



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
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
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"> 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 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) • Pt 200 <ul style="list-style-type: none"> — Input resistance (Pt 200) • Pt 500 	<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 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
— Number of reference channel groups	4; Group 0 to 3
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 $f = n \times (f1 \pm 1 \%)$, 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

Alarms

- 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

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

Dimensions

Width	15 mm
Height	73 mm
Depth	58 mm

last modified: 12/28/2021 