

Siemens
EcoTech



SIMATIC ET 200SP, Analog input module, AI 4xRTD/TC High Feature, suitable for BU type A0, A1, Color code CC00, channel diagnostics, 16 bit, +/-0.1%, 2-/3-/4-wire

General information

Product type designation	AI 4xRTD/TC 2-/3-/4-wire HF
Firmware version	V2.1
• FW update possible	Yes
usable BaseUnits	BU type A0, A1
Color code for module-specific color-coded label	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	V12 SP1 / V13
• STEP 7 configurable/integrated from version	V5.5 SP3 / V5.5 SP4
• PCS 7 configurable/integrated from version	V8.1 SP1
• PROFIBUS from GSD version/GSD revision	GSD Revision 5
• 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 (rated value)	30 mA
Current consumption, max.	32 mA

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

Hardware configuration

Automatic encoding	
• Mechanical coding element	Yes
• Type of mechanical coding element	Type A
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 — 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
Input ranges (rated values), thermocouples	
• 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
Input ranges (rated values), resistance thermometer	
• Cu 10 — Input resistance (Cu 10)	Yes; 16 bit incl. sign 1 MΩ
• 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) • Pt 100 — Input resistance (Pt 100) • Pt 1000 — Input resistance (Pt 1000) • Pt 200 — Input resistance (Pt 200) • Pt 500 — Input resistance (Pt 500)	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), resistors	
• 0 to 150 ohms — Input resistance (0 to 150 ohms) • 0 to 300 ohms — Input resistance (0 to 300 ohms) • 0 to 600 ohms — Input resistance (0 to 600 ohms) • 0 to 3000 ohms — Input resistance (0 to 3000 ohms) • 0 to 6000 ohms — Input resistance (0 to 6000 ohms) • PTC — Input resistance (PTC)	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 Yes; 15 bit 1 MΩ
Thermocouple (TC)	
Temperature compensation	
— Parameterizable — Reference channel of the module — internal comparison point — Reference channel of the group — Number of reference channel groups — fixed reference temperature	Yes Yes Yes; with BaseUnit type A1 Yes 4; Group 0 to 3 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. • Integration time, parameterizable • Basic conversion time, including integration time (ms) — additional processing time for wire-break check — additional power line wire-break check • Interference voltage suppression for interference frequency f1 in Hz • Conversion time (per channel)	16 bit Yes 2 ms; In the ranges resistance thermometers, resistors and thermocouples 2 ms; for 3/4 wire transducer (resistance thermometer and resistor) 16.6 / 50 / 60 Hz 180 / 60 / 50 / (67.5 / 22.5 / 18.75) ms
Smoothing of measured values	
• Number of smoothing levels • Parameterizable	4; None; 4/8/16 times 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; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB
• Common mode voltage, max.	10 V
• Common mode interference, min.	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)
Standards, approvals, certificates	
Ecological footprint	
• environmental product declaration	Yes
Global warming potential	
— global warming potential, (total) [CO ₂ eq]	9.32 kg
— global warming potential, (during production) [CO ₂ eq]	4.97 kg
— global warming potential, (during operation) [CO ₂ eq]	4.79 kg
— global warming potential, (after end of life cycle) [CO ₂ eq]	-0.449 kg
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; < 0 °C as of FS08
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS08
• 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 ET 200SP System Manual
Absolute humidity	
• dew point, min.	-60 °C; suitable for dry room applications
Dimensions	
Width	15 mm

Height	73 mm
Depth	58 mm

Classifications

	Version	Classification
eClass	16	27-24-26-01
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
IDEA	4	3562
UNSPSC	15	32-15-17-05

Approvals / Certificates

General Product Approval



[Manufacturer Declaration](#)

[Miscellaneous](#)



[Metrological Approval](#)

General Product Approval



[China RoHS](#)



General Product Approval

EMV

For use in hazardous locations



[FM](#)

[CCC-Ex](#)



For use in hazardous locations

Maritime application

[Type Examination Certificate](#)



[Miscellaneous](#)

[CCC-Ex](#)



Maritime application



[NK / Nippon Kaiji Kyokai](#)



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

Maritime application

Environment



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