

Your Global Automation Partner

TURCK

excom I/O System for Ex and Non-Ex Areas



Products are linked to further information.

excom – I/O System for Ex and Non-Ex Areas



Turck's excom offers a universal remote I/O system that can be installed in Zone 1/21, Zone 2/22 and C1D2 or in the non-Ex area. The field circuits are approved for Zone 0 and C1D1. You benefit not only in terms of components optimized for the particular zone, but also from the standard configuration and parameterization concept for the periphery and field instrumentation.

Whether via an Ethernet or fieldbus connection: The excom system is transparent for the full functionality of the DCS systems of Rockwell, Emerson, Honeywell, Siemens, ABB, Yokogawa, Schneider, or Supcon. Integration in the DCS/PLC is made easy and error-free thanks to the detailed integration manuals and worldwide support provided.

The excom systems can be optimally adapted to the number of signals to be connected and the space requirements on site thanks to the module racks available for 8, 16 and 24 I/O modules. The redundancy concept – each module rack can be run if needed with two power supply units and two gateways – gives you optimum availability guaranteed. The gateways act as masters to the internal data bus and as slaves to the higher-level fieldbuses PROFIBUS-DP as well as Profinet, EtherNet/IP and Modbus TCP.

The I/O density of up to 960 signals on five module racks in a standard control cabinet is the only one of its kind worldwide. The signal isolation from the Ex area is already integrated in the I/O system. This therefore completely eliminates the need for control cabinets for safety barriers, as well as I/O cards in the control system. This space benefit can be a critical factor, particularly in retrofit projects. Up to 192 binary or 96 analog signals can be connected via excom using a single IP address.

System module benefit

- A single system for all areas (non-Ex, Zone 1/21, Zone 2/22, C1D2)
- Application optimized system structure through modular concept
- High packing density through module racks for 8, 16 and 24 modules
- Up to 192 binary or 96 analog signals via one bus address

Availability benefit

- High availability through extensive redundancy concepts for PNO, line and system redundancy for all distributed control systems
- Full redundancy for power supplies and gateways
- Exchange and expansion of all components by inserting and removing all modules during operation (Hot Swap)

Approval benefit



Engineering benefit

- Standard configuration and setting of all parameters during operation (configuration in run)
- Online configuration and setting of all parameters during operation (configuration in run)
- DTM-based commissioning of the periphery and field instrumentation without control technology
- HART transparency from the process control system to the field device

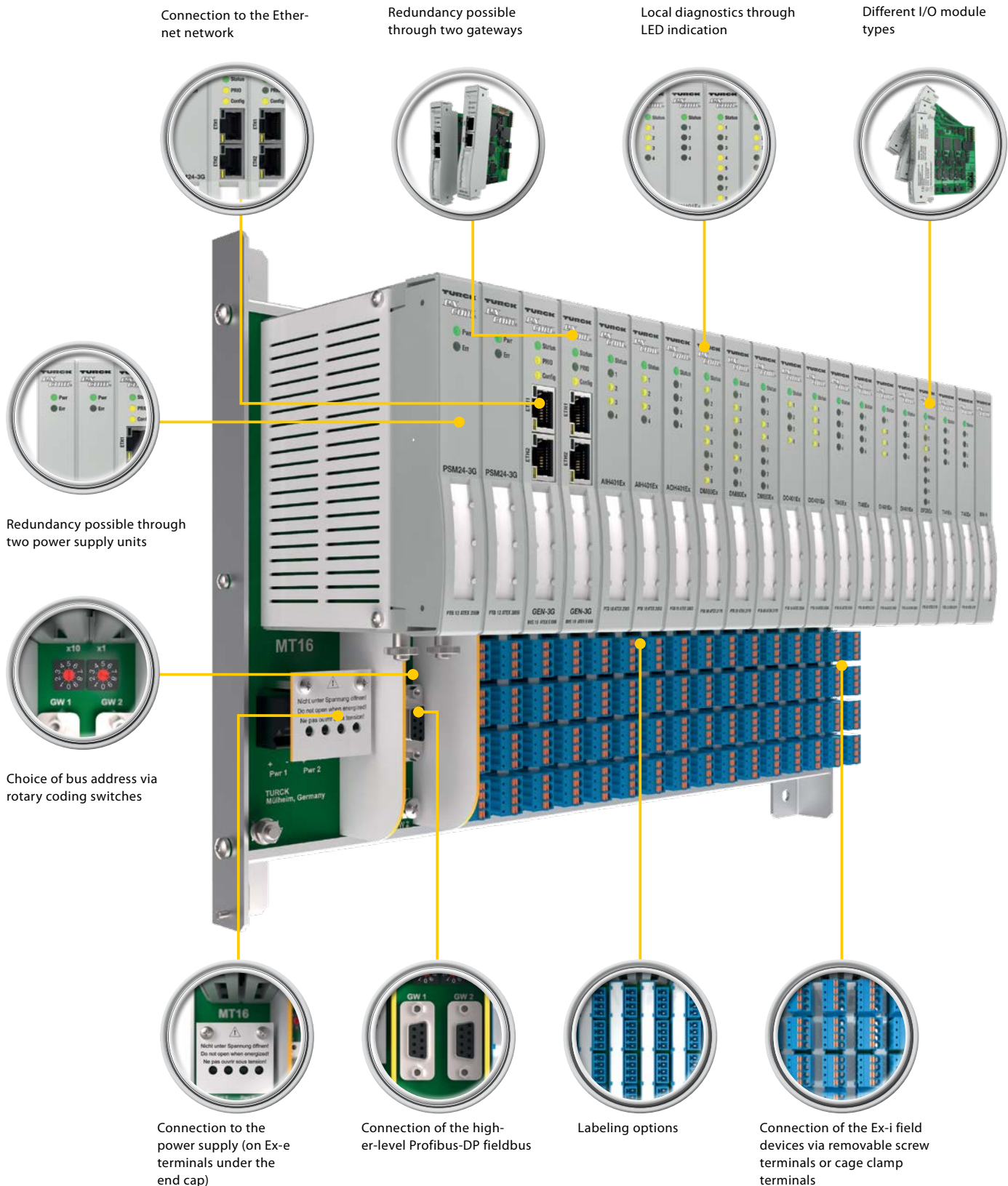
DCS integration benefit

- Simple connection to all standard process control systems of
- ABB
 - Emerson
 - Honeywell
 - Siemens
 - Yokogawa
 - Schneider Electric
 - SUPCON
 - ...

