



WARNING - DO NOT
CONNECT OR DISCONNECT
WHEN ENERGIZED



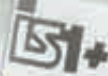
PWR
ERR
M/S

CPU Z2
9442/35-10-00



PWR IN M/S PWR OUT
PM Z2
9445/35-12
24 VDC

AS EXCH
CFG ERR



9470/32-16-11 DIOM 16

Installation
Zone 1 / Div. 1



IECEX



EAC

T_a = -40°C +75°C

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

FB Addr

THE STRONGEST LINK.



IS1+ THE REMOTE I/O

Expect the best for all hazardous areas

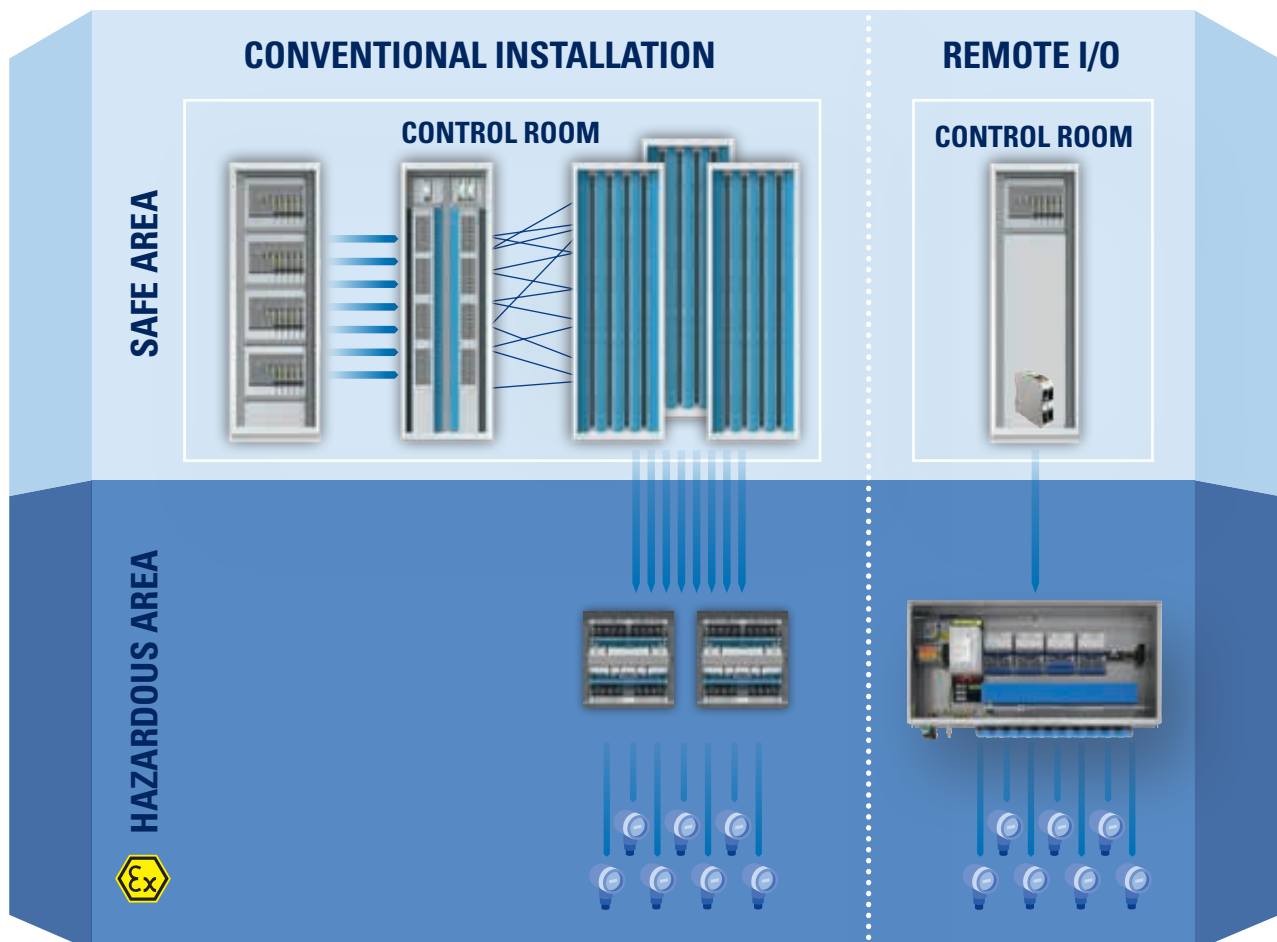
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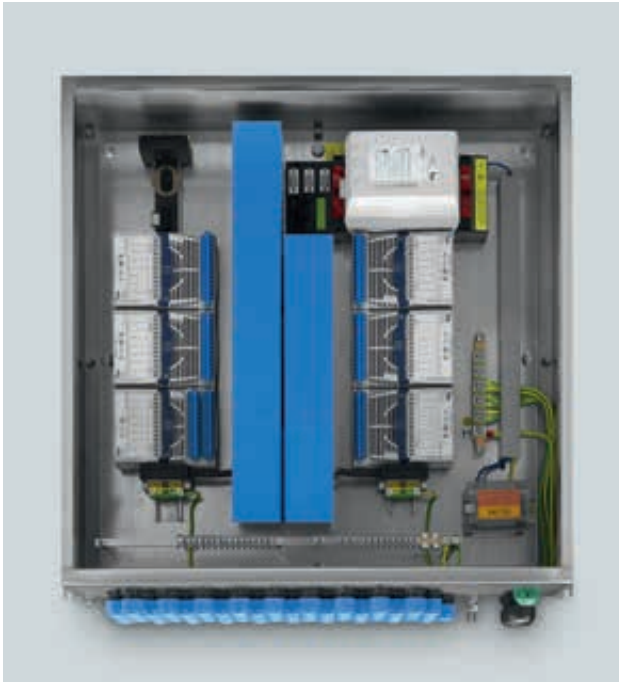


LEADING THE WAY FOR 30 YEARS

For 30 years, explosion-protected remote I/O systems from R. STAHL have been used for a wide range of process automation applications in Zone 1 and 2 as well as in Division 1 and 2. It is here that they have proven to be the most cost-effective solution with regards to procurement and installation (CAPEX) as well as during operation (OPEX). Thanks to their large range of functions and unique flexibility, remote I/O solutions from R. STAHL are suitable for virtually all tasks relating to process technology.

- Savings in field wiring and associated project engineering.
- No need to take up space in the control room with switching and distribution cabinets.
- Extensive functions for simplifying commissioning and troubleshooting.
- Integrated diagnostics provide an early warning of failures and avoid system downtimes.
- Fully compatible with conventional and HART-enabled field devices.

