

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	ET 200SP, AI 4x RTD/TC 2-/3-/4-wire HF, PU 1
Firmware version	V2.0
• 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
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	V12 SP1 / V13
• STEP 7 configurable/integrated as of version	V5.5 SP3 / V5.5 SP4
• PCS 7 configurable/integrated as of version	V8.1 SP1
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5
• PROFINET as of 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
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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; °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
• Input resistance (LG-Ni 1000)	1 MΩ
• 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
• PTC	Yes; 15 bit
• Input resistance (PTC)	1 MΩ
Thermocouple (TC)	
Temperature compensation	
— 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
Cable length	
• shielded, max.	200 m; 50 m with thermocouples
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
• 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
Smoothing of measured values	
• Number of smoothing levels	4; None; 4/8/16 times

- parameterizable

Yes

Encoder

Connection of signal encoders

- for voltage measurement
- for resistance measurement with two-wire connection
- for resistance measurement with three-wire connection
- for resistance measurement with four-wire connection

Yes

Yes

Yes

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 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 $f = n \times (f_1 \pm 1 \%)$, f_1 = interference frequency

- 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

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

Diagnostic messages

- Monitoring the supply voltage

Yes

- Wire-break

Yes; channel by channel

- Group error

Yes

- Overflow/underflow

Yes; channel by channel

Diagnostics indication LED

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|--|-------------------------|
| • 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

- | | |
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| • 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
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Isolation

Isolation tested with	707 V DC (type test)
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Dimensions

Width	15 mm
Height	73 mm
Depth	58 mm

Weights

Weight, approx.	30 g
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last modified:	10/28/2016
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