



SIMATIC ET 200SP HA, analog input module, AI 16XTC/8XRTD 2-/3-/4-wire HA, suitable for terminal block H1, M1, color code CC00, channel diagnostics, 16-bit, +/-0.05%, 2-/3-/4-wire

General information	
Product type designation	AI 16 x TC/8 x RTD 2/3/4-wire HA
Firmware version	V1.1
<ul style="list-style-type: none"> FW update possible 	Yes
Usable terminal block	TB type H1 and M1
Color code for module-specific color identification plate	CC00
Product function	
<ul style="list-style-type: none"> I&M data 	Yes; I&M0 to I&M3
Engineering with	
<ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated from version 	V16
<ul style="list-style-type: none"> STEP 7 configurable/integrated from version 	V5.6
<ul style="list-style-type: none"> PCS 7 configurable/integrated from version 	V9.0
<ul style="list-style-type: none"> PCS neo can be configured/integrated from version 	V3.0
<ul style="list-style-type: none"> PROFINET from GSD version/GSD revision 	GSDML V2.3
Redundancy	
<ul style="list-style-type: none"> Redundancy capability 	Yes; With TB type M1
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)	75 mA
Current consumption, max.	100 mA
Power loss	
Power loss, typ.	1.8 W
Address area	
Address space per module	
<ul style="list-style-type: none"> Address space per module, max. 	64 byte; + 2 bytes for QI information
Analog inputs	
Number of analog inputs	
<ul style="list-style-type: none"> For voltage measurement 	16
<ul style="list-style-type: none"> For resistance/resistance thermometer measurement 	8
<ul style="list-style-type: none"> For thermocouple measurement 	16
permissible input voltage for voltage input (destruction limit), max.	5 V
Constant measurement current for resistance-type transmitter, typ.	2 mA

Technical unit for temperature measurement adjustable	Yes; °C/°F/K
Input ranges (rated values), voltages	
<ul style="list-style-type: none"> ● -1 V to +1 V <ul style="list-style-type: none"> — Input resistance (-1 V to +1 V) ● -250 mV to +250 mV <ul style="list-style-type: none"> — Input resistance (-250 mV to +250 mV) ● -50 mV to +50 mV <ul style="list-style-type: none"> — Input resistance (-50 mV to +50 mV) ● -80 mV to +80 mV <ul style="list-style-type: none"> — Input resistance (-80 mV to +80 mV) 	<ul style="list-style-type: none"> Yes; 16 bit incl. sign 1 MΩ 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), thermocouples	
<ul style="list-style-type: none"> ● Type B <ul style="list-style-type: none"> — Input resistance (Type B) ● Type C <ul style="list-style-type: none"> — Input resistance (Type C) ● Type E <ul style="list-style-type: none"> — Input resistance (Type E) ● Type J <ul style="list-style-type: none"> — Input resistance (type J) ● Type K <ul style="list-style-type: none"> — Input resistance (Type K) ● Type L <ul style="list-style-type: none"> — Input resistance (Type L) ● Type N <ul style="list-style-type: none"> — Input resistance (Type N) ● Type R <ul style="list-style-type: none"> — Input resistance (Type R) ● Type S <ul style="list-style-type: none"> — Input resistance (Type S) ● Type T <ul style="list-style-type: none"> — Input resistance (Type T) ● Type U <ul style="list-style-type: none"> — Input resistance (Type U) ● Type TXK/TXK(L) to GOST <ul style="list-style-type: none"> — Input resistance (Type TXK/TXK(L) to GOST) 	<ul style="list-style-type: none"> Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ 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), resistance thermometer	
<ul style="list-style-type: none"> ● Cu 10 <ul style="list-style-type: none"> — Input resistance (Cu 10) ● Ni 100 <ul style="list-style-type: none"> — Input resistance (Ni 100) ● Ni 1000 <ul style="list-style-type: none"> — Input resistance (Ni 1000) ● LG-Ni 1000 ● Ni 120 <ul style="list-style-type: none"> — Input resistance (Ni 120) ● Ni 200 <ul style="list-style-type: none"> — Input resistance (Ni 200) ● Ni 500 <ul style="list-style-type: none"> — Input resistance (Ni 500) ● Pt 100 <ul style="list-style-type: none"> — Input resistance (Pt 100) ● Pt 1000 <ul style="list-style-type: none"> — Input resistance (Pt 1000) ● Pt 200 <ul style="list-style-type: none"> — Input resistance (Pt 200) ● Pt 500 <ul style="list-style-type: none"> — Input resistance (Pt 500) 	<ul style="list-style-type: none"> Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ 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	
<ul style="list-style-type: none"> ● 0 to 150 ohms <ul style="list-style-type: none"> — Input resistance (0 to 150 ohms) ● 0 to 300 ohms 	<ul style="list-style-type: none"> Yes; 15 bit 1 MΩ Yes; 15 bit

— Input resistance (0 to 300 ohms)	1 M Ω
• 0 to 600 ohms	Yes; 15 bit
— Input resistance (0 to 600 ohms)	1 M Ω
• 0 to 3000 ohms	Yes; 15 bit
— Input resistance (0 to 3000 ohms)	1 M Ω
• 0 to 6000 ohms	Yes; 15 bit
— Input resistance (0 to 6000 ohms)	1 M Ω
• PTC	Yes; 15 bit
— Input resistance (PTC)	1 M Ω
Thermocouple (TC)	
Temperature compensation	
— parameterizable	Yes
— external temperature compensation via RTD	Yes
— Reference channel of the module	Yes
— internal comparison point	Yes; with terminal block H1 and M1
— Reference channel of the group	Yes
— Number of reference channel groups	4
— fixed reference temperature	Yes
Cable length	
• shielded, max.	200 m; Measurement ranges for thermocouples / voltages: shielded cable length max. 600 m, loop resistance max 8 k Ω m; measuring ranges RTD: shielded cable length max. 600 m, cable resistance (single) max. 75 ohms
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.	16 bit
• Integration time, parameterizable	Yes; Channel-by-channel, results from the selected interference frequency suppression
• Interference voltage suppression for interference frequency f1 in Hz	16.6 / 50 / 60 Hz, channel-by-channel
• Conversion time (per channel)	60 ms; 180 / 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, (+/-)	0.1 %
• Resistance, relative to input range, (+/-)	0.1 %
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.05 %
• Resistance, relative to input range, (+/-)	0.05 %
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.	70 dB
• Common mode voltage, max.	60 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
• 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) 75 V DC/60 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

last modified: 11/2/2021 