



SIMATIC S7-1200 G2: SM 1231 analog input, 8 AI; inputs: 8x AI 14 bit ADC (+/-10 V, +/-5 V, +/-2.5 V or 0-20 mA/4-20 mA)

Figure similar

General information	
Product type designation	SM 1231, AI 8x 14 bit
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption, typ.	45 mA
from backplane bus 5 V DC, typ.	75 mA
Power loss	
Power loss, typ.	2.5 W
Analog inputs	
Number of analog inputs	8; Current or voltage differential inputs
permissible input voltage for voltage input (destruction limit), max.	35 V
permissible input current for current input (destruction limit), max.	40 mA
Cycle time (all channels) max.	1.25 ms; at 400 Hz rejection
Input ranges	
<ul style="list-style-type: none"> • Voltage 	Yes; ±10V, ±5V, ±2.5V
<ul style="list-style-type: none"> • Current 	Yes; 4 to 20 mA, 0 to 20 mA
<ul style="list-style-type: none"> • Thermocouple 	No
<ul style="list-style-type: none"> • Resistance thermometer 	No
<ul style="list-style-type: none"> • Resistance 	No
Input ranges (rated values), voltages	
<ul style="list-style-type: none"> • -10 V to +10 V <ul style="list-style-type: none"> — Input resistance (-10 V to +10 V) 	Yes ≥1 MOhm
<ul style="list-style-type: none"> • -2.5 V to +2.5 V <ul style="list-style-type: none"> — Input resistance (-2.5 V to +2.5 V) 	Yes ≥1 MOhm
<ul style="list-style-type: none"> • -5 V to +5 V <ul style="list-style-type: none"> — Input resistance (-5 V to +5 V) 	Yes ≥1 MOhm
Input ranges (rated values), currents	
<ul style="list-style-type: none"> • 0 to 20 mA <ul style="list-style-type: none"> — Input resistance (0 to 20 mA) 	Yes < 290 Ω, > 270 Ω
<ul style="list-style-type: none"> • 4 mA to 20 mA <ul style="list-style-type: none"> — Input resistance (4 mA to 20 mA) 	Yes < 290 Ω, > 270 Ω
Cable length	
<ul style="list-style-type: none"> • shielded, max. 	100 m; shielded, twisted pair
Analog value generation for the inputs	

Measurement principle	successive approximation
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 f_1 in Hz 	13 bit; + sign Yes 40 dB, DC to 60 Hz
Smoothing of measured values	
<ul style="list-style-type: none"> parameterizable Step: None Step: low Step: Medium Step: High 	Yes Yes Yes Yes Yes
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ± 0.1 % / -20 °C to 60 °C ± 0.2 % of the full-scale deflection
Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> Voltage, relative to input range, (+/-) Current, relative to input range, (+/-) 	0.1 % 0.1 %
Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, f_1 = interference frequency	
<ul style="list-style-type: none"> Common mode voltage, max. 	12 V
Interrupts/diagnostics/status information	
Diagnostics function	Yes
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"> DIAG LED for status of the inputs 	Yes Yes
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	No
Marine approval	No
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 40 °C; at max. voltages and max. specifications -20 °C 60 °C; at rated voltages, 50 % of max. specification and alternate IO active -20 °C 50 °C; at rated voltages, 50 % of max. specification and alternate IO active
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. 	540 hPa 1 140 hPa 540 hPa 1 140 hPa
Altitude during operation relating to sea level	
<ul style="list-style-type: none"> Installation altitude, min. Installation altitude, max. 	-1 000 m 5 000 m; Restrictions for installation altitudes > 2 000 m, see manual

Relative humidity	
• Operation at 25 °C without condensation, max.	95 %
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: strength of the shock 15 g (peak value), duration 11 ms
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	No
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	30 mm
Height	125 mm
Depth	100 mm
Weights	
Weight, approx.	175 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	9	EC001420
	ETIM	8	EC001420
	ETIM	7	EC001420

Approvals / Certificates	
General Product Approval	EMV

[Manufacturer Declaration](#)



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For use in hazardous locations



[CCC-Ex](#)

Environment



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