Future-proof



excom – System Configuration





EtherNet/IP™



Application range: non-intrinsically safe



MT08



MT16



MT24

Application range: intrinsically safe circuits and installation in the non-Ex area and in Zone 2 or C1D2



MT08



MT16



MT24

Application range: intrinsically safe circuits and installation in Zone 1 or C1D2



MT08

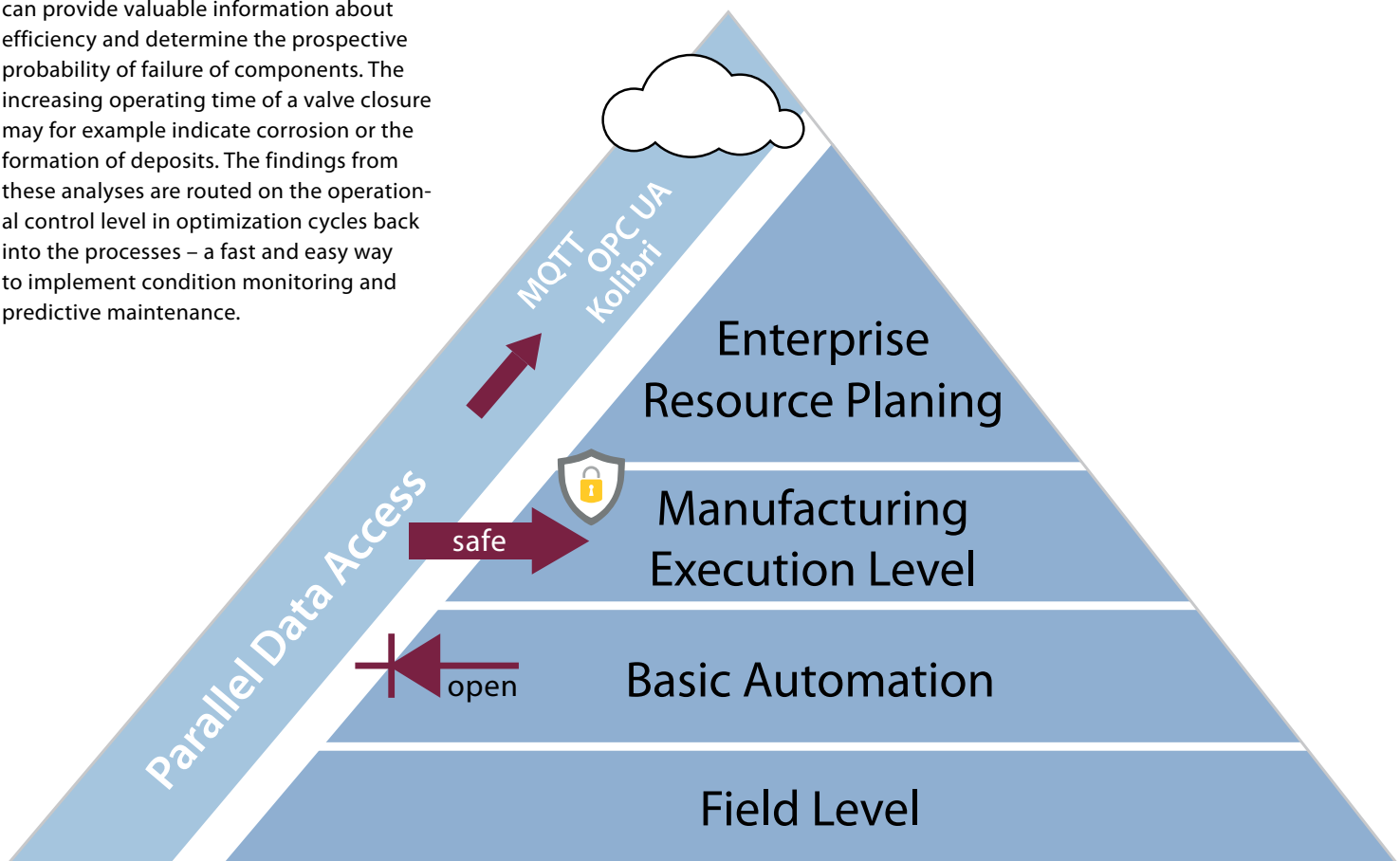


MT16

excom – Connecting to the Industrial Internet of Things

Future-proof thanks to parallel data access

Parallel data access technology brings IIoT to the process world. The data is routed beneath the control system level to a parallel IT structure. This ensures that control systems and process control are left untouched. Outside of these systems, the data can provide valuable information about efficiency and determine the prospective probability of failure of components. The increasing operating time of a valve closure may for example indicate corrosion or the formation of deposits. The findings from these analyses are routed on the operational control level in optimization cycles back into the processes – a fast and easy way to implement condition monitoring and predictive maintenance.





Connection

In addition to the exchange of process data with the control system, excom also features a second channel that provides the parallel data stream to any system. It is ideal for analyzing data firstly in an edge device and sending only these results to the cloud.

Turck also offers here alternative routes in addition to its proprietary cloud solution with industry specific data visualization and the encrypted Kolibri cloud protocol for the most demanding security requirements. The Turck cloud hardware also enables data to be transferred to one of the large cloud systems via MQTT or OPC UA.

Flexible network topology

The gateways are provided with an integrated 2-port switch and can thus be installed in line structures like conventional fieldbuses. Other standard Ethernet topologies like star, tree or ring structures are also supported.

Ethernet multiprotocol

One gateway, three protocols:

- Turck's multiprotocol I/O devices detect the master after startup and adjust themselves automatically to the protocol
- PROFINET, Modbus TCP or EtherNet/IP
- Fully developed web server enables device configuration, I/O parameterization and diagnostics via a PC or mobile terminal devices
- Integrated Ethernet switch also enables line and ring topologies

Turck's multiprotocol Ethernet technology has become a proven solution in several products and market segments. The system can be used straightaway with all control systems supporting Profinet, EtherNet/IP or Modbus TCP, including for example:

- Siemens
- Honeywell
- Rockwell
- Yokogawa
- Emerson
- Supcon
- ABB
- ...

