

# **SIMATIC ET 200SP HA**

## **The High Performance I/O for the Process Automation**

**Standard & new F, iEx Modules**

# | Overview

# SIMATIC ET 200SP HA

## ...high performance remote I/O for the Process Automation

### + Modular I/O series with one of the lowest footprint in process industries DCS

#### + Compact dimensions

- 203 x 163mm (high x depth)
- 16/32 channels at 22,5mm wide card
- up to 56 I/O modules per rack
- Cabinets with highest I/O density

#### + Ready for the field

- -40°..+70°C horizontal mounting, vertical +60°C
- conformal coating and severity level G3 (ISA-S71.04)
- EMC conformity according NAMUR NE21
- operation up to 4,000m above sea level

#### + Highest availability

- redundant 24V power supply
- redundant PROFINET interface
- redundant I/O modules

#### + Quick and easy wiring

- PROFINET via RJ45 and fiber optic
- field wire up to 2.5mm<sup>2</sup> with Push-In
- no screws, no torque testing
- D-SUB connector for preassembled cables

#### + Easy maintenance

- Online module replacement
- Online hardware configuration
- Online firmware update
- Identification & Maintenance data

#### + Full Range of I/O functionalities

- DI 24V with field device supply and 1ms time stamp
- DI 125V DC and DI 120..240V AC
- DQ 24V and RQ changeover relays 230V AC / 5A
- AI 0/4..20mA with HART, Thermocouple, RTD
- AQ with HART
- Configurable module with AI / DI / DQ, counter and frequency measurement

#### + Certificates



New!

- Intrinsically safe Ex modules
- Terminalblock with D-SUB

# SIMATIC ET 200SP HA

## ...flexible configuration of interface module and I/O modules



### Bus Adapter

Plugged into interface module to provide connectors for copper and fiber optic PROFINET cables



### Interface module

Plugged into carrier module to manage I/O data and PROFINET communication with Automation server



### Carrier module for interface modules

Placed on the left side of the mounting rail to carry one or two Interface modules

### I/O module

Plugged into terminal block to collect field sensor data (inputs) and to control field actuators (outputs)



### Terminal block

Plugged into the carrier it provides the process terminals for connecting field devices



### Carrier module

Fixed to mounting rail it provides mechanical support for terminal block and I/O module



### Server module and Powerbus cover

Both are plugged into the right-most carrier module to provide dust and EMC protection

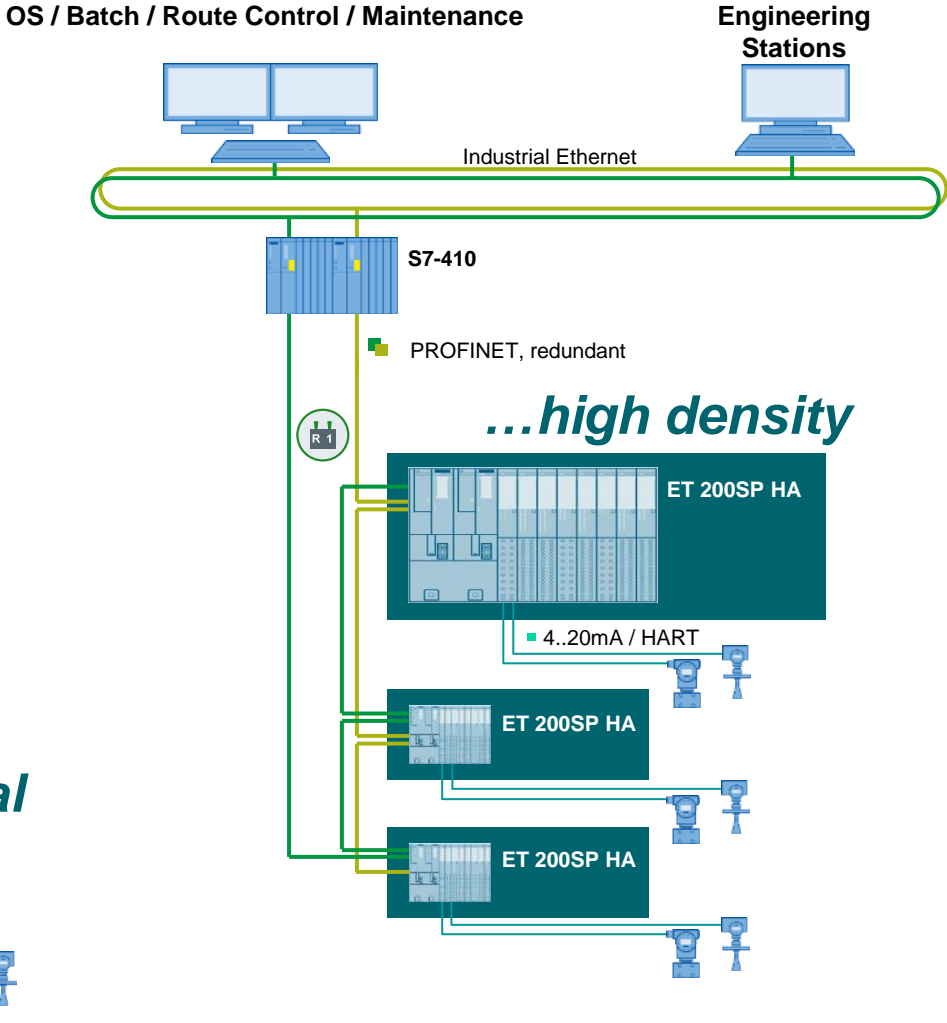
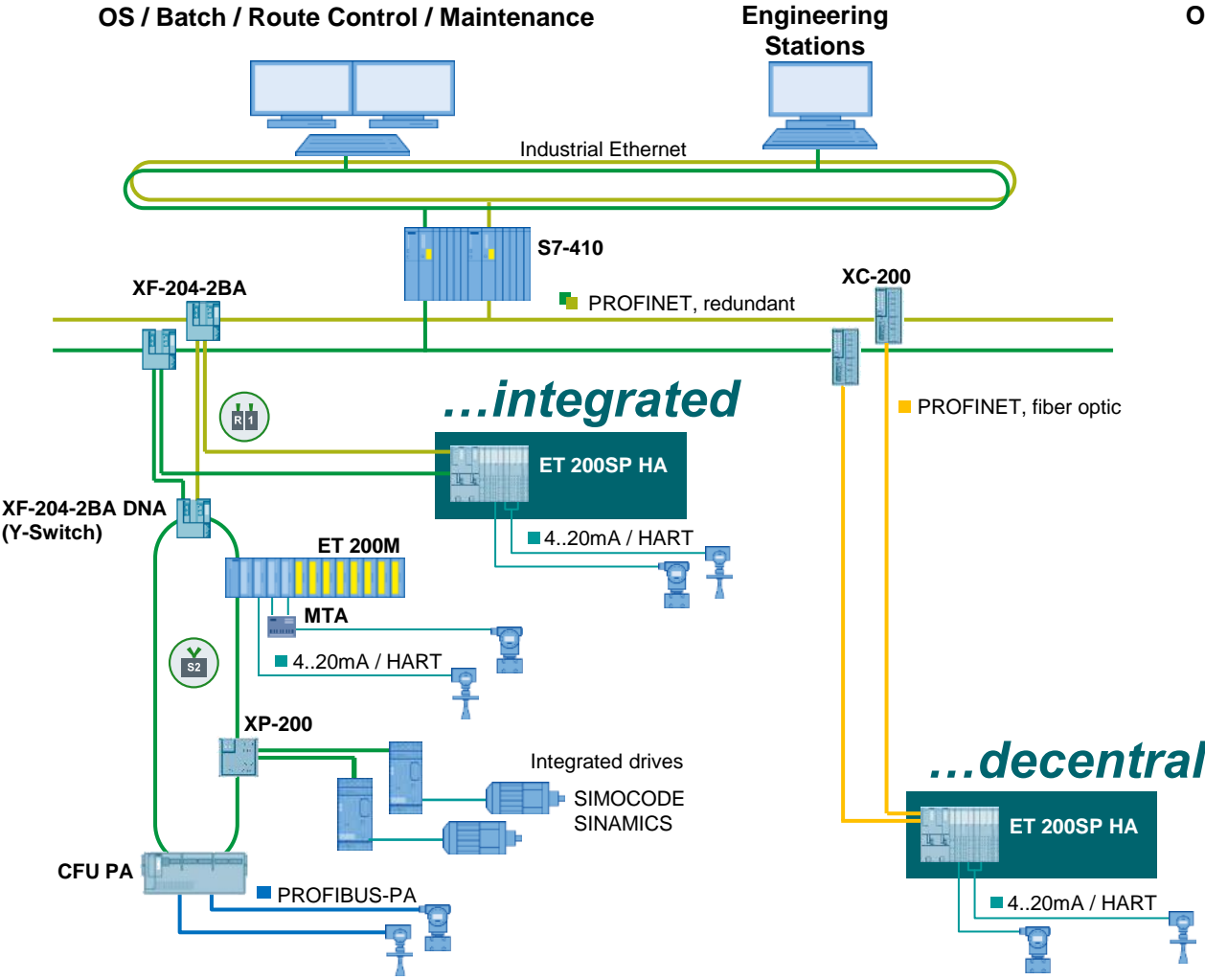


