

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.  $\pm 35$  V  
permissible input voltage for voltage input  
(destruction limit), max.  $\pm 35$  V  
Technical unit for temperature measurement  
adjustable Degrees Celsius/degrees Fahrenheit

### Input ranges

• Voltage	Yes
• Current	No
• Thermocouple	Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: $\pm 80$ mV
• Resistance thermometer	No
• Resistance	No
<b>Input ranges (rated values), voltages</b>	
• -80 mV to +80 mV	Yes
— Input resistance (-80 mV to +80 mV)	$\geq 1$ MOhm
<b>Input ranges (rated values), thermocouples</b>	
• Type J	Yes
— Input resistance (type J)	1 200 °C
• Type K	Yes
— Input resistance (Type K)	1 372 °C
<b>Thermocouple (TC)</b>	
<b>Temperature compensation</b>	
— parameterizable	No
<b>Analog outputs</b>	
Number of analog outputs	0
<b>Cable length</b>	
• shielded, max.	100 m; shielded, twisted pair
<b>Analog value generation for the inputs</b>	
Measurement principle	integrating
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	15 bit; + sign
• Integration time, parameterizable	No
• Interference voltage suppression for interference frequency $f_1$ in Hz	85 dB at 10 / 50 / 60 / 400 Hz
<b>Smoothing of measured values</b>	
• parameterizable	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>	
• Common mode interference, min.	120 dB
<b>Interrupts/diagnostics/status information</b>	
Alarms	Yes
Diagnostics function	Yes; Can be read out
<b>Alarms</b>	
• Diagnostic alarm	Yes

<b>Diagnostic messages</b>	
• Wire-break	Yes
<b>Diagnostics indication LED</b>	
• for status of the inputs	Yes
• for maintenance	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>	
• Fall height, max.	0.3 m; five times, in product package
<b>Ambient temperature during operation</b>	
• min.	-20 °C
• max.	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>	
<b>Enclosure material (front)</b>	
• Plastic	Yes

## Dimensions

Width	38 mm
Height	62 mm
Depth	21 mm

## Weights

Weight, approx.	35 g
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**last modified:** 07/10/2020