

SIMATIC S7-1200, Analog input, SM 1231, 8 AI, +/-10 V, +/-5 V, +/-2.5 V, or 0-20 mA/4-20 mA, 12 bit+sign or (13 bit ADC)



| General information | |
|---|---|
| Product type designation | SM 1231, AI 8x13 bit |
| Supply voltage | |
| Rated value (DC) | Yes |
| • 24 V DC | |
| Input current | |
| Current consumption, typ. | 45 mA |
| from backplane bus 5 V DC, typ. | 90 mA |
| Power loss | |
| Power loss, typ. | 1.5 W |
| Analog inputs | |
| Number of analog inputs | 8; 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 µs |
| Input ranges | |

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| • Voltage | Yes; $\pm 10\text{V}$, $\pm 5\text{V}$, $\pm 2.5\text{V}$ |
| • Current | Yes; 4 to 20 mA, 0 to 20 mA |
| • Thermocouple | No |
| • Resistance thermometer | No |
| • Resistance | Yes |
| Input ranges (rated values), voltages | |
| • -10 V to +10 V | Yes |
| • Input resistance (-10 V to +10 V) | $\geq 9\text{ MOhm}$ |
| • -2.5 V to +2.5 V | Yes |
| • Input resistance (-2.5 V to +2.5 V) | $\geq 9\text{ MOhm}$ |
| • -5 V to +5 V | Yes |
| • Input resistance (-5 V to +5 V) | $\geq 9\text{ MOhm}$ |
| Input ranges (rated values), currents | |
| • 0 to 20 mA | Yes |
| • Input resistance (0 to 20 mA) | $280\ \Omega$ |
| • 4 mA to 20 mA | Yes |
| • Input resistance (4 mA to 20 mA) | $280\ \Omega$ |
| Thermocouple (TC) | |
| Temperature compensation | |
| — parameterizable | No |
| Analog value generation for the inputs | |
| Integration and conversion time/resolution per channel | |
| • Resolution with overrange (bit including sign), max. | 12 bit; + sign |
| • Integration time, parameterizable | Yes |
| • Interference voltage suppression for interference frequency f_1 in Hz | 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), (+/-) | $25\text{ °C} \pm 0.1\%$, to $55\text{ °C} \pm 0.2\%$ 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 | |

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| Alarms | Yes |
| Diagnostics function | Yes |
| Alarms | |
| • Diagnostic alarm | Yes |
| Diagnostic messages | |
| • 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 | |
| Degree of protection acc. to EN 60529 | |
| • IP20 | Yes |
| Standards, approvals, certificates | |
| CE mark | Yes |
| CSA approval | Yes |
| FM approval | Yes |
| RCM (formerly C-TICK) | Yes |
| Marine approval | Yes |
| 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

last modified: 02/18/2019