




SIMATIC S7-1200, Analog input, SM 1231 TC, 8 AI thermocouples

| General information   |  |
|---|--|
| Product type designation  | SM 1231, AI 8x16 bit TC  |
| 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; Thermocouples   |
| 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>  | <ul style="list-style-type: none"> <li>Yes</li> <li>No</li> <li>Yes; J, K, T, E, R &amp; S, B, N, C, TXK/XK(L); voltage range: ±80 mV</li> <li>No</li> <li>No</li> </ul>   |
| Input ranges (rated values), voltages   |  |
| <ul style="list-style-type: none"> <li>• -80 mV to +80 mV</li> <li>— Input resistance (-80 mV to +80 mV)</li> </ul>   | <ul style="list-style-type: none"> <li>Yes</li> <li>≥1 MOhm</li> </ul>   |
| Input ranges (rated values), thermocouples  |  |
| <ul style="list-style-type: none"> <li>• Type B</li> <li>• Type C</li> <li>• Type E</li> <li>• Type J</li> <li>• Type K</li> <li>• Type N</li> <li>• Type R</li> <li>• Type S</li> <li>• Type T</li> <li>• Type TXK/TXK(L) to GOST</li> </ul> | <ul style="list-style-type: none"> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> </ul> |
| Thermocouple (TC)   |  |
| Temperature compensation  |  |
| — parameterizable   | No   |
| Analog value generation for the inputs  |  |
| Measurement principle   | integrating  |

|   |  |
|---|--|
| <b>Integration and conversion time/resolution per channel</b>   |  |
| <ul style="list-style-type: none"> <li>Resolution with overrange (bit including sign), max.</li> <li>Integration time, parameterizable</li> <li>Interference voltage suppression for interference frequency f1 in Hz</li> </ul> | 15 bit; + sign<br>No<br>85 dB at 50 / 60 / 400 Hz          |
| <b>Smoothing of measured values</b>   |  |
| <ul style="list-style-type: none"> <li>parameterizable</li> </ul>   | Yes  |
| <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), (+/-)  | 0.5 %  |
| <b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, f1 = interference frequency</b>  |  |
| <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                                       |
| <b>Alarms</b>   |  |
| <ul style="list-style-type: none"> <li>Diagnostic alarm</li> </ul>  | Yes  |
| <b>Diagnoses</b>  |  |
| <ul style="list-style-type: none"> <li>Monitoring the supply voltage</li> <li>Wire-break</li> </ul>   | Yes<br>Yes   |
| <b>Diagnostics indication LED</b>   |  |
| <ul style="list-style-type: none"> <li>for status of the inputs</li> <li>for maintenance</li> </ul>   | Yes<br>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  |
| <b>Ambient conditions</b>   |  |
| <b>Free fall</b>  |  |
| <ul style="list-style-type: none"> <li>Fall height, max.</li> </ul>   | 0.3 m; five times, in product package                      |
| <b>Ambient temperature during operation</b>   |  |
| <ul style="list-style-type: none"> <li>min.</li> <li>max.</li> <li>horizontal installation, min.</li> <li>horizontal installation, max.</li> <li>vertical installation, min.</li> <li>vertical installation, max.</li> </ul>    | -20 °C<br>60 °C<br>-20 °C<br>60 °C<br>-20 °C<br>50 °C      |
| <b>Ambient temperature during storage/transportation</b>  |  |
| <ul style="list-style-type: none"> <li>min.</li> <li>max.</li> </ul>  | -40 °C<br>70 °C  |
| <b>Air pressure acc. to IEC 60068-2-13</b>  |  |
| <ul style="list-style-type: none"> <li>Operation, min.</li> <li>Operation, max.</li> <li>Storage/transport, min.</li> <li>Storage/transport, max.</li> </ul>  | 795 hPa<br>1 080 hPa<br>660 hPa<br>1 080 hPa               |
| <b>Relative humidity</b>  |  |
| <ul style="list-style-type: none"> <li>Operation at 25 °C without condensation, max.</li> </ul>   | 95 %   |
| <b>Pollutant concentrations</b>   |  |
| <ul style="list-style-type: none"> <li>SO2 at RH &lt; 60% without condensation</li> </ul>   | SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free |
| <b>connection method / header</b>   |  |
| 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   |
| <b>last modified:</b>      | 2/26/2021  |