



SIMATIC ET 200SP HA, analog input module, AI 8xU/I/TC/4xRTD 2-/3-/4-wire HA suitable for terminal block, H1, N0, H0 color code CC00, channel diagnostics

General information	
Product type designation	AI 8xU/I/TC/4xRTD 2/3/4-wire HA
Firmware version	V1.0
• FW update possible	Yes
Usable terminal block	type H1, N0, H0 (see system manual for details)
Color code for module-specific color-coded label	CC00
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V18
• STEP 7 configurable/integrated from version	V5.6
• PCS 7 configurable/integrated from version	V9.1 SP2
• PCS neo can be configured/integrated from version	V4.0
• PROFINET from GSD version/GSD revision	GSDML V2.42 2023.01
Redundancy	
• Redundancy capability	No
CiR - Configuration in RUN	
Reparameterization possible in RUN	Yes
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)	220 mA
Encoder supply	
24 V encoder supply	
• 24 V	Yes
• Short-circuit protection	Yes; a max. of 1 channel may be operated in short-circuit
• Output current per channel, max.	0.032 A; max. 1 channel
Power loss	
Power loss, typ.	1.95 W
Address area	
Address space per module	
• Address space per module, max.	32 byte; + 2 bytes for QI information
Analog inputs	
Number of analog inputs	
• For current measurement	8
• For voltage measurement	8

• For resistance/resistance thermometer measurement	4
• For thermocouple measurement	8
permissible input voltage for voltage input (destruction limit), max.	24 V
permissible input current for current input (destruction limit), max.	40 mA
Constant measurement current for resistance-type transmitter, typ.	1.25 mA
Technical unit for temperature measurement adjustable	Yes; °C/°F/K
Input ranges (rated values), voltages	
• 0 to +10 V — Input resistance (0 to 10 V) • 1 V to 5 V — Input resistance (1 V to 5 V) • -1 V to +1 V — Input resistance (-1 V to +1 V) • -10 V to +10 V — Input resistance (-10 V to +10 V) • -2.5 V to +2.5 V — Input resistance (-2.5 V to +2.5 V) • -250 mV to +250 mV — Input resistance (-250 mV to +250 mV) • -5 V to +5 V — Input resistance (-5 V to +5 V) • -50 mV to +50 mV — Input resistance (-50 mV to +50 mV) • -500 mV to +500 mV — Input resistance (-500 mV to +500 mV) • -80 mV to +80 mV — Input resistance (-80 mV to +80 mV)	Yes; 15 bit 100 kΩ Yes; 15 bit 100 kΩ Yes; 16 bit incl. sign 10 MΩ Yes; 16 bit incl. sign 100 kΩ Yes; 16 bit incl. sign 100 kΩ Yes; 16 bit incl. sign 10 MΩ Yes; 16 bit incl. sign 100 kΩ Yes; 16 bit incl. sign 10 MΩ Yes; 16 bit incl. sign 10 MΩ Yes; 16 bit incl. sign 10 MΩ
Input ranges (rated values), currents	
• 0 to 20 mA — Input resistance (0 to 20 mA) • -20 mA to +20 mA — Input resistance (-20 mA to +20 mA) • 4 mA to 20 mA — Input resistance (4 mA to 20 mA)	Yes 50 Ω Yes 50 Ω Yes 50 Ω
Input ranges (rated values), thermocouples	
• type B — Input resistance (Type B) • type C — Input resistance (Type C) • Type E — Input resistance (Type E) • Type J — Input resistance (type J) • Type K — Input resistance (Type K) • Type L — Input resistance (Type L) • Type N — Input resistance (Type N) • Type R — Input resistance (Type R) • Type S — Input resistance (Type S) • Type T — Input resistance (Type T) • Type U — Input resistance (Type U)	Yes; 16 bit incl. sign 10 MΩ Yes; 16 bit incl. sign 10 MΩ Yes; 16 bit incl. sign 10 MΩ Yes; 16 bit incl. sign 10 MΩ Yes; 16 bit incl. sign 10 MΩ Yes; 16 bit incl. sign 10 MΩ Yes; 16 bit incl. sign 10 MΩ Yes; 16 bit incl. sign 10 MΩ Yes; 16 bit incl. sign 10 MΩ Yes; 16 bit incl. sign 10 MΩ Yes; 16 bit incl. sign 10 MΩ

