



SIMATIC ET 200SP, Analog input module, AI 8xRTD/TC 2-wire High Feature Pack quantity: 10 units, suitable for BU type A0, A1, Color code CC00, channel diagnostics, 16 bit, +/-0.1%

General information	
Product type designation	AI 8xRTD/TC 2-wire HF
HW functional status	From FS05
Firmware version	
• FW update possible	Yes
usable BaseUnits	BU type A0, A1
Color code for module-specific color identification plate	CC00
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
• Measuring range scalable	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V14 / -
• STEP 7 configurable/integrated from version	V5.6
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	GSDML V2.3
Operating mode	
• Oversampling	No
• MSI	No
CiR - Configuration in RUN	
Reparameterization possible in RUN	Yes
Calibration 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, max.	35 mA
Power loss	
Power loss, typ.	0.75 W
Address area	
Address space per module	
• Address space per module, max.	16 byte; + 1 byte for QI information
Hardware configuration	
Automatic encoding	Yes
• Mechanical coding element	Yes
• Type of mechanical coding element	Type A
Selection of BaseUnit for connection variants	
• 2-wire connection	BU type A0, A1

**Analog inputs**

Number of analog inputs	8
permissible input voltage for voltage input (destruction limit), max.	30 V
Constant measurement current for resistance-type transmitter, typ.	2 mA
Cycle time (all channels), min.	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)
Technical unit for temperature measurement adjustable	Yes; °C/°F/K
<b>Input ranges (rated values), voltages</b>	
• -1 V to +1 V — Input resistance (-1 V to +1 V)	Yes; 16 bit incl. sign 1 MΩ
• -250 mV to +250 mV — Input resistance (-250 mV to +250 mV)	Yes; 16 bit incl. sign 1 MΩ
• -50 mV to +50 mV — Input resistance (-50 mV to +50 mV)	Yes; 16 bit incl. sign 1 MΩ
• -80 mV to +80 mV — Input resistance (-80 mV to +80 mV)	Yes; 16 bit incl. sign 1 MΩ
<b>Input ranges (rated values), thermocouples</b>	
• Type B — Input resistance (Type B)	Yes; 16 bit incl. sign 1 MΩ
• Type C — Input resistance (Type C)	Yes; 16 bit incl. sign 1 MΩ
• Type E — Input resistance (Type E)	Yes; 16 bit incl. sign 1 MΩ
• Type J — Input resistance (type J)	Yes; 16 bit incl. sign 1 MΩ
• Type K — Input resistance (Type K)	Yes; 16 bit incl. sign 1 MΩ
• Type L — Input resistance (Type L)	Yes; 16 bit incl. sign 1 MΩ
• Type N — Input resistance (Type N)	Yes; 16 bit incl. sign 1 MΩ
• Type R — Input resistance (Type R)	Yes; 16 bit incl. sign 1 MΩ
• Type S — Input resistance (Type S)	Yes; 16 bit incl. sign 1 MΩ
• Type T — Input resistance (Type T)	Yes; 16 bit incl. sign 1 MΩ
• Type U — Input resistance (Type U)	Yes; 16 bit incl. sign 1 MΩ
• Type TXK/TXK(L) to GOST — Input resistance (Type TXK/TXK(L) to GOST)	Yes; 16 bit incl. sign 1 MΩ
<b>Input ranges (rated values), resistance thermometer</b>	
• Ni 100 — Input resistance (Ni 100)	Yes; 16 bit incl. sign 1 MΩ
• Ni 1000 — Input resistance (Ni 1000)	Yes; 16 bit incl. sign 1 MΩ
• LG-Ni 1000 — Input resistance (LG-Ni 1000)	Yes; 16 bit incl. sign 1 MΩ
• Ni 120 — Input resistance (Ni 120)	Yes; 16 bit incl. sign 1 MΩ
• Ni 200 — Input resistance (Ni 200)	Yes; 16 bit incl. sign 1 MΩ
• Ni 500 — Input resistance (Ni 500)	Yes; 16 bit incl. sign 1 MΩ
• Pt 100 — Input resistance (Pt 100)	Yes; 16 bit incl. sign 1 MΩ
• Pt 1000 — Input resistance (Pt 1000)	Yes; 16 bit incl. sign 1 MΩ
• Pt 200 — Input resistance (Pt 200)	Yes; 16 bit incl. sign 1 MΩ

