



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
HW functional status	From FS08
Firmware version	
• 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
• Adjustment of measuring range	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V14
• PCS 7 configurable/integrated from version	V8.1 SP1
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher
• 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, max.	35 mA
Power loss	
Power loss, typ.	0.75 W
Address area	
Address space per module	
• Address space per module, max.	8 byte; + 1 byte for QI information
Hardware configuration	
Automatic encoding	Yes

<ul style="list-style-type: none"> • Mechanical coding element 	Yes
<ul style="list-style-type: none"> • Type of mechanical coding element 	Type A
Selection of BaseUnit for connection variants	
<ul style="list-style-type: none"> • 2-wire connection 	BU type A0, A1
<ul style="list-style-type: none"> • 3-wire connection 	BU type A0, A1
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.	0.7 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) 	Yes; 16 bit incl. sign 1 MΩ
<ul style="list-style-type: none"> • -250 mV to +250 mV <ul style="list-style-type: none"> — Input resistance (-250 mV to +250 mV) 	Yes; 16 bit incl. sign 1 MΩ
<ul style="list-style-type: none"> • -50 mV to +50 mV <ul style="list-style-type: none"> — Input resistance (-50 mV to +50 mV) 	Yes; 16 bit incl. sign 1 MΩ
<ul style="list-style-type: none"> • -80 mV to +80 mV <ul style="list-style-type: none"> — Input resistance (-80 mV to +80 mV) 	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) 	Yes; 16 bit incl. sign 1 MΩ
<ul style="list-style-type: none"> • Type C <ul style="list-style-type: none"> — Input resistance (Type C) 	Yes; 16 bit incl. sign 1 MΩ
<ul style="list-style-type: none"> • Type E <ul style="list-style-type: none"> — Input resistance (Type E) 	Yes; 16 bit incl. sign 1 MΩ
<ul style="list-style-type: none"> • Type J <ul style="list-style-type: none"> — Input resistance (type J) 	Yes; 16 bit incl. sign 1 MΩ
<ul style="list-style-type: none"> • Type K <ul style="list-style-type: none"> — Input resistance (Type K) 	Yes; 16 bit incl. sign 1 MΩ
<ul style="list-style-type: none"> • Type L <ul style="list-style-type: none"> — Input resistance (Type L) 	Yes; 16 bit incl. sign 1 MΩ
<ul style="list-style-type: none"> • Type N <ul style="list-style-type: none"> — Input resistance (Type N) 	Yes; 16 bit incl. sign 1 MΩ
<ul style="list-style-type: none"> • Type R <ul style="list-style-type: none"> — Input resistance (Type R) 	Yes; 16 bit incl. sign 1 MΩ
<ul style="list-style-type: none"> • Type S <ul style="list-style-type: none"> — Input resistance (Type S) 	Yes; 16 bit incl. sign 1 MΩ
<ul style="list-style-type: none"> • Type T <ul style="list-style-type: none"> — Input resistance (Type T) 	Yes; 16 bit incl. sign 1 MΩ
<ul style="list-style-type: none"> • Type U <ul style="list-style-type: none"> — Input resistance (Type U) 	Yes; 16 bit incl. sign 1 MΩ
<ul style="list-style-type: none"> • Type TXK/TXK(L) to GOST <ul style="list-style-type: none"> — Input resistance (Type TXK/TXK(L) to GOST) 	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) 	Yes; 16 bit incl. sign 1 MΩ
<ul style="list-style-type: none"> • Ni 100 <ul style="list-style-type: none"> — Input resistance (Ni 100) 	Yes; 16 bit incl. sign 1 MΩ
<ul style="list-style-type: none"> • Ni 1000 <ul style="list-style-type: none"> — Input resistance (Ni 1000) 	Yes; 16 bit incl. sign 1 MΩ
<ul style="list-style-type: none"> • LG-Ni 1000 <ul style="list-style-type: none"> — Input resistance (LG-Ni 1000) 	Yes; 16 bit incl. sign 1 MΩ

<ul style="list-style-type: none"> • 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) • Pt 200 <ul style="list-style-type: none"> — Input resistance (Pt 200) • Pt 500 <ul style="list-style-type: none"> — Input resistance (Pt 500) 	<p>Yes; 16 bit incl. sign 1 MΩ</p> <p>Yes; 16 bit incl. sign 1 MΩ</p> <p>Yes; 16 bit incl. sign 1 MΩ</p> <p>Yes; 16 bit incl. sign 1 MΩ</p> <p>Yes; 16 bit incl. sign 1 MΩ</p> <p>Yes; 16 bit incl. sign 1 MΩ</p> <p>Yes; 16 bit incl. sign 1 MΩ</p>
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) 	<p>Yes; 15 bit 1 MΩ</p> <p>Yes; 15 bit 1 MΩ</p> <p>Yes; 15 bit 1 MΩ</p> <p>Yes; 15 bit 1 MΩ</p> <p>Yes; 15 bit 1 MΩ</p> <p>Yes 1 MΩ</p>
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 	<p>Yes</p> <p>Yes</p> <p>Yes; with BaseUnit type A1</p> <p>Yes</p> <p>4; Group 0 to 3</p> <p>Yes</p>
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) 	<p>16 bit</p> <p>Yes</p> <p>2 ms; In the ranges resistance thermometers, resistors and thermocouples 2 ms; for 3/4 wire transducer (resistance thermometer and resistor)</p> <p>16.6 / 50 / 60 Hz</p> <p>180 / 60 / 50 ms</p>
Smoothing of measured values	
<ul style="list-style-type: none"> • Number of smoothing levels • parameterizable 	<p>4; None; 4/8/16 times</p> <p>Yes</p>
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 	<p>Yes</p> <p>Yes</p> <p>Yes</p>

connection	
<ul style="list-style-type: none"> • 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	
<ul style="list-style-type: none"> • Voltage, relative to input range, (+/-) • Resistance, relative to input range, (+/-) 	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 %
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 < rated value of input range), min. • Common mode voltage, max. • Common mode interference, min. 	70 dB 10 V 90 dB
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
<ul style="list-style-type: none"> • Diagnostic alarm • Limit value alarm 	Yes Yes; two upper and two lower limit values in each case
Diagnoses	
<ul style="list-style-type: none"> • Monitoring the supply voltage • Wire-break • Group error • Overflow/underflow 	Yes Yes; channel by channel Yes Yes; channel by channel
Diagnostics indication LED	
<ul style="list-style-type: none"> • Monitoring of the supply voltage (PWR-LED) • Channel status display • for channel diagnostics • for module diagnostics 	Yes; green PWR LED Yes; green LED Yes; red LED Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
<ul style="list-style-type: none"> • between the channels • between the channels and backplane bus • between the channels and the power supply of the electronics 	No Yes 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	
<ul style="list-style-type: none"> • horizontal installation, min. • horizontal installation, max. • vertical installation, min. • vertical installation, max. 	-30 °C; < 0 °C as of FS08 60 °C -30 °C; < 0 °C as of FS08 50 °C
Altitude during operation relating to sea level	
<ul style="list-style-type: none"> • Installation altitude above sea level, max. 	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
last modified:	1/16/2021 

