



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 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</li> <li>— Input resistance (-80 mV to +80 mV)</li> </ul>	Yes ≥ 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 Yes Yes Yes Yes Yes Yes Yes Yes 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> </ul>	15 bit; + sign

<ul style="list-style-type: none"> <li>Integration time, parameterizable</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Interference voltage suppression for interference frequency f1 in Hz</li> </ul>	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
<ul style="list-style-type: none"> <li>Step: None</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Step: low</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Step: Medium</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Step: High</li> </ul>	Yes
<b>Errors/accuracies</b>	
cold connection point	±1,5 °C
Temperature error (relative to input range), (+/-)	25 °C ±0.05 % / -20 °C to 60 °C ±0.1 % of the full-scale range
Repeat accuracy in steady state at 25 °C (relative to input 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
<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> </ul>	Yes
<ul style="list-style-type: none"> <li>for status of the inputs</li> </ul>	Yes
<b>Isolation</b>	
Isolation tested with	707 V DC (type test)
tested with	
<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>	
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>horizontal installation, min.</li> </ul>	-20 °C
<ul style="list-style-type: none"> <li>horizontal installation, max.</li> </ul>	60 °C; at max. voltages and max. specification
<ul style="list-style-type: none"> <li>vertical installation, min.</li> </ul>	-20 °C
<ul style="list-style-type: none"> <li>vertical installation, max.</li> </ul>	50 °C; at max. voltages and max. specification
Ambient temperature during storage/transportation	
<ul style="list-style-type: none"> <li>min.</li> </ul>	-40 °C
<ul style="list-style-type: none"> <li>max.</li> </ul>	70 °C
Air pressure acc. to IEC 60068-2-13	
<ul style="list-style-type: none"> <li>Operation, min.</li> </ul>	540 hPa
<ul style="list-style-type: none"> <li>Operation, max.</li> </ul>	1 140 hPa
<ul style="list-style-type: none"> <li>Storage/transport, min.</li> </ul>	540 hPa
<ul style="list-style-type: none"> <li>Storage/transport, max.</li> </ul>	1 140 hPa
Altitude during operation relating to sea level	
<ul style="list-style-type: none"> <li>Installation altitude, min.</li> </ul>	-1 000 m
<ul style="list-style-type: none"> <li>Installation altitude, max.</li> </ul>	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Relative humidity	

• 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
<b>connection method</b>	
required front connector	Yes
<b>Mechanics/material</b>	
Enclosure material (front)	
• Plastic	Yes
<b>Dimensions</b>	
Width	15 mm
Height	62 mm
Depth	63 mm
<b>Weights</b>	
Weight, approx.	29 g

<b>Classifications</b>			
		<b>Version</b>	<b>Classification</b>
	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

<b>Approvals / Certificates</b>	
<b>General Product Approval</b>	<b>EMV</b>

[Manufacturer Declaration](#)

[Miscellaneous](#)

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last modified:

10/23/2025