### Mounting rail

Mechanical support for carrier modules

# SIMATIC ET 200SP HA in PCS 7

...integrated with other I/O's, for decentral and high density setups



# ET 200SP HA

## ...fast configuration in TIA Selection Tool

### 1) Visit Configurator Page

<https://mall.industry.siemens.com/mall/en/us/Catalog/Configurators>

Industry Mall English ▶ Contact Us ▶ Help

## Configurators

Overview of all available configurators

Here you find all current available configurators of the Industry Mall together with their description and start options. You can start each configurator either with prefilled values if available or directly in any case.

Open all product categories

**+** Drive technology

**-** Automation technology

- > TIA Selection Tool cloud
  - > Contactor
  - > Controllers
  - > Electronic Overload-Relay
  - > Identification systems
  - > Industrial Communication
  - > Industrial Controls
  - > I/O systems
  - > SIMATIC Industrial PC
  - > Central and compact starter solutions 3RA2
  - > Motorstarter-Protector

### 2) Select I/O systems

### Direct link

<https://mall.industry.siemens.com/spice/tstweb/#/New-Device/>

### 3) Configure ET 200SP HA racks

SIEMENS My Projects > Project > ET 200SP HA (SIMATIC ET 200SP HA)

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# SIMATIC ET 200SP HA

...Process Automation I/O fully integrated since TIA Portal V16

## TIA – Totally Integrated Automation

New! with TIA V17

- Intrinsically safe ET 200SP HA Ex I/O
- Analog I/O modules with channelwise galvanic isolation ET 200SP HA



### + Customers benefit from:

- highest availability with S2, ready for R1 (redundant PROFINET interface) and integrated I/O redundancy
- de-energize, remove & insert in operation
- conformal coating of all components
- extended ambient temperature -40 .. 70° C
- outstanding EMC immunity complies to NAMUR NE21 without the need for surge protection devices
- integrated overcurrent protection and channel diagnose
- standard I/O, galvanic isolated I/O, intrinsically safe I/O
- fastest HART and analog value processing
- cabinets with highest I/O density
- cabinet templates in EPLAN, AutoCAD and PDF



Standard CPU 1500  
SIPLUS CPU 1500  
Redundant CPU 1500

## SIMATIC ET 200SP HA

HA - High Availability I/O System  
for all industries

# ET 200SP HA for TIA V16


## ... features and limitations to be considered

### Features / limitations in TIA V16

- Release of ET 200SP HA with SIMATIC S7-1500 in TIA-Portal
- Flexible and easy-to-scale network structures based on PROFINET
- Fast engineering with full integration in TIA V16
- Limitations towards PCS 7 installations with SIMATIC S7-410:
  - Process automation functionalities SOE, CiR, R1 and I/O Redundancy are not supported

### ++ Benefits

- New I/O System for all SIMATIC customers
- Robustness: Coating and extended operational temperature
- New product, long-time availability
- Easy to expand depending on future needs
- Reduced cabling efforts using powerful PROFINET



ET 200SP HA features in TIA Portal, PCS7 and STEP7

	I/O Redundancy	Configuration in Run (CiR)	Sequence of Events (SOE 1ms)	S1 PROFINET structure (single interface module at single controller)	S2 PROFINET structure (single interface module at redundant controller)	R1 PROFINET structure (redundant interface module at single controller)	Multi-Hotswap
<b>TIA Portal Project (V16)</b>							
CPU 1500	-	-	-	X	-	-	X
CPU 1500 R/H	-	-	-	X	X	-	X
<b>PCS7 Project (V9.0)</b>							
CPU410 V8.2 H	X	X	X	X	X	X	X
CPU 400 V6 H	X	-	-	X	X	-	X
CPU 400 V7	-	-	-	X	-	-	X
CPU 400 V6	-	-	-	X	-	-	X
<b>STEP7 Project (V5.6)</b>							
CPU 400 V6 H	x*)	-	-	X	X	-	X
CPU 400 V7	-	-	-	X	-	-	X
CPU 400 V6	-	-	-	X	-	-	X
CP443-1EX/GX30 V3.2**)	-	-	-	X	-	-	X

\*) no redundancy library available

\*\*\*) used as PN controller



# | Components

# ET 200SP HA I/O modules

## ...digital inputs

### DI 16x 24VDC

6DL1131-6BH00-0PH1

- 16 digital inputs 24V DC
- 16 field device supplies 500mA with short-circuit protection per channel
- suitable for switches and 2-/3-wire sensors (IEC 61131-2, type 1 and 3)
- de-energize button (field device supplies)
- I/O redundancy (with terminal block type M1)
- channelwise diagnostics (field device supply, short circuit to ground, wire-break)
- time stamping with 1ms accuracy
- isolation tested with 1500V DC / 1 min



### DI 32x 24VDC

6DL1131-6BL00-0PH1

- 32 digital inputs 24V DC
- 32 field device supplies 20mA with short-circuit protection (with terminal block P0)
- suitable for switches and 2-/3-wire sensors (IEC 61131-2, type 1 and 3)
- channelwise diagnostics (wire-break)
- isolation tested with 1500V DC / 1 min



### DI 16x NAMUR

6DL1131-6TH00-0PH1

- 16 digital inputs 8,2V
- 16 field device supplies with short-circuit protection
- suitable for NAMUR sensors and changeover contacts IEC 60947-5-6, sensors and changeover contacts with and without 10 kΩ, 2-wire sensors according NAMUR
- I/O redundancy (with terminal block type M1)
- channelwise diagnostics (field device supply and short-circuit to ground, wire-break, changeover contact error)
- isolation tested with 1500V DC / 1 min



### DI 8x 24..125VDC

6DL1131-6DF00-0PK0

- 8 digital inputs 24V to 125V DC
- suitable for switches and 2-/3-/4-wire sensors (IEC 61131-2, type 1 and 3)
- time stamping with 1ms accuracy
- channelwise diagnostics (wire-break)
- permitted potential difference between different circuits 300V DC / 250V AC
- isolation tested with 3500V DC / 1 min



### DI 8x 120..230VAC

6DL1131-6GF00-0PK0

- 8 digital inputs 120V / 230V AC (47-63 Hz)
- suitable for switches and 2-wire sensors (IEC 61131-2, type 3)
- permitted potential difference between different circuits 120V AC and up to 230V AC on the same system phase
- isolation tested with 4200V DC / 1 min



# ET 200SP HA I/O modules

## ...digital outputs

### DQ 16x 24VDC / 0,5A

6DL1132-6BH00-0PH1

- 16 digital outputs 24V DC
- 16 ground terminals for field device
- output current 0.5A per channel, max 8A per module
- suitable for solenoid valves, DC contactors, and indicator lights
- de-energize button (outputs)
- I/O redundancy (with terminal block type M1)
- short-circuit protection, overload protection
- channelwise diagnostics (wire-break, short-circuit to ground and to L+)
- configurable substitute values
- isolation tested with 1500V DC / 1 min