Maximum availability

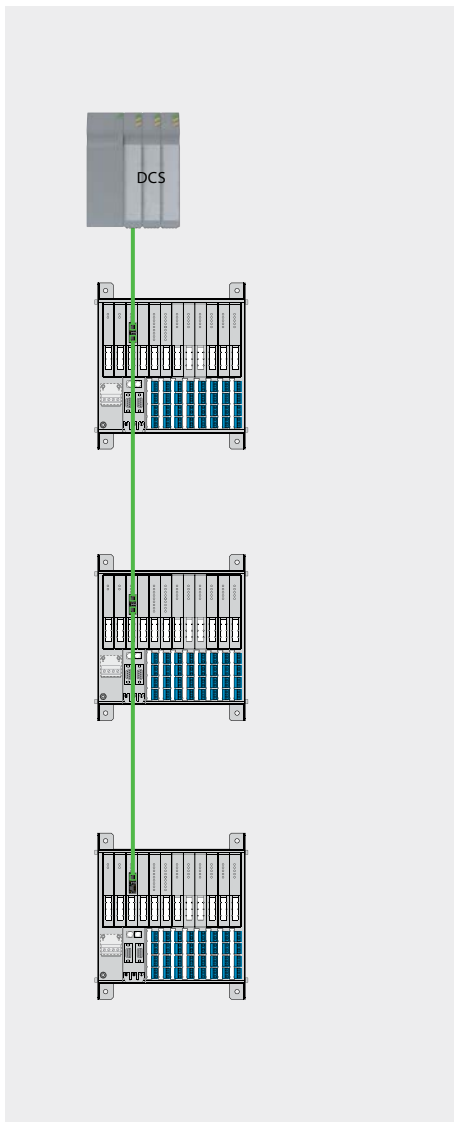
excom supports Profinet S2 redundancy and ring topologies. Even for Ethernet protocols that do not have a native redundancy specification, excom establishes with its own specification either system redundancy, gateway redundancy or combinations of both options. This makes it possible to achieve maximum availability with all systems – irrespective of whether the control systems support the redundancy concept or not.

Besides network and protocol redundancy, excom also supports hot swapping, i.e. the ability to exchange all components during operation. This considerably simplifies maintenance work.

Network Topology

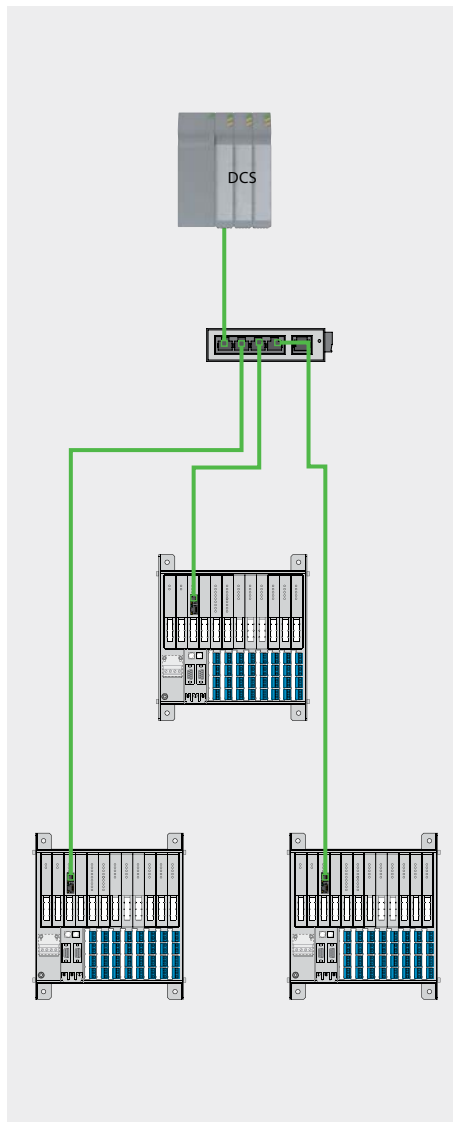
Line topology

I/O devices with an integrated switch enable networks to be created easily without any external switches. If a connection is broken, however, the downstream stations can no longer be reached.



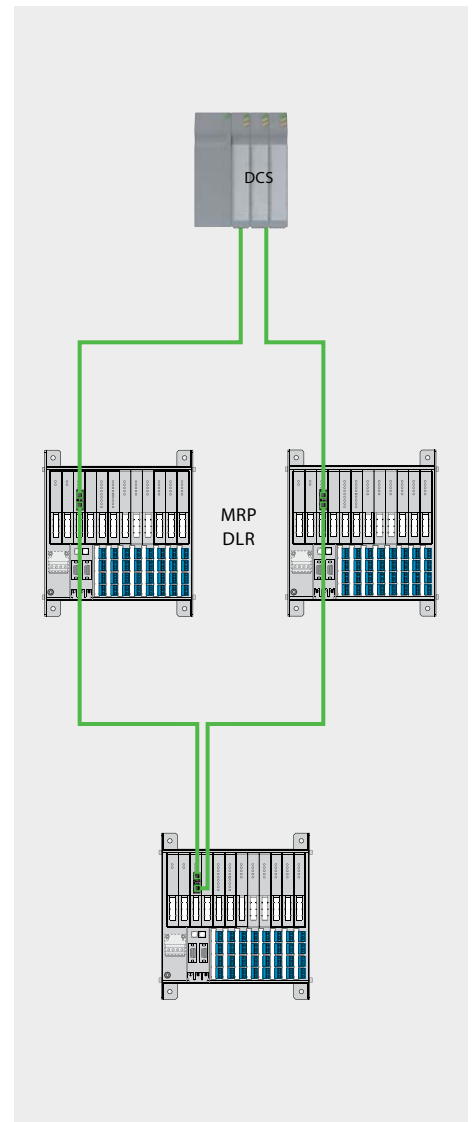
Star topology

All stations are connected via a switch. If one connection is broken, the remaining stations can still be reached.



