



SIMATIC ET 200SP HA, digital input module, safety-oriented F-DI 16X24VDC HA, SIL3 (IEC 61508), up to PL E (ISO 13849-1) suitable for terminal block H1, M1, color code CC01, channel diagnostics

General information	
Product type designation	F-DI 16x24VDC HA
Firmware version	V1.0
• FW update possible	Yes
Usable terminal block	type H1, M1, N0, H0, M0 (for details see the system manual)
Color code for module-specific color identification plate	CC01
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 configurable/integrated from version	V5.6 SP2 V9.0 SP3 (with S7 F Systems V6.3)
• PCS 7 configurable/integrated from version	V9.0 SP3 (with S7 F Systems V6.3)
• PROFINET from GSD version/GSD revision	GSDML V2.42 2023.01
Operating mode	
• DI	Yes
Redundancy	
• Redundancy capability	Yes; With TB type M1
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Input current	
Current consumption (rated value)	80 mA
Current consumption, max.	150 mA
Encoder supply	
Number of outputs	16
24 V encoder supply	
• 24 V	Yes; Min. L+ (-1 V)
• Short-circuit protection	Yes; electronic (response threshold 0.7 A to 1.5 A; for IO redundancy up to 3 A). Ensure sufficient cable cross-section to attain the response threshold. Depending on the cable cross-section used, there may be constraints regarding the usable length of cable
• Output current per channel, max.	0.5 A
• Output current per module, max.	8 A
Power	
Power consumption from the backplane bus	90 mW
Power loss	

Power loss, typ.	3.2 W; All channels equipped with internal encoder supply and switch contacts, at rated voltage and ambient temperature
Address area	
Address space per module	
• Inputs	9 byte
• Outputs	5 byte
Hardware configuration	
Automatic encoding	Yes
Digital inputs	
Number of digital inputs	16
Digital inputs, parameterizable	Yes
Source/sink input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input characteristic curve in accordance with IEC 61131, type 2	No
Input characteristic curve in accordance with IEC 61131, type 3	No
Pulse extension	Yes
• Length	off, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s
Time stamping	Yes; Resolution 10 ms
Signal change flutter	Yes
Flutter observation window	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5 V
• for signal "1"	+15 to +30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— parameterizable	Yes
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
— permissible quiescent current (2-wire sensor), max.	1.5 mA
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Maintenance interrupt	Yes
Diagnoses	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes; Module-wise
— parameterizable	Yes
• Monitoring of encoder power supply	Yes; channel by channel
• Wire-break	Yes; channel by channel, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 18 kOhm to 30 kOhm, typical 26 kOhm
• Short-circuit to M	Yes; Encoder supply to M, channel by channel
Diagnostics indication LED	
• MAINT LED	Yes; Yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red LED
Potential separation	
Potential separation channels	
• between the channels	No

- between the channels and backplane bus
- between the channels and the power supply of the electronics

Yes
No

Isolation

Isolation tested with 1 500 V DC/1 min, type test

Standards, approvals, certificates

Suitable for safety functions Yes

Highest safety class achievable in safety mode

- Performance level according to ISO 13849-1 Up to PLe
- Category according to ISO 13849-1 Cat. 4
- SIL acc. to IEC 61508 SIL 3

Probability of failure (for service life of 20 years and repair time of 100 hours)

- Low demand mode: PFDavg in accordance with SIL3 < 3.00E-05
- High demand/continuous mode: PFH in accordance with SIL3 < 2.00E-09 1/h

Ambient conditions

Ambient temperature during operation

- horizontal installation, min. -40 °C
- horizontal installation, max. 70 °C
- vertical installation, min. -40 °C
- vertical installation, max. 60 °C

Dimensions

Width 22.5 mm
Height 115 mm
Depth 138 mm

Weights

Weight, approx. 210 g

Classifications

	Version	Classification
eClass	14	27-24-26-04
eClass	12	27-24-26-04
eClass	9.1	27-24-26-04
eClass	9	27-24-26-04
eClass	8	27-24-26-04
eClass	7.1	27-24-26-04
eClass	6	27-24-26-04
ETIM	10	EC001599
ETIM	9	EC001599
ETIM	8	EC001599
ETIM	7	EC001599

Approvals / Certificates

General Product Approval



[China RoHS](#)



[KC](#)



General Product Approval

For use in hazardous locations



[Declaration of Conformity](#)



For use in hazard-

Functional Safety

Maritime application

ous locations					
Miscellaneous	TUEV	Type Examination Certificate	TUEV		
Maritime application					Environment
		NK / Nippon Kaiji Kyokai		CCS (China Classification Society)	
Environment	Industrial Communication				
	PROFIsafe				

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