<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> </ul>	Yes; 15 bit 1 MΩ
<ul style="list-style-type: none"> <li>● 0 to 300 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 300 ohms)</li> </ul> </li> </ul>	Yes; 15 bit 1 MΩ
<ul style="list-style-type: none"> <li>● 0 to 600 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 600 ohms)</li> </ul> </li> </ul>	Yes; 15 bit 1 MΩ
<ul style="list-style-type: none"> <li>● 0 to 3000 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 3000 ohms)</li> </ul> </li> </ul>	Yes; 15 bit 1 MΩ
<ul style="list-style-type: none"> <li>● 0 to 6000 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 6000 ohms)</li> </ul> </li> </ul>	Yes; 15 bit 1 MΩ
<ul style="list-style-type: none"> <li>● PTC <ul style="list-style-type: none"> <li>— Input resistance (PTC)</li> </ul> </li> </ul>	Yes; 15 bit 1 MΩ
<b>Thermocouple (TC)</b>	
<b>Temperature compensation</b>	
— parameterizable	Yes
— Reference channel of the module	Yes
— internal comparison point	Yes; with BaseUnit type A1
— Reference channel of the group	Yes
— Number of reference channel groups	4; Group 0 to 3
— fixed reference temperature	Yes
<b>Cable length</b>	
<ul style="list-style-type: none"> <li>● shielded, max.</li> </ul>	200 m; 50 m with thermocouples
<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> </ul>	16 bit
<ul style="list-style-type: none"> <li>● Integration time, parameterizable</li> </ul>	Yes
<ul style="list-style-type: none"> <li>● Basic conversion time, including integration time (ms) <ul style="list-style-type: none"> <li>— additional processing time for wire-break check</li> </ul> </li> </ul>	2 ms; In the ranges resistance thermometers, resistors and thermocouples
<ul style="list-style-type: none"> <li>● Interference voltage suppression for interference frequency <math>f_1</math> in Hz</li> </ul>	16.6 / 50 / 60 Hz
<ul style="list-style-type: none"> <li>● Conversion time (per channel)</li> </ul>	180 / 60 / 50 ms
<b>Smoothing of measured values</b>	
<ul style="list-style-type: none"> <li>● Number of smoothing levels</li> </ul>	4; None; 4/8/16 times
<ul style="list-style-type: none"> <li>● parameterizable</li> </ul>	Yes
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
<ul style="list-style-type: none"> <li>● for voltage measurement</li> </ul>	Yes
<ul style="list-style-type: none"> <li>● for resistance measurement with two-wire connection</li> </ul>	Yes
<ul style="list-style-type: none"> <li>● for resistance measurement with three-wire connection</li> </ul>	No
<ul style="list-style-type: none"> <li>● for resistance measurement with four-wire connection</li> </ul>	No
<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> </ul>	0.1 %
<ul style="list-style-type: none"> <li>● Resistance, relative to input range, (+/-)</li> </ul>	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> </ul>	0.05 %
<ul style="list-style-type: none"> <li>● Resistance, relative to input range, (+/-)</li> </ul>	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> </ul>	70 dB
<ul style="list-style-type: none"> <li>● Common mode voltage, max.</li> </ul>	10 V
<ul style="list-style-type: none"> <li>● Common mode interference, min.</li> </ul>	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
• Group error	Yes
• Overflow/underflow	Yes; channel by channel
Diagnostics indication 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 the power supply of the electronics	Yes
Permissible potential difference	
between the inputs (UCM)	10 V DC
Isolation	
Isolation tested with	707 V DC (type test)
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; < 0 °C as of FS05
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS05
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
<b>last modified:</b>	9/7/2023 