

SIMATIC ET 200SP, ANALOG INPUT MODULE, AI 4X1 2-/4-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 4x1 2-/4-wire ST
HW functional status	From FS02
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	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>Isochronous mode</li> </ul>	No
<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

<b>Operating mode</b>	
• Oversampling	No
• MSI	No
<b>CiR – Configuration in RUN</b>	
Reparameterization possible in RUN	Yes
Calibration possible in RUN	No
<b>Supply voltage</b>	
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
<b>Input current</b>	
Current consumption, max.	37 mA; without sensor supply
<b>Encoder supply</b>	
24 V encoder supply	
• 24 V	Yes
• Short-circuit protection	Yes
• Output current, max.	20 mA; max. 50 mA per channel for a duration < 10 s
<b>Power loss</b>	
Power loss, typ.	0.85 W; Without encoder supply voltage
<b>Address area</b>	
Address space per module	
• Address space per module, max.	8 byte; + 1 byte for QI information
<b>Hardware configuration</b>	
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
• 4-wire connection	BU type A0, A1
<b>Analog inputs</b>	
Number of analog inputs	4; Differential inputs
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)
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes; 16 bit incl. sign
— Input resistance (0 to 20 mA)	100 Ω; + approx. 0.7 V diode forward voltage in 2-wire operation

<ul style="list-style-type: none"> <li>• -20 mA to +20 mA <ul style="list-style-type: none"> <li>— Input resistance (-20 mA to +20 mA)</li> </ul> </li> <li>• 4 mA to 20 mA <ul style="list-style-type: none"> <li>— Input resistance (4 mA to 20 mA)</li> </ul> </li> </ul>	Yes 100 Ω Yes; 15 bit 100 Ω; + approx. 0.7 V diode forward voltage in 2-wire operation
<b>Cable length</b>	
<ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>	1 000 m

### Analog value generation for the inputs

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

### Encoder

<b>Connection of signal encoders</b>	
<ul style="list-style-type: none"> <li>• for voltage measurement</li> </ul>	No
<ul style="list-style-type: none"> <li>• for current measurement as 2-wire transducer <ul style="list-style-type: none"> <li>— Burden of 2-wire transmitter, max.</li> </ul> </li> </ul>	Yes 650 Ω
<ul style="list-style-type: none"> <li>• for current measurement as 4-wire transducer</li> </ul>	Yes

### Errors/accuracies

Linearity error (relative to input range), (+/-)	0.01 %
Temperature error (relative to input range), (+/-)	0.005 %/K
Crosstalk between the inputs, min.	50 dB; Applies to up to ±5 V overvoltage in other channels
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>• 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>• Current, relative to input range, (+/-)</li> </ul>	0.3 %
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>	
<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

### Interrupts/diagnostics/status information

Diagnostics function	Yes
----------------------	-----

Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	No
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; at 4 to 20 mA
• Short-circuit	Yes; 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply
• Group error	Yes
• Overflow/underflow	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED
• Channel status display	Yes; green LED
• for channel diagnostics	No
• for module diagnostics	Yes; green/red LED
Potential separation	
Potential separation channels	
• between the channels	Yes; channel group-specific between 2-wire current input group and 4-wire voltage input group
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	Yes; only for 4-wire transducer
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
Weights	

---

Weight, approx.

31 g

**last modified:**

06/11/2020