Ring topology

The line topology is extended into a ring topology by using a redundancy protocol. All stations must support the redundancy protocol (MRP or DLR).



System Redundancy

2 masters and 1 gateway

- Profinet = S2

S2 describes physical redundancy at the control level and logical redundancy at the field device/gateway level through communication relationships to the primary control and backup control. If the primary control fails, the physical twin automatically takes over.

1 master and 2 gateways

- Turck's own solution for all systems possible

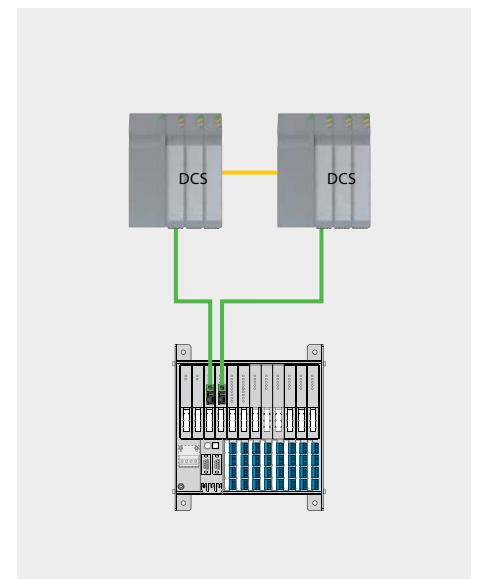
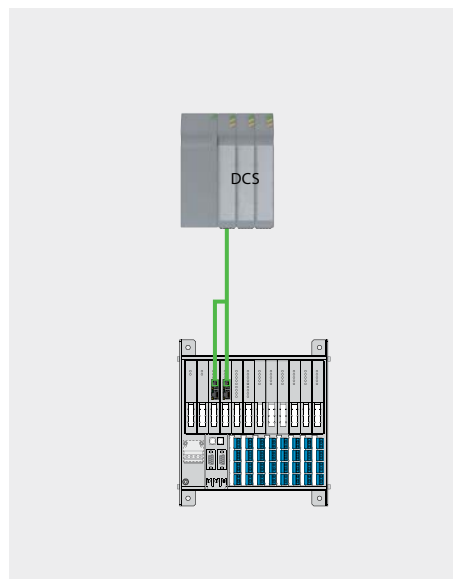
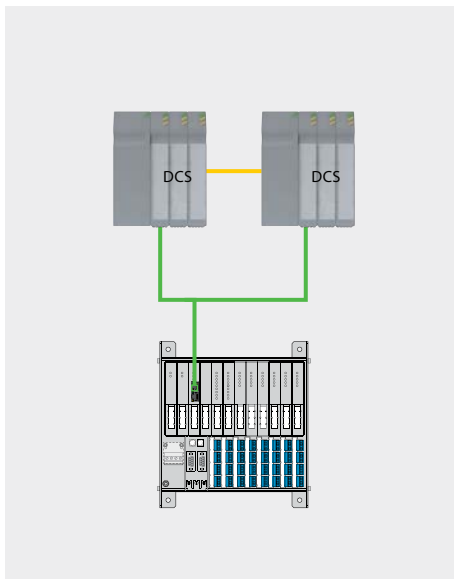
Simple and cost-effective redundancy concept for increasing availability at the connection level between the control level and gateways. Both gateways have a communication relationship with the control system and thus ensure that communication via the second gateway is maintained in the event of a gateway failure or line break.

2 masters and 2 gateways

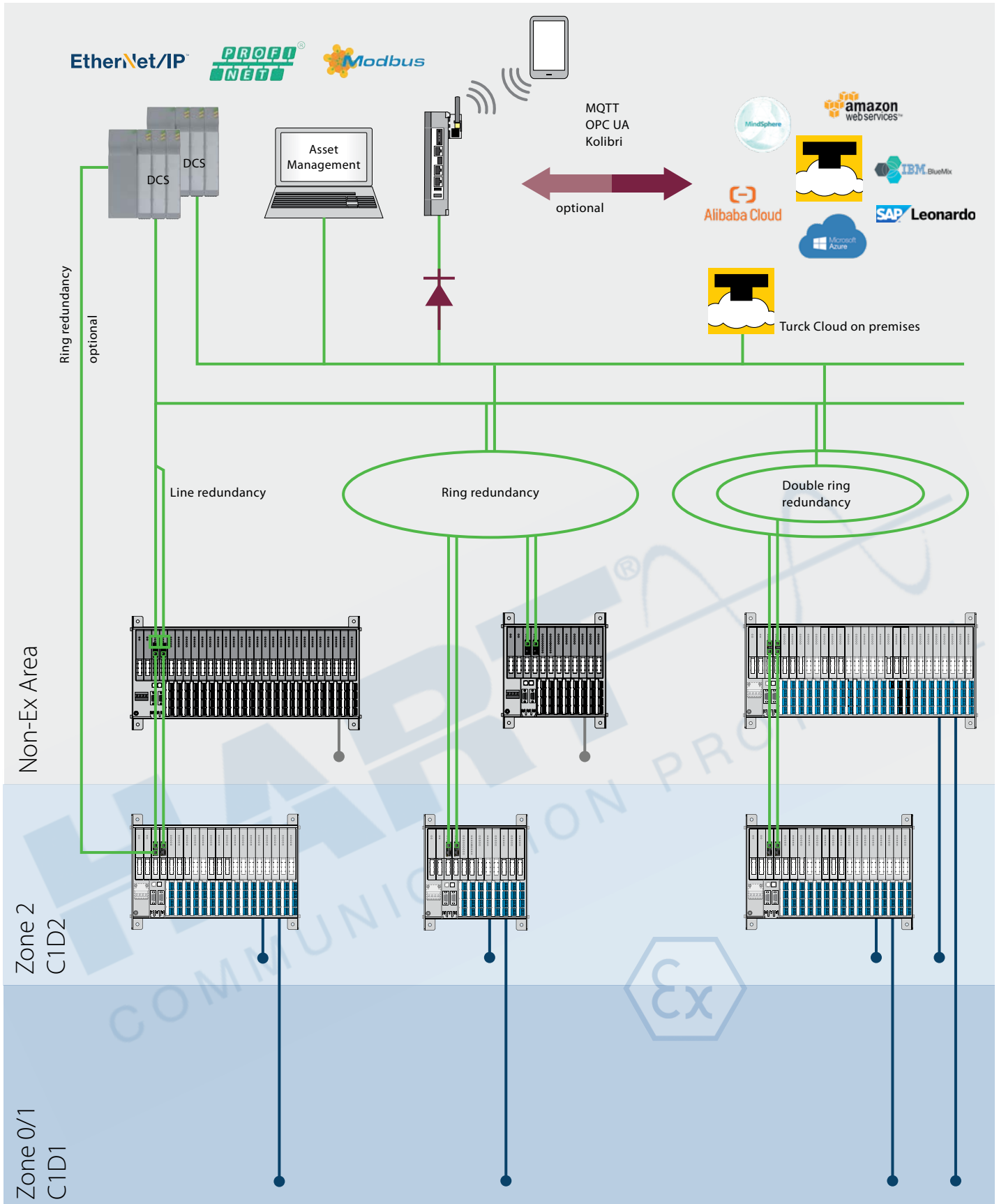
- Each gateway only communicates with one master