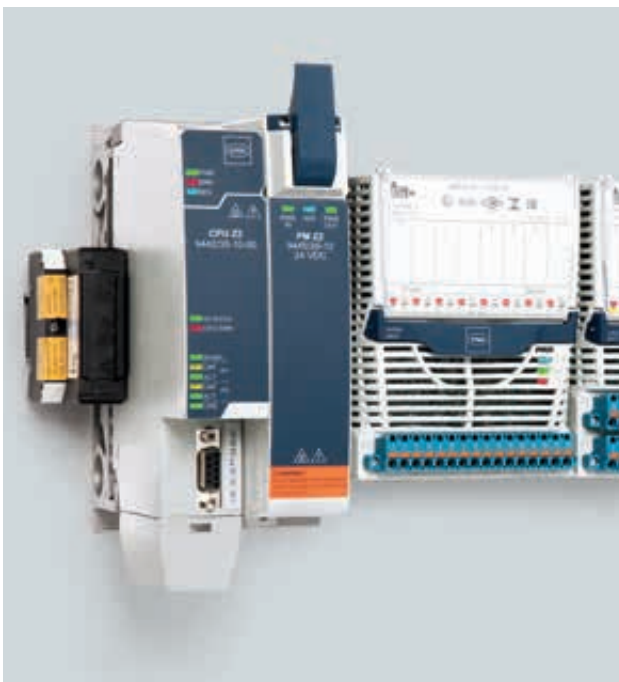




SIMPLY THE BEST REMOTE I/O

With the intrinsically safe IS1+ Remote I/O, R. STAHL has set standards on which the market has been based up to the present day.

- Extension, modification, maintenance – in ongoing operation in Zone 1 and 2 or Division 1 and 2.
- Hot-swappable for all modules and fieldbus interface connections in Zone 1 and 2 or Division 1 and 2.
- Extensive protocol support: PROFIBUS DP, Modbus TCP + RTU, PROFINET, EtherNet/IP.
- Extended temperature range -40 °C to +75 °C.
- Use of cost-effective Ex e GRP or stainless steel field enclosures – no Ex d or Ex p solutions required. Division 1 only requires a NEMA 4X enclosure.

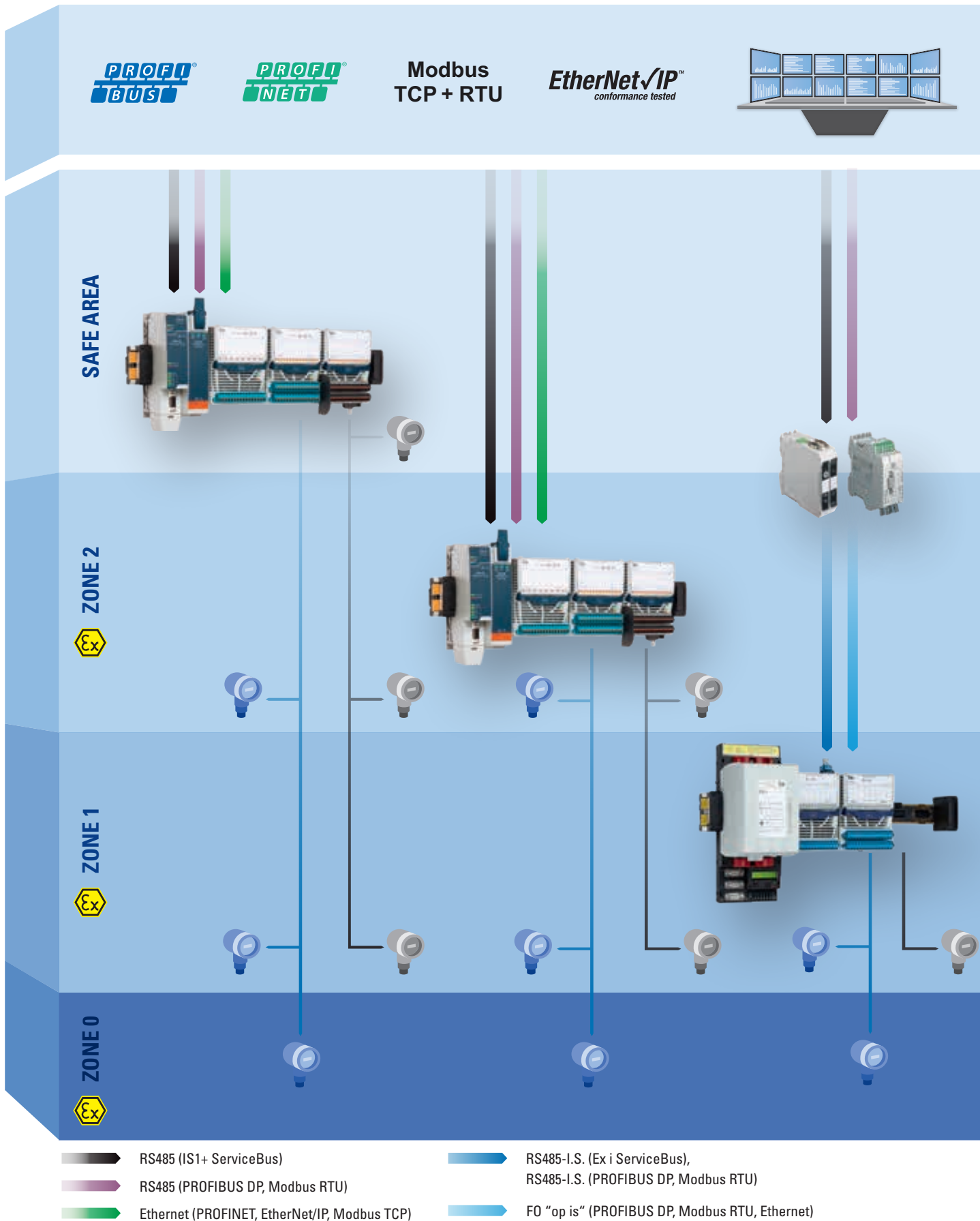


GOOD CAN ALWAYS BE BETTER

Continuous optimisations and extensions mean increasingly effective applications:

