

SIMATIC ET 200AL, AI 4XU/I/RTD, 4x M12, Degree of protection IP67



General information	
Product type designation	AI 4xU/I/RTD, 4xM12
HW functional status	E02
Firmware version	V1.0.x
Product function	
<ul style="list-style-type: none"> I&M data 	Yes; I&M0 to I&M3
Engineering with	
<ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated as of version 	STEP 7 V13 SP1 or higher
<ul style="list-style-type: none"> STEP 7 configurable/integrated as of version 	From V5.5 SP4 Hotfix 3
<ul style="list-style-type: none"> PROFIBUS as of GSD version/GSD revision 	GSD as of Revision 5
<ul style="list-style-type: none"> PROFINET as of GSD version/GSD revision 	GSDML V2.3.1
Supply voltage	
Load voltage 1L+	
<ul style="list-style-type: none"> Rated value (DC) 	24 V
<ul style="list-style-type: none"> permissible range, lower limit (DC) 	20.4 V
<ul style="list-style-type: none"> permissible range, upper limit (DC) 	28.8 V
<ul style="list-style-type: none"> Reverse polarity protection 	Yes; against destruction

Input current	
Current consumption (rated value)	35 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Encoder supply	
Number of outputs	4
24 V encoder supply	
<ul style="list-style-type: none"> • Short-circuit protection 	Yes; per channel, electronic
<ul style="list-style-type: none"> • Output current, max. 	0.5 A; per channel, total current of all channels max. 1 A
Power loss	
Power loss, typ.	1.5 W
Analog inputs	
Number of analog inputs	4
<ul style="list-style-type: none"> • For current measurement 	4
<ul style="list-style-type: none"> • For voltage measurement 	4
<ul style="list-style-type: none"> • For resistance/resistance thermometer measurement 	4
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.	8 ms
Technical unit for temperature measurement adjustable	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin
Input ranges (rated values), voltages	
<ul style="list-style-type: none"> • 0 to +10 V 	Yes
<ul style="list-style-type: none"> • Input resistance (0 to 10 V) 	10 M Ω
<ul style="list-style-type: none"> • 1 V to 5 V 	Yes
<ul style="list-style-type: none"> • Input resistance (1 V to 5 V) 	10 M Ω
Input ranges (rated values), currents	
<ul style="list-style-type: none"> • 0 to 20 mA 	Yes
<ul style="list-style-type: none"> • Input resistance (0 to 20 mA) 	50 Ω
<ul style="list-style-type: none"> • 4 mA to 20 mA 	Yes
<ul style="list-style-type: none"> • Input resistance (4 mA to 20 mA) 	50 Ω
Input ranges (rated values), resistance thermometer	
<ul style="list-style-type: none"> • Ni 100 	Yes; Standard/climate
<ul style="list-style-type: none"> • Input resistance (Ni 100) 	10 M Ω
<ul style="list-style-type: none"> • Pt 100 	Yes; Standard/climate
<ul style="list-style-type: none"> • Input resistance (Pt 100) 	10 M Ω
Input ranges (rated values), resistors	
<ul style="list-style-type: none"> • 0 to 150 ohms 	Yes

• Input resistance (0 to 150 ohms)	10 MΩ
• 0 to 300 ohms	Yes
• Input resistance (0 to 300 ohms)	10 MΩ
Cable length	
• shielded, max.	30 m

Analog value generation for the inputs

Measurement principle	integrating
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes; channel by channel
• Integration time (ms)	0,3 / 16,7 / 20 / 60
• Interference voltage suppression for interference frequency f1 in Hz	3 600 / 60 / 50 / 16.7
• Conversion time (per channel)	2 / 18 / 21 / 61 ms
Smoothing of measured values	
• parameterizable	Yes
• Step: None	Yes; 1x cycle time
• Step: low	Yes; 4x cycle time
• Step: Medium	Yes; 16x cycle time
• Step: High	Yes; 32x cycle time

Encoder

Connection of signal encoders	
• for voltage measurement	Yes
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes
• for resistance measurement with two-wire connection	Yes
• for resistance measurement with three-wire connection	Yes

Errors/accuracies

Linearity error (relative to input range), (+/-)	0.025 %
Temperature error (relative to input range), (+/-)	0.01 %/K
Crosstalk between the inputs, max.	-70 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.01 %
Operational error limit in overall temperature range	
• Voltage, relative to input range, (+/-)	0.35 %
• Current, relative to input range, (+/-)	0.45 %
• Resistance, relative to input range, (+/-)	0.25 %
• Resistance thermometer, relative to input range, (+/-)	0.25 %

Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Resistance thermometer, relative to input range, (+/-) 	<p>0.25 %</p> <p>0.25 %</p> <p>0.15 %</p> <p>0.15 %</p>
Interference voltage suppression for $f = n \times (f_1 \pm 0.5 \%)$, f_1 = interference frequency	
<ul style="list-style-type: none"> • Series mode interference (peak value of interference < rated value of input range), min. 	40 dB
Interrupts/diagnostics/status information	
Alarms	
<ul style="list-style-type: none"> • Diagnostic alarm • Limit value alarm 	<p>Yes; Parameterizable</p> <p>Yes; Parameterizable</p>
Diagnostic messages	
<ul style="list-style-type: none"> • Wire-break • Short-circuit • Overflow/underflow 	<p>Yes; at 4 mA to 20 mA and 1 V to 5 V</p> <p>Yes; Encoder supply to M, channel by channel</p> <p>Yes</p>
Diagnostics indication LED	
<ul style="list-style-type: none"> • Channel status display • for module diagnostics 	<p>Yes; Green LED</p> <p>Yes; Green/red LED</p>
Potential separation	
between the load voltages	Yes
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 	<p>No</p> <p>Yes</p> <p>No</p>
Isolation	
Isolation tested with	707 V DC (type test)
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; From FS02
Highest safety class achievable for safety-related tripping of standard modules	
<ul style="list-style-type: none"> • Performance level according to ISO 13849-1 • Category according to ISO 13849-1 • SILCL according to IEC 62061 	<p>PL d</p> <p>Cat. 3</p> <p>SILCL 2</p>
Ambient conditions	
Ambient temperature during operation	

- min. -25 °C
- max. 55 °C

Connection method

Design of electrical connection for the inputs and outputs	M12, 5-pole
Power supply	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded

Dimensions

Width	30 mm
Height	159 mm
Depth	40 mm

Weights

Weight, approx.	168 g
last modified:	10/30/2018