

SIMATIC ET 200SP HA, ANALOG INPUT MODULE, AI
16XTC/8XRTD 2-/3-/4-WIRE HA, FITS TO TERMINAL BLOCK H1,
M1, COLOR CODE CC00, CHANNEL DIAGNOSIS, 16BIT, +/-
0,05%, 2-/3-/4-WIRE



General information	
Product type designation	AI 16 x TC/8 x RTD 2/3/4-wire HA
HW functional status	FS01
Firmware version	V1.0
<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"> PCS 7 configurable/integrated as of version 	V9.0
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
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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 voltage measurement	16
• For resistance/resistance thermometer measurement	8
• 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
Cycle time (all channels), min.	125 ms; Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels); for line compensation in case of a three-wire connection, an additional cycle is necessary
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 Yes; 16 bit incl. sign
- 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 Yes; 16 bit incl. sign
- Input resistance (Pt 1000) 1 MΩ
- Pt 200 Yes; 16 bit incl. sign
- Input resistance (Pt 200) 1 MΩ
- Pt 500 Yes; 16 bit incl. sign
- Input resistance (Pt 500) 1 MΩ

Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes; 15 bit
• Input resistance (0 to 150 ohms)	1 MΩ
• 0 to 300 ohms	Yes; 15 bit
• Input resistance (0 to 300 ohms)	1 MΩ
• 0 to 600 ohms	Yes; 15 bit
• Input resistance (0 to 600 ohms)	1 MΩ
• 0 to 3000 ohms	Yes; 15 bit
• Input resistance (0 to 3000 ohms)	1 MΩ
• 0 to 6000 ohms	Yes; 15 bit
• Input resistance (0 to 6000 ohms)	1 MΩ
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 kOhm; 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
• Basic conversion time, including integration time (ms)	
— additional processing time for wire-break check	2 ms; In the ranges resistance thermometers, resistors and thermocouples
— additional power line wire-break check	2 ms; for 3/4 wire transducer (resistance thermometer and resistor)
• 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	
<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> Voltage, relative to input range, (+/-) Resistance, relative to input range, (+/-) 	0.1 %
Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> Voltage, relative to input range, (+/-) Resistance, relative to input range, (+/-) 	0.05 %
Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, $f_1 =$ interference frequency	
<ul style="list-style-type: none"> 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 90 dB
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
<ul style="list-style-type: none"> Diagnostic alarm Limit value alarm 	Yes Yes; two upper and two lower limit values in each case
Diagnostic messages	
<ul style="list-style-type: none"> Monitoring the supply voltage Wire-break Overflow/underflow 	Yes Yes; channel by channel Yes; channel by channel
Diagnostics indication LED	
<ul style="list-style-type: none"> 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
Potential separation	
Potential separation channels	
<ul style="list-style-type: none"> between the channels between the channels and backplane bus Between the channels and load voltage L+ 	No Yes 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
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Ambient conditions

Ambient temperature during operation

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|---------------------------------|--------|
| • 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
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Height	115 mm
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Depth	138 mm
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last modified:	10/13/2017
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