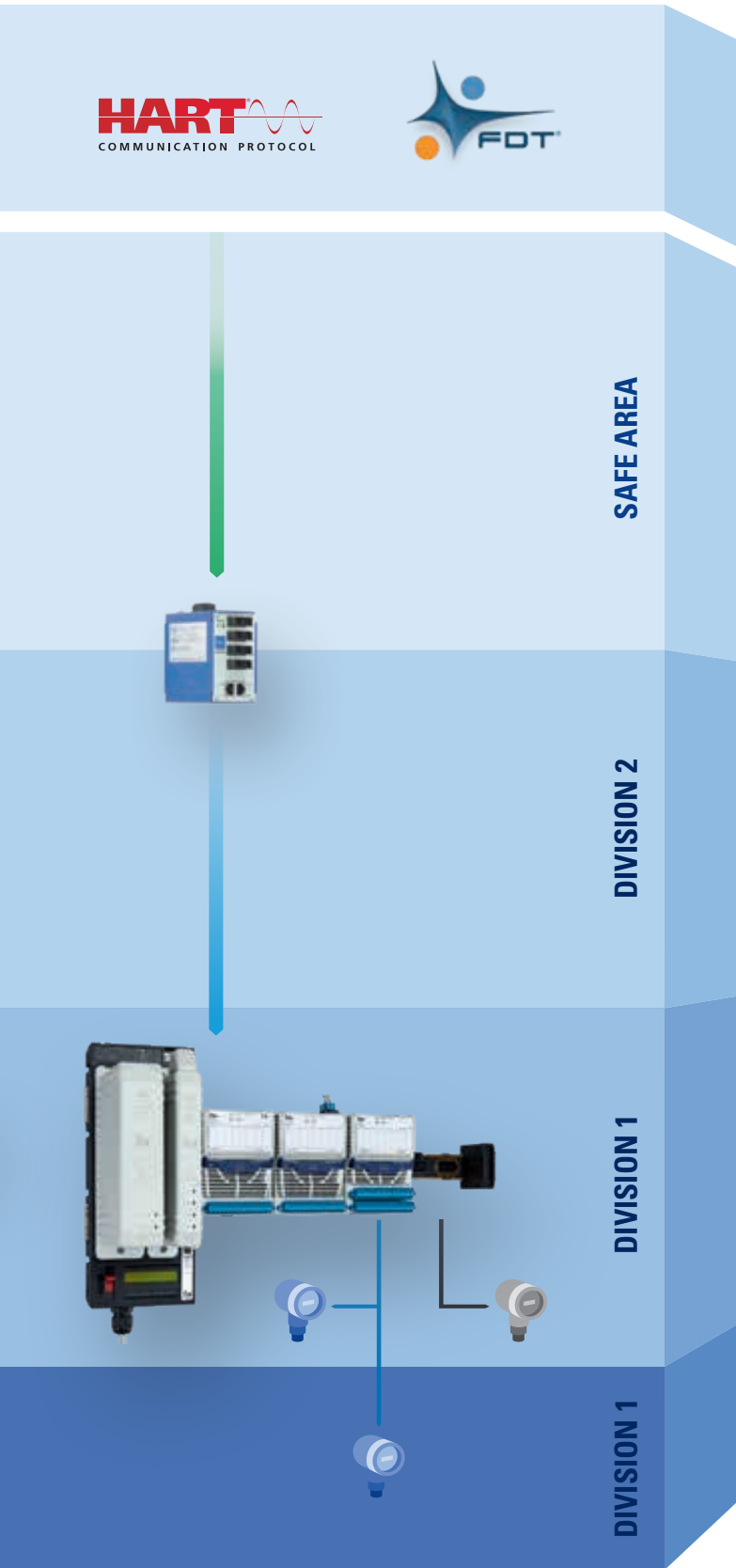
- Mixture of I/O modules for Ex i and non-Ex i signals.
- 8-channel Zone 1 and Division 1 modules with pneumatics and for Ex d valves.
- Multifunctional I/O modules for input/output signals.
- Zone 2 and Division 2 multiprotocol CPU, protocol adjustable by the user.
- Innovative proactive diagnostics provide an early warning of failures by means of a blue LED and alert telegrams as per NAMUR NE107.



INNOVATIONS IN DETAIL





HART
COMMUNICATION PROTOCOL



 Ex i analogue/digital field signals
 Non-Ex i analogue/digital field signals



Fieldbus isolating repeater Ex i PROFIBUS DP, Modbus RTU.



Fibre optic isolating repeater "op is" PROFIBUS DP, Modbus RTU.



Switch 4 FX/2 TX "op is" fibre optic.



Zone 2 CPU and Power Module PROFIBUS DP, PROFINET, Modbus TCP, EtherNet/IP.



Zone 2 I/O modules for Ex i field devices.



Zone 2 I/O modules for non-Ex i field devices.



Zone 1 CPU and Power Module PROFIBUS DP, Modbus RTU.



Zone 1 CPU and Power Module PROFIBUS DP, PROFINET, Modbus TCP, EtherNet/IP.



Zone 1 I/O modules for Ex i field devices.



Zone 1 I/O modules for non-Ex i field devices (pneumatics, relay).

YOUR BENEFITS AT A GLANCE



IS1+ SUPPORTS PROFIBUS DP, PROFINET, MODBUS TCP/RTU AND ETHERNET/IP.

Flexible and easy to use in virtually any automation system.

ATEX

IECEX

cFMus

EAC



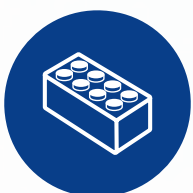
IS1+ BASED ON GLOBAL STANDARDS.

Can be combined with other products and technologies regardless of the manufacturer and process control system.



IS1+ FACILITATES INSTALLATION AND MAINTENANCE.

By effectively combining types of protection, there is no need for the "d" and "p" enclosure – all components in Zone 1 and 2 or Division 1 and 2 are hot-swappable.



IS1+ IS EASY TO PLAN AND QUICK TO INSTALL.

System design without special planning tools, three components are sufficient: CPU and Power Module, BusRail, I/O modules.



IS1+ IS UNIQUELY ROBUST AND DURABLE.

Specially developed and built for harsh field use in hazardous areas – typical service life of 15 years or longer.





INMETRO

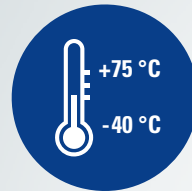
PESO

KTL



IS1+ IS INNOVATION WITH 30 YEARS OF EXPERIENCE.

IS1+ is our third generation of remote I/O. Our experienced system specialists mean that we can find solutions for virtually all requirements.



IS1+ IS DESIGNED AND MANUFACTURED FOR EXTREME ENVIRONMENTS.

Can be used both horizontally and vertically for temperatures from -40 °C to +75 °C. Also perfect for use on offshore platforms and LNG tankers.



IS1+ IS CONTINUOUSLY BEING EXTENDED AND OPTIMISED.

As a result of our continuous further development, the system is becoming increasingly diverse – but is always downward compatible.



IS1+ INCREASES THE AVAILABILITY OF YOUR SYSTEMS.

Redundancy and intelligent diagnostics ensure safe operation and predictive maintenance.



IS1+ OFFERS SIGNIFICANT COST SAVINGS COMPARED WITH OTHER SOLUTIONS.

Multifunctionality and new functions mean savings of up to 50% compared to conventional installations.

REMOTE I/O IS1+ IN DETAIL

PROFI
BUS

PROFI
NET

Modbus
TCP + RTU

EtherNet/IP™
conformance tested

24 V DC or 120/230 V AC *

Power supply for Ex i supply of
8 Zone 1 or 16 Zone 2 modules.

* for Zone 1 PROFIBUS DP and Modbus RTU.

Increased availability

with CPU, Power Module or
system redundancy and ring
structures.

