



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	
• Voltage	Yes
• Current	No
• Thermocouple	Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: ±80 mV
• Resistance thermometer	No
• Resistance	No
Input ranges (rated values), voltages	
• -80 mV to +80 mV	Yes
— Input resistance (-80 mV to +80 mV)	≥1 MOhm
Input ranges (rated values), thermocouples	
• Type J	Yes
— Input resistance (type J)	1 200 °C
• Type K	Yes
— Input resistance (Type K)	1 372 °C
Thermocouple (TC)	
Temperature compensation	
— Parameterizable	No
Analog outputs	
Number of analog outputs	0
Cable length	

• shielded, max.	100 m; shielded, twisted pair
Analog value generation for the inputs	
Measurement principle	integrating
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	15 bit; + sign
• Integration time, parameterizable	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 10 / 50 / 60 / 400 Hz
Smoothing of measured values	
• parameterizable	Yes
Errors/accuracies	
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 %
Interference voltage suppression for $f = n \times (f1 \pm 1 \%)$, f1 = interference frequency	
• Common mode interference, min.	120 dB
Interrupts/diagnostics/status information	
Alarms	Yes
Diagnostics function	Yes; Can be read out
Alarms	
• Diagnostic alarm	Yes
Diagnoses	
• Wire break	Yes
Diagnostics indication LED	
• for status of the inputs	Yes
• for maintenance	Yes
Standards, approvals, certificates	
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
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• 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
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Air pressure acc. to IEC 60068-2-13	
• Operation, min.	795 hPa
• Operation, max.	1 080 hPa
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
Relative humidity	
• Operation at 25 °C without condensation, max.	95 %
Pollutant concentrations	
• 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		38 mm			
Height		62 mm			
Depth		21 mm			
Weights					
Weight, approx.		35 g			
Classifications					
		Version	Classification		
	eClass	16	27-24-22-01		
	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		
	IDEA	4	3562		
	UNSPSC	15	32-15-17-05		
Approvals / Certificates					
General Product Approval					
 EG-Konf.		Manufacturer Declaration	 UL		 RCM
General Product Approval		For use in hazardous locations			
	 EG-Konf.		 UL	CCC-Ex	FM
For use in hazardous locations				Maritime application	
 ATEX	Type Examination Certificate	 IECEX	Miscellaneous	CCC-Ex	 ABS
Maritime application					
 BUREAU VERITAS	 DNV	 LRS	NK / Nippon Kaiji Kyokai	 RINA	 RMRS
Maritime application		Environment			

[CCS \(China Classification Society\)](#)

[KR \(Korean Register of Shipping\)](#)



last modified:

5/16/2025

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