### DQ 32x 24VDC / 0,5A

6DL1132-6BL00-0PH1

- 32 digital outputs 24V DC
- 32 ground terminals for field device (with terminal block type N0)
- output current 0.5 A per channel, max 10A per module
- suitable for solenoid valves, DC contactors, and indicator lights
- de-energize button (outputs)
- short-circuit protection, overload protection
- channelwise diagnostics (short-circuit to ground)
- configurable substitute values
- isolation tested with 1500V DC / 1 min



### RQ 4x120VDC-230VAC/5A CO \*\*)

6DL1132-6HD50-0PK0

- 4 electrically isolated changeover relay outputs (NO/NC)
- 5A per relay output, 24V..120V DC / 24..230V AC
- suitable for solenoid valves, DC contactors, and indicator lights
- de-energize button (relays)
- configurable substitute values
- isolation tested with 4200V DC / 1 min



\*\* ) no IECEx / ATEX certificates, operation up to 3,000m above sea level

# ET 200SP HA I/O modules

## ...analog input and outputs

### AI 16x I HART

6DL1134-6TH00-0PH1

- 16 analog inputs 0..10mA, 0..20mA, 4..20mA, 4..20mA with HART
- 16 transmitter supplies 500mA with short-circuit protection
- suitable for 2-wire transmitters and 4-wire transmitters (common ground)
- signal fault levels according NAMUR NE43<sup>\*)</sup> **New!**
- 16 A/D converters operate in parallel, up to 16 bit resolution
- 16 HART modems operate in parallel
- up to 64 HART variables as process value with multiHART
- de-energize button (transmitter supply)
- I/O redundancy (with terminal block type M1)
- channelwise diagnostics (transmitter supply, short-circuit to ground, wire-break, short-circuit of transmitter supply to analog input, overflow/underflow)
- isolation tested with 1500V DC / 1 min



### AI 16x TC / 8x RTD

6DL1134-6JH00-0PH1

- 16 analog inputs for thermocouples TC / 8 analog inputs for resistance temperature detectors RTD (configurable per channel)
- measurement of resistance and RTD 2-, 3-, 4-wire connection 16 bit
- thermocouples B, C, E, J, K, L, N, R, S, T, U, 16 bit resolution
- millivoltage Inputs (-/+50mV, -/+80mV, -/+250mV, -/+1000mV)
- high resolution temperature values, 24 Bit resolution<sup>\*)</sup> **New!**
- I/O redundancy (with terminal block type M1)
- temperature compensation point within terminal block
- channelwise diagnostics (wire-break, overflow/underflow)
- common mode voltage between channels 75V DC / 60V AC
- isolation tested with 1500V DC / 1 min



### AI-DI 16x / DQ 16x 24VDC HART

6DL1133-6EW00-0PH1

- 16 analog / digital inputs (configurable per channel)
- 16 digital outputs 24V / field device supplies 500mA with short-circuit protection
- 0..10mA, 0..20mA, 4..20mA, 4..20mA with HART
- suitable for digital switches and 2-wire sensors (IEC 61131-2, type 1 and 3)
- suitable for analog 2-wire and 4-wire transmitters with common ground
- signal fault levels according NAMUR NE43<sup>\*)</sup> **New!**
- 8 counter up to 5 kHz / 32 Bit and frequency measurement 0,1 till 5 kHz<sup>\*)</sup> **New!**
- 16 A/D converters in parallel, 16 bit resolution
- 16 HART modems in parallel, 64 HART variables as process value
- de-energize button (field device supply)
- I/O redundancy (with terminal block type M1)
- channelwise diagnostics (field device supply, short-circuit to ground, short-circuit of transmitter supply to analog input, wire-break, overflow/underflow)
- time stamping with 1ms accuracy
- isolation tested with 1500V DC / 1 min



### AQ 8x I HART

6DL1135-6TF00-0PH1

- 8 analog outputs 0..10mA / 0..20mA / 4..20mA / 4..20mA with HART
- suitable for 2-wire analog field devices
- 8 D/A converters operate in parallel, up to 16 bit resolution
- up to 32 HART variables as process value with multiHART
- I/O redundancy (with terminal block type M1)
- outputs short-circuit proof to ground
- channelwise diagnostics (short-circuit to ground, wire-break, overflow/underflow)
- isolation tested with 1500V DC / 1 min



\*) update to FW V1.1 needed

# ET 200SP HA I/O modules

## Failsafe I/O modules in detail – Digital Input/Output

### F-DI 16x 24 V DC HA 6DL1136-6BA00-0PH1

- 16x failsafe digital input channels (SIL3/Cat.4/PLe)
- SIL3 per channel
- Short circuit-proof outputs for encoder supply per channel (max. 0.5 mA per channel)
- Suitable for switches and 2-/3-/4-wire proximity switches (BEROs)
- Channel-by-channel or module-wide passivation
- Programmable diagnostics functions (short-circuit and wire-break)
- 1oo1 and 1oo2 evaluation configurable for individual channels
- 10 ms precision time stamping
- Support of IO redundancy with standard REDUNDANT TB



### F-DQ 10x 24 V DC/2 A HA 6DL1136-6BA00-0PH1

- 10x failsafe digital output channels (SIL3/Cat.4/PLe)
- SIL3 per channel
- Maximum 2 A per channel (max. 10 A per module, typical 5 A @ 60° C)
- Suitable for solenoid valves, DC relay contactors and signal lamps
- Channel-by-channel or module-wide passivation
- Programmable diagnostics functions (short-circuit, overload, and wire-break)
- Support of IO redundancy with standard REDUNDANT TB



### F-AI 8x I 2-/4-wire HART HA 6DL1136-6AA00-0PH1

- 8x failsafe analog input channels (SIL3/Cat.4/PLe)
- SIL3 per channel
- 0/4..20mA with HART (1 HART modem per group, 2 groups)
- Short circuit-proof outputs for encoder supply per channel (max. 30 mA per channel)
- Suitable for 2-/4-wire sensors
- Channel-by-channel or module-wide passivation
- 1oo2 evaluation in Controller
- Programmable diagnostics functions (short circuit and wire-break)
- Support of IO redundancy with dedicated REDUNDANT TB



### REDUNDANT TB for F-AI 8x 6DL1193-6TP00-0DF1

- Type F1 with built-in Z-diodes
- 36x Push-In terminals: up to 2,5mm<sup>2</sup> wiring
- No support of power bus



# SIMATIC ET 200SP HA – Goes Intrinsically Safe!

## Intrinsically Safe I/O system in detail – Power Modul

### Ex-PM-E POWER MODULE

6DL1133-6PX00-0HW0

#### Input

24 V (Ex ec)

#### Output

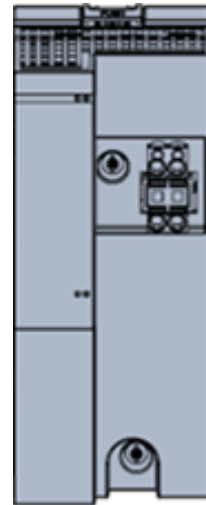
- 24 V intrinsically safe powering of subsequent Ex-ia I/O modules (Power Bus)
- Horizontal/vertical installation
- Up to 60° C/50° C : 0.8 A
- Up to 70° C/60° C : 0.6 A

#### Diagnostics

Monitoring the supply voltage

#### Characteristics

- Width: 50 mm
- Blank module (cover module) left-hand required, for combination with Standard ET 200SP HA I/O modules



### Ex-BU50 Type W0

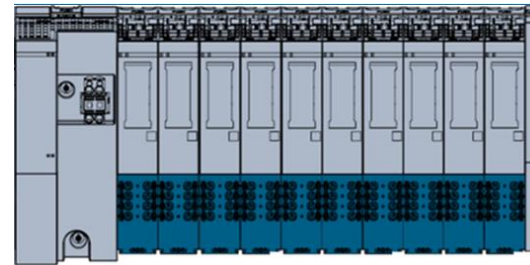
6DL1193-6BP00-0DW0

- Type W0 for Ex-PM-E (Power Module)
- Open Power Bus with up to 0.8 A
- Width: 50 mm

.....

