

Siemens  
EcoTech



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"> <li>FW update possible</li> </ul>	Yes
Usable terminal block	type H1, M1, N0, H0, M0 (for details see the system manual)
Color code for module-specific color-coded label	CC00
Product function	
<ul style="list-style-type: none"> <li>I&amp;M data</li> </ul>	Yes; I&M0 to I&M3
Engineering with	
<ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	V16
<ul style="list-style-type: none"> <li>STEP 7 configurable/integrated from version</li> </ul>	V5.6
<ul style="list-style-type: none"> <li>PCS 7 configurable/integrated from version</li> </ul>	V9.0
<ul style="list-style-type: none"> <li>PCS neo can be configured/integrated from version</li> </ul>	V3.0
<ul style="list-style-type: none"> <li>PROFINET from GSD version/GSD revision</li> </ul>	GSDML V2.3
Redundancy	
<ul style="list-style-type: none"> <li>Redundancy capability</li> </ul>	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"> <li>Address space per module, max.</li> </ul>	64 byte; + 2 bytes for QI information
Analog inputs	
Number of analog inputs	
<ul style="list-style-type: none"> <li>For voltage measurement</li> </ul>	16
<ul style="list-style-type: none"> <li>For resistance/resistance thermometer measurement</li> </ul>	8
<ul style="list-style-type: none"> <li>For thermocouple measurement</li> </ul>	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
<b>Input ranges (rated values), voltages</b>	
<ul style="list-style-type: none"> <li>• -1 V to +1 V <ul style="list-style-type: none"> <li>— Input resistance (-1 V to +1 V)</li> </ul> </li> <li>• -250 mV to +250 mV <ul style="list-style-type: none"> <li>— Input resistance (-250 mV to +250 mV)</li> </ul> </li> <li>• -50 mV to +50 mV <ul style="list-style-type: none"> <li>— Input resistance (-50 mV to +50 mV)</li> </ul> </li> <li>• -80 mV to +80 mV <ul style="list-style-type: none"> <li>— Input resistance (-80 mV to +80 mV)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> </ul>
<b>Input ranges (rated values), thermocouples</b>	
<ul style="list-style-type: none"> <li>• Type B <ul style="list-style-type: none"> <li>— Input resistance (Type B)</li> </ul> </li> <li>• Type C <ul style="list-style-type: none"> <li>— Input resistance (Type C)</li> </ul> </li> <li>• Type E <ul style="list-style-type: none"> <li>— Input resistance (Type E)</li> </ul> </li> <li>• Type J <ul style="list-style-type: none"> <li>— Input resistance (type J)</li> </ul> </li> <li>• Type K <ul style="list-style-type: none"> <li>— Input resistance (Type K)</li> </ul> </li> <li>• Type L <ul style="list-style-type: none"> <li>— Input resistance (Type L)</li> </ul> </li> <li>• Type N <ul style="list-style-type: none"> <li>— Input resistance (Type N)</li> </ul> </li> <li>• Type R <ul style="list-style-type: none"> <li>— Input resistance (Type R)</li> </ul> </li> <li>• Type S <ul style="list-style-type: none"> <li>— Input resistance (Type S)</li> </ul> </li> <li>• Type T <ul style="list-style-type: none"> <li>— Input resistance (Type T)</li> </ul> </li> <li>• Type U <ul style="list-style-type: none"> <li>— Input resistance (Type U)</li> </ul> </li> <li>• Type TXK/TXK(L) to GOST <ul style="list-style-type: none"> <li>— Input resistance (Type TXK/TXK(L) to GOST)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> </ul>
<b>Input ranges (rated values), resistance thermometer</b>	
<ul style="list-style-type: none"> <li>• Cu 10 <ul style="list-style-type: none"> <li>— Input resistance (Cu 10)</li> </ul> </li> <li>• Ni 100 <ul style="list-style-type: none"> <li>— Input resistance (Ni 100)</li> </ul> </li> <li>• Ni 1000 <ul style="list-style-type: none"> <li>— Input resistance (Ni 1000)</li> </ul> </li> <li>• LG-Ni 1000</li> <li>• Ni 120 <ul style="list-style-type: none"> <li>— Input resistance (Ni 120)</li> </ul> </li> <li>• Ni 200 <ul style="list-style-type: none"> <li>— Input resistance (Ni 200)</li> </ul> </li> <li>• Ni 500 <ul style="list-style-type: none"> <li>— Input resistance (Ni 500)</li> </ul> </li> <li>• Pt 100 <ul style="list-style-type: none"> <li>— Input resistance (Pt 100)</li> </ul> </li> <li>• Pt 1000 <ul style="list-style-type: none"> <li>— Input resistance (Pt 1000)</li> </ul> </li> <li>• Pt 200 <ul style="list-style-type: none"> <li>— Input resistance (Pt 200)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> <li>Yes; 16 bit incl. sign 1 MΩ</li> </ul>