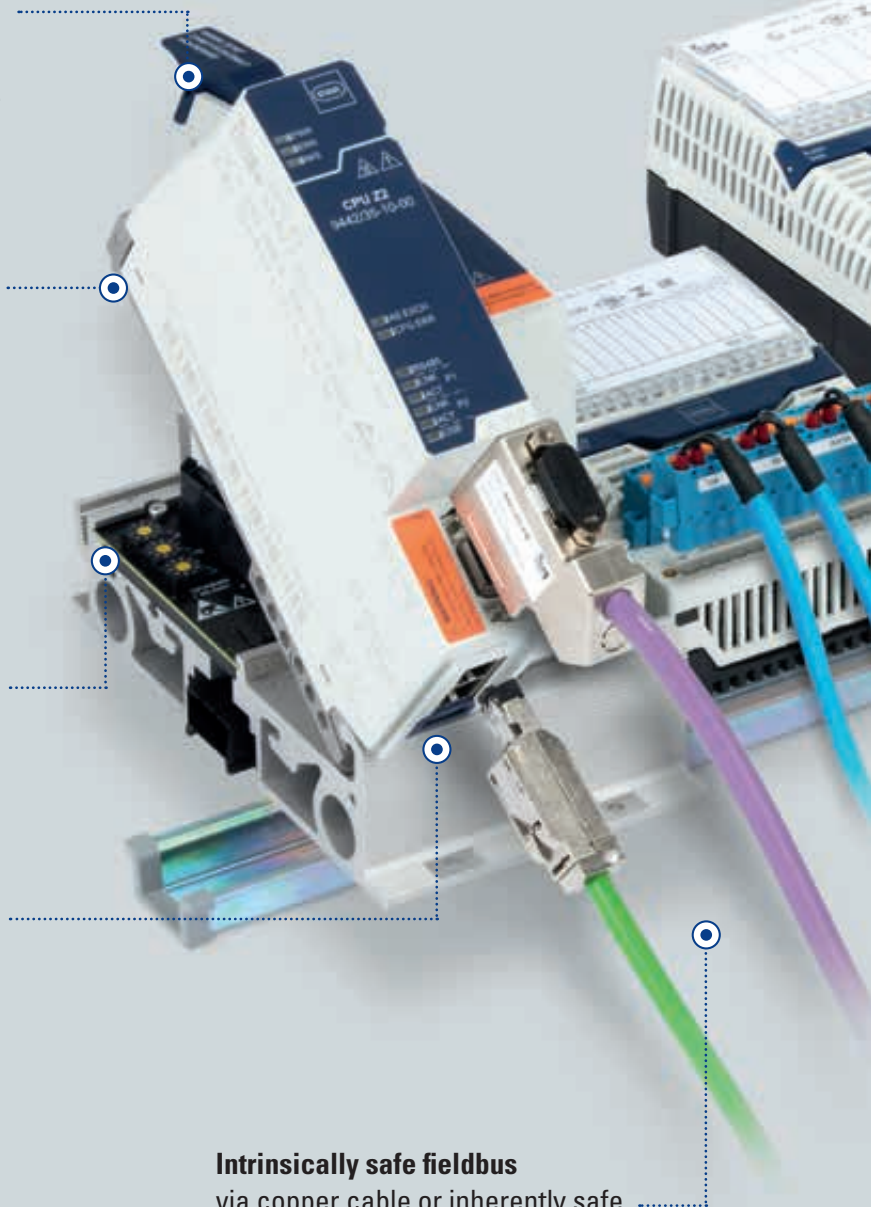
Free fieldbus selection
via rotary switch ** and
multiprotocol CPU.**

** For new Zone 2 CPU.

Plant asset management
and engineering via ServiceBus
or process bus.

Intrinsically safe fieldbus

via copper cable or inherently safe
"op is" with fibre optic.





HART
COMMUNICATION PROTOCOL



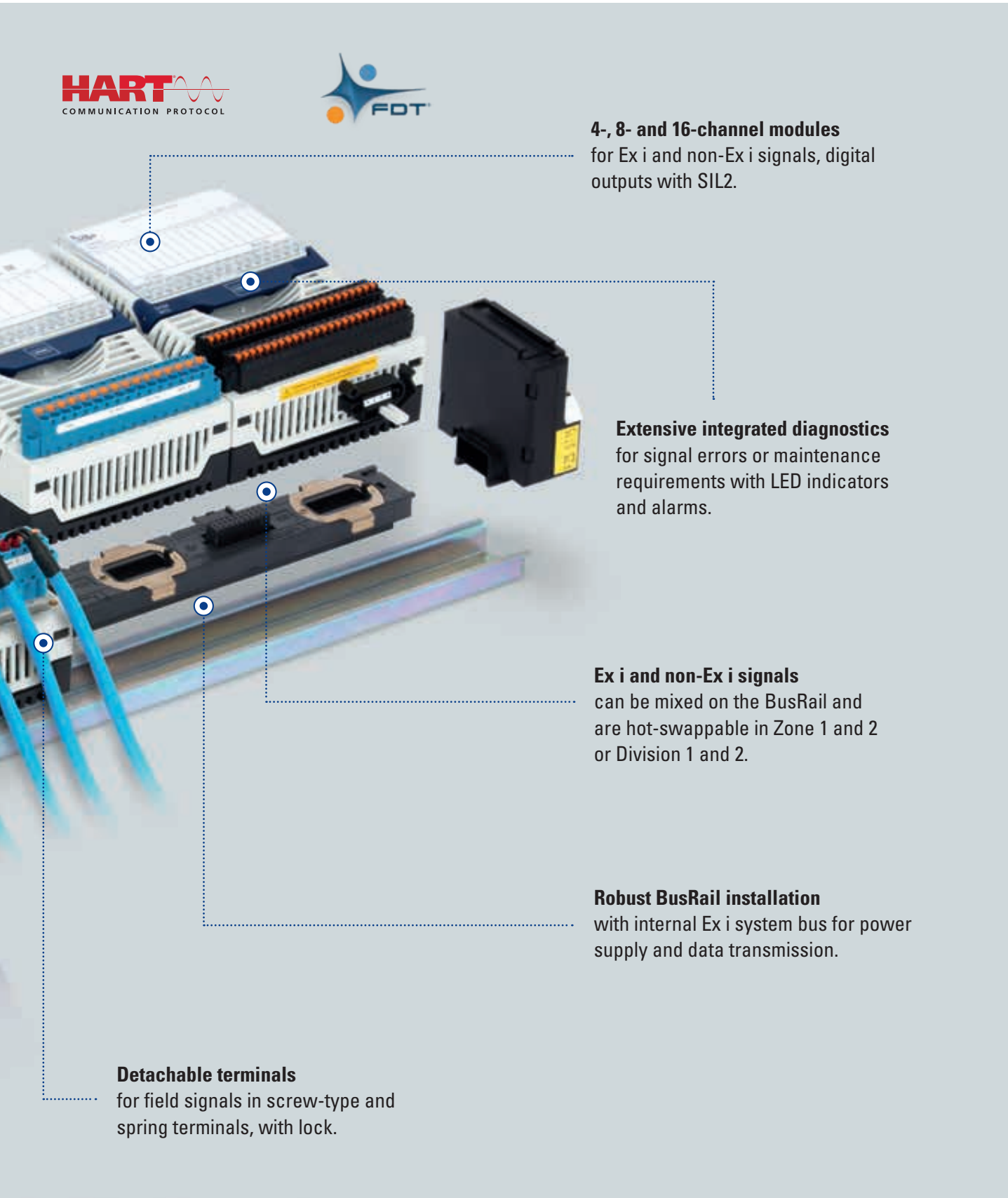
4-, 8- and 16-channel modules
for Ex i and non-Ex i signals, digital
outputs with SIL2.

Extensive integrated diagnostics
for signal errors or maintenance
requirements with LED indicators
and alarms.

