

SIMATIC ET 200SP, Analog input module, AI 2x U/I 2-/4-wire High Speed, suitable for BU type A0, A1, Color code CC00, channel diagnostics, 16 bit, +/-0.3%



General information	
Product type designation	AI 2xU/I 2-/4-wire HS
HW functional status	From FS07
Firmware version	
• FW update possible	Yes
usable BaseUnits	BU type A0, A1
Color code for module-specific color identification plate	CC00
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
• Measuring range scalable	No
• Scalable measured values	No
• Adjustment of measuring range	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	V13 SP1
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -
• PROFIBUS as of GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher

• PROFINET as of GSD version/GSD revision	GSDML V2.3
<b>Operating mode</b>	
• Oversampling	Yes; 2 channels per module
• 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 (rated value)	39 mA; without sensor supply
<b>Encoder supply</b>	
24 V encoder supply	
• 24 V	Yes; For current measurement
• 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.	0.95 W; without sensor supply
<b>Address area</b>	
Address space per module	
• Address space per module, max.	4 byte; + 1 byte for QI information (32 bytes in the oversampling operating mode)
<b>Hardware configuration</b>	
Automatic encoding	Yes
• Mechanical coding element	Yes
• Type of mechanical coding element	Type A
<b>Selection of BaseUnit for connection variants</b>	
• 2-wire connection	BU type A0, A1
• 4-wire connection	BU type A0, A1
<b>Analog inputs</b>	
Number of analog inputs	2; Differential inputs
• For current measurement	2
• For voltage measurement	2
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.	125 $\mu$ s
Analog input with oversampling	Yes
• Values per cycle, max.	16
• Resolution, min.	50 $\mu$ s
<b>Input ranges (rated values), voltages</b>	
• 0 to +10 V	Yes; 15 bit
— Input resistance (0 to 10 V)	75 k $\Omega$
• 1 V to 5 V	Yes; 13 bit
— Input resistance (1 V to 5 V)	75 k $\Omega$
• -10 V to +10 V	Yes; 16 bit incl. sign
— Input resistance (-10 V to +10 V)	75 k $\Omega$
• -5 V to +5 V	Yes; 15 bit incl. sign
— Input resistance (-5 V to +5 V)	75 k $\Omega$
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes; 15 bit
— Input resistance (0 to 20 mA)	130 $\Omega$
• -20 mA to +20 mA	Yes; 16 bit incl. sign
— Input resistance (-20 mA to +20 mA)	130 $\Omega$
• 4 mA to 20 mA	Yes; 14 bit
— Input resistance (4 mA to 20 mA)	130 $\Omega$
<b>Cable length</b>	
• shielded, max.	1 000 m; 200 m for voltage measurement
<b>Analog value generation for the inputs</b>	
Measurement principle	Actual value encryption (successive approximation)
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	16 bit
• Interference voltage suppression for interference frequency f1 in Hz	No
• Conversion time (per channel)	10 $\mu$ s
<b>Smoothing of measured values</b>	
• Number of smoothing levels	7; none; 2-/4-/8-/16-/32-/64-fold
• parameterizable	Yes
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
• for voltage measurement	Yes
• for current measurement as 2-wire transducer	Yes
— Burden of 2-wire transmitter, max.	650 $\Omega$
• for current measurement as 4-wire transducer	Yes
<b>Errors/accuracies</b>	
Linearity error (relative to input range), (+/-)	0.03 %

Temperature error (relative to input range), (+/-)	0.01 %/K
Crosstalk between the inputs, min.	-50 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.1 %
<b>Operational error limit in overall temperature range</b>	
• Voltage, relative to input range, (+/-)	0.3 %
• Current, relative to input range, (+/-)	0.3 %
<b>Basic error limit (operational limit at 25 °C)</b>	
• Voltage, relative to input range, (+/-)	0.2 %
• Current, relative to input range, (+/-)	0.2 %
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1 =</math> interference frequency</b>	
• Common mode voltage, max.	35 V
• Common mode interference, min.	90 dB
<b>Isochronous mode</b>	
Filtering and processing time (TCI), min.	80 $\mu$ s
Bus cycle time (TDP), min.	125 $\mu$ s; Starting from firmware Version V2.0.1
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
<b>Diagnostic messages</b>	
• Wire-break	Yes; channel-by-channel, at 4 to 20 mA only
• Short-circuit	Yes; channel-by-channel, at 1 to 5 V or for current measuring ranges short-circuit in encoder supply
• Group error	Yes
• Overflow/underflow	Yes
<b>Diagnostics indication LED</b>	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; green LED
• for channel diagnostics	Yes; red LED
• for module diagnostics	Yes; green/red DIAG LED
<b>Potential separation</b>	
<b>Potential separation channels</b>	
• between the channels	Yes
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	Yes
<b>Permissible potential difference</b>	
between the inputs (UCM)	75 V DC/60 V AC
<b>Isolation</b>	
Isolation tested with	707 V DC (type test)

## Ambient conditions

### Ambient temperature during operation

- |                                 |                           |
|---------------------------------|---------------------------|
| • horizontal installation, min. | -30 °C; < 0 °C as of FS07 |
| • horizontal installation, max. | 60 °C                     |
| • vertical installation, min.   | -30 °C; < 0 °C as of FS07 |
| • 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 |
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## Dimensions

Width	15 mm
Height	73 mm
Depth	58 mm

## Weights

Weight, approx.	32 g
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**last modified:** 06/11/2020