



Figure similar

SIMATIC S7-1200, Analog input, SM 1231 RTD, 4xAI RTD module

| General information                                                   |                                                                                                                                             |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Product type designation                                              | SM 1231, AI 4x16 bit RTD                                                                                                                    |
| Supply voltage                                                        |                                                                                                                                             |
| Rated value (DC)                                                      | 24 V                                                                                                                                        |
| Input current                                                         |                                                                                                                                             |
| Current consumption, typ.                                             | 40 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; Resistance thermometer                                                                                                                   |
| permissible input voltage for voltage input (destruction limit), max. | ±35 V                                                                                                                                       |
| Technical unit for temperature measurement adjustable                 | Degrees Celsius/degrees Fahrenheit                                                                                                          |
| Input ranges                                                          |                                                                                                                                             |
| • Voltage                                                             | No                                                                                                                                          |
| • Current                                                             | No                                                                                                                                          |
| • Thermocouple                                                        | No                                                                                                                                          |
| • Resistance thermometer                                              | Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000 |
| • Resistance                                                          | Yes; 150 Ω, 300 Ω, 600 Ω                                                                                                                    |
| Input ranges (rated values), resistance thermometer                   |                                                                                                                                             |
| • Cu 10                                                               | Yes                                                                                                                                         |
| — Input resistance (Cu 10)                                            | 10 Ω                                                                                                                                        |
| • Ni 100                                                              | Yes                                                                                                                                         |
| — Input resistance (Ni 100)                                           | 100 Ω                                                                                                                                       |
| • Ni 1000                                                             | Yes                                                                                                                                         |
| — Input resistance (Ni 1000)                                          | 1 000 Ω                                                                                                                                     |
| • LG-Ni 1000                                                          | Yes                                                                                                                                         |
| — Input resistance (LG-Ni 1000)                                       | 1 000 Ω                                                                                                                                     |
| • Ni 120                                                              | Yes                                                                                                                                         |
| — Input resistance (Ni 120)                                           | 120 Ω                                                                                                                                       |
| • Ni 200                                                              | Yes                                                                                                                                         |
| — Input resistance (Ni 200)                                           | 200 Ω                                                                                                                                       |
| • Ni 500                                                              | Yes                                                                                                                                         |
| — Input resistance (Ni 500)                                           | 500 Ω                                                                                                                                       |
| • Pt 100                                                              | Yes                                                                                                                                         |
| — Input resistance (Pt 100)                                           | 100 Ω                                                                                                                                       |
| • Pt 1000                                                             | Yes                                                                                                                                         |
| — Input resistance (Pt 1000)                                          | 1 000 Ω                                                                                                                                     |

|                                                                                                     |                                                                  |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| • Pt 200                                                                                            | Yes                                                              |
| — Input resistance (Pt 200)                                                                         | 200 $\Omega$                                                     |
| • Pt 500                                                                                            | Yes                                                              |
| — Input resistance (Pt 500)                                                                         | 500 $\Omega$                                                     |
| Input ranges (rated values), resistors                                                              |                                                                  |
| • 0 to 150 ohms                                                                                     | Yes                                                              |
| • 0 to 300 ohms                                                                                     | Yes                                                              |
| • 0 to 600 ohms                                                                                     | Yes                                                              |
| Thermocouple (TC)                                                                                   |                                                                  |
| Temperature compensation                                                                            |                                                                  |
| — parameterizable                                                                                   | No                                                               |
| Analog value generation for the inputs                                                              |                                                                  |
| Measurement principle                                                                               | integrating                                                      |
| Integration and conversion time/resolution per channel                                              |                                                                  |
| • Resolution with overrange (bit including sign), max.                                              | 15 bit; + sign                                                   |
| • Integration time, parameterizable                                                                 | No                                                               |
| • Interference voltage suppression for interference frequency $f_1$ in Hz                           | 85 dB at 50 / 60 / 400 Hz                                        |
| Errors/accuracies                                                                                   |                                                                  |
| Temperature error (relative to input range), (+/-)                                                  | 25 °C $\pm 0.1\%$ , to 55 °C $\pm 0.2\%$ total measurement range |
| Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)                          | 0.05 %                                                           |
| Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$ , $f_1$ = interference frequency |                                                                  |
| • Common mode interference, min.                                                                    | 120 dB                                                           |
| Interrupts/diagnostics/status information                                                           |                                                                  |
| Alarms                                                                                              | Yes                                                              |
| Diagnostics function                                                                                | Yes; Can be read out                                             |
| 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                                                              |
| 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  |