

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	ET 200SP, AI 4x U/I 2-wire, PU 1
Firmware version	V2.0
<ul style="list-style-type: none"> FW update possible 	Yes
usable BaseUnits	BU type A0, A1
Color code for module-specific color identification plate	CC03
Product function	
<ul style="list-style-type: none"> I&M data 	Yes; I&M0 to I&M3
<ul style="list-style-type: none"> Measuring range scalable 	No
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 and higher
<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	
<ul style="list-style-type: none"> Oversampling 	No

- MSI

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
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Encoder supply

24 V encoder supply

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|----------------------------|---|
| • 24 V | Yes |
| • Short-circuit protection | Yes |
| • Output current, max. | 20 mA; max. 50 mA per channel for a duration < 10 s |

Power loss

Power loss, typ.	0.85 W; Without encoder supply voltage
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Address area

Address space per module

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|----------------------------------|-------------------------------------|
| • Address space per module, max. | 8 byte; + 1 byte for QI information |
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Hardware configuration

Automatic encoding	
• Mechanical coding element	Yes

Selection of BaseUnit for connection variants

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|---------------------|----------------|
| • 2-wire connection | BU type A0, A1 |
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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

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|---------------------------------|------------------------|
| • 0 to +10 V | Yes; 15 bit |
| • Input resistance (0 to 10 V) | 120 kΩ |
| • 1 V to 5 V | Yes; 15 bit |
| • Input resistance (1 V to 5 V) | 120 kΩ |
| • -10 V to +10 V | Yes; 16 bit incl. sign |

• Input resistance (-10 V to +10 V)	120 kΩ
• -5 V to +5 V	Yes; 16 bit incl. sign
• Input resistance (-5 V to +5 V)	120 kΩ
Input ranges (rated values), currents	
• 0 to 20 mA	Yes; 15 bit
• Input resistance (0 to 20 mA)	100 Ω; + approx. 0.7 V diode forward voltage
• 4 mA to 20 mA	Yes; 15 bit
• Input resistance (4 mA to 20 mA)	100 Ω; + approx. 0.7 V diode forward voltage
Cable length	
• shielded, max.	1 000 m; 200 m for voltage measurement

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
• Interference voltage suppression for interference frequency f1 in Hz	16.6 / 50 / 60 Hz
• Conversion time (per channel)	180 / 60 / 50 ms
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 current measurement as 2-wire transducer	Yes
— Burden of 2-wire transmitter, max.	650 Ω
• for current measurement as 4-wire transducer	No

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
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, (+/-)	0.5 %
• Current, relative to input range, (+/-)	0.5 %
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.3 %
• Current, relative to input range, (+/-)	0.3 %
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

Isochronous mode

Isochronous operation (application synchronized up to terminal)	No
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Interrupts/diagnostics/status information

Diagnostics function	Yes
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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; 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
• 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 voltage input group
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	Yes; only for voltage inputs

Permissible potential difference

between the inputs (UCM)	10 V DC
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Isolation

Isolation tested with	707 V DC (type test)
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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. 0 °C
- horizontal installation, max. 60 °C
- vertical installation, min. 0 °C
- vertical installation, max. 50 °C

Altitude during operation relating to sea level

- Ambient air temperature-barometric pressure-altitude On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m

Dimensions

Width	15 mm
Height	73 mm
Depth	58 mm

Weights

Weight, approx.	31 g
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last modified: 10/30/2018