



Figure similar

SIMATIC S7-1200, Analog input, SM 1231 TC, 4 AI thermocouples

General information	
Product type designation	SM 1231, AI 4x16 bit TC
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	40 mA
from backplane bus 5 V DC, typ.	80 mA
Power loss	
Power loss, typ.	1.5 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, 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 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	No
Analog value generation for the inputs	

Measurement principle	integrating
Integration and conversion time/resolution per channel	
- Resolution with overrange (bit including sign), max. - Integration time, parameterizable - Interference voltage suppression for interference frequency f_1 in Hz	15 bit; + sign No 85 dB at 50 / 60 / 400 Hz
Smoothing of measured values	
parameterizable	Yes
Errors/accuracies	
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 %
Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, f_1 = 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	
- Monitoring the supply voltage - Wire break	Yes Yes
Diagnostics indication LED	
- for status of the inputs - for maintenance	Yes Yes
Degree and class of protection	
IP degree of protection	IP20
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
Ecological footprint	
environmental product declaration	Yes
Global warming potential	
— global warming potential, (total) [CO ₂ eq]	43.1 kg
— global warming potential, (during production) [CO ₂ eq]	7.62 kg
— global warming potential, (during operation) [CO ₂ eq]	36 kg
— global warming potential, (after end of life cycle) [CO ₂ eq]	-0.544 kg
Ambient conditions	
Free fall	
Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
- min. - max. - horizontal installation, min. - horizontal installation, max. - vertical installation, min. - vertical installation, max.	-20 °C 60 °C -20 °C 60 °C -20 °C 50 °C
Ambient temperature during storage/transportation	
- min. - max.	-40 °C 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

- Operation at 25 °C without condensation, max.

95 %

- SO₂ at RH < 60% without condensation

S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60 % condensation-free

required front connector

Yes

Enclosure material (front)

- Plastic

Yes

Width

45 mm

Height

100 mm

Depth

75 mm

Weight, approx.

180 g

	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
IDEA	4	3562
UNSPSC	15	32-15-17-05

General Product Approval

other



Confirmation

7/2/2025