



SIMATIC ET 200SP HA, ET 200SP, analog ex-i input module, Ex-AI 4xTC/2xRTD 2-/3-/4-wire, suitable for BaseUnit type X1, channel diagnostics, 16bit, +/-0.05%



Figure similar

General information	
Product type designation	Ex-AI 4xTC/2xRTD 2-/3-/4-wire
Firmware version	V1.0
• FW update possible	Yes
usable BaseUnits	BU type X1
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V16
• STEP 7 configurable/integrated from version	V5.6 SP2
• PCS 7 configurable/integrated from version	V9.1
• PCS neo can be configured/integrated from version	V3.1
• PROFINET from GSD version/GSD revision	GSDML V2.35
Operating mode	
• MSI	Yes
Redundancy	
• Redundancy capability	No
CiR - Configuration in RUN	
Reparameterization possible in RUN	Yes
Input current	
Current consumption (rated value)	33 mA
Current consumption, max.	40 mA
Power loss	
Power loss, typ.	0.8 W
Address area	
Address space per module	
• Address space per module, max.	16 byte; + 1 byte for QI information
• Inputs	16 byte; + 1 byte for QI information
Hardware configuration	
Automatic encoding	
• Mechanical coding element	Yes
Selection of BaseUnit for connection variants	
• 2-wire connection	BU type X1
• 3-wire connection	BU type X1

• 4-wire connection	BU type X1
Analog inputs	
Number of analog inputs	
• For voltage measurement	4
• For resistance/resistance thermometer measurement	2
• For thermocouple measurement	4
Constant measurement current for resistance-type transmitter, typ.	0.5 mA
Technical unit for temperature measurement adjustable	Yes; °C/°F/K
Input ranges (rated values), voltages	
• -1 V to +1 V	Yes; 16 bit incl. sign
— Input resistance (-1 V to +1 V)	1 MΩ
• -250 mV to +250 mV	Yes; 16 bit incl. sign
— Input resistance (-250 mV to +250 mV)	1 MΩ
• -50 mV to +50 mV	Yes; 16 bit incl. sign
— Input resistance (-50 mV to +50 mV)	1 MΩ
• -80 mV to +80 mV	Yes; 16 bit incl. sign
— Input resistance (-80 mV to +80 mV)	1 MΩ
Input ranges (rated values), thermocouples	
• type B	Yes; 16 bit incl. sign
— Input resistance (Type B)	1 MΩ
• type C	Yes; 16 bit incl. sign
— Input resistance (Type C)	1 MΩ
• Type E	Yes; 16 bit incl. sign
— Input resistance (Type E)	1 MΩ
• Type J	Yes; 16 bit incl. sign
— Input resistance (type J)	1 MΩ
• Type K	Yes; 16 bit incl. sign
— Input resistance (Type K)	1 MΩ
• Type L	Yes; 16 bit incl. sign
— Input resistance (Type L)	1 MΩ
• Type N	Yes; 16 bit incl. sign
— Input resistance (Type N)	1 MΩ
• Type R	Yes; 16 bit incl. sign
— Input resistance (Type R)	1 MΩ
• Type S	Yes; 16 bit incl. sign
— Input resistance (Type S)	1 MΩ
• Type T	Yes; 16 bit incl. sign
— Input resistance (Type T)	1 MΩ
• Type U	Yes; 16 bit incl. sign
— Input resistance (Type U)	1 MΩ
• Type TXK/TXK(L) to GOST	Yes; 16 bit incl. sign
— Input resistance (Type TXK/TXK(L) to GOST)	1 MΩ
Input ranges (rated values), resistance thermometer	
• Cu 10	Yes; 16 bit incl. sign
— Input resistance (Cu 10)	1 MΩ
• Ni 100	Yes; 16 bit incl. sign
— Input resistance (Ni 100)	1 MΩ
• Ni 1000	
— Input resistance (Ni 1000)	1 MΩ
• LG-Ni 1000	Yes; 16 bit incl. sign
• Ni 120	Yes; 16 bit incl. sign
— Input resistance (Ni 120)	1 MΩ
• Ni 200	Yes; 16 bit incl. sign
— Input resistance (Ni 200)	1 MΩ
• Ni 500	Yes; 16 bit incl. sign
— Input resistance (Ni 500)	1 MΩ
• Pt 100	Yes; 16 bit incl. sign
— Input resistance (Pt 100)	1 MΩ

