



SIMATIC ET 200SP, Analog input module, AI 2x U/I 2-/4-wire High Feat., suitable for BU type A0, A1, Color code CC05, channel diagnostics, 16 bit, +/-0.1%

General information	
Product type designation	AI 2xU/I 2-/4-wire HF
HW functional status	From FS06
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>	Yes
<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>	V13
<ul style="list-style-type: none"> <li>STEP 7 configurable/integrated from version</li> </ul>	V5.5 / -
<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>	Yes
CiR - Configuration in RUN	
Reparameterization possible in RUN	Yes
Calibration possible in RUN	Yes
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"> <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 (two-wire)
Additional 24 V encoder supply	
<ul style="list-style-type: none"> <li>Short-circuit protection</li> </ul>	Yes; channel by channel
<ul style="list-style-type: none"> <li>Output current, max.</li> </ul>	100 mA; max. 150 mA for a duration of < 10 s (four-wire)
Power loss	
Power loss, typ.	0.95 W; without sensor supply

Address area	
Address space per module	
<ul style="list-style-type: none"> <li>Address space per module, max.</li> </ul>	4 byte; + 4 byte for scaling of measured values, + 1 byte for QI information
Hardware configuration	
Automatic encoding	
<ul style="list-style-type: none"> <li>Mechanical coding element</li> <li>Type of mechanical coding element</li> </ul>	Yes 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
Analog inputs	
Number of analog inputs	
<ul style="list-style-type: none"> <li>For current measurement</li> <li>For voltage measurement</li> </ul>	2; Differential inputs 2 2
permissible input voltage for voltage input (destruction limit), max.	30 V
permissible input current for current input (destruction limit), max.	50 mA
Analog input with oversampling	No
Standardization of measured values	Yes
Input ranges (rated values), voltages	
<ul style="list-style-type: none"> <li>0 to +10 V               <ul style="list-style-type: none"> <li>Input resistance (0 to 10 V)</li> </ul> </li> <li>1 V to 5 V               <ul style="list-style-type: none"> <li>Input resistance (1 V to 5 V)</li> </ul> </li> <li>-10 V to +10 V               <ul style="list-style-type: none"> <li>Input resistance (-10 V to +10 V)</li> </ul> </li> <li>-5 V to +5 V               <ul style="list-style-type: none"> <li>Input resistance (-5 V to +5 V)</li> </ul> </li> </ul>	Yes; 15 bit 75 kΩ Yes; 15 bit 75 kΩ Yes; 16 bit incl. sign 75 kΩ Yes; 16 bit incl. sign 75 kΩ
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; 15 bit 130 Ω Yes; 16 bit incl. sign 130 Ω Yes; 15 bit 130 Ω
Cable length	
<ul style="list-style-type: none"> <li>shielded, max.</li> </ul>	1 000 m; 200 m for voltage measurement
Analog value generation for the inputs	
Measurement principle	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>Integration time (ms)</li> <li>Basic conversion time, including integration time (ms)</li> <li>Interference voltage suppression for interference frequency f1 in Hz</li> <li>Conversion time (per channel)</li> <li>Basic execution time of the module (all channels released)</li> </ul>	16 bit Yes 67.5 / 22.5 / 18.75 / 10 / 5 / 2.5 / 1.25 / 0.625 ms 68.03 / 22.83 / 19.03 / 10.28 / 5.23 / 2.68 / 1.43 / 0.730 ms 16.6 / 50 / 60 / 300 / 600 / 1 200 / 2 400 / 4 800 68.2 / 23 / 19.2 / 10.45 / 5.40 / 2.85 / 1.6 / 0.9 ms 1 ms
Smoothing of measured values	
<ul style="list-style-type: none"> <li>Number of smoothing levels</li> <li>parameterizable</li> </ul>	6; none; 2-/4-/8-/16-/32-fold Yes
Encoder	
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>	Yes Yes 650 Ω Yes
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.01 %

Temperature error (relative to input range), (+/-)	0.003 %/K
Crosstalk between the inputs, min.	-50 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.01 %
<b>Operational error limit in overall temperature range</b>	
• Voltage, relative to input range, (+/-)	0.1 %
• Current, relative to input range, (+/-)	0.1 %
<b>Basic error limit (operational limit at 25 °C)</b>	
• Voltage, relative to input range, (+/-)	0.05 %; 0.1 % at SFU 4.8 kHz
• Current, relative to input range, (+/-)	0.05 %; 0.1 % at SFU 4.8 kHz
<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.	800 $\mu$ s
Bus cycle time (TDP), min.	1 ms
Jitter, max.	5 $\mu$ s
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; Measuring range 4 to 20 mA only
• Short-circuit	Yes; channel-by-channel, at 1 to 5 V or for 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>Isolation</b>	
Isolation tested with	707 V DC (type test)
<b>Ambient conditions</b>	
<b>Ambient temperature during operation</b>	
• horizontal installation, min.	-30 °C; < 0 °C as of FS06
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; < 0 °C as of FS06
• vertical installation, max.	50 °C
<b>Altitude during operation relating to sea level</b>	
• Installation altitude above sea level, max.	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.	32 g

**last modified:** 1/24/2021 