SIEMENS

Data sheet 6ES7231-5QD50-0XB0

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	
● 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)	>= 10 MOhm
Input ranges (rated values), thermocouples	
● Type B	Yes
● Type C	Yes
● Type E	Yes
● Type J	Yes
● Type K	Yes
● Type N	Yes
● Type R	Yes
● Type S	Yes
● Type T	Yes
● Type TXK/TXK(L) to GOST	Yes
Thermocouple (TC)	
Temperature compensation	
— parameterizable	Yes
Cable length	
● shielded, max.	100 m; to the sensor
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	Yes
● Interference voltage suppression for interference frequency f1 in Hz	85 dB at 10 / 50 / 60 / 400 Hz
Smoothing of measured values	
● parameterizable	Yes
● Step: None	Yes
● Step: low	Yes
● Step: Medium	Yes
● Step: High	Yes
Errors/accuracies	
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 x (f1 +/- 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	
● DIAG LED	Yes
● for status of the inputs	Yes
Isolation	
Isolation tested with	707 V DC (type test)
tested with	
● Between channels	120 V AC
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
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
Ambient conditions	
Free fall	
● Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
● horizontal installation, min.	-20 °C
● horizontal installation, max.	60 °C; at max. voltages and max. specification
● vertical installation, min.	-20 °C
● vertical installation, max.	50 °C; at max. voltages and max. specification
Ambient temperature during storage/transportation	
● min.	-40 °C
● max.	70 °C
Air pressure acc. to IEC 60068-2-13	
● Operation, min.	540 hPa
● Operation, max.	1 140 hPa
● Storage/transport, min.	540 hPa
● Storage/transport, max.	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
Relative humidity	

● Operation, max.	95 %; no condensation
Vibrations	
● 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
Shock testing	
● tested according to IEC 60068-2-27	Yes; IEC 68, Part 2-27; half-sine, 15 g, 11 ms
Pollutant concentrations	
● SO2 at RH < 60% without condensation	S02: < 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					EMV
Manufacturer Declaration	Miscellaneous	KC	CE EG-Konf.	UKCA	KC

last modified: 7/9/2025