



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	Yes
<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 from version</li> </ul>	V14 / -
<ul style="list-style-type: none"> <li>STEP 7 configurable/integrated from version</li> </ul>	V5.6 and higher
<ul style="list-style-type: none"> <li>PCS 7 configurable/integrated from version</li> </ul>	V8.1 SP1
<ul style="list-style-type: none"> <li>PROFIBUS from GSD version/GSD revision</li> </ul>	One GSD file each, Revision 3 and 5 and higher
<ul style="list-style-type: none"> <li>PROFINET from GSD version/GSD revision</li> </ul>	GSDML V2.3
Operating mode	
<ul style="list-style-type: none"> <li>Oversampling</li> </ul>	No
<ul style="list-style-type: none"> <li>MSI</li> </ul>	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	
<ul style="list-style-type: none"> <li>24 V</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Short-circuit protection</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Output current, max.</li> </ul>	20 mA; max. 50 mA per channel for a duration < 10 s
Power loss	
Power loss, typ.	0.85 W; Without encoder supply voltage
Address area	
Address space per module	

<ul style="list-style-type: none"> <li>Address space per module, max.</li> </ul>	8 byte; + 1 byte for QI information
<b>Hardware configuration</b>	
Automatic encoding	Yes
<ul style="list-style-type: none"> <li>Mechanical coding element</li> <li>Type of mechanical coding element</li> </ul>	Yes Type A
Selection of BaseUnit for connection variants	
<ul style="list-style-type: none"> <li>2-wire connection</li> <li>4-wire connection</li> </ul>	BU type A0, A1 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)
Input ranges (rated values), currents	
<ul style="list-style-type: none"> <li>0 to 20 mA <ul style="list-style-type: none"> <li>Input resistance (0 to 20 mA)</li> </ul> </li> <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; 16 bit incl. sign 100 Ω; + approx. 0.7 V diode forward voltage in 2-wire operation Yes 100 Ω Yes; 15 bit 100 Ω; + approx. 0.7 V diode forward voltage in 2-wire operation
Cable length	
<ul style="list-style-type: none"> <li>shielded, max.</li> </ul>	1 000 m
<b>Analog value generation for the inputs</b>	
Measurement principle	integrating (Sigma-Delta)
Integration and conversion time/resolution per channel	
<ul style="list-style-type: none"> <li>Resolution with overrange (bit including sign), max.</li> <li>Integration time, parameterizable</li> <li>Interference voltage suppression for interference frequency f1 in Hz</li> <li>Conversion time (per channel)</li> </ul>	16 bit Yes 16.6 / 50 / 60 Hz 180 / 60 / 50 ms
Smoothing of measured values	
<ul style="list-style-type: none"> <li>Number of smoothing levels</li> <li>parameterizable</li> </ul>	4; None; 4/8/16 times Yes
<b>Encoder</b>	
Connection of signal encoders	
<ul style="list-style-type: none"> <li>for voltage measurement</li> <li>for current measurement as 2-wire transducer <ul style="list-style-type: none"> <li>Burden of 2-wire transmitter, max.</li> </ul> </li> <li>for current measurement as 4-wire transducer</li> </ul>	No Yes 650 Ω Yes
<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; Applies to up to ±5 V overvoltage in other channels
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"> <li>Current, relative to input range, (+/-)</li> </ul>	0.5 %
Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> <li>Current, relative to input range, (+/-)</li> </ul>	0.3 %
Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$ , $f1 =$ interference frequency	
<ul style="list-style-type: none"> <li>Series mode interference (peak value of interference &lt; rated value of input range), min.</li> <li>Common mode voltage, max.</li> <li>Common mode interference, min.</li> </ul>	70 dB 10 V 90 dB
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
Alarms	
<ul style="list-style-type: none"> <li>Diagnostic alarm</li> <li>Limit value alarm</li> </ul>	Yes No
Diagnoses	
<ul style="list-style-type: none"> <li>Monitoring the supply voltage</li> <li>Wire-break</li> </ul>	Yes Yes; at 4 to 20 mA

<ul style="list-style-type: none"> <li>• Short-circuit</li> </ul>	Yes; 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
<b>Diagnostics indication LED</b>	
<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
<b>Potential separation</b>	
<b>Potential separation channels</b>	
<ul style="list-style-type: none"> <li>• between the channels</li> </ul>	Yes; channel group-specific between 2-wire current input group and 4-wire 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 4-wire transducer
<b>Permissible potential difference</b>	
between the inputs (UCM)	10 V DC
<b>Isolation</b>	
Isolation tested with	707 V DC (type test)
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
<ul style="list-style-type: none"> <li>• horizontal installation, min.</li> </ul>	-30 °C; < 0 °C as of FS02
<ul style="list-style-type: none"> <li>• horizontal installation, max.</li> </ul>	60 °C
<ul style="list-style-type: none"> <li>• vertical installation, min.</li> </ul>	-30 °C; < 0 °C as of FS02
<ul style="list-style-type: none"> <li>• vertical installation, max.</li> </ul>	50 °C
<b>Altitude during operation relating to sea level</b>	
<ul style="list-style-type: none"> <li>• Installation altitude above sea level, max.</li> </ul>	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Dimensions</b>	
Width	15 mm
Height	73 mm
Depth	58 mm
<b>Weights</b>	
Weight, approx.	31 g
<b>last modified:</b>	12/19/2020 