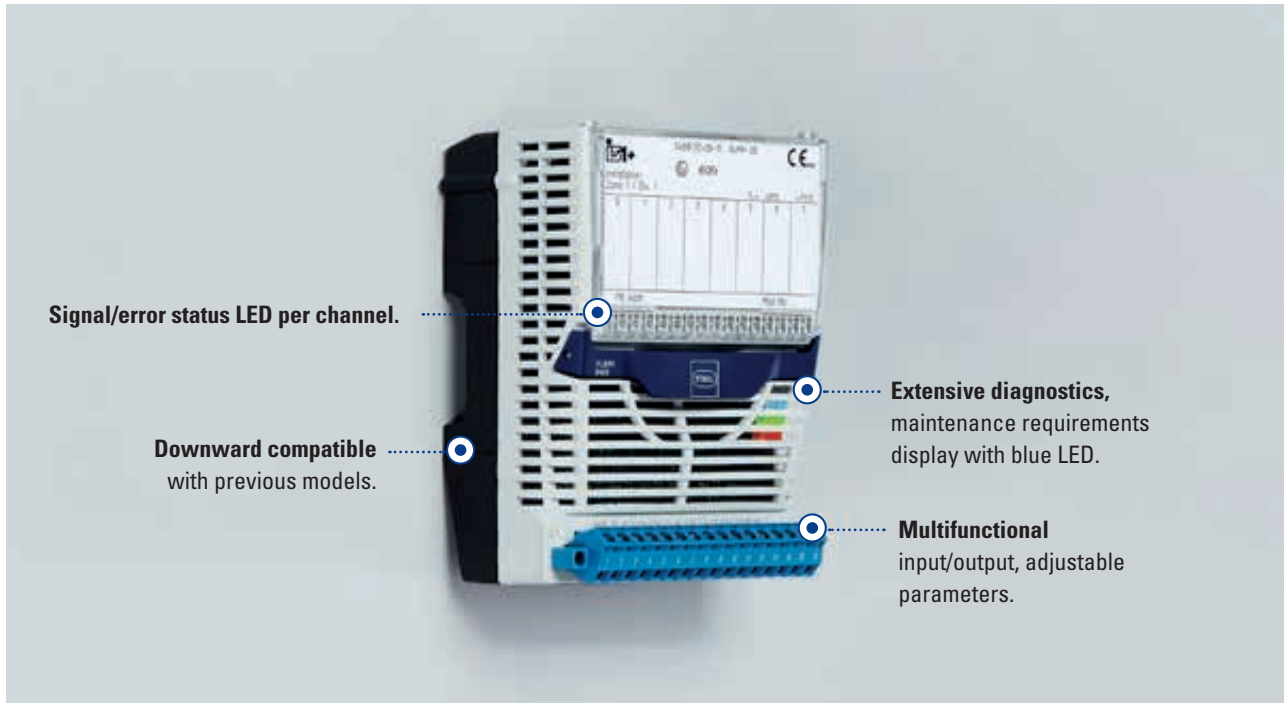
Ex i and non-Ex i signals
can be mixed on the BusRail and
are hot-swappable in Zone 1 and 2
or Division 1 and 2.

Robust BusRail installation
with internal Ex i system bus for power
supply and data transmission.

Detachable terminals
for field signals in screw-type and
spring terminals, with lock.



THE MULTIFUNCTIONAL I/O LEVEL



Communications modules for Zone 1 and Zone 2 or Division 1 and 2

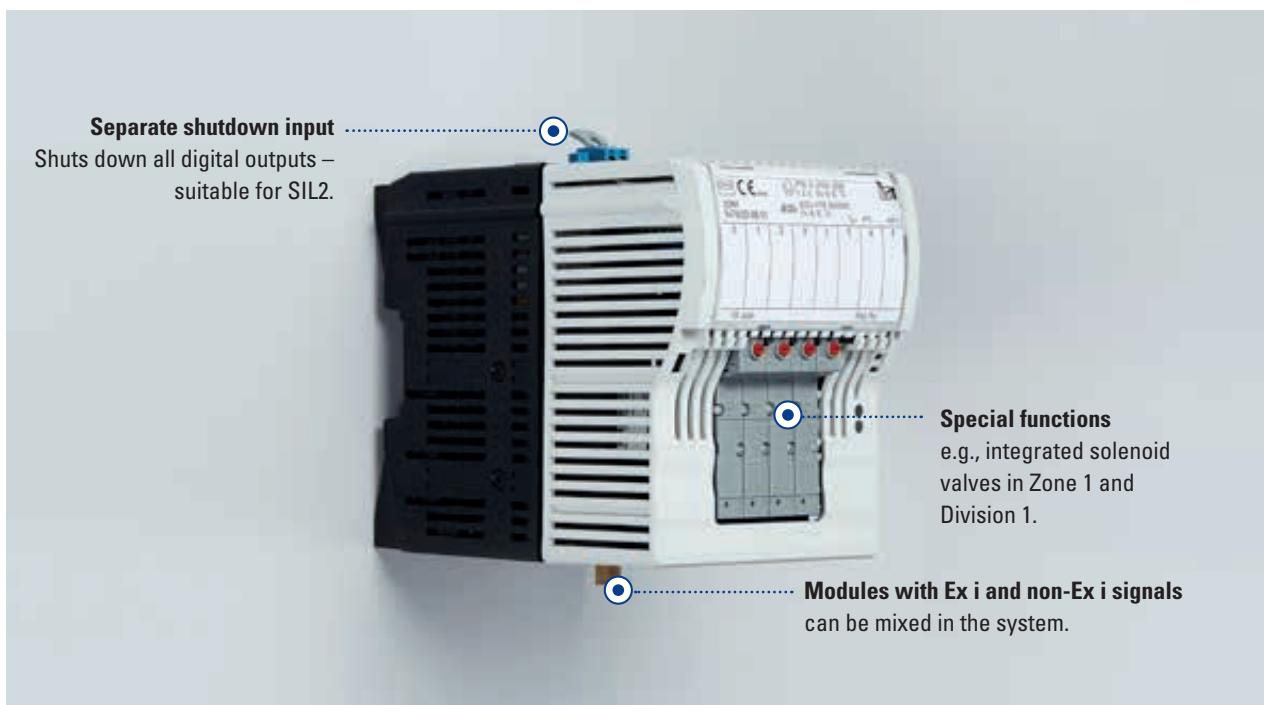
Protocols	Installation	Max. no. of I/O modules	Power supply		Type series
PROFIBUS DP or Modbus RTU	Zone 1 / Div. 1	8	24 V DC	120/230 V AC	9440/22
Modbus TCP or EtherNet/IP or PROFINET	Zone 1 / Div. 1	8	24 V DC		9441/12
PROFIBUS DP, PROFINET, EtherNet/IP and Modbus TCP	Zone 2 / Div. 2	16	24 V DC		9442/35

