



Figure similar

SIMATIC S7-1200, Analog input, SM 1231 RTD, 8xAI RTD module

| General information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product type designation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | SM 1231, AI 8x16 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 8; 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>• Voltage</li> <li>• Current</li> <li>• Thermocouple</li> <li>• Resistance thermometer</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | No<br>No<br>No<br>Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000 |
| <ul style="list-style-type: none"> <li>• Resistance</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Yes; 150 Ω, 300 Ω, 600 Ω                                                                                                                                      |
| Input ranges (rated values), resistance thermometer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>• Cu 10               <ul style="list-style-type: none"> <li>— Input resistance (Cu 10)</li> </ul> </li> <li>• Ni 100               <ul style="list-style-type: none"> <li>— Input resistance (Ni 100)</li> </ul> </li> <li>• Ni 1000               <ul style="list-style-type: none"> <li>— Input resistance (Ni 1000)</li> </ul> </li> <li>• LG-Ni 1000               <ul style="list-style-type: none"> <li>— Input resistance (LG-Ni 1000)</li> </ul> </li> <li>• Ni 120               <ul style="list-style-type: none"> <li>— Input resistance (Ni 120)</li> </ul> </li> <li>• Ni 200               <ul style="list-style-type: none"> <li>— Input resistance (Ni 200)</li> </ul> </li> <li>• Ni 500               <ul style="list-style-type: none"> <li>— Input resistance (Ni 500)</li> </ul> </li> <li>• Pt 100               <ul style="list-style-type: none"> <li>— Input resistance (Pt 100)</li> </ul> </li> <li>• Pt 1000</li> </ul> | Yes<br>10 Ω<br>Yes<br>100 Ω<br>Yes<br>1 000 Ω<br>Yes<br>1 000 Ω<br>Yes<br>120 Ω<br>Yes<br>200 Ω<br>Yes<br>500 Ω<br>Yes<br>100 Ω<br>Yes                        |

|                                                                                                 |                                                     |
|-------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| — Input resistance (Pt 1000)                                                                    | 1 000 Ω                                             |
| • Pt 200                                                                                        | Yes                                                 |
| — Input resistance (Pt 200)                                                                     | 200 Ω                                               |
| • Pt 500                                                                                        | Yes                                                 |
| — Input resistance (Pt 500)                                                                     | 500 Ω                                               |
| 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 f1 in Hz                          | 85 dB at 50 / 60 / 400 Hz                           |
| Errors/accuracies                                                                               |                                                     |
| Temperature error (relative to input range), (+/-)                                              | 25 °C ±0.1%, to 55 °C ±0.2% total measurement range |
| Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)                      | 0.05 %                                              |
| Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$ , f1 = 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 / header                      |                                                                                             |
| required front connector                        | Yes                                                                                         |
| Mechanics/material                              |                                                                                             |
| Enclosure material (front)                      |                                                                                             |
| • Plastic                                       | Yes                                                                                         |
| Dimensions                                      |                                                                                             |
| Width                                           | 70 mm                                                                                       |
| Height                                          | 100 mm                                                                                      |
| Depth                                           | 75 mm                                                                                       |
| Weights                                         |                                                                                             |
| Weight, approx.                                 | 220 g                                                                                       |
| last modified:                                  | 2/26/2021  |