

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	
HW functional status	From FS08
Firmware version	
<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 as of version 	V14
<ul style="list-style-type: none"> STEP 7 configurable/integrated as of version 	V5.6
<ul style="list-style-type: none"> PCS 7 configurable/integrated as of version 	V8.1 SP1
<ul style="list-style-type: none"> PROFIBUS as of GSD version/GSD revision 	One GSD file each, Revision 3 and 5 and higher
<ul style="list-style-type: none"> 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

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

- Mechanical coding element

Yes

Selection of BaseUnit for connection variants

- 2-wire connection

BU type A0, A1

- 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; 1.7 mA for Cu10 sensors

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 necessaryTechnical unit for temperature measurement
adjustable

Yes; °C/°F/K

Input ranges (rated values), voltages

- -1 V to +1 V

Yes; 16 bit incl. sign

— Input resistance (-1 V to +1 V)

1 MΩ

- -250 mV to +250 mV

Yes; 16 bit incl. sign

— Input resistance (-250 mV to +250 mV)

1 MΩ

- -50 mV to +50 mV

Yes; 16 bit incl. sign

- Input resistance (-50 mV to +50 mV) 1 M Ω
- -80 mV to +80 mV Yes; 16 bit incl. sign
- Input resistance (-80 mV to +80 mV) 1 M Ω

Input ranges (rated values), thermocouples

- Type B Yes; 16 bit incl. sign
 - Input resistance (Type B) 1 M Ω
- Type C Yes; 16 bit incl. sign
 - Input resistance (Type C) 1 M Ω
- Type E Yes; 16 bit incl. sign
 - Input resistance (Type E) 1 M Ω
- Type J Yes; 16 bit incl. sign
 - Input resistance (type J) 1 M Ω
- Type K Yes; 16 bit incl. sign
 - Input resistance (Type K) 1 M Ω
- Type L Yes; 16 bit incl. sign
 - Input resistance (Type L) 1 M Ω
- Type N Yes; 16 bit incl. sign
 - Input resistance (Type N) 1 M Ω
- Type R Yes; 16 bit incl. sign
 - Input resistance (Type R) 1 M Ω
- Type S Yes; 16 bit incl. sign
 - Input resistance (Type S) 1 M Ω
- Type T Yes; 16 bit incl. sign
 - Input resistance (Type T) 1 M Ω
- Type U Yes; 16 bit incl. sign
 - Input resistance (Type U) 1 M Ω
- Type TXK/TXK(L) to GOST Yes; 16 bit incl. sign
 - Input resistance (Type TXK/TXK(L) to GOST) 1 M Ω

Input ranges (rated values), resistance thermometer

- Cu 10 Yes; 16 bit incl. sign
 - Input resistance (Cu 10) 1 M Ω
- Ni 100 Yes; 16 bit incl. sign
 - Input resistance (Ni 100) 1 M Ω
- Ni 1000 Yes; 16 bit incl. sign
 - Input resistance (Ni 1000) 1 M Ω
- LG-Ni 1000 Yes; 16 bit incl. sign
 - Input resistance (LG-Ni 1000) 1 M Ω
- Ni 120 Yes; 16 bit incl. sign
 - Input resistance (Ni 120) 1 M Ω
- Ni 200 Yes; 16 bit incl. sign

— Input resistance (Ni 200)	1 MΩ
• Ni 500	Yes; 16 bit incl. sign
— Input resistance (Ni 500)	1 MΩ
• Pt 100	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

<ul style="list-style-type: none"> • 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 f_1 in Hz • Conversion time (per channel) 	<p>2 ms; In the ranges resistance thermometers, resistors and thermocouples</p> <p>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 connection • for resistance measurement with four-wire connection 	<p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>

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, (+/-) 	<p>0.1 %</p> <p>0.1 %</p>
Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> • Voltage, relative to input range, (+/-) • Resistance, relative to input range, (+/-) 	<p>0.05 %</p> <p>0.05 %</p>
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. 	<p>70 dB</p> <p>10 V</p> <p>90 dB</p>

Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
<ul style="list-style-type: none"> • Diagnostic alarm 	Yes

• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnostic messages	
• 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
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• 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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