



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 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	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) • -250 mV to +250 mV — Input resistance (-250 mV to +250 mV) • -50 mV to +50 mV — Input resistance (-50 mV to +50 mV) • -80 mV to +80 mV — Input resistance (-80 mV to +80 mV)	- 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), thermocouples	
• Type B — Input resistance (Type B) • Type C — Input resistance (Type C) • 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 - 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	- 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

— 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 / (67.5 / 22.5 / 18.75) 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	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 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 x (f1 +/- 1 %), f1 = 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) [CO2 eq]		9.32 kg	
— global warming potential, (during production) [CO2 eq]		4.97 kg	
— global warming potential, (during operation) [CO2 eq]		4.79 kg	
— global warming potential, (after end of life cycle) [CO2 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	
Dimensions			
Width		15 mm	
Height		73 mm	
Depth		58 mm	
Classifications			
		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
IDEA	4	3562
UNSPSC	15	32-15-17-05

Approvals / Certificates

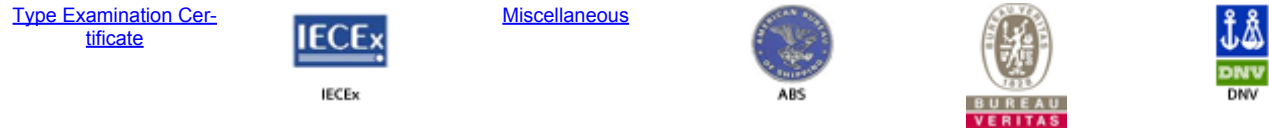
General Product Approval



General Product Approval For use in hazardous locations



For use in hazardous locations Maritime application



Maritime application



Environment



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