



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
<ul style="list-style-type: none"> FW update possible 	Yes
usable BaseUnits	BU type A0, A1
Color code for module-specific color identification plate	CC00
Product function	
<ul style="list-style-type: none"> I&M data 	Yes; I&M0 to I&M3
<ul style="list-style-type: none"> Isochronous mode 	No
<ul style="list-style-type: none"> Adjustment of measuring range 	Yes
Engineering with	
<ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated from version 	V12 SP1 / V13
<ul style="list-style-type: none"> STEP 7 configurable/integrated from version 	V5.5 SP3 / V5.5 SP4
<ul style="list-style-type: none"> PCS 7 configurable/integrated from version 	V8.1 SP1
<ul style="list-style-type: none"> PROFIBUS from GSD version/GSD revision 	GSD Revision 5
<ul style="list-style-type: none"> PROFINET from GSD version/GSD revision 	GSDML V2.3
Operating mode	
<ul style="list-style-type: none"> Oversampling 	No
<ul style="list-style-type: none"> 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
Address area	
Address space per module	
<ul style="list-style-type: none"> Address space per module, max. 	8 byte; + 1 byte for QI information
Hardware configuration	
Automatic encoding	
<ul style="list-style-type: none"> Mechanical coding element 	Yes
<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> ● -1 V to +1 V <ul style="list-style-type: none"> — Input resistance (-1 V to +1 V) ● -250 mV to +250 mV <ul style="list-style-type: none"> — Input resistance (-250 mV to +250 mV) ● -50 mV to +50 mV <ul style="list-style-type: none"> — Input resistance (-50 mV to +50 mV) ● -80 mV to +80 mV <ul style="list-style-type: none"> — Input resistance (-80 mV to +80 mV) 	<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> ● Type B <ul style="list-style-type: none"> — Input resistance (Type B) ● Type C <ul style="list-style-type: none"> — Input resistance (Type C) ● Type E <ul style="list-style-type: none"> — Input resistance (Type E) ● Type J <ul style="list-style-type: none"> — Input resistance (type J) ● Type K <ul style="list-style-type: none"> — Input resistance (Type K) ● Type L <ul style="list-style-type: none"> — Input resistance (Type L) ● Type N <ul style="list-style-type: none"> — Input resistance (Type N) ● Type R <ul style="list-style-type: none"> — Input resistance (Type R) ● Type S <ul style="list-style-type: none"> — Input resistance (Type S) ● Type T <ul style="list-style-type: none"> — Input resistance (Type T) ● Type U <ul style="list-style-type: none"> — Input resistance (Type U) ● Type TXK/TXK(L) to GOST <ul style="list-style-type: none"> — Input resistance (Type TXK/TXK(L) to GOST) 	<ul style="list-style-type: none"> 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 Yes; 16 bit incl. sign 1 MΩ Yes; 16 bit incl. sign 1 MΩ
Input ranges (rated values), resistance thermometer	
<ul style="list-style-type: none"> ● Cu 10 <ul style="list-style-type: none"> — Input resistance (Cu 10) ● Ni 100 <ul style="list-style-type: none"> — Input resistance (Ni 100) ● Ni 1000 <ul style="list-style-type: none"> — Input resistance (Ni 1000) ● LG-Ni 1000 <ul style="list-style-type: none"> — Input resistance (LG-Ni 1000) ● Ni 120 <ul style="list-style-type: none"> — Input resistance (Ni 120) ● Ni 200 <ul style="list-style-type: none"> — Input resistance (Ni 200) ● Ni 500 <ul style="list-style-type: none"> — Input resistance (Ni 500) ● Pt 100 <ul style="list-style-type: none"> — Input resistance (Pt 100) ● Pt 1000 <ul style="list-style-type: none"> — Input resistance (Pt 1000) 	<ul style="list-style-type: none"> 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

<ul style="list-style-type: none"> ● Pt 200 <ul style="list-style-type: none"> — Input resistance (Pt 200) ● Pt 500 <ul style="list-style-type: none"> — Input resistance (Pt 500) 	Yes; 16 bit incl. sign 1 M Ω Yes; 16 bit incl. sign 1 M Ω
Input ranges (rated values), resistors	
<ul style="list-style-type: none"> ● 0 to 150 ohms <ul style="list-style-type: none"> — Input resistance (0 to 150 ohms) ● 0 to 300 ohms <ul style="list-style-type: none"> — Input resistance (0 to 300 ohms) ● 0 to 600 ohms <ul style="list-style-type: none"> — Input resistance (0 to 600 ohms) ● 0 to 3000 ohms <ul style="list-style-type: none"> — Input resistance (0 to 3000 ohms) ● 0 to 6000 ohms <ul style="list-style-type: none"> — Input resistance (0 to 6000 ohms) ● PTC <ul style="list-style-type: none"> — Input resistance (PTC) 	Yes; 15 bit 1 M Ω Yes; 15 bit 1 M Ω Yes; 15 bit 1 M Ω Yes; 15 bit 1 M Ω Yes; 15 bit 1 M Ω
Thermocouple (TC)	
Temperature compensation	
<ul style="list-style-type: none"> — 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	
<ul style="list-style-type: none"> ● 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	
<ul style="list-style-type: none"> ● Resolution with overrange (bit including sign), max. ● Integration time, parameterizable ● Basic conversion time, including integration time (ms) <ul style="list-style-type: none"> — 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	
<ul style="list-style-type: none"> ● Number of smoothing levels ● parameterizable 	4; None; 4/8/16 times Yes
Encoder	
Connection of signal encoders	
<ul style="list-style-type: none"> ● 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	
<ul style="list-style-type: none"> ● Voltage, relative to input range, (+/-) ● Resistance, relative to input range, (+/-) 	0.1 % 0.1 %
Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> ● Voltage, relative to input range, (+/-) ● Resistance, relative to input range, (+/-) 	0.05 % 0.05 %
Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, f_1 = interference frequency	
<ul style="list-style-type: none"> ● Series mode interference (peak value of interference < 	70 dB; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB

rated value of input range), min.		
• 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)	
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	9	EC001596
ETIM	8	EC001596
ETIM	7	EC001596
IDEA	4	3562
UNSPSC	15	32-15-17-05
Approvals / Certificates		
General Product Approval		other



[Miscellaneous](#)



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Environment

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