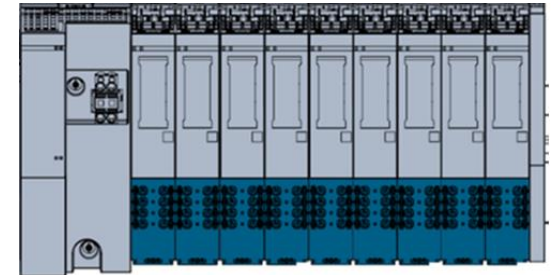
#### Typical configuration examples

**A):** 6x DI and 4x DQ



**Current consumption:**  
650 mA

**B):** 5x AI, 2x TC/RTD, 2x AQ



**Current consumption:**  
680 mA

# SIMATIC ET 200SP HA – Goes Intrinsically Safe!

## Intrinsically Safe I/O system in detail – Digital Input

### Ex-DI 4x NAMUR

6DL1131-6TD00-0HX1

#### Number of channels

4x intrinsically safe (Ex-ia) digital input channels (2-wire)

#### Sensor types

- NAMUR sensor
- Dry contact connected with or w/o 10 kΩ resistor

#### Functionalities

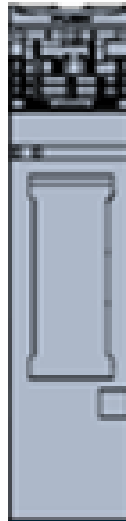
- 2x Counter up to 5 kHz
- Short-circuit protection

#### Channel diagnostics

- Supply voltage monitoring
- Wire-break/short-circuit

#### Characteristics

- Max input current consumption: 55 mA
- Encoder supply: 8.2 V
- Width: 20 mm



### Ex-BU20 Type X1

6DL1193-6BP00-0BX1

#### Type X1 Base Unit (BU) for:

- Ex-DI 4x NAMUR
- Ex-DQ 2x 17.4 V DC/27 mA/Ex-DQ 2x 23.1V DC/20 mA
- Ex-AI 2x I 2-wire HART/Ex-AI 4x TC/2x RTD 2-/3-/4-wire
- Ex-AQ 2x I HART
- Base Unit = “Terminalblock incl. Carrier”
- 8x Push-In terminals: up to 2.5 mm<sup>2</sup> wiring
- Integrated Power Bus
- Width: 20 mm



# SIMATIC ET 200SP HA – Goes Intrinsically Safe!

## Intrinsically Safe I/O system in detail – Digital Output

### Ex-DQ 2x 17.4 V DC/27 mA

6DL1132-6CB00-0HX1

#### Number of channels

2x intrinsically safe (Ex-ia) digital output channels (2-wire)

#### Actuator types

- Ex-i solenoid valves
- DC current relay

#### Functionalities

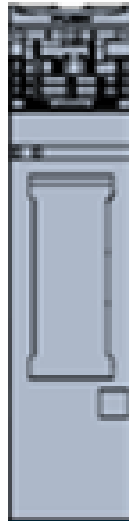
- Set substitute value, hold last value
- Short-circuit protection

#### Channel diagnostics

- Supply voltage monitoring
- Wire-break/Short-circuit

#### Characteristics

- Max input current consumption: 80 mA
- Output voltage: 17.4 V
- Max output current: 27 mA  
(54 mA – 2 channels in parallel)
- Width: 20 mm



### Ex-DQ 2x 23.1 V DC/20 mA

6DL1132-6EB00-0HX1

#### Number of channels

• 2x intrinsically safe (Ex-ia) digital output channels (2-wire)

#### Actuator types

- Ex-i solenoid valves
- DC current relay

#### Functionalities

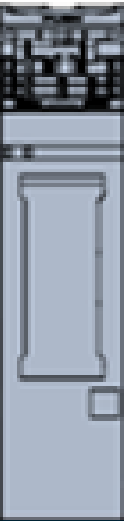
- Set substitute value, hold last value
- Short-circuit protection

#### Channel diagnostics

- Supply voltage monitoring
- Wire-break/Short-circuit

#### Characteristics

- Max input current consumption: 80 mA
- Output voltage: 23.1 V
- Max output current: 20 mA
- Width: 20 mm





# SIMATIC ET 200SP HA – Goes Intrinsically Safe!

## Intrinsically Safe I/O system in detail – Analog Input

### Ex-AI 2x I 2-wire HART

6DL1134-6TB00-0HX1

#### Number of channels

2x intrinsically safe (Ex-ia) analog input channels (2-wire)

#### Input Ranges

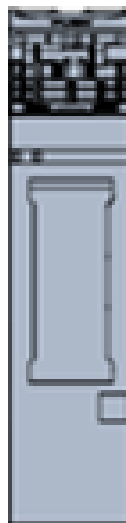
0/4..20 mA with HART

#### Channel diagnostics

- Supply voltage monitoring
- Wire-break (4..20 mA)/Short-circuit

#### Characteristics

- Max input current consumption: 92 mA
- Encoder supply: 24 V
- Resolution 16 bit
- Accuracy:  $\pm 0.3\%$
- Width: 20 mm



### Ex-AI 4x TC/2x RTD 2-/3-/4-wire

6DL1134-6JD00-0HX1

#### Number of channels

2x/4x intrinsically safe (Ex-ia) analog input channels (2/3/4-wire)

#### Inputs

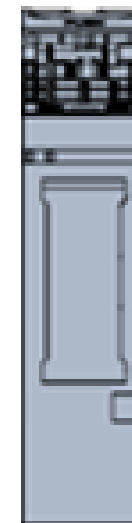
- 2x RTD (Resistance Temperature Device)
  - CU10, NI100/1000/120/200/500, LG-NI1000, PT100/200/500/1000
- 4x Voltage
  - $\pm 1$  V,  $\pm 250$  mV,  $\pm 50$  mV,  $\pm 80$  mV
- 4x TC (Thermocouple)
  - Typ B,C,E,J,K,L,N,R,S,T,U,TKX & TKX(L)
- 2x Resistance
  - PTC, 0-150/300/600/3000/6000  $\Omega$

#### Channel diagnostics

- Supply voltage monitoring
- Wire-break
- Overflow and underflow

#### Characteristics

- Max input current consumption: 40 mA
- Encoder supply: 24 V
- Resolution 16 bit
- Accuracy:  $\pm 0.1\%$
- Width: 20 mm



# SIMATIC ET 200SP HA – Goes Intrinsically Safe!

## Intrinsically Safe I/O system in detail – Analog Output

**Ex-AQ 2x I HART**

6DL1135-6TB00-0HX1

### Channels

- 2x intrinsically safe (Ex-ia) analog output channels (2-wire)

### Output Ranges

- 0/4..20 mA with HART

### Channel diagnostics

- Supply voltage monitoring
- Wire-break/short-circuit
- Overflow and underflow

### Characteristics

- Max input current consumption 70 mA
- Load impedance 500  $\Omega$
- Accuracy:  $\pm 0.5\%$  ( $\pm 0.3\%$  @60C)
- Width: 20 mm



# ET 200SP HA additional I/O modules

## ...extension of the ET 200SP HA system by additional modules

### + Additional I/O modules

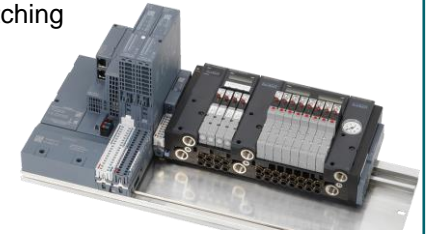
- Reduced system operating temperature range (e.g. -30°..+60°C)
- Strict slot rules: SP HA I/O modules behind additional modules not allowed (no mixture)
- I/O redundancy not supported
- No conformal coating
- No NE21 conformity
- Reduced Isolation protection



