

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	
• FW update possible	Yes
usable BaseUnits	BU type A0, A1
Color code for module-specific color identification plate	CC03
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
• Measuring range scalable	No
Engineering with	
• STEP 7 TIA Portal configurable/integrated as of version	V13
• STEP 7 configurable/integrated as of version	V5.5 / -
• PCS 7 configurable/integrated as of version	V8.1 SP1
• PROFIBUS as of GSD version/GSD revision	GSD Revision 5
• PROFINET as of GSD version/GSD revision	GSDML V2.3

Operating mode	
• Oversampling	No
• MSI	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	
• 24 V	Yes
• Short-circuit protection	Yes
• Output current, max.	20 mA; max. 50 mA per channel for a duration < 10 s (two-wire)
Additional 24 V encoder supply	
• Short-circuit protection	Yes; channel by channel
• Output current, max.	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	
• Address space per module, max.	4 byte; + 4 byte for scaling of measured values, + 1 byte for QI information
Hardware configuration	
Selection of BaseUnit for connection variants	
• 2-wire connection	BU type A0, A1
• 4-wire connection	BU type A0, A1
Analog inputs	
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
Analog input with oversampling	No

Standardization of measured values	Yes
<b>Input ranges (rated values), voltages</b>	
<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>	<ul style="list-style-type: none"> <li>Yes; 15 bit</li> <li>75 k<math>\Omega</math></li> <li>Yes; 15 bit</li> <li>75 k<math>\Omega</math></li> <li>Yes; 16 bit incl. sign</li> <li>75 k<math>\Omega</math></li> <li>Yes; 16 bit incl. sign</li> <li>75 k<math>\Omega</math></li> </ul>
<b>Input ranges (rated values), currents</b>	
<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>	<ul style="list-style-type: none"> <li>Yes; 15 bit</li> <li>130 <math>\Omega</math></li> <li>Yes; 16 bit incl. sign</li> <li>130 <math>\Omega</math></li> <li>Yes; 15 bit</li> <li>130 <math>\Omega</math></li> </ul>
<b>Cable length</b>	
<ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>	1 000 m; 200 m for voltage measurement
<b>Analog value generation for the inputs</b>	
Measurement principle	Sigma Delta
<b>Integration and conversion time/resolution per channel</b>	
<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>	<ul style="list-style-type: none"> <li>16 bit</li> <li>Yes</li> <li>67.5 / 22.5 / 18.75 / 10 / 5 / 2.5 / 1.25 / 0.625 ms</li> <li>68.03 / 22.83 / 19.03 / 10.28 / 5.23 / 2.68 / 1.43 / 0.730 ms</li> <li>16.6 / 50 / 60 / 300 / 600 / 1 200 / 2 400 / 4 800</li> <li>68.2 / 23 / 19.2 / 10.45 / 5.40 / 2.85 / 1.6 / 0.9 ms</li> <li>1 ms</li> </ul>
<b>Smoothing of measured values</b>	
<ul style="list-style-type: none"> <li>• Number of smoothing levels</li> <li>• parameterizable</li> </ul>	<ul style="list-style-type: none"> <li>6; none; 2-/4-/8-/16-/32-fold</li> <li>Yes</li> </ul>
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
<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> </ul>	<ul style="list-style-type: none"> <li>Yes</li> <li>Yes</li> <li>650 <math>\Omega</math></li> </ul>

- for current measurement as 4-wire transducer

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

### Isochronous mode

Filtering and processing time (TCI), min.	800 $\mu$ s
Bus cycle time (TDP), min.	1 ms
Jitter, max.	5 $\mu$ s

### Interrupts/diagnostics/status information

Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
<b>Diagnostic messages</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

### Potential separation

<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

### Isolation

Isolation tested with 707 V DC (type test)

### Ambient conditions

#### Ambient temperature during operation

- horizontal installation, min. -30 °C
- horizontal installation, max. 60 °C
- vertical installation, min. -30 °C
- 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

### Dimensions

Width 15 mm

Height 73 mm

Depth 58 mm

### Weights

Weight, approx. 32 g

**last modified:** 04/28/2020