- Turck's own solution for all systems possible

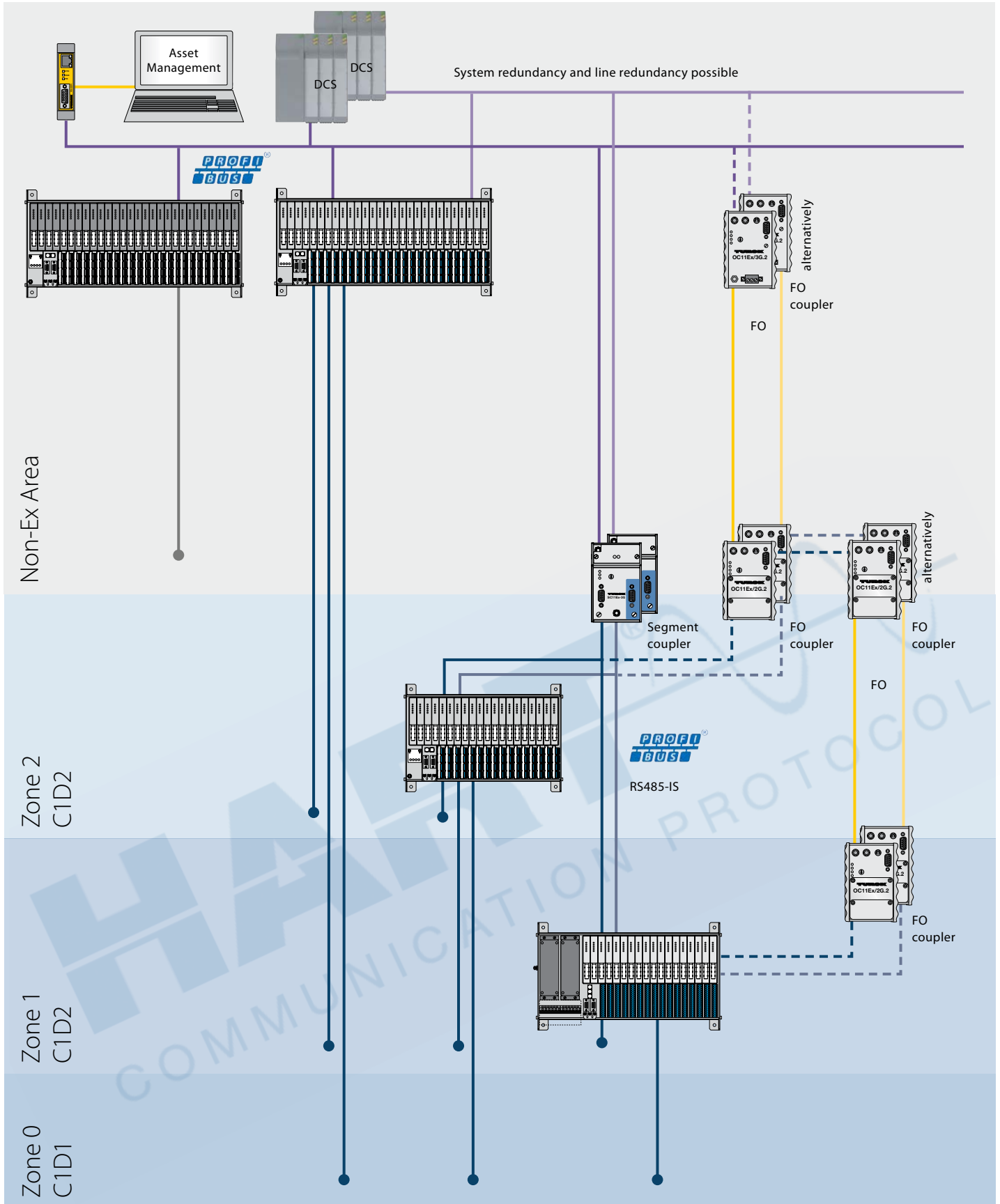
The highest availability is ensured if both the master and the gateway are operated redundantly. In this case, the gateway communicates with only one master. The two masters negotiate internally who is the master and who is the backup master. With the intelligent excom solution, permanent system availability can be implemented.