### Bürkert AirLINE SP (Add-on product)

Valve islands type 8647 by Bürkert Fluid Control Systems

- High quality pneumatics from Bürkert
- Pilot valves, Globe valves, solenoid valves in 3/2, 2x 3/2, 5/2 and 5/3 way
- Integrated Safety functionality for a safe valve deactivation up to SIL3 / Ple
- Integrated check valves to avoid unwanted valve switching
- Easy diagnostics by LC display, e.g. display of valve switching positions, short-circuit & wire-break
- Hot-Swap support
- Operating temperature: 0 .. +50°C
- Integration since PCS 7 V9.0 SP2 via Hardware Update Package (HUP) provided by Bürkert



### ET 200SP AI Energy Meter 480VAC ST

6ES7134-6PA20-0BD0

- Measurement of voltage, current, energy, frequency, power, active and reactive power and power factor e.g. for load management applications
- Retentive count value storage after each measuring cycle (50 ms)
- 3 x 1-phase measurement
- 16 individual limit values, with hysteresis
- Energy meter: periodic or infinite, with gate
- Calculation of neutral conductor current
- Min/max values
- Operating hours counter with gate and selectable low current limit
- User calibration of current, voltage and phase angle
- isolation tested with 2300V AC / 1 min
- Operating temperature: 0 .. +60°C



### SIWAREX WP321 (Add-on product)

7MH4138-6AA00-0BA0

- Basic scale for ET 200SP
- Measuring of weights and forces with a resolution of up to +/- 2 million parts
- 100 / 120 / 600 Hz measurement rate
- Internal scale monitoring of freely definable limit values
- Automatic calibration is possible without the need for calibration weights
- Full-bridge strain gauges in 4-wire or 6-wire system are supported
- Dedicated firmware for platform scales, silo-, tank, hopper scales
- Support of Siwarex DB digital junction box for single cell monitoring
- Operating temperature: -25 .. +60°C
- Including function block and faceplate in APL style (7MH4900-1AK61) since PCS 7 V9.0 SP2



# ET 200SP HA Bus Adapter

## ...modular PROFINET connection for various topologies

+ cost-efficient PROFINET connection

+ fast connection of PROFINET wire without plug assembly effort

+ long distance and EMC robustness with fiber optic cables

+ media switchover / fiber optic

+ migration, copper up to 500m

standard RJ 45 connector



**BUSADAPTER 2xRJ45**  
6DL1193-6AR00-0AA0

Fast Connect connection



**BUSADAPTER 2xFC**  
6DL1193-6AF00-0AA0

Fiber optic LC connector



**BUSADAPTER 2xLC**  
6DL1193-6AG00-0AA0

Media switchover Co/FO

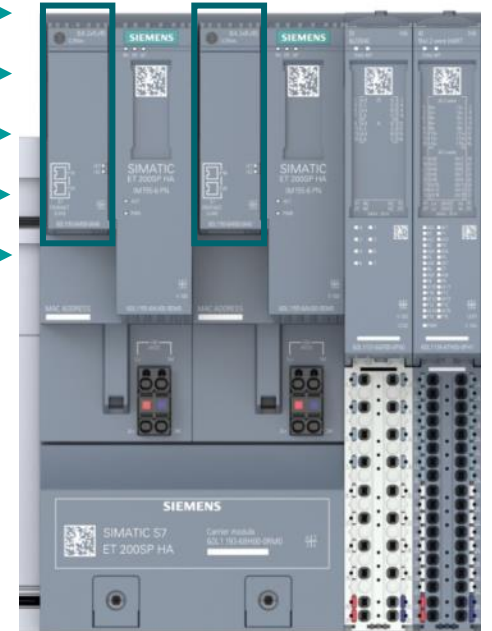


**BUSADAPTER LC/RJ45**  
6DL1193-6AG20-0AA0  
**BUSADAPTER LC/FC**  
6DL1193-6AG40-0AA0

existing copper wires



**BUSADAPTER 2xVD**  
6GK5991-2VA00-8AA2



**+ Universal interface for PROFINET connection via Bus Adapter**

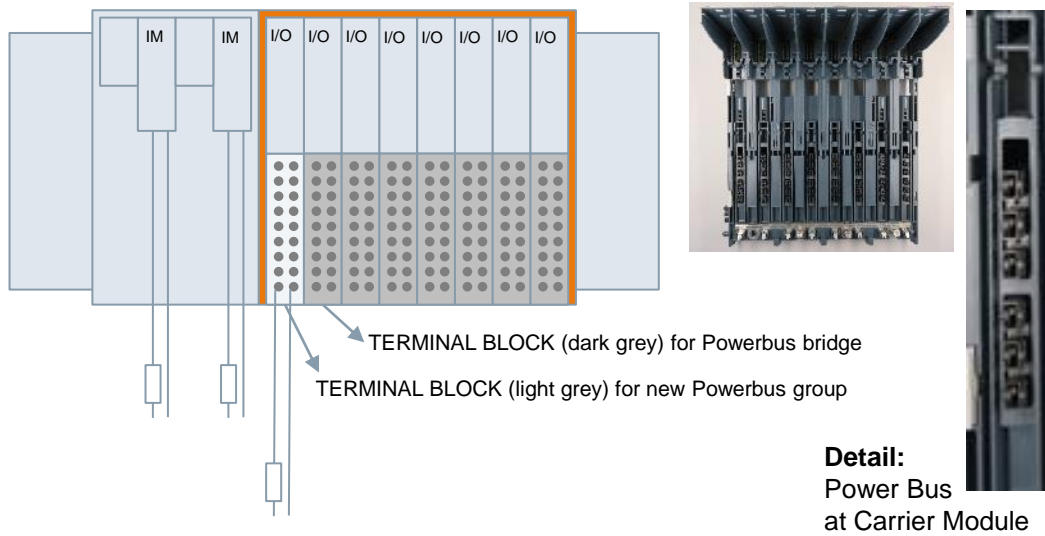
PROFINET cable specification min. CAT 5(e)

# ET 200SP HA Carrier Module options

## ...cost reduction and new possibilities

### CARRIER MODULE EIGHTFOLD (with Power Bus)

6DL1193-6GC00-0NN0

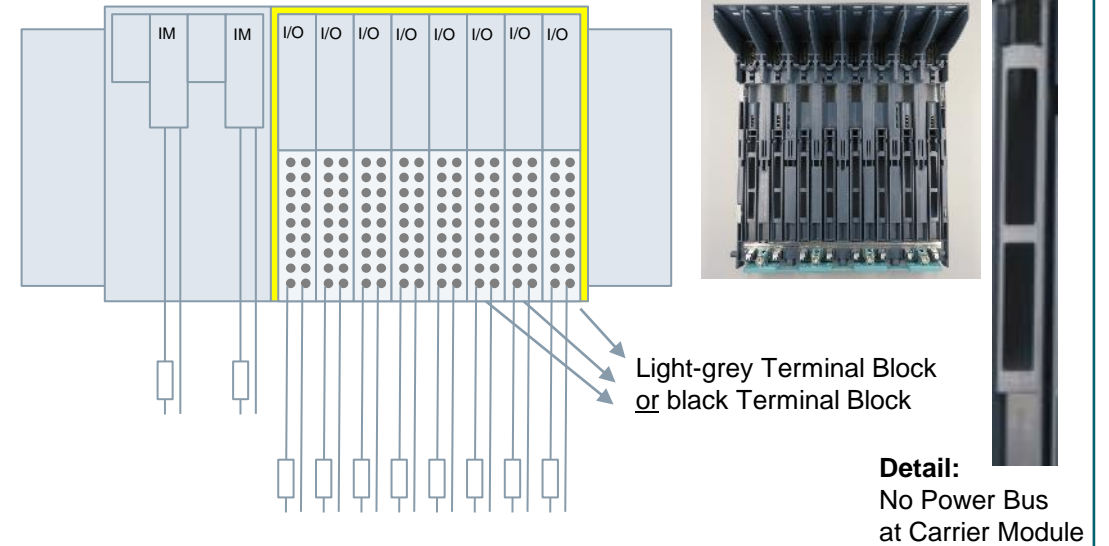


- One power feed at light-grey terminal block per Power Bus group
- Power transmitted to next I/O card by clamps of Carrier module
- Advantage: less cabling and less fusing

### CARRIER MODULE EIGHTFOLD W/O PB

6DL1193-6GC00-8NN0

New!



