



SIMATIC S7-1200, Analog input, SB 1231, 1 AI, +/-10 V DC (12 bit resol.) or 0-20 mA

General information	
Product type designation	SB 1231, AI 1x12 bit
Supply voltage	
Rated value (DC)	24 V
Input current	
from backplane bus 5 V DC, typ.	55 mA
Power loss	
Power loss, typ.	0.4 W
Analog inputs	
Number of analog inputs	1; Current or voltage differential inputs
permissible input voltage for current input (destruction limit), max.	±35 V
permissible input voltage for voltage input (destruction limit), max.	35 V
permissible input current for voltage input (destruction limit), max.	40 mA
permissible input current for current input (destruction limit), max.	40 mA
Cycle time (all channels) max.	156.25 µs; 400 Hz suppression
Input ranges	
<ul style="list-style-type: none"> <li>• Voltage</li> </ul>	Yes; ±10V, ±5V, ±2.5V
<ul style="list-style-type: none"> <li>• Current</li> </ul>	Yes; 0 to 20 mA
<ul style="list-style-type: none"> <li>• Thermocouple</li> </ul>	No
<ul style="list-style-type: none"> <li>• Resistance thermometer</li> </ul>	No
<ul style="list-style-type: none"> <li>• Resistance</li> </ul>	No
Input ranges (rated values), voltages	
<ul style="list-style-type: none"> <li>• -10 V to +10 V</li> <li>— Input resistance (-10 V to +10 V)</li> </ul>	Yes ≥9 MOhm
<ul style="list-style-type: none"> <li>• -2.5 V to +2.5 V</li> <li>— Input resistance (-2.5 V to +2.5 V)</li> </ul>	Yes ≥9 MOhm
<ul style="list-style-type: none"> <li>• -5 V to +5 V</li> <li>— Input resistance (-5 V to +5 V)</li> </ul>	Yes ≥9 MOhm
Input ranges (rated values), currents	
<ul style="list-style-type: none"> <li>• 0 to 20 mA</li> <li>— Input resistance (0 to 20 mA)</li> </ul>	Yes ≥ 250 Ohm
Analog outputs	
Number of analog outputs	0
Cable length	
<ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>	100 m; shielded, twisted pair
Analog value generation for the inputs	
Measurement principle	integrating

<b>Integration and conversion time/resolution per channel</b>	
<ul style="list-style-type: none"> <li>Resolution with overrange (bit including sign), max.</li> <li>Integration time, parameterizable</li> <li>Interference voltage suppression for interference frequency <math>f_1</math> in Hz</li> </ul>	<p>11 bit; + sign</p> <p>Yes</p> <p>40 dB, DC to 60 Hz</p>
<b>Smoothing of measured values</b>	
<ul style="list-style-type: none"> <li>parameterizable</li> <li>Step: None</li> <li>Step: low</li> <li>Step: Medium</li> <li>Step: High</li> </ul>	<p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>
<b>Errors/accuracies</b>	
Temperature error (relative to input range), (+/-)	25 °C $\pm$ 0.3%, to 55 °C $\pm$ 0.6% total measurement range
<b>Interrupts/diagnostics/status information</b>	
Alarms	Yes
Diagnostics function	Yes
<b>Alarms</b>	
<ul style="list-style-type: none"> <li>Diagnostic alarm</li> </ul>	Yes
<b>Diagnoses</b>	
<ul style="list-style-type: none"> <li>Wire-break</li> </ul>	No
<b>Diagnostics indication LED</b>	
<ul style="list-style-type: none"> <li>for status of the inputs</li> <li>for maintenance</li> </ul>	<p>Yes</p> <p>Yes</p>
<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>	
<ul style="list-style-type: none"> <li>Fall height, max.</li> </ul>	0.3 m; five times, in product package
<b>Ambient temperature during operation</b>	
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> <li>horizontal installation, min.</li> <li>horizontal installation, max.</li> <li>vertical installation, min.</li> <li>vertical installation, max.</li> </ul>	<p>-20 °C</p> <p>60 °C</p> <p>-20 °C</p> <p>60 °C</p> <p>-20 °C</p> <p>50 °C</p>
<b>Ambient temperature during storage/transportation</b>	
<ul style="list-style-type: none"> <li>min.</li> <li>max.</li> </ul>	<p>-40 °C</p> <p>70 °C</p>
<b>Air pressure acc. to IEC 60068-2-13</b>	
<ul style="list-style-type: none"> <li>Operation, min.</li> <li>Operation, max.</li> <li>Storage/transport, min.</li> <li>Storage/transport, max.</li> </ul>	<p>795 hPa</p> <p>1 080 hPa</p> <p>660 hPa</p> <p>1 080 hPa</p>
<b>Relative humidity</b>	
<ul style="list-style-type: none"> <li>Operation at 25 °C without condensation, max.</li> </ul>	95 %
<b>Pollutant concentrations</b>	
<ul style="list-style-type: none"> <li>SO<sub>2</sub> at RH &lt; 60% without condensation</li> </ul>	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>connection method</b>	
required front connector	Yes
<b>Mechanics/material</b>	
Enclosure material (front) <ul style="list-style-type: none"> <li>Plastic</li> </ul>	Yes
<b>Dimensions</b>	

Width	38 mm
Height	62 mm
Depth	21 mm
<b>Weights</b>	
Weight, approx.	35 g

**last modified:** 4/25/2024 