



SIMATIC S7-1200, Analog input, SM 1231 TC, 8 AI thermocouples

General information	
Product type designation	SM 1231, AI 8x16 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	8; Thermocouples
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit
Input ranges	
<ul style="list-style-type: none"> • Voltage • Current • Thermocouple • Resistance thermometer • Resistance 	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"> • -80 mV to +80 mV — Input resistance (-80 mV to +80 mV) 	Yes ≥ 1 MOhm
Input ranges (rated values), thermocouples	
<ul style="list-style-type: none"> • Type B • Type C • Type E • Type J • Type K • Type N • Type R • Type S • Type T • Type TXK/TXK(L) to GOST 	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes
Thermocouple (TC)	
Temperature compensation	
— parameterizable	No
Analog value generation for the inputs	
Measurement principle	integrating

Integration and conversion time/resolution per channel	
<ul style="list-style-type: none"> Resolution with overrange (bit including sign), max. Integration time, parameterizable Interference voltage suppression for interference frequency f1 in Hz 	15 bit; + sign No 85 dB at 50 / 60 / 400 Hz
Smoothing of measured values	
<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> Common mode interference, min. 	120 dB
Interrupts/diagnostics/status information	
Alarms	Yes
Diagnostics function	Yes; Can be read out
Alarms	
<ul style="list-style-type: none"> Diagnostic alarm 	Yes
Diagnoses	
<ul style="list-style-type: none"> Monitoring the supply voltage Wire-break 	Yes Yes
Diagnostics indication LED	
<ul style="list-style-type: none"> for status of the inputs for maintenance 	Yes 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	
<ul style="list-style-type: none"> Fall height, max. 	0.3 m; five times, in product package
Ambient temperature during operation	
<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> min. max. 	-40 °C 70 °C
Air pressure acc. to IEC 60068-2-13	
<ul style="list-style-type: none"> Operation, min. Operation, max. Storage/transport, min. Storage/transport, max. 	795 hPa 1 080 hPa 660 hPa 1 080 hPa
Relative humidity	
<ul style="list-style-type: none"> Operation at 25 °C without condensation, max. 	95 %
Connection method	
required front connector	Yes
Mechanics/material	
Enclosure material (front) <ul style="list-style-type: none"> Plastic 	Yes

Dimensions	
Width	45 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	220 g
last modified:	3/14/2020 