




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

| General information | |
|---|--|
| Product type designation | AI 4xU/I/RTD |
| HW functional status | FS04 |
| Firmware version | V1.0.x |
| Product function | |
| • I&M data | Yes; I&M0 to I&M3 |
| Engineering with | |
| • STEP 7 TIA Portal configurable/integrated from version | STEP 7 V13 SP1 or higher |
| • STEP 7 configurable/integrated from version | From V5.5 SP4 Hotfix 3 |
| • PROFIBUS from GSD version/GSD revision | GSD as of Revision 5 |
| • PROFINET from GSD version/GSD revision | GSDML V2.3.1 |
| Supply voltage | |
| power supply according to NEC Class 2 required | No |
| Load voltage 1L+ | |
| • Rated value (DC) | 24 V |
| • permissible range, lower limit (DC) | 20.4 V |
| • permissible range, upper limit (DC) | 28.8 V |
| • 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 | |
| • Short-circuit protection | Yes; per channel, electronic |
| • 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 |
| • For current measurement | 4 |
| • For voltage measurement | 4 |
| • 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 <ul style="list-style-type: none"> — Input resistance (0 to 10 V) ● 1 V to 5 V <ul style="list-style-type: none"> — Input resistance (1 V to 5 V) | Yes 10 MΩ Yes 10 MΩ |
| 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) ● 4 mA to 20 mA <ul style="list-style-type: none"> — Input resistance (4 mA to 20 mA) | Yes 50 Ω Yes 50 Ω |
| Input ranges (rated values), resistance thermometer | |
| <ul style="list-style-type: none"> ● Ni 100 <ul style="list-style-type: none"> — Input resistance (Ni 100) ● Pt 100 <ul style="list-style-type: none"> — Input resistance (Pt 100) | Yes; Standard/climate 10 MΩ Yes; Standard/climate 10 MΩ |
| Input ranges (rated values), resistors | |
| <ul style="list-style-type: none"> ● 0 to 150 ohms <ul style="list-style-type: none"> — Input resistance (0 to 150 ohms) ● 0 to 300 ohms <ul style="list-style-type: none"> — Input resistance (0 to 300 ohms) | Yes 10 MΩ Yes 10 MΩ |
| Cable length | |
| <ul style="list-style-type: none"> ● shielded, max. | 30 m |
| Analog value generation for the inputs | |
| Measurement principle | integrating |
| Integration and conversion time/resolution per channel | |
| <ul style="list-style-type: none"> ● Resolution with overrange (bit including sign), max. ● Integration time, parameterizable ● Integration time (ms) ● Interference voltage suppression for interference frequency f1 in Hz ● Conversion time (per channel) | 16 bit Yes; channel by channel 0,3 / 16,7 / 20 / 60 3 600 / 60 / 50 / 16.7 2 / 18 / 21 / 61 ms |
| Smoothing of measured values | |
| <ul style="list-style-type: none"> ● parameterizable ● Step: None ● Step: low ● Step: Medium ● Step: High | Yes Yes; 1x cycle time Yes; 4x cycle time Yes; 16x cycle time Yes; 32x cycle time |
| Encoder | |
| Connection of signal encoders | |
| <ul style="list-style-type: none"> ● for voltage measurement ● for current measurement as 2-wire transducer ● for current measurement as 4-wire transducer ● for resistance measurement with two-wire connection ● for resistance measurement with three-wire connection | Yes Yes Yes Yes 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 | |
| <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, (+/-) | 0.35 % 0.45 % 0.25 % 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, (+/-) | 0.25 % 0.25 % 0.15 % 0.15 % |
| Interference voltage suppression for $f = n \times (f1 \pm 0.5 \%)$, f1 = 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 | Yes; Parameterizable Yes; Parameterizable |
| Diagnoses | |
| <ul style="list-style-type: none"> Wire-break Short-circuit Overflow/underflow | Yes; at 4 mA to 20 mA and 1 V to 5 V Yes; Encoder supply to M, channel by channel Yes |
| Diagnostics indication LED | |
| <ul style="list-style-type: none"> Channel status display for module diagnostics | Yes; green LED Yes; green/red LED |
| 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 | No Yes No |
| 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 SIL acc. to IEC 62061 remark on safety-oriented shutdown | PL d Cat. 3 SIL 2 https://support.industry.siemens.com/cs/de/en/view/39198632 |
| Ambient conditions | |
| Ambient temperature during operation | |
| <ul style="list-style-type: none"> min. max. | -30 °C 55 °C |
| connection method | |
| Design of electrical connection for the inputs and outputs | M12, 5-pole |
| Design of electrical connection for supply voltage | M8, 4-pole |
| ET-Connection | |
| <ul style="list-style-type: none"> ET-Connection | M8, 4-pin, shielded |
| Dimensions | |
| Width | 30 mm |
| Height | 159 mm |
| Depth | 40 mm |
| Weights | |
| Weight, approx. | 168 g |
| last modified: | 8/16/2023  |

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