Zone 2 and Division 2 I/O modules, Ex i signals

Function	Channels	Application	Type series
Analogue Universal Module HART	8	Analogue inputs/outputs: 0/4 ... 20 mA with HART	9468/33-08-10
Temperature Input Module	8	Resistance thermometers (2-, 3-, 4-wire), THCs and potentiometers, joysticks	9482/33-08-10
Digital Input Output Module	16	Digital inputs/outputs: Contacts, proximity switches and low-power solenoid valves	9470/33-16-10
Digital Output Module	8	Solenoid valves 12.6 V/30 mA	9475/33-08-50
Digital Output Module	8	Solenoid valves 17.5 V/30 mA	9475/33-08-60

Zone 2 and Division 2 I/O modules, other signals

Function	Channels	Application	Type series
Universal Module HART	8	Analogue and digital Ex nA/ec inputs/outputs: 0/4 ... 20 mA with HART, pnp contacts, digital output 24 V/0.5 A; SIL2 output shutdown	9469/35-08-12
Digital Input Output Module NAMUR	16	Digital Ex nA/ec inputs/outputs: Contacts, (pnp) proximity switches, low-power solenoid valves	9471/35-16-11
Digital Output Module 24 V	16	Digital Ex nA/ec inputs/outputs: Contacts, (pnp) proximity switches, 24 V/0.5 A solenoid valves; SIL2 output shutdown	9472/35-16-12
Digital Output Module Relais	8	Integrated Ex nA/ec NO for loads up to 250 V AC/2 A	9477/15-08-12



Zone 1 and Division 1 I/O modules, Ex i signals

Function	Channels	Application	Type series
Analogue Universal Module HART	8	Analogue inputs/outputs: 0/4 ... 20 mA with HART	9468/32-08-11
Temperature Input Module	8	Resistance thermometers (2-, 3-, 4-wire), THCs and potentiometers, joysticks	9482/32-08-11
Digital Input Output Module	16	Digital inputs/outputs: Contacts, proximity switches and low-power solenoid valves	9470/32-16-11
Digital Output Module	4	Solenoid valves 11.3 V/40 mA; SIL2 output shutdown	9475/32-04-12
Digital Output Module	4	Solenoid valves 12.3 V/75 mA; SIL2 output shutdown	9475/32-04-22
Digital Output Module	4	Hydraulic valves 12.3 V / 75 mA; Output shutdown SIL2	9475/32-04-72
Digital Output Module	8	Solenoid valves 12.6 V/30 mA; SIL2 output shutdown	9475/32-08-52
Digital Output Module	8	Solenoid valves 17.5 V/20 mA; SIL2 output shutdown	9475/32-08-62

Zone 1 and Division 1 I/O modules, non-Ex i / pneumatic signals

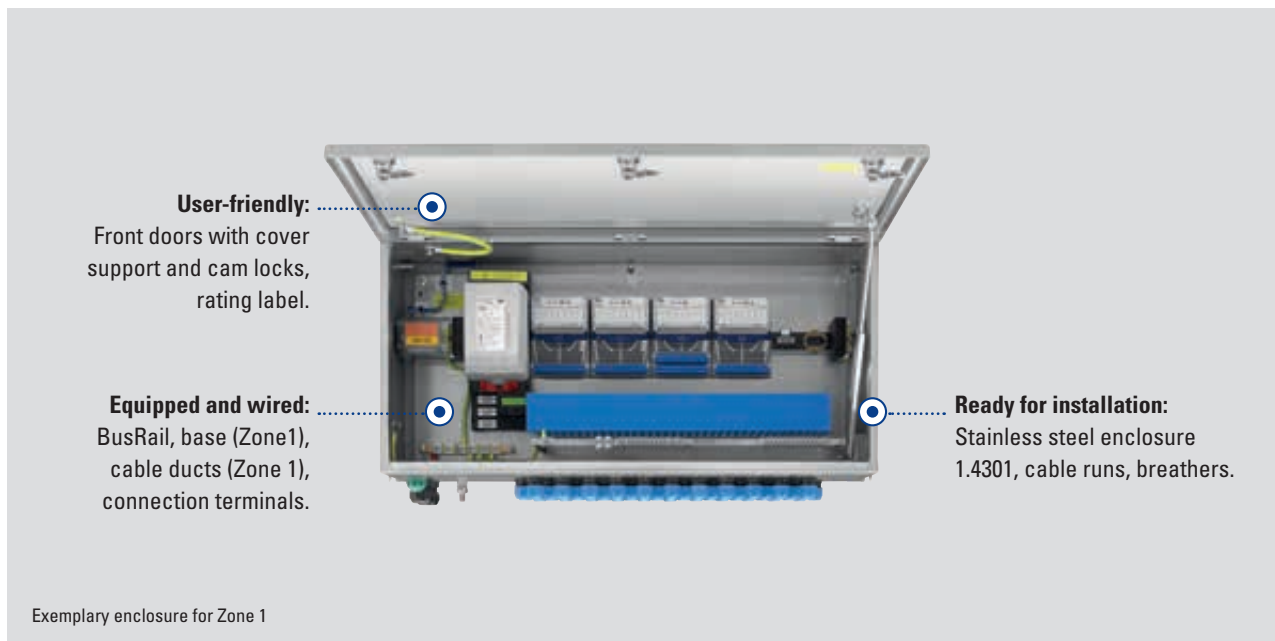
Function	Channels	Application	Type series
Digital Output Module Valve	8	Pneumatic control of valves via 3/2-way solenoid valves with 2.5 ... 7 bar; SIL2 output shutdown	9478/22-08-51
Digital Output Module Relais	6	Integrated relay contacts for loads up to 250 V AC/2 A	9477/12-06-12
Digital Output Module Relais	8	Integrated relay contacts for loads up to 60 V AC/2 A	9477/12-08-12

THE STANDARD FOR ZONE 1 AND 2 OR DIVISION 2





STANDARD ENCLOSURES FOR IS1+ – DELIVERY TIMES APPROX. 3 WEEKS.

IS1+ Remote I/O offers great flexibility for a wide range of intended purposes. We have designed a series of STANDARD field enclosures based on many years of experience with customer-specific system solutions. These field enclosures are available from stock with short delivery times and already meet most requirements in the standard version. For even greater flexibility, in the STANDARD+ version, we provide the option of performing adaptations and modifications in a very short time period.

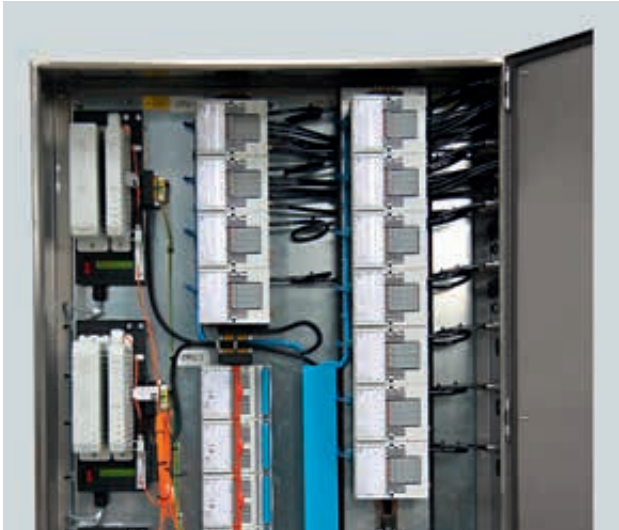
- Preconfigured field enclosures for installation in Zone 1 or Zone 2 and Division 2.
- Prepared for installation of IS1+ for up to 120 analogue or 240 digital signals.
- Version according to EN 61439, no additional acceptances or certificates required.
- Various options available, e.g., heating, inspection window, fibre optic.