excom – Installation Overview with Ethernet

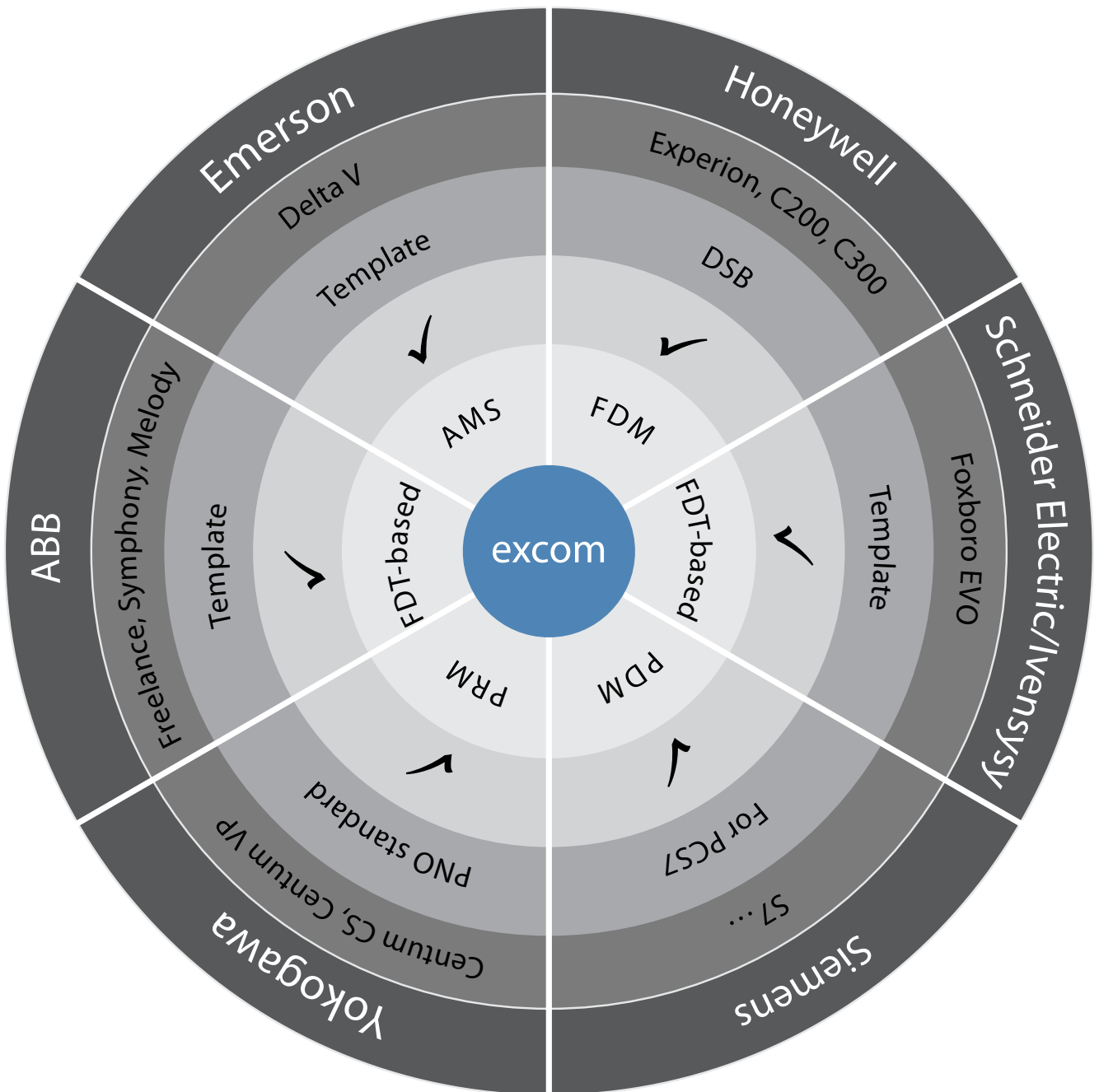


excom – Installation Overview with Profibus-DP



excom – Control System Integration and Asset Management

- Redundancy
- Function blocks
- HCIR
- Asset Management





DTM for excom®

The modular excom DTM enables you to manage the many different functions of the I/O system. The individual components are arranged in the “Rack”, “Module”, “Channel” and “Connected device” levels in an FDT frame. Using this hierarchy the user can click on the individual assets directly via a browser.

Startup

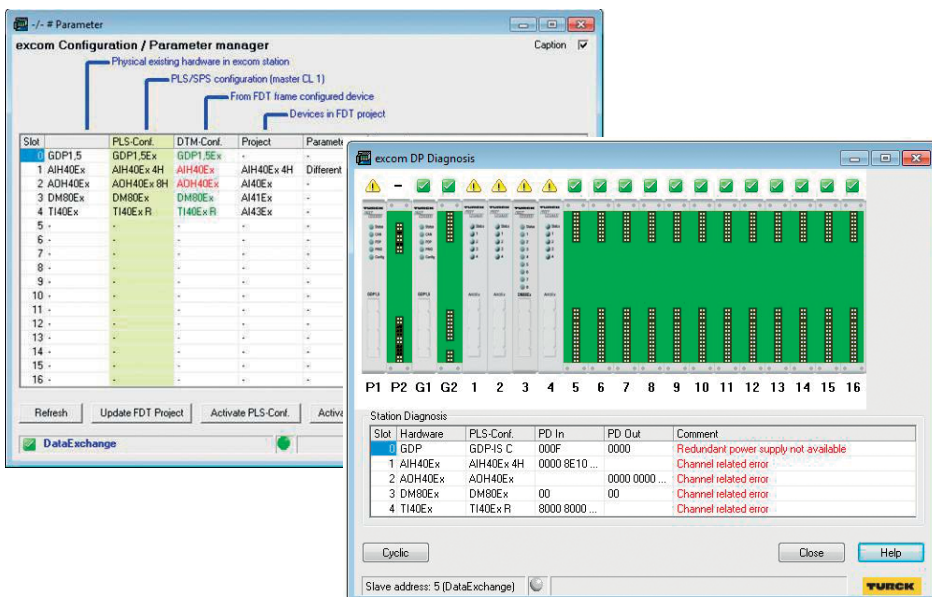
The excom DTM makes it possible to easily commission the periphery and the field instrumentation via the Profibus network even without a higher-level Class 1 master of the distributed control system. The integrated system scan function enables fast and fault-free commissioning.

Parameterization

The module-specific settings for each excom module are mapped for each channel. The entry of incorrect parameters is prevented by a plausibility check which is carried out immediately for the entry concerned.

Simulation

The simulation view of the DTM simplifies the commissioning of excom together with the periphery. Input data can be overwritten, in order, for example, to simulate key values for field instrumentation. Actuators can be switched to the simulation state via the output data.



