

SIMATIC ET 200SP, ANALOG INPUT MODULE, AI 4XU/I 2-WIRE STANDARD, PACKING UNIT: 1 PIECE, FITS TO BU-TYPE A0, A1, COLOR CODE CC03, MODULE DIAGNOSIS, 16BIT, +/-0,3%



General information	
Product type designation	AI 4x U/I 2-wire
HW functional status	From FS02
Firmware version	V2.0
<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	CC03
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>Measuring range scalable</li> </ul>	No
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 and higher
<ul style="list-style-type: none"> <li>PCS 7 configurable/integrated as of version</li> </ul>	V8.1 SP1
<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	

- Oversampling
- MSI

No

No

### CiR – Configuration in RUN

Reparameterization possible in RUN

Yes

Calibration possible in RUN

No

### 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.

37 mA; without sensor supply

### Encoder supply

24 V encoder supply

- 24 V
- Short-circuit protection
- Output current, max.

Yes

Yes

20 mA; max. 50 mA per channel for a duration &lt; 10 s

### Power loss

Power loss, typ.

0.85 W; Without encoder supply voltage

### Address area

Address space per module

- Address space per module, max.

8 byte; + 1 byte for QI information

### Hardware configuration

Automatic encoding

- Mechanical coding element

Yes

Selection of BaseUnit for connection variants

- 2-wire connection

BU type A0, A1

### Analog inputs

Number of analog inputs

4; Differential inputs

permissible input voltage for voltage input  
(destruction limit), max.

30 V

permissible input current for current input (destruction  
limit), max.

50 mA

Cycle time (all channels), min.

Sum of the basic conversion times and additional processing  
times (depending on the parameterization of the active channels)

Input ranges (rated values), voltages

- 0 to +10 V
- Input resistance (0 to 10 V)
- 1 V to 5 V
- Input resistance (1 V to 5 V)

Yes; 15 bit

120 k $\Omega$ 

Yes; 15 bit

120 k $\Omega$

<ul style="list-style-type: none"> <li>• -10 V to +10 V</li> </ul>	Yes; 16 bit incl. sign
<ul style="list-style-type: none"> <li>• Input resistance (-10 V to +10 V)</li> </ul>	120 k $\Omega$
<ul style="list-style-type: none"> <li>• -5 V to +5 V</li> </ul>	Yes; 16 bit incl. sign
<ul style="list-style-type: none"> <li>• Input resistance (-5 V to +5 V)</li> </ul>	120 k $\Omega$
<b>Input ranges (rated values), currents</b>	
<ul style="list-style-type: none"> <li>• 0 to 20 mA</li> </ul>	Yes; 15 bit
<ul style="list-style-type: none"> <li>• Input resistance (0 to 20 mA)</li> </ul>	100 $\Omega$ ; + approx. 0.7 V diode forward voltage
<ul style="list-style-type: none"> <li>• 4 mA to 20 mA</li> </ul>	Yes; 15 bit
<ul style="list-style-type: none"> <li>• Input resistance (4 mA to 20 mA)</li> </ul>	100 $\Omega$ ; + approx. 0.7 V diode forward voltage
<b>Cable length</b>	
<ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>	1 000 m; 200 m for voltage measurement
<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> </ul>	16 bit
<ul style="list-style-type: none"> <li>• Integration time, parameterizable</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Interference voltage suppression for interference frequency f1 in Hz</li> </ul>	16.6 / 50 / 60 Hz
<ul style="list-style-type: none"> <li>• Conversion time (per channel)</li> </ul>	180 / 60 / 50 ms
<b>Smoothing of measured values</b>	
<ul style="list-style-type: none"> <li>• Number of smoothing levels</li> </ul>	4; None; 4/8/16 times
<ul style="list-style-type: none"> <li>• parameterizable</li> </ul>	Yes
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
<ul style="list-style-type: none"> <li>• for voltage measurement</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• for current measurement as 2-wire transducer</li> </ul>	Yes
<ul style="list-style-type: none"> <li>— Burden of 2-wire transmitter, max.</li> </ul>	650 $\Omega$
<ul style="list-style-type: none"> <li>• for current measurement as 4-wire transducer</li> </ul>	No
<b>Errors/accuracies</b>	
Linearity error (relative to input range), (+/-)	0.01 %
Temperature error (relative to input range), (+/-)	0.005 %/K
Crosstalk between the inputs, min.	50 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.05 %
<b>Operational error limit in overall temperature range</b>	
<ul style="list-style-type: none"> <li>• Voltage, relative to input range, (+/-)</li> </ul>	0.5 %
<ul style="list-style-type: none"> <li>• Current, relative to input range, (+/-)</li> </ul>	0.5 %
<b>Basic error limit (operational limit at 25 °C)</b>	
<ul style="list-style-type: none"> <li>• Voltage, relative to input range, (+/-)</li> </ul>	0.3 %
<ul style="list-style-type: none"> <li>• Current, relative to input range, (+/-)</li> </ul>	0.3 %

Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$ , $f_1 =$ interference frequency	
<ul style="list-style-type: none"> <li>• Series mode interference (peak value of interference &lt; rated value of input range), min.</li> </ul>	70 dB
<ul style="list-style-type: none"> <li>• Common mode voltage, max.</li> </ul>	10 V
<ul style="list-style-type: none"> <li>• Common mode interference, min.</li> </ul>	90 dB
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No
Interrupts/diagnostics/status information	
Diagnostics function	Yes
Alarms	
<ul style="list-style-type: none"> <li>• Diagnostic alarm</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Limit value alarm</li> </ul>	No
Diagnostic messages	
<ul style="list-style-type: none"> <li>• Monitoring the supply voltage</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Wire-break</li> </ul>	Yes; at 4 to 20 mA
<ul style="list-style-type: none"> <li>• Short-circuit</li> </ul>	Yes; with 1 to 5 V or 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply
<ul style="list-style-type: none"> <li>• Group error</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Overflow/underflow</li> </ul>	Yes
Diagnostics indication LED	
<ul style="list-style-type: none"> <li>• Monitoring of the supply voltage (PWR-LED)</li> </ul>	Yes; Green LED
<ul style="list-style-type: none"> <li>• Channel status display</li> </ul>	Yes; Green LED
<ul style="list-style-type: none"> <li>• for channel diagnostics</li> </ul>	No
<ul style="list-style-type: none"> <li>• for module diagnostics</li> </ul>	Yes; Green/red LED
Potential separation	
Potential separation channels	
<ul style="list-style-type: none"> <li>• between the channels</li> </ul>	Yes; channel group-specific between 2-wire current input group and voltage input group
<ul style="list-style-type: none"> <li>• between the channels and backplane bus</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• between the channels and the power supply of the electronics</li> </ul>	Yes; only for voltage inputs
Permissible potential difference	
between the inputs (UCM)	10 V DC
Isolation	
Isolation tested with	707 V DC (type test)
Standards, approvals, certificates	
Suitable for applications according to AMS 2750	Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9	Yes

## 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. | 2 000 m; On request: Installation altitudes greater than 2 000 m |
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## Dimensions

Width	15 mm
Height	73 mm
Depth	58 mm

## Weights

Weight, approx.	31 g
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**last modified:** 02/13/2019