



SIMATIC S7-1200, Analog input, SM 1231, 4 AI, +/-10 V, +/-5 V, +/-2.5 V, +/-1.25 or 0-20 mA/4-20 mA, 15 bit+sign bit

General information	
Product type designation	SM 1231, AI 4x16 bit
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	65 mA
from backplane bus 5 V DC, typ.	80 mA
Power loss	
Power loss, typ.	1.8 W
Analog inputs	
Number of analog inputs	4; 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.	100 µs
Input ranges	
• Voltage	Yes; ±10V, ±5V, ±2.5V or ±1.25V
• Current	Yes; 4 to 20 mA, 0 to 20 mA
• Thermocouple	No
• Resistance thermometer	No
• Resistance	No
Input ranges (rated values), voltages	
• -1.25 V to +1.25 V	Yes
• -10 V to +10 V	Yes
— Input resistance (-10 V to +10 V)	≥1 MOhm
• -2.5 V to +2.5 V	Yes
— Input resistance (-2.5 V to +2.5 V)	≥1 MOhm
• -5 V to +5 V	Yes
— Input resistance (-5 V to +5 V)	≥1 MOhm
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Analog value generation for the inputs	
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	40 dB, DC to 60 V for interference frequency 50 / 60 Hz

frequency f1 in Hz	
<b>Smoothing of measured values</b>	
• parameterizable	Yes
• Step: None	Yes
• Step: low	Yes
• Step: Medium	Yes
• Step: High	Yes
<b>Errors/accuracies</b>	
Temperature error (relative to input range), (+/-)	25 °C ±0.1% / ±0.3% total measurement range
<b>Basic error limit (operational limit at 25 °C)</b>	
• Voltage, relative to input range, (+/-)	0.1 %
• Current, relative to input range, (+/-)	0.1 %
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, <math>f1 =</math> interference frequency</b>	
• Common mode voltage, max.	12 V
<b>Interrupts/diagnostics/status information</b>	
Alarms	Yes
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
<b>Diagnostics indication LED</b>	
• for status of the inputs	Yes
• for maintenance	Yes
<b>Standards, approvals, certificates</b>	
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
<b>Ambient conditions</b>	
<b>Free fall</b>	
• Fall height, max.	0.3 m; five times, in product package
<b>Ambient temperature during operation</b>	
• 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
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Operation, min.	795 hPa
• Operation, max.	1 080 hPa
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
<b>Relative humidity</b>	
• Operation at 25 °C without condensation, max.	95 %
<b>Connection method</b>	
required front connector	Yes
<b>Mechanics/material</b>	

Enclosure material (front)	
• Plastic	Yes
<b>Dimensions</b>	
Width	45 mm
Height	100 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	180 g
<b>last modified:</b>	3/14/2020 