



SIMATIC S7-1200 G2, SB 1231 TC, AI 4x TC type J or K

| General information   |  |
|---|--|
| Product type designation  | SB 1231, AI 4x 16-bit TC   |
| Input current   |  |
| from backplane bus 5 V DC, typ.   | 20 mA  |
| Power loss  |  |
| Power loss, typ.  | 0.1 W  |
| Analog inputs   |  |
| Number of analog inputs   | 4; 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>  | Yes<br>No<br>Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: ±80 mV<br>No<br>No |
| 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>   | Yes<br>≥ 10 MOhm   |
| 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> | Yes<br>Yes<br>Yes<br>Yes<br>Yes<br>Yes<br>Yes<br>Yes<br>Yes<br>Yes                         |
| Thermocouple (TC)   |  |
| Temperature compensation  |  |
| — Parameterizable   | Yes  |
| Cable length  |  |
| <ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>  | 100 m; to the sensor   |
| Analog value generation for the inputs  |  |
| 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> <li>Integration time, parameterizable</li> <li>Interference voltage suppression for interference frequency <math>f_1</math> in Hz</li> </ul> | 15 bit; + sign<br>Yes<br>85 dB at 10 / 50 / 60 / 400 Hz  |
| <b>Smoothing of measured values</b>   |  |
| <ul style="list-style-type: none"> <li>parameterizable</li> <li>Step: None</li> <li>Step: low</li> <li>Step: Medium</li> <li>Step: High</li> </ul>  | Yes<br>Yes<br>Yes<br>Yes<br>Yes  |
| <b>Errors/accuracies</b>  |  |
| cold connection point   | $\pm 1,5$ °C   |
| Temperature error (relative to input range), (+/-)  | 25 °C $\pm 0.05$ % / -20 °C to 60 °C $\pm 0.1$ % of the full-scale range   |
| Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)   | 0.05 %   |
| <b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1</math> = 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>Wire break</li> </ul>  | Yes  |
| <b>Diagnostics indication LED</b>   |  |
| <ul style="list-style-type: none"> <li>DIAG LED</li> <li>for status of the inputs</li> </ul>  | Yes<br>Yes   |
| <b>Isolation</b>  |  |
| Isolation tested with   | 707 V DC (type test)   |
| <b>tested with</b>  |  |
| <ul style="list-style-type: none"> <li>Between channels</li> </ul>  | 120 V AC   |
| <b>Degree and class of protection</b>   |  |
| IP degree of protection   | IP20   |
| <b>Standards, approvals, certificates</b>   |  |
| CE mark   | Yes  |
| CSA approval  | No   |
| UL approval   | Yes  |
| cULus   | Yes  |
| FM approval   | No   |
| RCM (formerly C-TICK)   | Yes  |
| KC approval   | Yes  |
| Marine approval   | No   |
| <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>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; at max. voltages and max. specification<br>-20 °C<br>50 °C; at max. voltages and max. specification |
| <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>  | 540 hPa<br>1 140 hPa<br>540 hPa<br>1 140 hPa   |
| Altitude during operation relating to sea level   |  |

|   |  |
|---|--|
| • Installation altitude, min.                                 | -1 000 m   |
| • Installation altitude, max.                                 | 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual |
| <b>Relative humidity</b>                                      |  |
| • Operation, max.   | 95 %; no condensation  |
| <b>Vibrations</b>   |  |
| • Vibration resistance during operation acc. to IEC 60068-2-6 | 3.5 mm from 5 - 8.4 Hz, 1g from 8.4 - 150 Hz                           |
| • Operation, tested according to IEC 60068-2-6                | Yes  |
| <b>Shock testing</b>  |  |
| • tested according to IEC 60068-2-27                          | Yes; IEC 68, Part 2-27; half-sine, 15 g, 11 ms                         |
| <b>Pollutant concentrations</b>                               |  |
| • 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  | 15 mm |
| Height | 62 mm |
| Depth  | 63 mm |

**Weights**

|                 |      |
|-----------------|------|
| Weight, approx. | 29 g |
|-----------------|------|

**Classifications**

|        | Version | Classification |
|--------|---------|----------------|
| eClass | 14      | 27-24-22-01    |
| eClass | 12      | 27-24-22-01    |
| eClass | 9.1     | 27-24-22-01    |
| eClass | 9       | 27-24-22-01    |
| eClass | 8       | 27-24-22-01    |
| eClass | 7.1     | 27-24-22-01    |
| eClass | 6       | 27-24-22-01    |
| ETIM   | 10      | EC001420       |
| ETIM   | 9       | EC001420       |
| ETIM   | 8       | EC001420       |
| ETIM   | 7       | EC001420       |

**Approvals / Certificates**

**General Product Approval**

[Manufacturer Declaration](#)

[Miscellaneous](#)

[China RoHS](#)



**General Product Approval**      **EMV**      **Environment**



[Manufacturer Declaration](#)



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