Field enclosures for Zone 1 and Zone 2 or Division 2

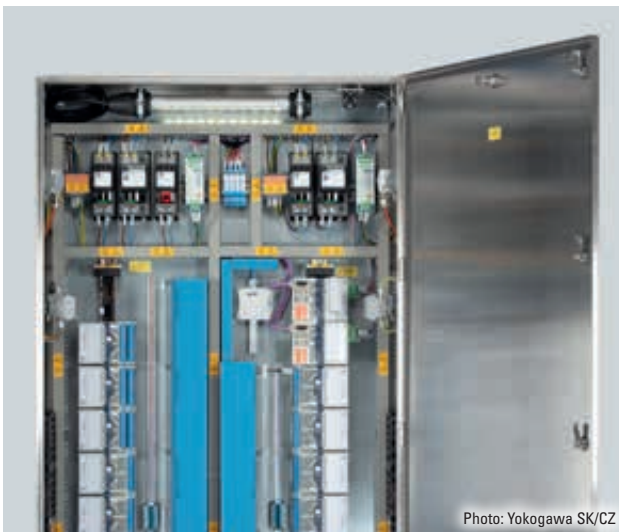
Zone 2 enclosures (similar to representation for Zone 1 – see above)					
Max. signals Zone 1	40 analogue / 80 digital	64 analogue / 128 digital	56 analogue / 112 digital	64 analogue / 128 digital	112 analogue / 224 digital
Max. signals Zone 2	40 analogue / 80 digital	72 analogue / 144 digital	56 analogue / 112 digital	88 analogue / 176 digital	120 analogue / 240 digital
Enclosure sizes	360 x 750 x 230 mm	360 x 1300 x 230 mm	600 x 600 x 230 mm	760 x 760 x 300 mm	800 x 1000 x 300 mm

YOUR SYSTEM SOLUTIONS



FIELD STATION WITH IS1+ ETHERNET AND INTEGRATED SOLENOID VALVE ISLAND

- Installation possible in Zone 1 or Zone 2 and Division 1 or Division 2.
- Control of processes with intrinsically safe and pneumatic signals.
- IS1+ Zone 1 solenoid valve module 9478 for shortening distances when using pneumatics.
- Options for communication via EtherNet/IP, Modbus TCP or PROFINET.
- Interference-free fibre optic transmission up to Zone 1 and Division 1.



HIGHLY AVAILABLE FIELD STATION FOR ZONE 2 OUTDOOR INSTALLATION IN A REFINERY

- Fully redundant system design with redundant PROFIBUS DP, redundant CPM assembly, redundant power supply and redundant heating.
- Integrated remote monitoring via temperature sensor and humidity sensor.
- Installed surge protection for the fieldbus cable and moulded case circuit breakers for all power supply circuits.
- Stainless steel field enclosures with LED lighting controlled via door contact and metal cable entries for armoured cables.
- Very easy retrofitting for Zone 1 field station by installing Zone 1 CPM assemblies with 230 V AC.



COMPACT REMOTE I/O SOLUTION FOR INSTALLATION ON OFFSHORE PLATFORMS AND LNG TANKERS

- Ready for connection for Zone 1 with ATEX, IECEx and shipbuilding approvals.
- Compact cabinet design with double doors to save space when opening.
- Various sizes for up to 150 analogue or 300 digital signals.
- Optimised internal structure for special EMC requirements.
- Additional Ex i operating and display elements integrated in the front doors and operated via IS1+.

IS1+ ALWAYS THE RIGHT SOLUTION FOR ANY SITUATION

Selection of previously implemented couplings

		PROFINET BUS	Modbus RTU	PROFINET	Modbus TCP	EtherNet/IP <small>conformance tested</small>
Emerson	DeltaV	✓	✓	✓	✓	✓
Yokogawa	Centum CS	✓	✓			
	Centum VP	✓	✓		✓	
Honeywell	Experion C200	✓				
	Experion C300	✓	✓			
Siemens	S7 / PCS7	✓	✓	✓		
Azbil	Harmonas DEO	✓	✓			
ABB	Sattline	✓				
	Freelance	✓				
	Symphony	✓				
	800xA	✓		✓		
Kongsberg Maritime	K-Chief 700	✓	✓			
Schneider Electric	M580				✓	✓
	M340		✓		✓	✓
	EVO	✓				
Mitsubishi	MELSEC-Q	✓			✓	
Rockwell	SLC500	✓				
	ControlLogic	✓			✓	✓

Incl. connection to common plant asset management systems, e.g., AMS, FDM, FieldCare, FieldMate, PACTware, PDM, PRM, etc.



PAINTING FACTORY IN ACCORDANCE WITH NEC
IS1+ in Division 1 with communication via PROFINET and explosion-protected "op is" fibre optic.



IS1+ FOR USE ON FPSO
Typical installation on a floating conveyor system, located near Rio de Janeiro.



ETHERNET AND REMOTE I/O
One of the world's first installations with Ethernet in Zone 1 and redundancy is in Germany.



REMOTE I/O AT HIGH TEMPERATURES
IS1+ can be used without active cooling thanks to the extended temperature range from -40 °C to +75 °C.



REMOTE I/O FOR USE ON LNG TANKERS
IS1+ is a highly space-saving and lightweight solution which is certified in accordance with most shipping standards.