Diagnosis and identification

Another two useful functions of the DTM are the “Diagnosis” and “Identification” dialog windows. The channel faults of the periphery are displayed in the Diagnosis view. Any faults that have occurred are indicated in plain text with the channel number. The corresponding terminals are shown in red. The Identification view supplies the data required to manage the system such as data type, order number, batch code, version states and other device information.

excom – Individual and Standard System Solutions

System solution benefit

Turck can also supply on request fully pre-assembled excom control cabinets, either as standard variants or with additional fitted components to your specifications.

This has two clear advantages:

- You will receive system approval for the entire cabinet.
- You will receive proof of intrinsic safety for the complete system.



No new approval required even for expansions

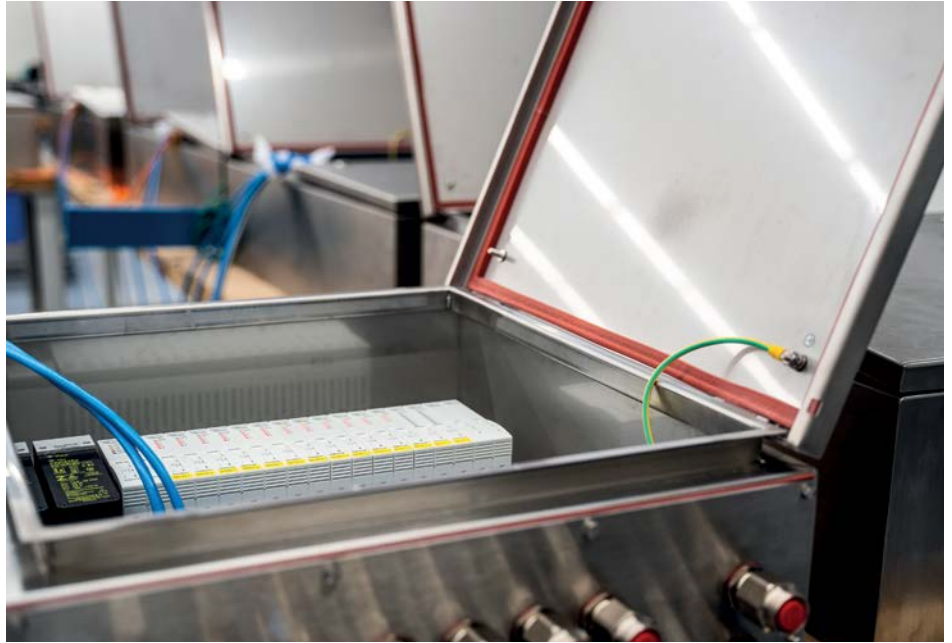
The entire system is approved for the appropriate Ex areas. Thanks to the system approval, users can flexibly replace or even add gateways or I/O cards. Plant operators can carry out any necessary re-evaluation of temperature values themselves in the housing without the need for an external test body.



Turck Mechatec (Germany) and
TEPS (USA)

Turck Mechatec and TEPS (Turck Engineered Packaged Systems) offers complete electrical system solutions to customer specifications for all areas of industrial automation. The Turck subsidiary can also assemble excom control cabinets – either in a standard configuration or individually to customer specifications.

As a service provider Turck Mechatec places great importance on customer service. Turck mechatec has already implemented a wide range of solutions for several customers in all major industrial sectors. The products and systems have been tried and tested in a several different projects and application conditions. Depending on the project, the factory acceptance test (FAT) can be carried out directly at Turck. The benefit: You only have one contact partner for your turnkey I/O system.



Standard Housing Sizes



MT16 standard solution

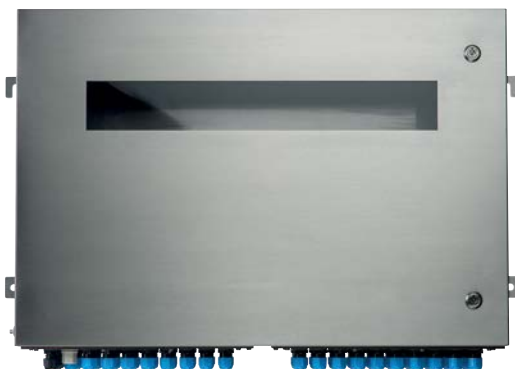
for Zones 1 and 2

- 128 digital I/O
- 64 analog I/O
- 65 cm housing width
- customer-specific components fitted

MT16 compact solution

for Zone 2

- 128 digital I/O
- 64 analog I/O
- 46 cm housing width
- maximum channel density



MT24 standard solution

for Zone 2

- 196 digital I/O
- 96 analog I/O
- 80 cm housing width
- customer-specific components fitted

Type Code for System Enclosures

EG - VA 65 55 26 / 1 1 1 - 02 0 0 / 2GD 60

EG System enclosure - **VA** Optional labeling **65 55 26** Dimensions /

System enclosure
EG excom system enclosure, stainless steel

Optional labeling
VA Optional labeling

Dimensions

- Depth**
26 Housing depth (cm)
- Height**
55 Housing height (cm)
- Width**
 - 46 Housing width (cm)
 - 65 Housing width (cm)
 - 80 Housing width (cm)

1 Material **1** Viewing window **1** Drilling pattern -

Material

- 0 Stainless steel 1.4301
- 1 Stainless steel 1.4404
- 2 Other alloy

Viewing window

- 0 Without viewing window
- 1 With viewing window

Drilling pattern

- 0 Dummy plate
- 1 Receptacle plate M16*, version 1
- 2 Receptacle plate M20*, version 1
- 3 Special version, such as drilling pattern
- * With M16/M20 cable gland for I/O signals

02 Module rack **0** Upstream sub-rack **0** Segment coupler /

Module rack

- 00 Without module rack
- 01 Module rack MT08-2G
- 02 Module rack MT16-2G
- 04 Module rack MT08-3G
- 05 Module rack MT16-3G
- 06 Module rack MT24-3G
- 07 Module rack MT08-N
- 08 Module rack MT16-N
- 09 Module rack MT24-N
- 10 Module rack MT16-2G/MSA

