



SIMATIC S7-1200, Analog input, SB 1231 TC, 1 AI thermocouples Type J or K

General information	
Product type designation	SB 1231, AI 1x16 bit TC
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	5 mA
from backplane bus 5 V DC, typ.	20 mA
Power loss	
Power loss, typ.	0.5 W
Analog inputs	
Number of analog inputs	1; Thermocouples
permissible input voltage for current input (destruction limit), max.	±35 V
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 No Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: ±80 mV No No
Input ranges (rated values), voltages	
<ul style="list-style-type: none"> <li>• -80 mV to +80 mV                             <ul style="list-style-type: none"> <li>— Input resistance (-80 mV to +80 mV)</li> </ul> </li> </ul>	Yes ≥1 MOhm
Input ranges (rated values), thermocouples	
<ul style="list-style-type: none"> <li>• Type J                             <ul style="list-style-type: none"> <li>— Input resistance (type J)</li> </ul> </li> <li>• Type K                             <ul style="list-style-type: none"> <li>— Input resistance (Type K)</li> </ul> </li> </ul>	Yes 1 200 °C Yes 1 372 °C
Thermocouple (TC)	
Temperature compensation <ul style="list-style-type: none"> <li>— parameterizable</li> </ul>	No
Analog outputs	
Number of analog outputs	0
Cable length	
<ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>	100 m; shielded, twisted pair
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 No 85 dB at 10 / 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 $\pm$ 0.1%, to 55 °C $\pm$ 0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.5 %
<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>for status of the inputs</li> <li>for maintenance</li> </ul>	Yes Yes
<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 60 °C -20 °C 60 °C -20 °C 50 °C
<b>Ambient temperature during storage/transportation</b>	
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> </ul>	-40 °C 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 1 080 hPa 660 hPa 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>SO<sub>2</sub> at RH &lt; 60% without condensation</li> </ul>	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>connection method</b>	
required front connector	Yes
<b>Mechanics/material</b>	
Enclosure material (front) <ul style="list-style-type: none"> <li>Plastic</li> </ul>	Yes
<b>Dimensions</b>	
Width	38 mm
Height	62 mm

Depth	21 mm
<b>Weights</b>	
Weight, approx.	35 g
<b>last modified:</b>	8/16/2023 