- Carrier without Power Bus clamps
- Each I/O card has to be individually powered
- Advantage: reduced price due to reduced material and manufacturing cost

# SIMATIC ET 200SP HA

...New D-SUB Terminal Block for fast wiring and simple field connection

## TERMINAL BLOCK, TYPE H0, D-SUB

6DL1193-6TC00-0DH0

New!

- for the connection of preassembled cables with D-SUB 37 (female)
- D-SUB Terminal Block with 32 x I/O connections
- current carrying capacity per pin (D-SUB) up to 2A
- isolation tested with 1500V DC / 1 min
- additional connector for 24V load supply and M (0V)
- compatible with all carrier modules (8-fold, 8-fold w/o PB, 2-fold)
- black color: no Powerbus feature
- no temperature compensation for TC



## Supported ET 200SP HA Modules

- AI 16xI HART, AI-DI16/DQ16X24VDC HART
- AI 16XTC/8XRTD (no temperature compensation for TC)
- AQ 8xI HART
- DI 16x24VDC, DI 32x24VDC, DI 16XNAMUR
- DQ 16x24VDC/0,5A, DQ 32x24VDC/0,5A



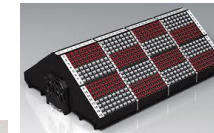
## usecase #migration

fast switchover without touching field wire



## usecase #greenfield

fast and error-free connection of wiring boards and marshalling terminals



## SIMATIC TOP Connect Cable

- Pre-assembled D-SUB to ferruled flying leads cable
- 32x wire with 0,14mm<sup>2</sup>
- label per wire
- 3m: 6ES7923-3BD00-0HB0
- 5m: 6ES7923-3BF00-0HB0
- 8m: 6ES7923-3BJ00-0HB0



New!

# | Features

# ET 200SP HA

## ...one platform, many chances

### Redundant Interface Module

- Highest I/O rack availability



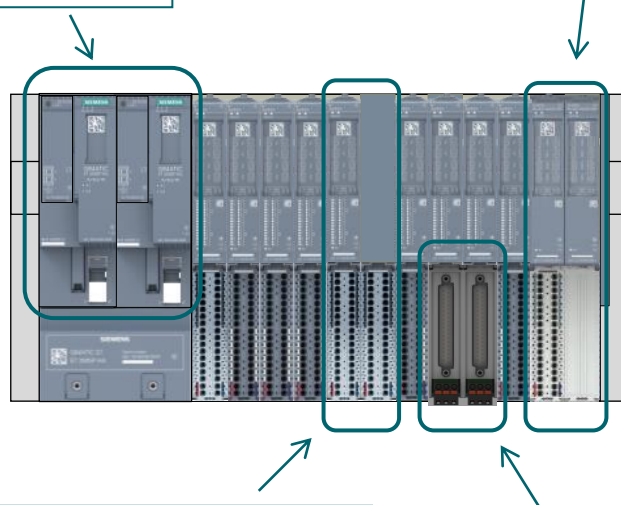
### Redundant I/O modules

- Flexible use with I/O Redundancy Terminal blocks
- Fast switchover of side-by-side cards, independent of CPU
- no additional components, no MTA
- no additional wiring
- much less cabinet space needed

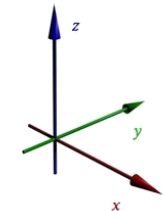


Alternative:

### Singular Interface Module



### Compact dimensions



y: rack width 16 I/O modules 500 mm  
 x: Tiefe inkl Profilschiene 163 mm  
 z: Höhe 203 mm

### 32-channel cards

- binary Inputs and Outputs for cost sensitive applications, smart channel diagnostics
- even more compact dimensions for large I/O installations
- Additional terminals for field device supply and ground via Terminal Blocks Type P0 / N0

### D-Sub Terminal Blocks

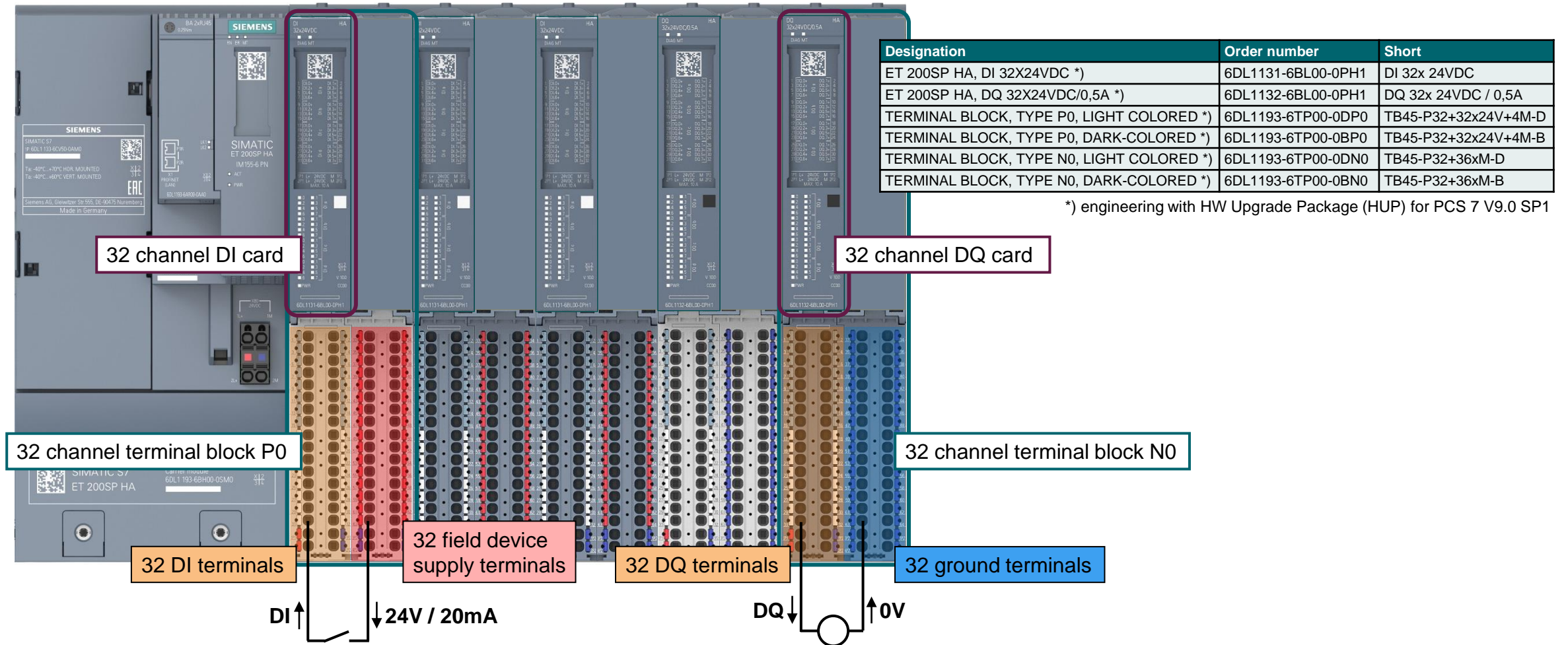
- Fast and error-free switchover for migrations
- Easy connection of terminal and relay boards or marshalling cabinets