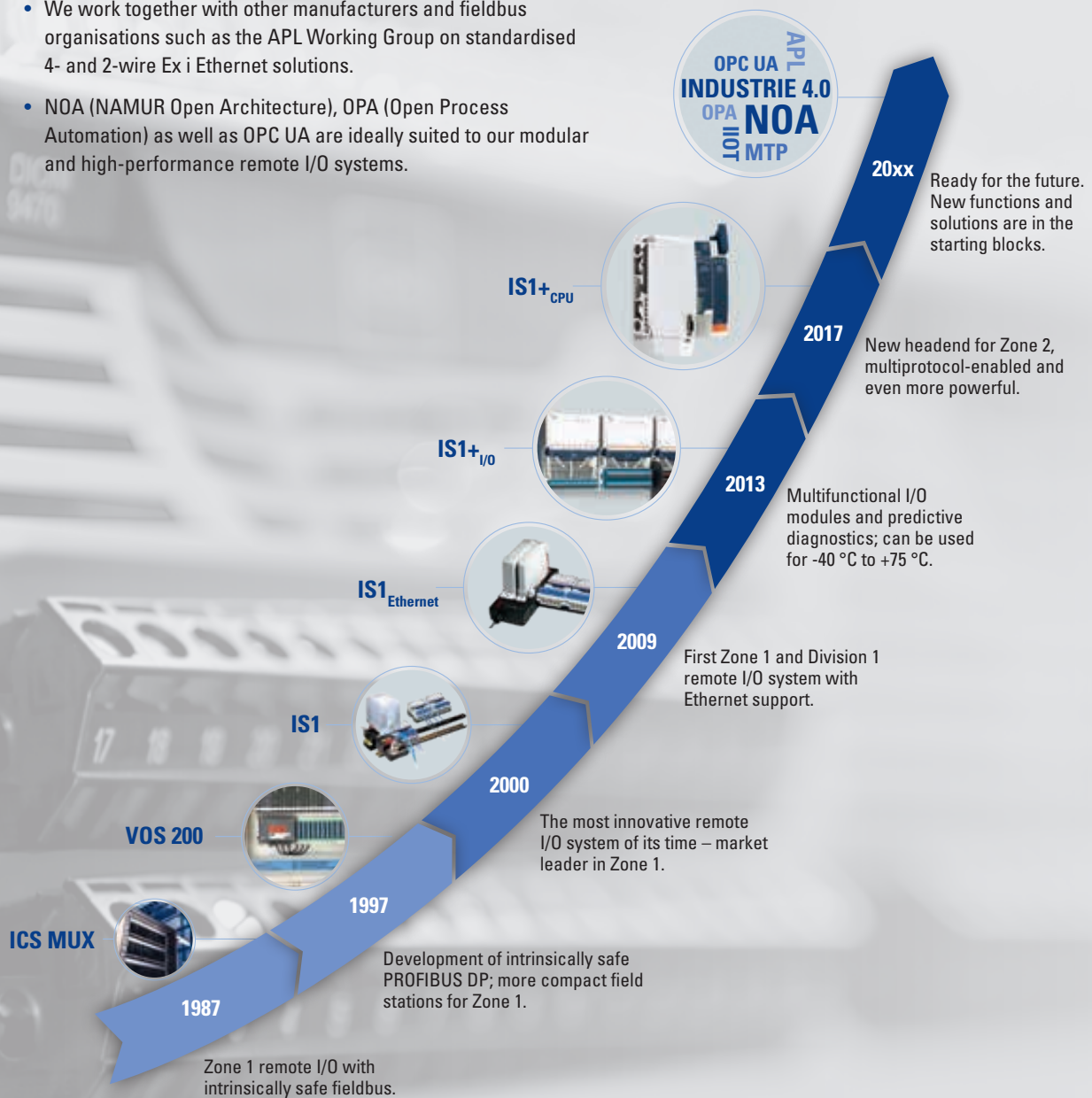
REMOTE I/O AND FIBERBUS
In a pharma plant in India, signals are transmitted both via remote I/O and PROFIBUS DP as well as via fieldbus couplers and FF H1.

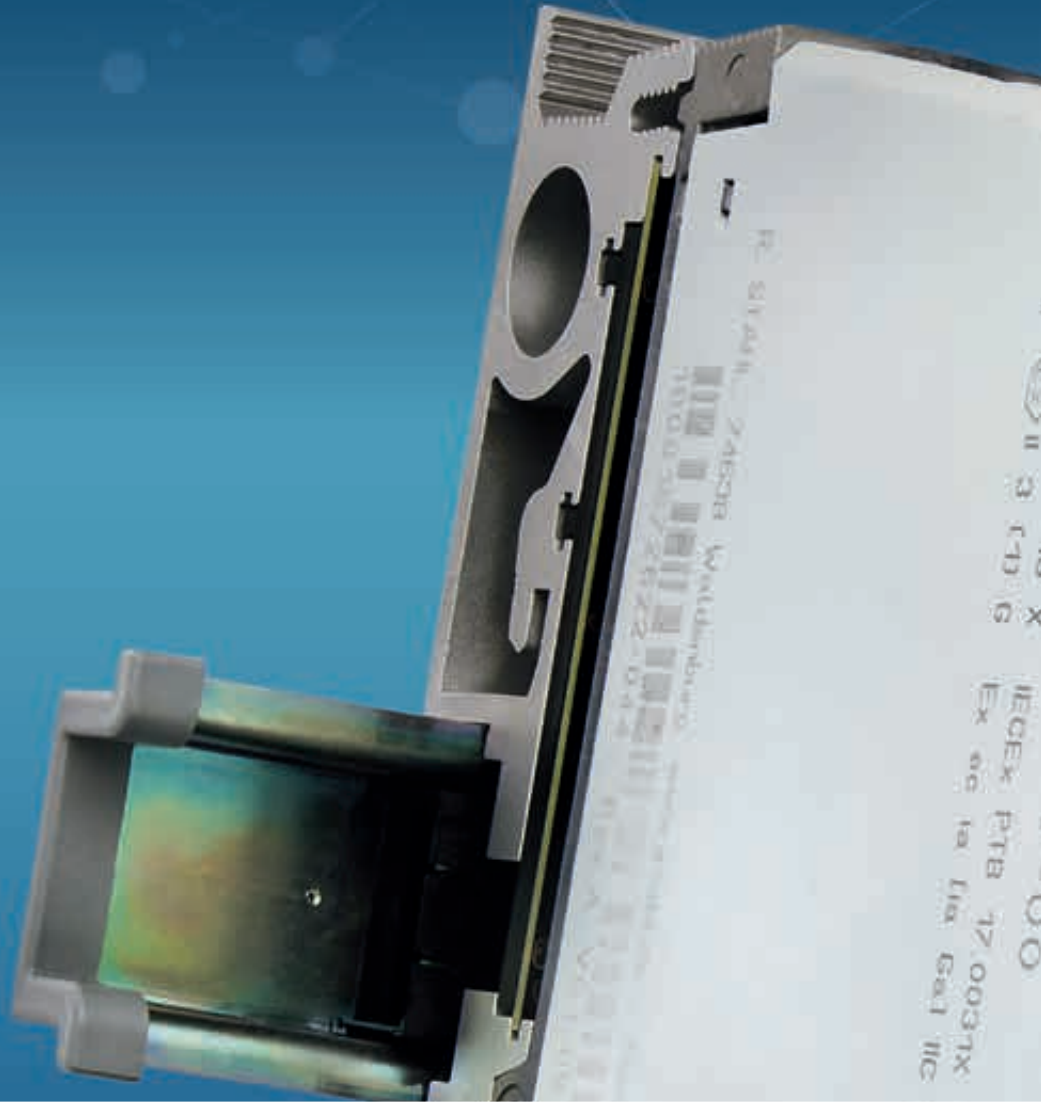


THE EVOLUTION OF REMOTE I/O

Nothing is more resistant than change – this still applies today and, in particular, to process automation. Remote I/O is playing an important role in this:

- Ethernet is becoming increasingly established for communication in the field – with IS1+, solutions for Zone 1 with optical interface are already available.
- We work together with other manufacturers and fieldbus organisations such as the APL Working Group on standardised 4- and 2-wire Ex i Ethernet solutions.
- NOA (NAMUR Open Architecture), OPA (Open Process Automation) as well as OPC UA are ideally suited to our modular and high-performance remote I/O systems.





R. STAHL
Am Bahnhof 30
74638 Waldenburg, Germany
T +49 7942 943-0
F +49 7942 943-4333
r-stahl.com/remoteio

