



Figure similar

SIMATIC S7-1200, Analog input, SM 1231, 4 AI, +/-10 V, +/-5 V, +/-2.5 V, or 0-20 mA/4-20 mA, 12 bit+sign (13 bit ADC)

| General information | |
|---|---|
| Product type designation | SM 1231, AI 4x13 bit |
| Supply voltage | |
| Rated value (DC) | 24 V |
| Input current | |
| Current consumption, typ. | 45 mA |
| from backplane bus 5 V DC, typ. | 80 mA |
| Power loss | |
| Power loss, typ. | 1.5 W |
| Analog inputs | |
| Number of analog inputs | 4; Current or voltage differential inputs |
| permissible input voltage for voltage input (destruction limit), max. | 35 V |
| permissible input current for current input (destruction limit), max. | 40 mA |
| Cycle time (all channels) max. | 625 μ s |
| Input ranges | |
| <ul style="list-style-type: none"> • Voltage • Current • Thermocouple • Resistance thermometer • Resistance | Yes; $\pm 10V$, $\pm 5V$, $\pm 2.5V$ Yes; 4 to 20 mA, 0 to 20 mA No No No |
| Input ranges (rated values), voltages | |
| <ul style="list-style-type: none"> • -10 V to +10 V — Input resistance (-10 V to +10 V) • -2.5 V to +2.5 V — Input resistance (-2.5 V to +2.5 V) • -5 V to +5 V — Input resistance (-5 V to +5 V) | Yes ≥ 9 MOhm Yes ≥ 9 MOhm Yes ≥ 9 MOhm |
| Input ranges (rated values), currents | |
| <ul style="list-style-type: none"> • 0 to 20 mA — Input resistance (0 to 20 mA) • 4 mA to 20 mA — Input resistance (4 mA to 20 mA) | Yes 280 Ω Yes 280 Ω |
| Analog value generation for the inputs | |
| Integration and conversion time/resolution per channel | |
| <ul style="list-style-type: none"> • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Interference voltage suppression for interference frequency f_1 in Hz | 12 bit; + sign Yes 40 dB, DC to 60 V for interference frequency 50 / 60 Hz |

| | |
|---|---|
| Smoothing of measured values | |
| • parameterizable | Yes |
| • Step: None | Yes |
| • Step: low | Yes |
| • Step: Medium | Yes |
| • Step: High | Yes |
| Errors/accuracies | |
| Temperature error (relative to input range), (+/-) | 25 °C ±0.1%, to 55 °C ±0.2% total measurement range |
| Basic error limit (operational limit at 25 °C) | |
| • Voltage, relative to input range, (+/-) | 0.1 % |
| • Current, relative to input range, (+/-) | 0.1 % |
| Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, $f_1 =$ interference frequency | |
| • Common mode voltage, max. | 12 V |
| Interrupts/diagnostics/status information | |
| Alarms | Yes |
| Diagnostics function | Yes |
| Alarms | |
| • Diagnostic alarm | Yes |
| Diagnoses | |
| • Monitoring the supply voltage | Yes |
| • Wire-break | Yes |
| Diagnostics indication LED | |
| • for status of the inputs | Yes |
| • for maintenance | Yes |
| Degree and class of protection | |
| IP degree of protection | IP20 |
| Standards, approvals, certificates | |
| CE mark | Yes |
| CSA approval | Yes |
| UL approval | Yes |
| cULus | Yes |
| FM approval | Yes |
| RCM (formerly C-TICK) | Yes |
| KC approval | Yes |
| Marine approval | Yes |
| Ecological footprint | |
| • environmental product declaration | Yes |
| Global warming potential | |
| — global warming potential, (total) [CO2 eq] | 43.1 kg |
| — global warming potential, (during production) [CO2 eq] | 7.62 kg |
| — global warming potential, (during operation) [CO2 eq] | 36 kg |
| — global warming potential, (after end of life cycle) [CO2 eq] | -0.544 kg |
| Ambient conditions | |
| Free fall | |
| • Fall height, max. | 0.3 m; five times, in product package |
| Ambient temperature during operation | |
| • min. | -20 °C |
| • max. | 60 °C |
| • horizontal installation, min. | -20 °C |
| • horizontal installation, max. | 60 °C |
| • vertical installation, min. | -20 °C |
| • vertical installation, max. | 50 °C |
| Ambient temperature during storage/transportation | |
| • min. | -40 °C |
| • max. | 70 °C |
| Air pressure acc. to IEC 60068-2-13 | |
| • Operation, min. | 795 hPa |
| • Operation, max. | 1 080 hPa |

| | |
|---|---|
| • Storage/transport, min. | 660 hPa |
| • Storage/transport, max. | 1 080 hPa |
| Relative humidity | |
| • Operation at 25 °C without condensation, max. | 95 % |
| Pollutant concentrations | |
| • SO2 at RH < 60% without condensation | SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60 % condensation-free |
| connection method | |
| required front connector | Yes |
| Mechanics/material | |
| Enclosure material (front) | |
| • Plastic | Yes |
| Dimensions | |
| Width | 45 mm |
| Height | 100 mm |
| Depth | 75 mm |
| Weights | |
| Weight, approx. | 180 g |

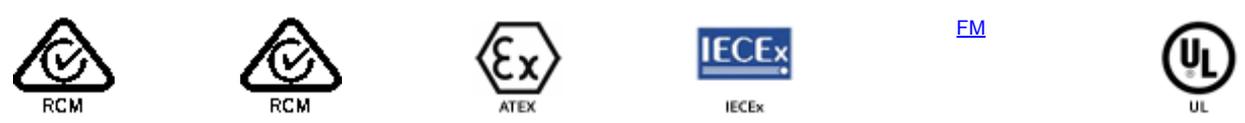
| Classifications | | | |
|------------------------|--------|----------------|-----------------------|
| | | Version | Classification |
| | eClass | 14 | 27-24-22-01 |
| | eClass | 12 | 27-24-22-01 |
| | eClass | 9.1 | 27-24-22-01 |
| | eClass | 9 | 27-24-22-01 |
| | eClass | 8 | 27-24-22-01 |
| | eClass | 7.1 | 27-24-22-01 |
| | eClass | 6 | 27-24-22-01 |
| | ETIM | 9 | EC001420 |
| | ETIM | 8 | EC001420 |
| | ETIM | 7 | EC001420 |
| | IDEA | 4 | 3562 |
| | UNSPSC | 15 | 32-15-17-05 |

Approvals / Certificates

General Product Approval



General Product Approval | EMV | For use in hazardous locations



For use in hazardous locations | Maritime application



Maritime application | Environment



last modified:

5/16/2025