

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



General information	
HW functional status	From FS05
Firmware version	
<ul style="list-style-type: none"> <li>FW update possible</li> </ul>	Yes
usable BaseUnits	BU type A0, A1
Color code for module-specific color identification plate	CC00
Product function	
<ul style="list-style-type: none"> <li>I&amp;M data</li> </ul>	Yes; I&M0 to I&M3
<ul style="list-style-type: none"> <li>Isochronous mode</li> </ul>	No
<ul style="list-style-type: none"> <li>Measuring range scalable</li> </ul>	Yes
Engineering with	
<ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated as of version</li> </ul>	V14 / -
<ul style="list-style-type: none"> <li>STEP 7 configurable/integrated as of version</li> </ul>	V5.6
<ul style="list-style-type: none"> <li>PROFIBUS as of GSD version/GSD revision</li> </ul>	One GSD file each, Revision 3 and 5 and higher
<ul style="list-style-type: none"> <li>PROFINET as of GSD version/GSD revision</li> </ul>	GSDML V2.3
Operating mode	
<ul style="list-style-type: none"> <li>Oversampling</li> </ul>	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
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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

#### 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 MΩ
- -250 mV to +250 mV
  - Input resistance (-250 mV to +250 mV) 1 MΩ
- -50 mV to +50 mV
  - Input resistance (-50 mV to +50 mV) 1 MΩ
- -80 mV to +80 mV
  - Input resistance (-80 mV to +80 mV) 1 MΩ

Input ranges (rated values), thermocouples

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

Input ranges (rated values), resistance thermometer

• Ni 100	Yes; 16 bit incl. sign
— Input resistance (Ni 100)	1 MΩ
• Ni 1000	Yes; 16 bit incl. sign
— Input resistance (Ni 1000)	1 MΩ
• LG-Ni 1000	Yes; 16 bit incl. sign
— Input resistance (LG-Ni 1000)	1 MΩ
• Ni 120	Yes; 16 bit incl. sign
— Input resistance (Ni 120)	1 MΩ
• 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

<ul style="list-style-type: none"> <li>• Pt 1000 <ul style="list-style-type: none"> <li>— Input resistance (Pt 1000)</li> </ul> </li> <li>• Pt 200 <ul style="list-style-type: none"> <li>— Input resistance (Pt 200)</li> </ul> </li> <li>• Pt 500 <ul style="list-style-type: none"> <li>— Input resistance (Pt 500)</li> </ul> </li> </ul>	<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>
<b>Input ranges (rated values), resistors</b>	
<ul style="list-style-type: none"> <li>• 0 to 150 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 150 ohms)</li> </ul> </li> <li>• 0 to 300 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 300 ohms)</li> </ul> </li> <li>• 0 to 600 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 600 ohms)</li> </ul> </li> <li>• 0 to 3000 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 3000 ohms)</li> </ul> </li> <li>• 0 to 6000 ohms <ul style="list-style-type: none"> <li>— Input resistance (0 to 6000 ohms)</li> </ul> </li> <li>• PTC <ul style="list-style-type: none"> <li>— Input resistance (PTC)</li> </ul> </li> </ul>	<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; 15 bit 1 MΩ</p>
<b>Thermocouple (TC)</b>	
<b>Temperature compensation</b>	
<ul style="list-style-type: none"> <li>— parameterizable</li> <li>— Reference channel of the module</li> <li>— internal comparison point</li> <li>— Reference channel of the group</li> <li>— Number of reference channel groups</li> <li>— fixed reference temperature</li> </ul>	<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>
<b>Cable length</b>	
<ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>	200 m; 50 m with thermocouples
<b>Analog value generation for the inputs</b>	
Measurement principle	integrating (Sigma-Delta)
<b>Integration and conversion time/resolution per channel</b>	
<ul style="list-style-type: none"> <li>• Resolution with overrange (bit including sign), max.</li> <li>• Integration time, parameterizable</li> <li>• Basic conversion time, including integration time (ms) <ul style="list-style-type: none"> <li>— additional processing time for wire-break check</li> </ul> </li> <li>• Interference voltage suppression for interference frequency f1 in Hz</li> <li>• Conversion time (per channel)</li> </ul>	<p>16 bit</p> <p>Yes</p> <p>2 ms; In the ranges resistance thermometers, resistors and thermocouples</p> <p>16.6 / 50 / 60 Hz</p> <p>180 / 60 / 50 ms</p>

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	No
• for resistance measurement with four-wire connection	No

## Errors/accuracies

Linearity error (relative to input range), (+/-)	0.01 %; $\pm 0.1$ % for resistance thermometers and resistance
Temperature error (relative to input range), (+/-)	0.0009 %/K; $\pm 0.005$ % / 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 $f = n \times (f_1 \pm 1 \%)$ , $f_1$ = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB
• 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
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
- for module diagnostics

Yes; red LED  
Yes; green/red DIAG LED

### Potential separation

#### Potential separation channels

- 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

- horizontal installation, min.
- horizontal installation, max.
- vertical installation, min.
- vertical installation, max.

-30 °C  
60 °C  
-30 °C  
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

**last modified:**

04/10/2020