

SIMATIC ET 200SP, Analog input module, AI 8xRTD/TC 2-wire High Feature Pack quantity: 10 units, suitable for BU type A0, A1, Color code CC00, channel diagnostics, 16 bit, +/-0.1%



General information	
Product type designation	AI 8xRTD/TC 2-wire HF, PU 10
HW functional status	From FS05
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
• Measuring range scalable	Yes
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	V14 / -
• STEP 7 configurable/integrated as of version	V5.6
• PROFIBUS as of GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher
• PROFINET as of GSD version/GSD revision	GSDML V2.3
Operating mode	

- Oversampling
- MSI

No

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
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Power loss

Power loss, typ.	0.75 W
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Address area

Address space per module

- Address space per module, max. 16 byte; + 1 byte for QI information

Hardware configuration

Automatic encoding	Yes
• Mechanical coding element	Yes
• Type of mechanical coding element	Type A

Selection of BaseUnit for connection variants

- 2-wire connection BU type A0, A1

Analog inputs

Number of analog inputs	8
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)
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) 1 M Ω
- -250 mV to +250 mV
 - Input resistance (-250 mV to +250 mV) 1 M Ω
- -50 mV to +50 mV
 - Input resistance (-50 mV to +50 mV) 1 M Ω

<ul style="list-style-type: none"> • -80 mV to +80 mV <ul style="list-style-type: none"> — Input resistance (-80 mV to +80 mV) 	<p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p>
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) 	<p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p>
Input ranges (rated values), resistance thermometer	
<ul style="list-style-type: none"> • 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) 	<p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p>

<ul style="list-style-type: none"> • 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</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>1 MΩ</p> <p>Yes; 16 bit incl. sign</p> <p>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</p> <p>1 MΩ</p> <p>Yes; 15 bit</p> <p>1 MΩ</p> <p>Yes; 15 bit</p> <p>1 MΩ</p> <p>Yes; 15 bit</p> <p>1 MΩ</p> <p>Yes; 15 bit</p> <p>1 MΩ</p> <p>Yes; 15 bit</p> <p>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. 	<p>200 m; 50 m with thermocouples</p>
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 	<p>16 bit</p> <p>Yes</p> <p>2 ms; In the ranges resistance thermometers, resistors and thermocouples</p>

<ul style="list-style-type: none"> • Interference voltage suppression for interference frequency f1 in Hz 	16.6 / 50 / 60 Hz
<ul style="list-style-type: none"> • Conversion time (per channel) 	180 / 60 / 50 ms
Smoothing of measured values	
<ul style="list-style-type: none"> • Number of smoothing levels 	4; None; 4/8/16 times
<ul style="list-style-type: none"> • parameterizable 	Yes

Encoder

Connection of signal encoders	
<ul style="list-style-type: none"> • for voltage measurement 	Yes
<ul style="list-style-type: none"> • for resistance measurement with two-wire connection 	Yes
<ul style="list-style-type: none"> • for resistance measurement with three-wire connection 	No
<ul style="list-style-type: none"> • for resistance measurement with four-wire connection 	No

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, (+/-) 	0.1 %
<ul style="list-style-type: none"> • 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, (+/-) 	0.05 %
<ul style="list-style-type: none"> • Resistance, relative to input range, (+/-) 	0.05 %
Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$, f1 = interference frequency	
<ul style="list-style-type: none"> • Series mode interference (peak value of interference < rated value of input range), min. 	70 dB
<ul style="list-style-type: none"> • Common mode voltage, max. 	10 V
<ul style="list-style-type: none"> • Common mode interference, min. 	90 dB

Interrupts/diagnostics/status information

Diagnostics function	Yes
Alarms	
<ul style="list-style-type: none"> • Diagnostic alarm 	Yes
<ul style="list-style-type: none"> • Limit value alarm 	Yes; two upper and two lower limit values in each case
Diagnostic messages	
<ul style="list-style-type: none"> • Monitoring the supply voltage 	Yes
<ul style="list-style-type: none"> • Wire-break 	Yes; channel by channel
<ul style="list-style-type: none"> • Group error 	Yes
<ul style="list-style-type: none"> • 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 FS05
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS05
• 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 manual

Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
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