



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 FS21
Firmware version	V2.0.3
<ul style="list-style-type: none"> FW update possible 	Yes
usable BaseUnits	BU type A0, A1
Color code for module-specific color identification plate	CC00
Product function	
<ul style="list-style-type: none"> I&M data 	Yes; I&M0 to I&M3
<ul style="list-style-type: none"> Isochronous mode 	Yes; 125 µs
<ul style="list-style-type: none"> Measuring range scalable 	No
<ul style="list-style-type: none"> Scalable measured values 	No
<ul style="list-style-type: none"> Adjustment of measuring range 	No
Engineering with	
<ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated from version 	V13 SP1
<ul style="list-style-type: none"> STEP 7 configurable/integrated from version 	V5.5 SP3 / -
<ul style="list-style-type: none"> PROFIBUS from GSD version/GSD revision 	One GSD file each, Revision 3 and 5 and higher
<ul style="list-style-type: none"> PROFINET from GSD version/GSD revision 	GSDML V2.3
Operating mode	
<ul style="list-style-type: none"> Oversampling 	Yes; 2 channels per module
<ul style="list-style-type: none"> MSI 	No
CiR - Configuration in RUN	
Reparameterization possible in RUN	No
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	
<ul style="list-style-type: none"> 24 V 	Yes; For current measurement
<ul style="list-style-type: none"> Short-circuit protection 	Yes
<ul style="list-style-type: none"> 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, (+/-) 	0.3 %	
<ul style="list-style-type: none"> • Current, relative to input range, (+/-) 	0.3 %	
Basic error limit (operational limit at 25 °C)		
<ul style="list-style-type: none"> • Voltage, relative to input range, (+/-) 	0.2 %	
<ul style="list-style-type: none"> • Current, relative to input range, (+/-) 	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. 	35 V	
<ul style="list-style-type: none"> • Common mode interference, min. 	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 	Yes	
<ul style="list-style-type: none"> • Limit value alarm 	Yes; two upper and two lower limit values in each case	
Diagnoses		
<ul style="list-style-type: none"> • Wire-break 	Yes; channel-by-channel, at 4 to 20 mA only	
<ul style="list-style-type: none"> • Short-circuit 	Yes; channel-by-channel, at 1 to 5 V or for current measuring ranges short-circuit in encoder supply	
<ul style="list-style-type: none"> • Group error 	Yes	
<ul style="list-style-type: none"> • Overflow/underflow 	Yes; channel by channel	
Diagnostics indication LED		
<ul style="list-style-type: none"> • Monitoring of the supply voltage (PWR-LED) 	Yes; green PWR LED	
<ul style="list-style-type: none"> • Channel status display 	Yes; green LED	
<ul style="list-style-type: none"> • for channel diagnostics 	Yes; red LED	
<ul style="list-style-type: none"> • for module diagnostics 	Yes; green/red DIAG LED	
Potential separation		
Potential separation channels		
<ul style="list-style-type: none"> • between the channels 	Yes	
<ul style="list-style-type: none"> • between the channels and backplane bus 	Yes	
<ul style="list-style-type: none"> • between the channels and the power supply of the electronics 	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. 	-30 °C; < 0 °C as of FS07	
<ul style="list-style-type: none"> • horizontal installation, max. 	60 °C	
<ul style="list-style-type: none"> • vertical installation, min. 	-30 °C; < 0 °C as of FS07	
<ul style="list-style-type: none"> • vertical installation, max. 	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 ET 200SP system manual	
Dimensions		
Width	15 mm	
Height	73 mm	
Depth	58 mm	
Weights		
Weight, approx.	32 g	
Classifications		
	Version	Classification
eClass	14	27-24-26-01
eClass	12	27-24-26-01
eClass	9.1	27-24-26-01
eClass	9	27-24-26-01
eClass	8	27-24-26-01
eClass	7.1	27-24-26-01
eClass	6	27-24-26-01
ETIM	9	EC001596

ETIM	8	EC001596
ETIM	7	EC001596
IDEA	4	3562
UNSPSC	15	32-15-17-05

Approvals / Certificates

General Product Approval

[Miscellaneous](#)



[Manufacturer Declaration](#)



[KC](#)

General Product Approval

For use in hazardous locations

[Metrological Approval](#)



[FM](#)

[CCC-Ex](#)



For use in hazardous locations

Maritime application



IECEX

[Miscellaneous](#)



ABS



BUREAU VERITAS



DNV



LRS

Maritime application

Environment

[NK / Nippon Kaiji Kyokai](#)



RINA



RMRS

[CCS \(China Classification Society\)](#)



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