# ET 200SP HA 32 Channel cards

... new entry level cards and terminal blocks with overcurrent protection



# ET 200SP HA field device supplies

... integrated field supply with diagnostics reduces downtime and costs

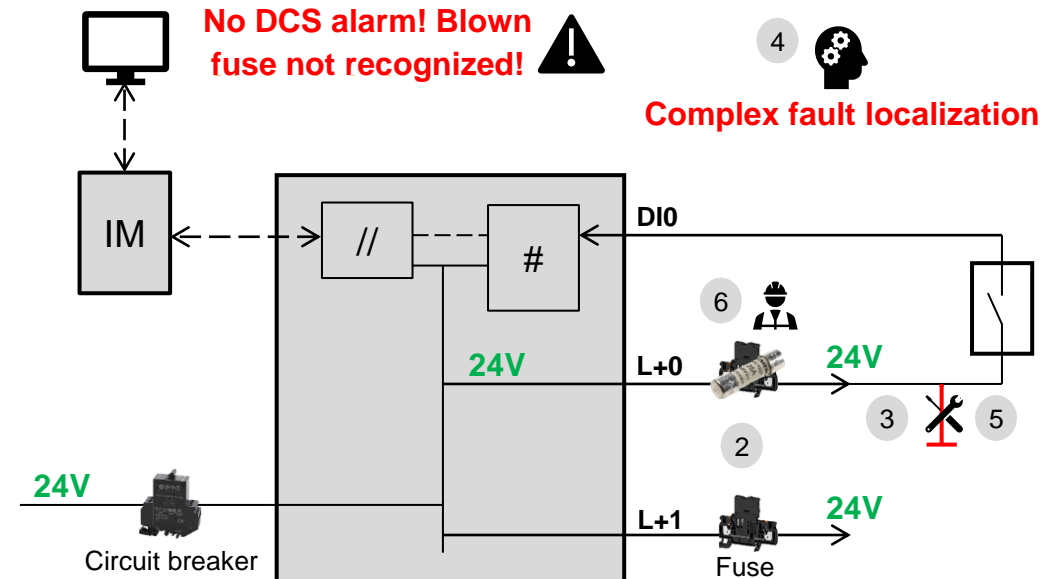
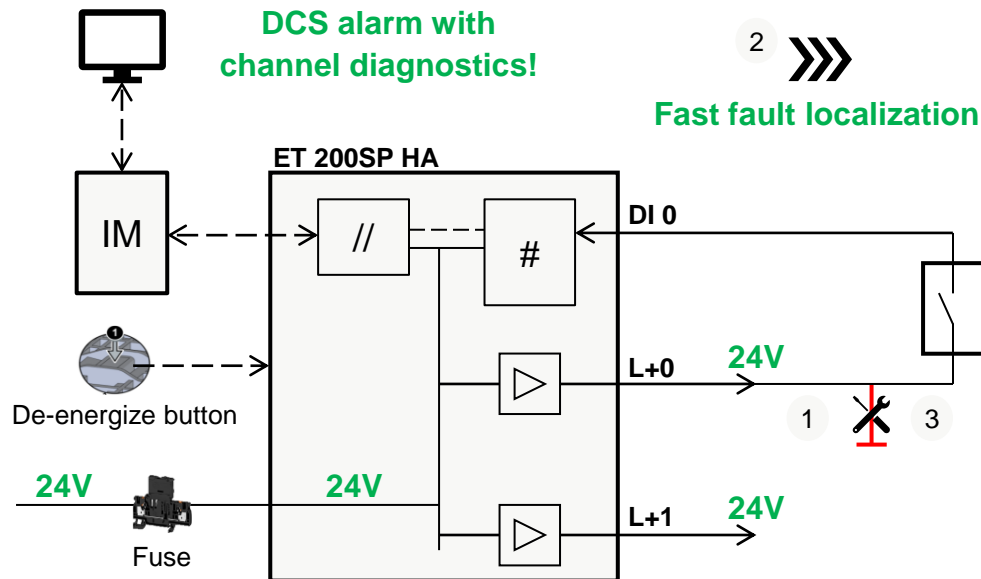
## Short circuit with ET 200SP HA

- 1) Short-circuit → Power output stops → DCS alarm
- 2) Diagnose on single channel level → Fast fault localization
- 3) Fix short-circuit → Operation resumes



## Short circuit with conventional I/O

- 1) Short-circuit → CB blows → DCS alarm
- 2) To avoid full stop: Single channel fuses
- 3) Short circuit → Fuse blows → No DCS alarm!
- 4) No diagnose → Complex fault localization
- 5) Fix short circuit
- 6) Replace fuse → Operation resumes



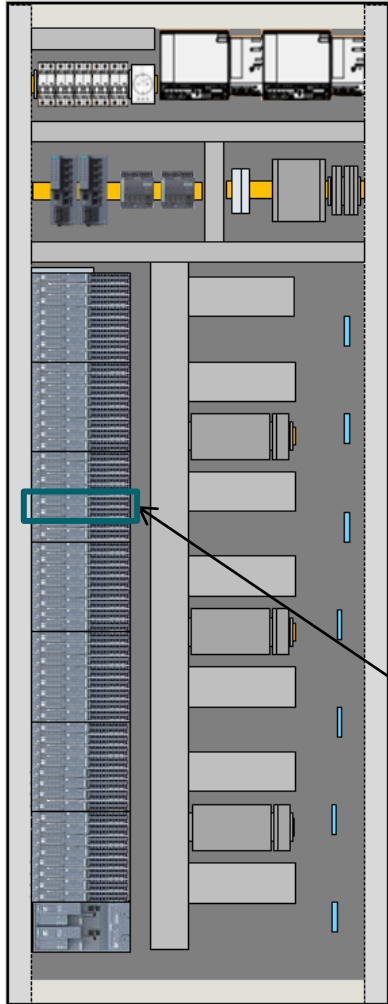
**Pros: cheap card fusing, no channel fusing, DCS alarm, detailed diagnose, fast fault localization, no fuse replacement**

**Cons: cost of circuit breaker, cost of single channel fusing, no DCS alarm, no fault diagnose, complex fault localization, fuse replacement**

# | Cabinet design

# SIMATIC ET 200SP HA

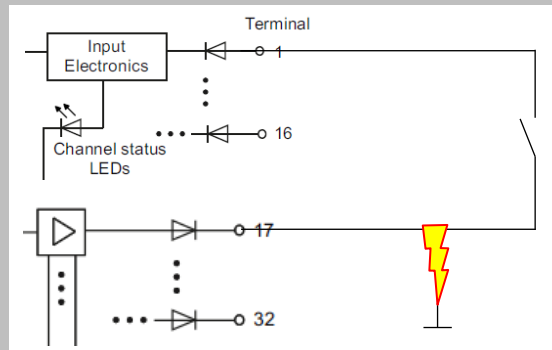
... integrated electronic protection for fast troubleshooting and reduced costs



## ET 200SP HA – integrated field device supply with overcurrent protection

In the case of short-circuit:

- 1) field device supply stops power output
- 2) alarm on single channel level
- 3) troubleshooting
- 4) resume operation at DCS



integrated short-circuit protection (~780 I/O)

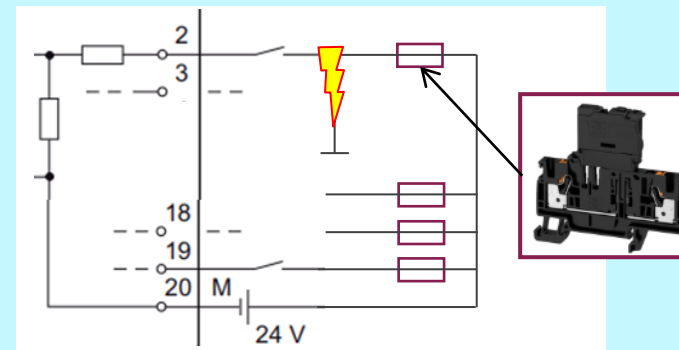
→ Compact and cheaper cabinets due to integrated overcurrent protection

- ✓ compact cabinets (no space consuming field fuses)
- ✓ faster and cheaper manufacturing (no internal wiring of field fuses)
- ✓ faster troubleshooting (channelwise diagnose and no fuse replacement)

