



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 from version	V13 SP1
• STEP 7 configurable/integrated from version	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	One GSD file each, Revision 3 and 5 and higher
• PROFINET from GSD version/GSD revision	GSDML V2.3
Operating mode	
• Oversampling	Yes; 2 channels per module
• 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 (rated value)	39 mA; without sensor supply
Encoder supply	
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
Power loss	
Power loss, typ.	0.95 W; without sensor supply
Address area	
Address space per module	

- Address space per module, max.

4 byte; + 1 byte for QI information (32 bytes in the oversampling operating mode)

Hardware configuration

Automatic encoding	Yes
<ul style="list-style-type: none"> • Mechanical coding element 	Yes
<ul style="list-style-type: none"> • Type of mechanical coding element 	Type A

Selection of BaseUnit for connection variants

<ul style="list-style-type: none"> • 2-wire connection 	BU type A0, A1
<ul style="list-style-type: none"> • 4-wire connection 	BU type A0, A1

Analog inputs

Number of analog inputs	2; Differential inputs
<ul style="list-style-type: none"> • For current measurement 	2
<ul style="list-style-type: none"> • 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 μ s
Analog input with oversampling	Yes
<ul style="list-style-type: none"> • Values per cycle, max. 	16
<ul style="list-style-type: none"> • Resolution, min. 	50 μ s

Input ranges (rated values), voltages

<ul style="list-style-type: none"> • 0 to +10 V <ul style="list-style-type: none"> — Input resistance (0 to 10 V) 	Yes; 15 bit 75 k Ω
<ul style="list-style-type: none"> • 1 V to 5 V <ul style="list-style-type: none"> — Input resistance (1 V to 5 V) 	Yes; 13 bit 75 k Ω
<ul style="list-style-type: none"> • -10 V to +10 V <ul style="list-style-type: none"> — Input resistance (-10 V to +10 V) 	Yes; 16 bit incl. sign 75 k Ω
<ul style="list-style-type: none"> • -5 V to +5 V <ul style="list-style-type: none"> — Input resistance (-5 V to +5 V) 	Yes; 15 bit incl. sign 75 k Ω

Input ranges (rated values), currents

<ul style="list-style-type: none"> • 0 to 20 mA <ul style="list-style-type: none"> — Input resistance (0 to 20 mA) 	Yes; 15 bit 130 Ω
<ul style="list-style-type: none"> • -20 mA to +20 mA <ul style="list-style-type: none"> — Input resistance (-20 mA to +20 mA) 	Yes; 16 bit incl. sign 130 Ω
<ul style="list-style-type: none"> • 4 mA to 20 mA <ul style="list-style-type: none"> — Input resistance (4 mA to 20 mA) 	Yes; 14 bit 130 Ω

Cable length

<ul style="list-style-type: none"> • shielded, max. 	1 000 m; 200 m for voltage measurement
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Analog value generation for the inputs

Measurement principle	Actual value encryption (successive approximation)
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Integration and conversion time/resolution per channel

<ul style="list-style-type: none"> • Resolution with overrange (bit including sign), max. 	16 bit
<ul style="list-style-type: none"> • Interference voltage suppression for interference frequency f_1 in Hz 	No
<ul style="list-style-type: none"> • Conversion time (per channel) 	10 μ s

Smoothing of measured values

<ul style="list-style-type: none"> • Number of smoothing levels 	7; none; 2-/4-/8-/16-/32-/64-fold
<ul style="list-style-type: none"> • parameterizable 	Yes

Encoder

Connection of signal encoders

<ul style="list-style-type: none"> • for voltage measurement 	Yes
<ul style="list-style-type: none"> • for current measurement as 2-wire transducer <ul style="list-style-type: none"> — Burden of 2-wire transmitter, max. 	Yes 650 Ω
<ul style="list-style-type: none"> • for current measurement as 4-wire transducer 	Yes

Errors/accuracies

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 %
Operational error limit in overall temperature range	

<ul style="list-style-type: none"> • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) 	0.3 % 0.3 %
Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) 	0.2 % 0.2 %
Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, f_1 = interference frequency	
<ul style="list-style-type: none"> • Common mode voltage, max. • Common mode interference, min. 	35 V 90 dB
Isochronous mode	
Filtering and processing time (TCI), min.	80 μ s
Bus cycle time (TDP), min.	125 μ s; Starting from firmware Version V2.0.1
Interrupts/diagnostics/status information	
Alarms	
<ul style="list-style-type: none"> • Diagnostic alarm • Limit value alarm 	Yes Yes; two upper and two lower limit values in each case
Diagnoses	
<ul style="list-style-type: none"> • Wire-break • Short-circuit • Group error • Overflow/underflow 	Yes; channel-by-channel, at 4 to 20 mA only Yes; channel-by-channel, at 1 to 5 V or for current measuring ranges short-circuit in encoder supply Yes Yes
Diagnostics indication LED	
<ul style="list-style-type: none"> • Monitoring of the supply voltage (PWR-LED) • Channel status display • for channel diagnostics • for module diagnostics 	Yes; green PWR LED Yes; green LED Yes; red LED Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
<ul style="list-style-type: none"> • between the channels • between the channels and backplane bus • between the channels and the power supply of the electronics 	Yes Yes Yes
Isolation	
Isolation tested with	707 V DC (type test)
Ambient conditions	
Ambient temperature during operation	
<ul style="list-style-type: none"> • horizontal installation, min. • horizontal installation, max. • vertical installation, min. • vertical installation, max. 	-30 °C 60 °C -30 °C 50 °C
Altitude during operation relating to sea level	
<ul style="list-style-type: none"> • 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.	32 g
last modified:	8/16/2023 