<ul style="list-style-type: none"> <li>● Pt 500 <ul style="list-style-type: none"> <li>— Input resistance (Pt 500)</li> </ul> </li> </ul>	Yes; 16 bit incl. sign 1 MΩ
<b>Input ranges (rated values), resistors</b>	
<ul style="list-style-type: none"> <li>● 0 to 150 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 150 ohms)</li> </ul> </li> <li>● 0 to 300 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 300 ohms)</li> </ul> </li> <li>● 0 to 600 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 600 ohms)</li> </ul> </li> <li>● 0 to 3000 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 3000 ohms)</li> </ul> </li> <li>● 0 to 6000 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 6000 ohms)</li> </ul> </li> <li>● PTC <ul style="list-style-type: none"> <li>— Input resistance (PTC)</li> </ul> </li> </ul>	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
<b>Thermocouple (TC)</b>	
<b>Temperature compensation</b>	
<ul style="list-style-type: none"> <li>— parameterizable</li> <li>— external temperature compensation via RTD</li> <li>— Reference channel of the module</li> <li>— internal comparison point</li> <li>— Reference channel of the group</li> <li>— Number of reference channel groups</li> <li>— fixed reference temperature</li> </ul>	Yes Yes Yes Yes; with terminal block H1 and M1 Yes 4 Yes
<b>Cable length</b>	
<ul style="list-style-type: none"> <li>● shielded, max.</li> </ul>	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
<b>Analog value generation for the inputs</b>	
Measurement principle	integrating (Sigma-Delta)
<b>Integration and conversion time/resolution per channel</b>	
<ul style="list-style-type: none"> <li>● Resolution with overrange (bit including sign), max.</li> <li>● Integration time, parameterizable</li> <li>● Interference voltage suppression for interference frequency f1 in Hz</li> <li>● Conversion time (per channel)</li> </ul>	16 bit Yes; Channel-by-channel, results from the selected interference frequency suppression 16.6 / 50 / 60 Hz, channel-by-channel 60 ms; 180 / 50 ms, results from the selected interference frequency suppression
<b>Smoothing of measured values</b>	
<ul style="list-style-type: none"> <li>● parameterizable</li> </ul>	Yes; none, weak, medium, strong, channel-by-channel
<b>Errors/accuracies</b>	
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 %
<b>Operational error limit in overall temperature range</b>	
<ul style="list-style-type: none"> <li>● Voltage, relative to input range, (+/-)</li> <li>● Resistance, relative to input range, (+/-)</li> </ul>	0.1 % 0.1 %
<b>Basic error limit (operational limit at 25 °C)</b>	
<ul style="list-style-type: none"> <li>● Voltage, relative to input range, (+/-)</li> <li>● Resistance, relative to input range, (+/-)</li> </ul>	0.05 % 0.05 %
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>	
<ul style="list-style-type: none"> <li>● Series mode interference (peak value of interference &lt; rated value of input range), min.</li> <li>● Common mode voltage, max.</li> <li>● Common mode interference, min.</li> </ul>	70 dB 60 V 90 dB
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
<b>Alarms</b>	
<ul style="list-style-type: none"> <li>● Diagnostic alarm</li> </ul>	Yes

• Limit value alarm	Yes; two upper and two lower limit values in each case
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire break	Yes; channel by channel
• Overflow/Underflow	Yes; channel by channel
<b>Diagnostics indication LED</b>	
• 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
<b>Potential separation</b>	
Potential separation channels	
• between the channels	No
• between the channels and backplane bus	Yes
• Between the channels and load voltage L+	Yes
<b>Permissible potential difference</b>	
between the inputs (UCM)	75 V DC/60 V AC
<b>Isolation</b>	
Isolation tested with	1 500 V DC/1 min, type test
<b>Ambient conditions</b>	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C
• horizontal installation, max.	70 °C
• vertical installation, min.	-40 °C
• vertical installation, max.	60 °C
<b>Dimensions</b>	
Width	22.5 mm
Height	115 mm
Depth	138 mm
<b>Weights</b>	
Weight, approx.	150 g
<b>Classifications</b>	

	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**



[Miscellaneous](#)



[Declaration of Conformity](#)



General Product Approval	For use in hazardous locations
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[Declaration of Conformity](#)



For use in hazardous locations | Maritime application



[Miscellaneous](#)



Maritime application | Environment

[NK / Nippon Kaiji Kyokai](#)



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



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