



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 µs                                    |
| Input ranges                                                          |                                           |
| • Voltage                                                             | Yes; ±10V, ±5V, ±2.5V                     |
| • Current                                                             | Yes; 4 to 20 mA, 0 to 20 mA               |
| • Thermocouple                                                        | No                                        |
| • Resistance thermometer                                              | No                                        |
| • Resistance                                                          | No                                        |
| Input ranges (rated values), voltages                                 |                                           |
| • -10 V to +10 V                                                      | Yes                                       |
| — Input resistance (-10 V to +10 V)                                   | ≥9 MOhm                                   |
| • -2.5 V to +2.5 V                                                    | Yes                                       |
| — Input resistance (-2.5 V to +2.5 V)                                 | ≥9 MOhm                                   |
| • -5 V to +5 V                                                        | Yes                                       |
| — Input resistance (-5 V to +5 V)                                     | ≥9 MOhm                                   |
| Input ranges (rated values), currents                                 |                                           |
| • 0 to 20 mA                                                          | Yes                                       |
| — Input resistance (0 to 20 mA)                                       | 280 Ω                                     |
| • 4 mA to 20 mA                                                       | Yes                                       |
| Analog outputs                                                        |                                           |
| Number of analog outputs                                              | 2; Current or voltage                     |
| Output ranges, voltage                                                |                                           |
| • -10 V to +10 V                                                      | Yes                                       |
| Output ranges, current                                                |                                           |
| • 0 to 20 mA                                                          | Yes                                       |
| • 4 mA to 20 mA                                                       | Yes                                       |

|                                                                                                 |                                                                  |
|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Load impedance (in rated range of output)                                                       |                                                                  |
| • with voltage outputs, min.                                                                    | 1 000 $\Omega$                                                   |
| • with current outputs, max.                                                                    | 600 $\Omega$                                                     |
| Cable length                                                                                    |                                                                  |
| • shielded, max.                                                                                | 100 m; shielded, twisted pair                                    |
| Analog value generation for the inputs                                                          |                                                                  |
| Measurement principle                                                                           | Differential                                                     |
| 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 f1 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                                                              |
| Analog value generation for the outputs                                                         |                                                                  |
| Integration and conversion time/resolution per channel                                          |                                                                  |
| • Resolution with overrange (bit including sign), max.                                          | 14 bit; Voltage: 14 bit; Current : 13 bit                        |
| Errors/accuracies                                                                               |                                                                  |
| Temperature error (relative to input range), (+/-)                                              | 25 °C $\pm 0.1\%$ , to 55 °C $\pm 0.2\%$ total measurement range |
| Temperature error (relative to output range), (+/-)                                             | 25 °C $\pm 0.3\%$ , to 55 °C $\pm 0.6\%$ 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 %                                                            |
| • Voltage, relative to output range, (+/-)                                                      | 0.3 %                                                            |
| • Current, relative to output range, (+/-)                                                      | 0.3 %                                                            |
| Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$ , f1 = 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                                                              |
| • Short-circuit                                                                                 | Yes                                                              |
| Diagnostics indication LED                                                                      |                                                                  |
| • for status of the inputs                                                                      | Yes                                                              |
| • for status of the outputs                                                                     | Yes                                                              |
| • for maintenance                                                                               | Yes                                                              |
| Potential separation                                                                            |                                                                  |
| Potential separation analog outputs                                                             |                                                                  |
| • between the channels and the power supply of the electronics                                  | No                                                               |
| 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                                                              |
| 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.                                   | 220 g                                                      |

last modified: 8/23/2023 