




SIMATIC S7-1200, analog I/O SM 1234, 4 AI/2 AO, +/-10 V, 14-bit resolution or 0 (4)-20mA, 13-bit resolution

| General information  |   |
|--|---|
| Product type designation   | SM 1234, AI 4x13 bit/AQ 2x14 bit  |
| Supply voltage   |   |
| Rated value (DC)   | 24 V  |
| Input current  |   |
| Current consumption, typ.  | 60 mA   |
| from backplane bus 5 V DC, typ.  | 80 mA   |
| Power loss   |   |
| Power loss, typ.   | 2 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 $\mu$ s   |
| Input ranges   |   |
| <ul style="list-style-type: none"> <li>• Voltage</li> <li>• Current</li> <li>• Thermocouple</li> <li>• Resistance thermometer</li> <li>• Resistance</li> </ul>   | Yes; $\pm 10V$ , $\pm 5V$ , $\pm 2.5V$<br>Yes; 4 to 20 mA, 0 to 20 mA<br>No<br>No<br>No |
| Input ranges (rated values), voltages  |   |
| <ul style="list-style-type: none"> <li>• -10 V to +10 V<br/>— Input resistance (-10 V to +10 V)</li> <li>• -2.5 V to +2.5 V<br/>— Input resistance (-2.5 V to +2.5 V)</li> <li>• -5 V to +5 V<br/>— Input resistance (-5 V to +5 V)</li> </ul> | Yes<br>$\geq 9$ MOhm<br>Yes<br>$\geq 9$ MOhm<br>Yes<br>$\geq 9$ MOhm                    |
| Input ranges (rated values), currents  |   |
| <ul style="list-style-type: none"> <li>• 0 to 20 mA<br/>— Input resistance (0 to 20 mA)</li> <li>• 4 mA to 20 mA</li> </ul>  | Yes<br>280 $\Omega$<br>Yes  |
| Analog outputs   |   |
| Number of analog outputs   | 2; Current or voltage   |
| Output ranges, voltage   |   |
| <ul style="list-style-type: none"> <li>• -10 V to +10 V</li> </ul>   | Yes   |
| Output ranges, current   |   |

|  |   |
|--|---|
| • 0 to 20 mA   | Yes   |
| • 4 mA to 20 mA  | Yes   |
| <b>Load impedance (in rated range of output)</b>   |   |
| • with voltage outputs, min.   | 1 000 Ω   |
| • with current outputs, max.   | 600 Ω   |
| <b>Cable length</b>  |   |
| • shielded, max.   | 100 m; shielded, twisted pair                           |
| <b>Analog value generation for the inputs</b>  |   |
| Measurement principle  | Differential  |
| <b>Integration and conversion time/resolution per channel</b>  |   |
| • Resolution with overrange (bit including sign), max.   | 12 bit; + sign  |
| • Integration time, parameterizable  | Yes   |
| • Interference voltage suppression for interference frequency f1 in Hz   | 40 dB, DC to 60 V for interference frequency 50 / 60 Hz |
| <b>Smoothing of measured values</b>  |   |
| • parameterizable  | Yes   |
| • Step: None   | Yes   |
| • Step: low  | Yes   |
| • Step: Medium   | Yes   |
| • Step: High   | Yes   |
| <b>Analog value generation for the outputs</b>   |   |
| <b>Integration and conversion time/resolution per channel</b>  |   |
| • Resolution with overrange (bit including sign), max.   | 14 bit; Voltage: 14 bit; Current : 13 bit               |
| <b>Errors/accuracies</b>   |   |
| Temperature error (relative to input range), (+/-)   | 25 °C ±0.1%, to 55 °C ±0.2% total measurement range     |
| Temperature error (relative to output range), (+/-)  | 25 °C ±0.3%, to 55 °C ±0.6% total measurement range     |
| <b>Basic error limit (operational limit at 25 °C)</b>  |   |
| • Voltage, relative to input range, (+/-)  | 0.1 %   |
| • Current, relative to input range, (+/-)  | 0.1 %   |
| • Voltage, relative to output range, (+/-)   | 0.3 %   |
| • Current, relative to output range, (+/-)   | 0.3 %   |
| <b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, f1 = interference frequency</b> |   |
| • Common mode voltage, max.  | 12 V  |
| <b>Interrupts/diagnostics/status information</b>   |   |
| Alarms   | Yes   |
| Diagnostics function   | Yes   |
| <b>Alarms</b>  |   |
| • Diagnostic alarm   | Yes   |
| <b>Diagnoses</b>   |   |
| • Monitoring the supply voltage  | Yes   |
| • Wire-break   | Yes   |
| • Short-circuit  | Yes   |
| <b>Diagnostics indication LED</b>  |   |
| • for status of the inputs   | Yes   |
| • for status of the outputs  | Yes   |
| • for maintenance  | Yes   |
| <b>Potential separation</b>  |   |
| <b>Potential separation analog outputs</b>   |   |
| • between the channels and the power supply of the electronics   | No  |
| <b>Degree and class of protection</b>  |   |
| IP degree of protection  | IP20  |
| <b>Standards, approvals, certificates</b>  |   |
| 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   |
| <b>Ambient conditions</b>                          |   |
| 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                           |   |
| • SO <sub>2</sub> at RH < 60% without condensation | SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free          |
| <b>Connection method</b>                           |   |
| required front connector                           | Yes   |
| <b>Mechanics/material</b>                          |   |
| Enclosure material (front)                         |   |
| • Plastic  | Yes   |
| <b>Dimensions</b>                                  |   |
| Width  | 45 mm   |
| Height   | 100 mm  |
| Depth  | 75 mm   |
| <b>Weights</b>                                     |   |
| Weight, approx.                                    | 220 g   |
| <b>last modified:</b>                              | 3/11/2021  |