused power supply slot**

Type	BM-PS
Ident-No.	6884044
Protection class	IP20
Ambient temperature	-20…+70 °C
Relative humidity	≤ 95 % at 55 °C acc. to EN 60068-2
Vibration test	according to IEC 60068-2-6
Shock test	according to IEC 60068-2-27
Dimensions	45 x 155 x 16 mm
Weight	126 g

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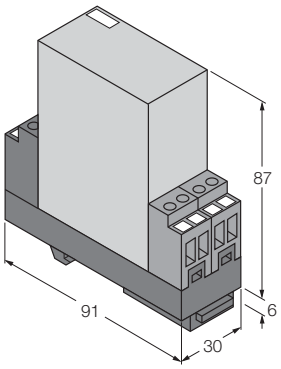
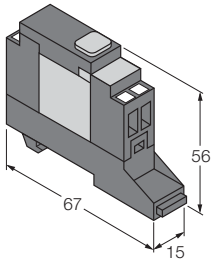
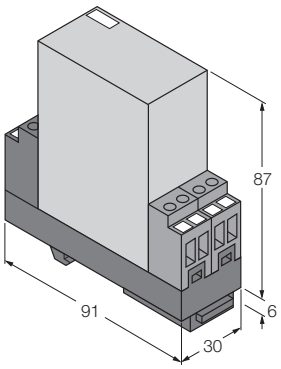
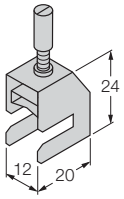
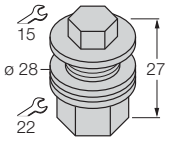
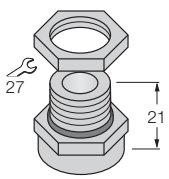
Accessories

Dimension drawing	Type	Description
	MODEX filter Ident-no.: 6884062	Capacitor for improving startup behaviour/ increasing operational reliability
	MODEX switching terminal Ident-no.: 6884069	Switching terminal for manual switching in hazardous area (enabling of downstream devices)
	MODEX isolating relay Ident-no.: 6884070	Isolating relay for isolating intrinsically safe and non-intrinsically safe circuits
	SK8 Phoenix shield terminal Ident-no.: 6900360	Shield terminal for connecting the shield to the shield bus
	ELST-M20Ex IP54 plastic M20 venting pipe Ident-no.: 6884033	Pressure compensation element for preventing condensation water in the device
	ELVA-M20Ex IP65 stainless steel M20 venting pipe Ident-no.: 6884110	Pressure compensation element for preventing condensation water in the device

TURCK

Industrial Automation

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