• Type TXK/TXK(L) to GOST	Yes; 16 bit incl. sign
— Input resistance (Type TXK/TXK(L) to GOST)	10 MΩ
Input ranges (rated values), resistance thermometer	
• Cu 10	Yes; 16 bit incl. sign
— Input resistance (Cu 10)	10 MΩ
• Cu 50	Yes; 16 bit incl. sign
— Input resistance (Cu 50)	10 MΩ
• Cu 100	Yes; 16 bit incl. sign
— Input resistance (Cu 100)	10 MΩ
• Ni 100	Yes; 16 bit incl. sign
— Input resistance (Ni 100)	10 MΩ
• Ni 1000	Yes; 16 bit incl. sign
— Input resistance (Ni 1000)	10 MΩ
• LG-Ni 1000	Yes; 16 bit incl. sign
— Input resistance (LG-Ni 1000)	10 MΩ
• Ni 120	Yes; 16 bit incl. sign
— Input resistance (Ni 120)	10 MΩ
• Ni 200	Yes; 16 bit incl. sign
— Input resistance (Ni 200)	10 MΩ
• Ni 500	Yes; 16 bit incl. sign
— Input resistance (Ni 500)	10 MΩ
• Pt 100	Yes; 16 bit incl. sign
— Input resistance (Pt 100)	10 MΩ
• Pt 1000	Yes; 16 bit incl. sign
— Input resistance (Pt 1000)	10 MΩ
• Pt 200	Yes; 16 bit incl. sign
— Input resistance (Pt 200)	10 MΩ
• Pt 500	Yes; 16 bit incl. sign
— Input resistance (Pt 500)	10 MΩ
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes; 15 bit
— Input resistance (0 to 150 ohms)	10 MΩ
• 0 to 300 ohms	Yes; 15 bit
— Input resistance (0 to 300 ohms)	10 MΩ
• 0 to 600 ohms	Yes; 15 bit
— Input resistance (0 to 600 ohms)	10 MΩ
• 0 to 3000 ohms	Yes; 15 bit
— Input resistance (0 to 3000 ohms)	10 MΩ
• 0 to 6000 ohms	Yes; 15 bit
— Input resistance (0 to 6000 ohms)	10 MΩ
• PTC	Yes; 15 bit
— Input resistance (PTC)	10 MΩ
Thermocouple (TC)	
Temperature compensation	
— Parameterizable	Yes
— external temperature compensation via RTD	Yes
— Reference channel of the module	Yes; channel 7
— internal comparison point	Yes; with terminal block H1
— Reference channel of the group	Yes
— Number of reference channel groups	4
— fixed reference temperature	Yes
Cable length	
• shielded, max.	thermocouples: shielded cable length max. 200 m, voltages: shielded cable length max. 600 m, loop resistance max 8 kΩm; measuring ranges RTD: shielded cable length max. 600 m, cable resistance (single) max. 75 ohm, current measurement: shielded cable length max. 800 m
• unshielded, max.	200 m; Only applies when connecting current sensors
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 - 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 10 / 50 / 60 / 400 Hz Channel-by-channel, results from the selected interference frequency suppression
Smoothing of measured values	
parameterizable	Yes; none, weak, medium, strong, channel-by-channel
Encoder	
Connection of signal encoders	
for voltage measurement	Yes
- for current measurement as 2-wire transducer — Burden of 2-wire transmitter, max.	Yes 820 Ω
for current measurement as 4-wire transducer	Yes
for resistance measurement with two-wire connection	Yes; all measuring ranges incl. PTC
for resistance measurement with three-wire connection	Yes; All measuring ranges except PTC; internal compensation of the cable resistances
for resistance measurement with four-wire connection	Yes; All measuring ranges except PTC
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.01 %; ±0.1 % for resistance thermometers and resistance
Temperature error (relative to input range), (+/-)	0.002 %/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, (+/-)	0.3 %
Current, relative to input range, (+/-)	0.3 %
Resistance, relative to input range, (+/-)	0.3 %
Basic error limit (operational limit at 25 °C)	
Voltage, relative to input range, (+/-)	0.1 %
Current, relative to input range, (+/-)	0.1 %
Resistance, relative to input range, (+/-)	0.1 %
Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$, f1 = interference frequency	
Series mode interference (peak value of interference < rated value of input range), min.	60 dB
Common mode voltage, max.	15 V
Common mode interference, min.	90 dB
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
Diagnostic alarm	Yes
Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnoses	
Monitoring the supply voltage	Yes
Wire break	Yes; channel-by-channel current 4 ... 20 mA, R and RTD
Short-circuit	Yes; channel by channel for current (2-wire)
Overflow/Underflow	Yes; 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 DIAG LED
Potential separation	
Potential separation channels	
between the channels	No
between the channels and backplane bus	Yes
Between the channels and load voltage L+	Yes
Permissible potential difference	

between the inputs (UCM)	15 V DC/10 V AC
Isolation	
Isolation tested with	1 500 V DC/1 min, type test
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.	150 g
Classifications	

	Version	Classification
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



[Declaration of Conformity](#)



For use in hazardous locations

Maritime application



[Miscellaneous](#)



[CCS \(China Classification Society\)](#)

Environment



