

SIMATIC ET 200SP, ANALOG INPUT MODULE, AI 4xRTD/TC HIGH FEATURE, FITS TO BU-TYPE A0, A1, COLOR CODE CC00, CHANNEL DIAGNOSIS, 16BIT, +/-0,1%, 2-/3-/4-WIRE



General information	
Product type designation	AI 4xRTD/TC 2-/3-/4-wire HF
Firmware version	V2.0
<ul style="list-style-type: none"> <li>FW update possible</li> </ul>	Yes
usable BaseUnits	BU type A0, A1
Color code for module-specific color identification plate	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 as of version</li> </ul>	V12 SP1 / V13
<ul style="list-style-type: none"> <li>STEP 7 configurable/integrated as of version</li> </ul>	V5.5 SP3 / V5.5 SP4
<ul style="list-style-type: none"> <li>PCS 7 configurable/integrated as of version</li> </ul>	V8.1 SP1
<ul style="list-style-type: none"> <li>PROFIBUS as of GSD version/GSD revision</li> </ul>	GSD Revision 5
<ul style="list-style-type: none"> <li>PROFINET as of GSD version/GSD revision</li> </ul>	GSDML V2.3
Operating mode	
<ul style="list-style-type: none"> <li>Oversampling</li> </ul>	No
<ul style="list-style-type: none"> <li>MSI</li> </ul>	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
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## Power loss

Power loss, typ.	0.75 W
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## Address area

Address space per module	
• Address space per module, max.	8 byte; + 1 byte for QI information

## Analog inputs

Number of analog inputs	4
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); for line compensation in case of a three-wire connection, an additional cycle is necessary
Technical unit for temperature measurement adjustable	Yes

## Input ranges (rated values), voltages

• -1 V to +1 V	Yes; 16 bit incl. sign
• Input resistance (-1 V to +1 V)	1 M $\Omega$
• -250 mV to +250 mV	Yes; 16 bit incl. sign
• Input resistance (-250 mV to +250 mV)	1 M $\Omega$
• -50 mV to +50 mV	Yes; 16 bit incl. sign
• Input resistance (-50 mV to +50 mV)	1 M $\Omega$
• -80 mV to +80 mV	Yes; 16 bit incl. sign
• Input resistance (-80 mV to +80 mV)	1 M $\Omega$

## Input ranges (rated values), thermocouples

• Type B	Yes; 16 bit incl. sign
• Input resistance (Type B)	1 M $\Omega$
• Type C	Yes; 16 bit incl. sign
• Input resistance (Type C)	1 M $\Omega$

- 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)
- Type TXK/TXK(L) to GOST
- Input resistance (Type TXK/TXK(L) to GOST)

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**

- Cu 10
- Input resistance (Cu 10)
- Ni 100
- Input resistance (Ni 100)
- Ni 1000
- Input resistance (Ni 1000)
- LG-Ni 1000
- Input resistance (LG-Ni 1000)
- Ni 120
- Input resistance (Ni 120)
- Ni 200
- Input resistance (Ni 200)
- Ni 500
- Input resistance (Ni 500)
- Pt 100
- Input resistance (Pt 100)
- Pt 1000
- Input resistance (Pt 1000)
- Pt 200
- Input resistance (Pt 200)

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

• Pt 500	Yes; 16 bit incl. sign
• Input resistance (Pt 500)	1 M $\Omega$
<b>Input ranges (rated values), resistors</b>	
• 0 to 150 ohms	Yes; 15 bit
• Input resistance (0 to 150 ohms)	1 M $\Omega$
• 0 to 300 ohms	Yes; 15 bit
• Input resistance (0 to 300 ohms)	1 M $\Omega$
• 0 to 600 ohms	Yes; 15 bit
• Input resistance (0 to 600 ohms)	1 M $\Omega$
• 0 to 3000 ohms	Yes; 15 bit
• Input resistance (0 to 3000 ohms)	1 M $\Omega$
• 0 to 6000 ohms	Yes; 15 bit
• Input resistance (0 to 6000 ohms)	1 M $\Omega$
• PTC	Yes; 15 bit
• Input resistance (PTC)	1 M $\Omega$
<b>Thermocouple (TC)</b>	
• Technical unit for temperature measurement	$^{\circ}\text{C}/^{\circ}\text{F}/\text{K}$
<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>Resistance thermometer (RTD)</b>	
• permissible input voltage for voltage input (destruction limit), max.	30 V
• Technical unit for temperature measurement	$^{\circ}\text{C}/^{\circ}\text{F}/\text{K}$
<b>Cable length</b>	
• shielded, max.	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>	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes
• 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
• Conversion time (per channel)	180 / 60 / 50 ms
<b>Smoothing of measured values</b>	
• Number of levels	4; None; 4/8/16 times
• parameterizable	Yes

## Encoder

<b>Connection of signal encoders</b>	
• for voltage measurement	Yes
• for resistance measurement with two-wire connection	Yes
• for resistance measurement with three-wire connection	Yes
• for resistance measurement with four-wire connection	Yes

## 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 area), (+/-)	0.05 %
<b>Operational error limit in overall temperature range</b>	
• Voltage, relative to input area, (+/-)	0.1 %
• Resistance, relative to input area, (+/-)	0.1 %
<b>Basic error limit (operational limit at 25 °C)</b>	
• Voltage, relative to input area, (+/-)	0.05 %
• Resistance, relative to input area, (+/-)	0.05 %
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, f1 = interference frequency</b>	
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB
• Common mode voltage, max.	10 V
• Common mode interference, min.	90 dB

## Isochronous mode

Isochronous operation (application synchronized up to terminal)	No
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## Interrupts/diagnostics/status information

<b>Alarms</b>	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
<b>Diagnostic messages</b>	
• Diagnostics	Yes
• Monitoring the supply voltage	Yes

• Wire-break	Yes; channel by channel
• Group error	Yes
• Overflow/underflow	Yes; channel by channel
<b>Diagnostics indication LED</b>	
• 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>	
<b>Potential separation channels</b>	
• between the channels	No
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	Yes
<b>Permissible potential difference</b>	
between different circuits	75 V DC/60 V AC (base isolation)
between the inputs (UCM)	10 V DC
<b>Isolation</b>	
Isolation tested with	707 V DC (type test)
<b>Dimensions</b>	
Width	15 mm
<b>Weights</b>	
Weight, approx.	30 g
<b>last modified:</b>	13.08.2015