




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  |  |
| <ul style="list-style-type: none"> <li>• Voltage</li> <li>• Current</li> <li>• Thermocouple</li> <li>• Resistance thermometer</li> <li>• Resistance</li> </ul>  | <p>No</p> <p>No</p> <p>No</p> <p>Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000</p> <p>Yes; 150 Ω, 300 Ω, 600 Ω</p>             |
| 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                             <ul style="list-style-type: none"> <li>— Input resistance (Pt 1000)</li> </ul> </li> </ul> | <p>Yes</p> <p>10 Ω</p> <p>Yes</p> <p>100 Ω</p> <p>Yes</p> <p>1 000 Ω</p> <p>Yes</p> <p>1 000 Ω</p> <p>Yes</p> <p>120 Ω</p> <p>Yes</p> <p>200 Ω</p> <p>Yes</p> <p>500 Ω</p> <p>Yes</p> <p>100 Ω</p> <p>Yes</p> <p>1 000 Ω</p> |

|   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Pt 200 <ul style="list-style-type: none"> <li>— Input resistance (Pt 200)</li> </ul> </li> </ul> | Yes<br>200 Ω  |
| <ul style="list-style-type: none"> <li>• Pt 500 <ul style="list-style-type: none"> <li>— Input resistance (Pt 500)</li> </ul> </li> </ul> | Yes<br>500 Ω  |
| <b>Input ranges (rated values), resistors</b>   |   |
| <ul style="list-style-type: none"> <li>• 0 to 150 ohms</li> </ul>   | Yes   |
| <ul style="list-style-type: none"> <li>• 0 to 300 ohms</li> </ul>   | Yes   |
| <ul style="list-style-type: none"> <li>• 0 to 600 ohms</li> </ul>   | Yes   |
| <b>Thermocouple (TC)</b>  |   |
| Temperature compensation  |   |
| — parameterizable   | No  |
| <b>Analog value generation for the inputs</b>   |   |
| Measurement principle   | integrating   |
| Integration and conversion time/resolution per channel  |   |
| <ul style="list-style-type: none"> <li>• Resolution with overrange (bit including sign), max.</li> </ul>                                  | 15 bit; + sign                                      |
| <ul style="list-style-type: none"> <li>• Integration time, parameterizable</li> </ul>   | No  |
| <ul style="list-style-type: none"> <li>• Interference voltage suppression for interference frequency <math>f_1</math> in Hz</li> </ul>    | 85 dB at 50 / 60 / 400 Hz                           |
| <b>Errors/accuracies</b>  |   |
| 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 $f = n \times (f_1 \pm 1 \%)$ , $f_1$ = interference frequency                                       |   |
| <ul style="list-style-type: none"> <li>• Common mode interference, min.</li> </ul>  | 120 dB  |
| <b>Interrupts/diagnostics/status information</b>  |   |
| Alarms  | Yes   |
| Diagnostics function  | Yes; Can be read out                                |
| Alarms  |   |
| <ul style="list-style-type: none"> <li>• Diagnostic alarm</li> </ul>  | Yes   |
| Diagnoses   |   |
| <ul style="list-style-type: none"> <li>• Monitoring the supply voltage</li> </ul>   | Yes   |
| <ul style="list-style-type: none"> <li>• Wire-break</li> </ul>  | Yes   |
| Diagnostics indication LED  |   |
| <ul style="list-style-type: none"> <li>• for status of the inputs</li> </ul>  | Yes   |
| <ul style="list-style-type: none"> <li>• for maintenance</li> </ul>   | Yes   |
| <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   |
| Ecological footprint  |   |
| <ul style="list-style-type: none"> <li>• environmental product declaration</li> </ul>   | Yes   |
| Global warming potential  |   |
| — global warming potential, (total) [CO2 eq]  | 43.1 kg   |
| — global warming potential, (during production) [CO2 eq]  | 7.62 kg   |
| — global warming potential, (during operation) [CO2 eq]   | 36 kg   |
| — global warming potential, (after end of life cycle) [CO2 eq]  | -0.544 kg   |
| <b>Ambient conditions</b>   |   |
| Free fall   |   |
| <ul style="list-style-type: none"> <li>• Fall height, max.</li> </ul>   | 0.3 m; five times, in product package               |
| Ambient temperature during operation  |   |
| <ul style="list-style-type: none"> <li>• min.</li> </ul>  | -20 °C  |
| <ul style="list-style-type: none"> <li>• max.</li> </ul>  | 60 °C   |

|  |   |
|--|---|
| • horizontal installation, min.                          | -20 °C  |
| • horizontal installation, max.                          | 60 °C   |
| • vertical installation, min.                            | -20 °C  |
| • vertical installation, max.                            | 50 °C   |
| <b>Ambient temperature during storage/transportation</b> |   |
| • min.   | -40 °C  |
| • max.   | 70 °C   |
| <b>Air pressure acc. to IEC 60068-2-13</b>               |   |
| • Operation, min.  | 795 hPa   |
| • Operation, max.  | 1 080 hPa   |
| • Storage/transport, min.                                | 660 hPa   |
| • Storage/transport, max.                                | 1 080 hPa   |
| <b>Relative humidity</b>                                 |   |
| • Operation at 25 °C without condensation, max.          | 95 %  |
| <b>Pollutant concentrations</b>                          |   |
| • SO2 at RH < 60% without condensation                   | SO2: < 0.5 ppm; H2S: < 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>                                    | 10/9/2024  |


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| Power loss, typ.  | 1.5 W   |
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| 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  |   |
| • 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   |

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| • 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                           |
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| <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   |

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| • horizontal installation, max.                          | 60 °C   |
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| • vertical installation, max.                            | 50 °C   |
| <b>Ambient temperature during storage/transportation</b> |   |
| • min.   | -40 °C  |
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| • Operation, max.  | 1 080 hPa   |
| • Storage/transport, min.                                | 660 hPa   |
| • Storage/transport, max.                                | 1 080 hPa   |
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| • Operation at 25 °C without condensation, max.          | 95 %  |
| <b>Pollutant concentrations</b>                          |   |
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| <b>connection method</b>                                 |   |
| required front connector                                 | Yes   |
| <b>Mechanics/material</b>                                |   |
| Enclosure material (front)                               |   |
| • Plastic  | Yes   |
| <b>Dimensions</b>  |   |
| Width  | 70 mm   |
| Height   | 100 mm  |
| Depth  | 75 mm   |
| <b>Weights</b>   |   |
| Weight, approx.  | 220 g   |
| <b>last modified:</b>                                    | 10/9/2024  |