• Pt 1000 — Input resistance (Pt 1000) • Pt 200 — Input resistance (Pt 200) • Pt 500 — Input resistance (Pt 500)	Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ
Input ranges (rated values), resistors	
• 0 to 150 ohms — Input resistance (0 to 150 ohms) • 0 to 300 ohms — Input resistance (0 to 300 ohms) • 0 to 600 ohms — Input resistance (0 to 600 ohms) • 0 to 3000 ohms — Input resistance (0 to 3000 ohms) • 0 to 6000 ohms — Input resistance (0 to 6000 ohms) • PTC — Input resistance (PTC)	Yes; 15 bit 1 MΩ Yes; 15 bit 1 MΩ Yes; 15 bit 1 MΩ Yes; 15 bit 1 MΩ Yes; 15 bit 1 MΩ Yes; 15 bit 1 MΩ
Thermocouple (TC)	
Temperature compensation	
— Parameterizable — internal comparison point — Reference channel of the group — Number of reference channel groups — fixed reference temperature	Yes Yes; BU type X1 Yes 4 Yes
Cable length	
• shielded, max.	200 m; Ex characteristic values must be observed; line resistance at RTD (simple) max. 25 ohm; loop resistance at TC max. 8 kOhm
Analog value generation for the inputs	
Measurement principle	integrating (Sigma-Delta)
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Basic conversion time, including integration time (ms) — additional processing time for wire-break check — additional power line wire-break check • Interference voltage suppression for interference frequency f1 in Hz • Conversion time (per channel)	16 bit Yes; Channel-by-channel, results from the selected interference frequency suppression 20 ms; In the ranges resistance thermometers, resistors and thermocouples 20 ms, for 3/4-wire transducer (resistance thermometer and resistor) 16.6 / 50 / 60 Hz, channel-by-channel 180 / 60 / 50 ms, results from the selected interference frequency suppression
Smoothing of measured values	
• Parameterizable	Yes; none, weak, medium, strong, channel-by-channel
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.01 %; ±0.1 % for resistance thermometers and resistance
Temperature error (relative to input range), (+/-)	0.0009 %/K; ±0.005 % / K at thermocouple
Crosstalk between the inputs, min.	50 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.05 %
Operational error limit in overall temperature range	
• Voltage, relative to input range, (+/-) • Resistance, relative to input range, (+/-)	0.1 % 0.1 %
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-) • Resistance, relative to input range, (+/-)	0.05 % 0.05 %
Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, f_1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min. • Common mode voltage, max. • Common mode interference, min.	70 dB 60 V; Applicable for use in non-hazardous areas; no common mode voltage permissible in hazardous areas 90 dB

Interrupts/diagnostics/status information			
Diagnostics function	Yes		
Alarms			
- Diagnostic alarm - Limit value alarm	Yes Yes; two upper and two lower limit values in each case		
Diagnoses			
- Monitoring the supply voltage - Wire break - Overflow/Underflow	Yes Yes; channel by channel Yes; channel by channel		
Diagnostics indication LED			
- MAINT LED - Monitoring of the supply voltage (PWR-LED) - Channel status display - for channel diagnostics - for module diagnostics	Yes; Yellow LED Yes; green PWR LED Yes; green LED Yes; red LED Yes; green/red DIAG LED		
Ex(i) characteristics			
maximum values for connecting terminals for gas group IIC			
- Uo (no-load voltage), max. - Io (short-circuit current), max. - Po (power output), max. - Co (permissible external capacity), max. - Lo (permissible external inductivity), max. - Um (voltage at non-intrinsically safe connecting terminals), max.	5.9 V 18 mA 27 mW 43 µF 110 mH 60 V		
Potential separation			
Potential separation channels			
- between the channels - between the channels and backplane bus - between the channels and the power supply of the electronics	No Yes Yes; Electrical isolation between the channels and input voltage PME		
Isolation			
Isolation tested with	further information on insulation can be found in the "ET 200SP HA / ET 200SP modules for devices in hazardous areas" System Manual		
insulation of the field circuits to local ground acc. to IEC/EN 60079-11 tested with	707 V DC (type test)		
Ambient conditions			
Ambient temperature during operation			
- horizontal installation, min. - horizontal installation, max. - vertical installation, min. - vertical installation, max.	-40 °C 70 °C -40 °C 60 °C		
Altitude during operation relating to sea level			
Installation altitude above sea level, max.	2 000 m		
Dimensions			
Width	20 mm		
Height	73 mm		
Depth	58 mm		
Weights			
Weight, approx.	55 g		
Classifications			
		Version	Classification
	eClass	16	27-24-26-01
	eClass	14	27-24-26-01
	eClass	12	27-24-26-01
	eClass	9.1	27-24-26-01
	eClass	9	27-24-26-01
	eClass	8	27-24-26-01
	eClass	7.1	27-24-26-01

eClass	6	27-24-26-01
ETIM	10	EC001596
ETIM	9	EC001596
ETIM	8	EC001596
ETIM	7	EC001596

Approvals / Certificates

General Product Approval



General Product Approval For use in hazardous locations



Maritime application



Maritime application Environment



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