Upstream sub-rack

- 0 Without upstream sub-rack MT-PPS
- 1 With upstream sub-rack MT-PPS
- 2 Installation of one power supply 230 VAC
- 3 Installation of two power supplies 230 VAC
- 4 Special version

Segment coupler

- 0 Without segment coupler
- 1 Installation of one segment coupler OC11Ex/2G.2
- 2 Installation of two segment couplers OC11Ex/2G.2
- 3 Installation of one external coupler
- 4 Installation of two external couplers
- 5 Installation of a segment coupler OC11Ex/3G.2
- 6 Installation of two segment couplers OC11Ex/3G.2

2GD System enclosure **60** Temperature class **. ...** Special number

System enclosure

- 2GD System enclosure category 2 for installation in zone 1 and 21
- 3GD System enclosure category 3 for installation in zone 2 and 22
- N System enclosure for installation in safe area (non-ex area)

Only for system enclosures category 2: Max. ambient temperature of the I/O modules

- 60 60 °C and 70 °C
- 70 70 °C

Special number

- ... Special number for all additional installations such as trace heating, circuit breaker, fuses or drilling pattern

Number of cable glands for I/O signals

Housing width	Version 1
46 cm	66
65 cm	96
80 cm	108

Number of cable glands per flange plate	
4 × M25	Power supply
4 × M20	Fieldbus
1 × M20	Breather-drainer element

excom for Intrinsically Safe Circuits

Module rack						
For taking	MT08-2G	MT16-2G	MT08-3G	MT16-3G	MT24-3G	MT-PPS
Power supply units	1 x PSD24Ex	2 x PSD24Ex	2 x PSM24-3G	2 x PSM24-3G	2 x PSM24-3G	2 x PPSA.../Ex
Gateways	1	2	2	2	2	-
I/O modules	8	16	8	16	24	-
Mounting in	Zone 1/2, Non-Ex, C1D2	Zone 1/2, Non-Ex, C1D2	Zone 2, Non-Ex, C1D2*	Zone 2, Non-Ex, C1D2*	Zone 2, Non-Ex, C1D2*	Zone 1/2, Non-Ex, C1D2*

Gateways	GEN-3G	GDP-IS	GDP-NI
Ethernet/fieldbus connection	Profinet, EtherNet/IP, Modbus TCP	Profibus-DP	Profibus-DP
Mounting in	Zone 2, Non-Ex, C1D2*	Zone 1/2, Non-Ex, C1D2	Zone 2, Non-Ex, C1D2*

I/O modules	DM80Ex	DI401Ex	DO401Ex	AI43Ex	AIH401Ex	AOH401Ex	TI40EX	TI41EX	DF20EX
Channels	8	4	4	4	4	4	4	4	2
Function	DI/DO DI: Namur, mechanical contact DO: < 4 mA	DI Namur, mechanical contact	DO < 50 mA	Poti	AI with HART	AO with HART	RTD / TC	RTD	Frequency/Counter

Network components	SC11EX-3G	SC11-3G	OC11Ex/2G.2	OC11Ex/3G.2
Function	Segment coupler with RS485-IS	Segment coupler with RS485	FO coupler	FO coupler
Mounting in	Zone 2, Non-Ex, C1D2*	Zone 2, Non-Ex, C1D2*	Zone 1/2, Non-Ex, C1D2*	Zone 2, Non-Ex, C1D2*

Accessories	D9T-RS485	D9T-RS485PG	D9T-RS485-IS	STB16-4RC/1.5-BU	STB16-4RS/1.5-BU	BM-1	BM-PS	MT-Cod-GY
Function	Sub-D connector	Sub-D connector with program connection	Sub-D connector for RS485-IS	Cage clamp terminal for connection of the I/O	Screw terminal for connection of the I/O	Dummy module for unused slots	Dummy module for unused power supply units	Coding pins for I/O modules



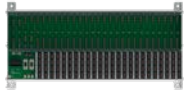
Accessories	SE20-84XT-RJ822	TBEN-L5-SE-M2	Cable452-xxxM	Cable452B-xxxM	Cable4416-xxxM
Function	IP20 switch	IP65/67/69K switch	Profibus-DP cable, purple	Profibus-DP cable, blue	Ethernet cable, green (also with pre-assembled connectors)

* = pending



Products are linked to further information.

excom for Non-Intrinsically Safe Circuits

Module rack			
For taking	MT08-N	MT16-N	MT24-N
Power supply units	2 x PSM24-N	2 x PSM24-N	2 x PSM24-N
Gateways	2	2	2
I/O modules	8	16	24
Installation in the non-Ex area			

Gateways	GEN-N	GDP-N
Ethernet/fieldbus connection	Profinet, EtherNet/IP, Modbus TCP	Profibus-DP

I/O modules	DM80-N	DI40-N	DI80-N	DO40-N	DO80-N	DO60R-N	AI43-N	AIH401-N	AOH401-N	TI40-N	TI41-N	DF20-N
Channels	8	4	8	4	8	6	4	4	4	4	4	2
Function	DI/DO DI: Namur, mechanical contact DO: < 4 mA	DI Namur, mechanical contact, 3-wire (NPN/PNP)	DI 3-wire (NPN/PNP)	DO < 50 mA	DO < 500 mA	Relays	Poti	AI with HART	AO with HART	RTD/TC	RTD	Frequency/Counter

Network components	SC11-3G	OC11Ex/3G.2
Function	Segment coupler with RS485	FO coupler

Accessories	D9T-RS485	D9T-RS485PG	STB16-4RC/1.5-BK	STB16-4RS/1.5-BK	BM-N	MT-Cod-GK
Function	Sub-D connector	Sub-D connector with programming connection	Cage clamp terminal for I/O connection	Screw terminal for connection of the I/O	Dummy module for unused slots	Coding pins for I/O modules

Accessories	SE20-84XT-RJ822	TBEN-L5-SE-M2	Cable452-xxxM	Cable4416-xxxM
Function	IP20 switch	IP65/67/69K switch	Profibus-DP cable, purple	Ethernet cable, green (also with pre-assembled connectors)

 Products are linked to further information.

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60 representatives worldwide!

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