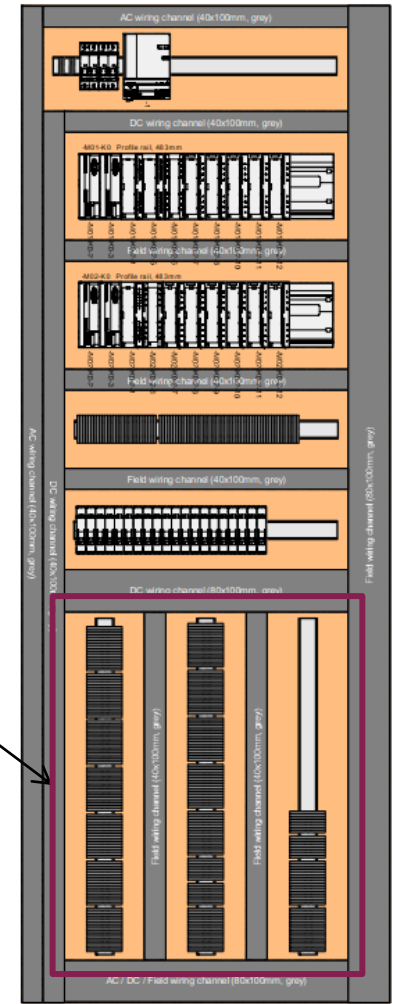
## Standard I/O – field wire must be protected by single fuses

In the case of short-circuit:

- 1) fuse will blow
- 2) no diagnose (opt. trouble alarm, costly)
- 3) localization, troubleshooting, fuse replace
- 4) resume operation at DCS

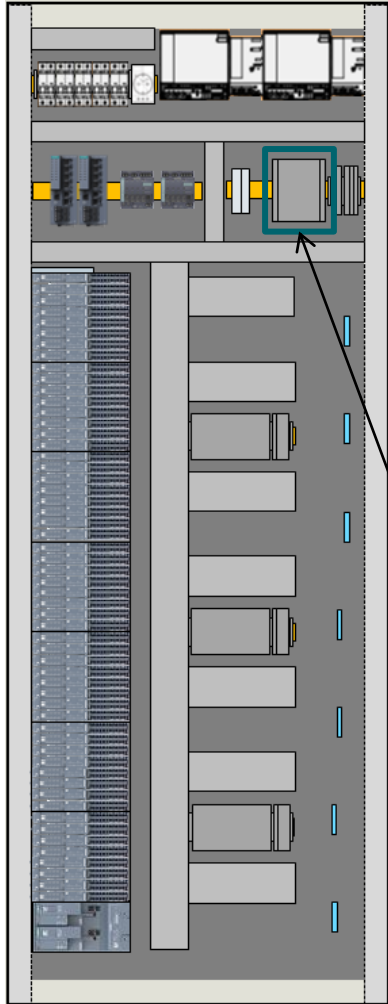


single channel fusing (~220 I/O)



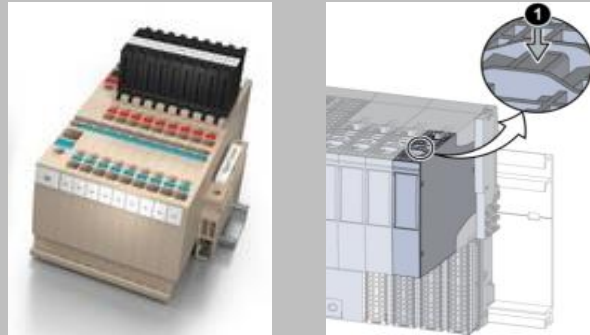
# SIMATIC ET 200SP HA

... fusing cost and space consumption dramatically reduced



## ET 200SP HA – integrated functionality

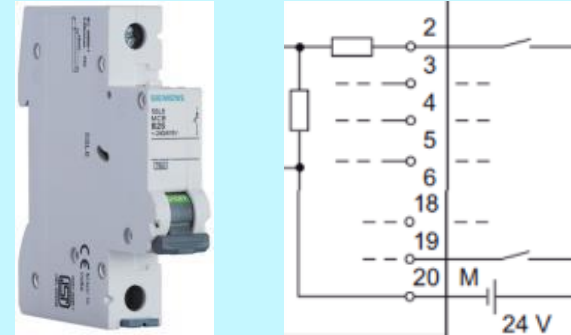
- de-energize of outputs: pushbutton
- protection of field wire: overcurrent protection
- protection of I/O card: internal fuse
- protection of supply wire: cheap cartridge fuse
- number of fuses: variable with Powerbus



compact and cheap fuses

## Standard I/O – circuit breakers needed

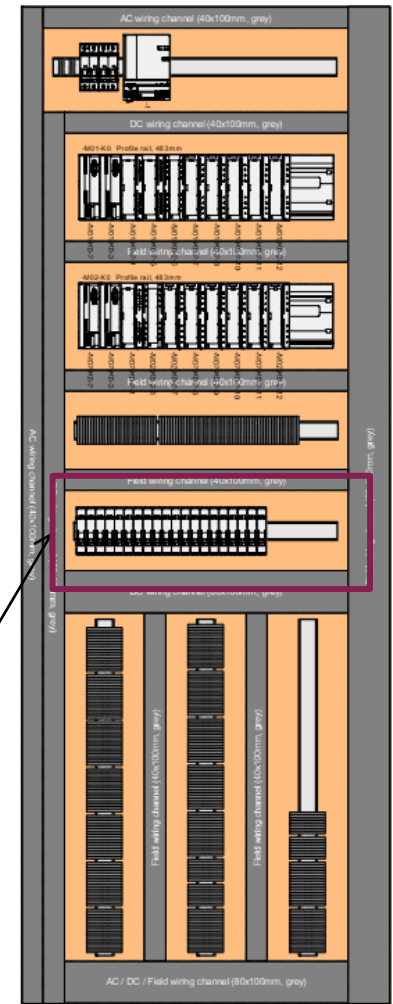
- de-energize of outputs: circuit breaker
- protection of field wire: circuit breaker
- protection of I/O card: circuit breaker
- protection of I/O card supply wire: circuit breaker
- number of circuit breaker: CB per I/O card



costly and space consuming circuit breakers

## → Less fusing and more compact cabinets with ET 200SP HA

- ✓ cheaper fusing (fuse “only” protects internal cabinet wiring)
- ✓ compact fusing (compared to circuit breakers)
- ✓ less fusing (one fuse for several I/O modules with Powerbus)



## **...ET 200SP HA provides cabinet cost savings, simplified cabinet standardization and comes with robustness for decentral installation**

### **+ Compact design and vertical installation**

Up to 896 I/O per side can be installed in a 800 mm wide enclosure. Even marshalling can be provided on the same panel due to vertical I/O rack installation. No additional marshalling cabinets or marshalling to the rear cabinet side are needed.

→ **less I/O and marshalling cabinets, less electronic room real estate**

### **+ Integrated short-circuit overcurrent protection**

In case of a short-circuit in the field the overcurrent protection stops the power supply of the affected field device. This ensures the further operation of the non-affected channels. An individual fusing of channels is not needed anymore. Short-circuit diagnose is provided on the single channel level.

→ **less panel space, no field fusing and wiring cost, detailed short-circuit diagnostics**

### **+ System-integrated I/O redundancy**

Flexible use of I/O redundancy with Redundancy Terminal Blocks. No additional components or wiring are needed.

→ **less panel space, no additional components and wiring cost, optimized cabinet standardization**

### **+ Optimized cabinet standardization and project execution**

System-integrated features facilitate the cabinet standardization. Standard cabinets can be ordered in early project phase and manufactured in parallel to detailed engineering. Field wires can be terminated without having the I/O card in place. Finally the right I/O card is ordered and plugged in.

→ **optimized cabinet standardization, compressed project schedule**

### **+ Robustness for decentral installation**

Decentral installation significantly reduces field cabling effort and results in major construction cost savings. ET 200SP HA components have a conformal coating and can be operated up to 70°C. Components can be installed in Ex Zone 2 and provide extended EMC robustness for in-the-field operation. Long distance PROFINET communication with EMC-resistant fiber optic cables.

→ **less cableway engineering, less cable material and installation, less electronic room real estate**

# I Thank you for your attention!

**For further information and support, please contact:**

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