

Siemens  
EcoTech



SIMATIC S7-1200 G2: SB 1233 analog I/O, 2 AI/2 AO inputs: 2 x AI 14 bit ADC (+/-10 V, +/-5 V, +/-2.5 V or 0-20 mA/4-20 mA) outputs: 2 x AQ 14 bit DAC (+/-10 V, 0-20 mA or 4-20 mA)

General information	
Product type designation	SB 1233, AI 2x 14 bit/AQ 2x 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.	25 mA
from backplane bus 5 V DC, typ.	29 mA
Power loss	
Power loss, typ.	2 W
Analog inputs	
Number of analog inputs	2; 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.	0.625 ms; at 400 Hz rejection
Input ranges	
<ul style="list-style-type: none"> <li>• Voltage</li> <li>• Current</li> <li>• Thermocouple</li> <li>• Resistance thermometer</li> <li>• Resistance</li> </ul>	Yes; $\pm 10V$ , $\pm 5V$ , $\pm 2.5V$ Yes; 4 to 20 mA, 0 to 20 mA No No No
Input ranges (rated values), voltages	
<ul style="list-style-type: none"> <li>• -10 V to +10 V                             <ul style="list-style-type: none"> <li>— Input resistance (-10 V to +10 V)</li> </ul> </li> <li>• -2.5 V to +2.5 V                             <ul style="list-style-type: none"> <li>— Input resistance (-2.5 V to +2.5 V)</li> </ul> </li> <li>• -5 V to +5 V                             <ul style="list-style-type: none"> <li>— Input resistance (-5 V to +5 V)</li> </ul> </li> </ul>	Yes $\geq 1 \text{ MOhm}$ Yes $\geq 1 \text{ MOhm}$ Yes $\geq 1 \text{ MOhm}$
Input ranges (rated values), currents	
<ul style="list-style-type: none"> <li>• 0 to 20 mA                             <ul style="list-style-type: none"> <li>— Input resistance (0 to 20 mA)</li> </ul> </li> <li>• 4 mA to 20 mA                             <ul style="list-style-type: none"> <li>— Input resistance (4 mA to 20 mA)</li> </ul> </li> </ul>	Yes $< 290 \Omega$ , $> 270 \Omega$ Yes $< 290 \Omega$ , $> 270 \Omega$

<b>Cable length</b>	
• shielded, max.	100 m; shielded, twisted pair
<b>Analog outputs</b>	
Number of analog outputs	2; Current or voltage
<b>Output ranges, voltage</b>	
• -10 V to +10 V	Yes
<b>Output ranges, current</b>	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
<b>Load impedance (in rated range of output)</b>	
• with voltage outputs, min.	1 000 Ω
• with current outputs, max.	600 Ω
<b>Cable length</b>	
• shielded, max.	100 m; shielded, twisted pair
<b>Analog value generation for the inputs</b>	
Measurement principle	Differential
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	13 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency $f_1$ in Hz	40 dB, DC to 60 Hz
<b>Smoothing of measured values</b>	
• parameterizable	Yes
• Step: None	Yes
• Step: low	Yes
• Step: Medium	Yes
• Step: High	Yes
<b>Analog value generation for the outputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	14 bit; Voltage: 14 bit; Current : 13 bit
<b>Errors/accuracies</b>	
Temperature error (relative to input range), (+/-)	25 °C ±0.1 % / -20 °C to 60 °C ±0.2 % of the full-scale deflection
Temperature error (relative to output range), (+/-)	25 °C ±0.3 % / -20 °C to 60 °C ±0.6 % of the full-scale deflection
<b>Basic error limit (operational limit at 25 °C)</b>	
• Voltage, relative to input range, (+/-)	0.1 %
• Current, relative to input range, (+/-)	0.1 %
• Voltage, relative to output range, (+/-)	0.3 %
• Current, relative to output range, (+/-)	0.3 %
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1</math> = interference frequency</b>	
• Common mode voltage, max.	2 V
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	Yes
<b>Alarms</b>	
• Diagnostic alarm	Yes
<b>Diagnoses</b>	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
<b>Diagnostics indication LED</b>	
• DIAG LED	Yes
• for status of the inputs	Yes
• for status of the outputs	Yes
<b>Potential separation</b>	
<b>Potential separation analog inputs</b>	
• between the channels and the power supply of the electronics	No
<b>Potential separation analog outputs</b>	
• between the channels and the power supply of the electronics	No

Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
Siemens Eco Profile (SEP)	Siemens EcoTech
CE mark	Yes
CSA approval	No
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	No
Ecological footprint	
<ul style="list-style-type: none"> <li>environmental product declaration</li> </ul>	Yes; type 2 acc. to ISO 14021
Global warming potential	
<ul style="list-style-type: none"> <li>— global warming potential, (total) [CO2 eq]</li> </ul>	16.6 kg
<ul style="list-style-type: none"> <li>— global warming potential, (during production) [CO2 eq]</li> </ul>	3.51 kg
<ul style="list-style-type: none"> <li>— global warming potential, (during operation) [CO2 eq]</li> </ul>	13.3 kg
<ul style="list-style-type: none"> <li>— global warming potential, (after end of life cycle) [CO2 eq]</li> </ul>	-0.257 kg
Ambient conditions	
Free fall	
<ul style="list-style-type: none"> <li>Fall height, max.</li> </ul>	0.3 m; five times, in product package
Ambient temperature during operation	
<ul style="list-style-type: none"> <li>min.</li> </ul>	-20 °C
<ul style="list-style-type: none"> <li>max.</li> </ul>	40 °C; at max. voltages and max. specifications
<ul style="list-style-type: none"> <li>horizontal installation, min.</li> </ul>	-20 °C
<ul style="list-style-type: none"> <li>horizontal installation, max.</li> </ul>	60 °C; at rated voltages, 50 % of max. specification and alternate IO active
<ul style="list-style-type: none"> <li>vertical installation, min.</li> </ul>	-20 °C
<ul style="list-style-type: none"> <li>vertical installation, max.</li> </ul>	50 °C; at rated voltages, 50 % of max. specification and alternate IO active
Ambient temperature during storage/transportation	
<ul style="list-style-type: none"> <li>min.</li> </ul>	-40 °C
<ul style="list-style-type: none"> <li>max.</li> </ul>	70 °C
Air pressure acc. to IEC 60068-2-13	
<ul style="list-style-type: none"> <li>Operation, min.</li> </ul>	540 hPa
<ul style="list-style-type: none"> <li>Operation, max.</li> </ul>	1 140 hPa
<ul style="list-style-type: none"> <li>Storage/transport, min.</li> </ul>	540 hPa
<ul style="list-style-type: none"> <li>Storage/transport, max.</li> </ul>	1 140 hPa
Altitude during operation relating to sea level	
<ul style="list-style-type: none"> <li>Installation altitude, min.</li> </ul>	-1 000 m
<ul style="list-style-type: none"> <li>Installation altitude, max.</li> </ul>	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Relative humidity	
<ul style="list-style-type: none"> <li>Operation at 25 °C without condensation, max.</li> </ul>	95 %
Vibrations	
<ul style="list-style-type: none"> <li>Vibration resistance during operation acc. to IEC 60068-2-6</li> </ul>	3.5 mm from 5 - 8.4 Hz, 1g from 8.4 - 150 Hz
<ul style="list-style-type: none"> <li>Operation, tested according to IEC 60068-2-6</li> </ul>	Yes
Shock testing	
<ul style="list-style-type: none"> <li>tested according to IEC 60068-2-27</li> </ul>	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
Pollutant concentrations	
<ul style="list-style-type: none"> <li>SO2 at RH &lt; 60% without condensation</li> </ul>	SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60 % condensation-free
Connection method	
required front connector	No
Mechanics/material	
Enclosure material (front)	
<ul style="list-style-type: none"> <li>Plastic</li> </ul>	Yes
Dimensions	

Width	15 mm
Height	62 mm
Depth	63 mm
<b>Weights</b>	
Weight, approx.	30 g
<b>Classifications</b>	

	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

**Approvals / Certificates**

**General Product Approval**



[Miscellaneous](#)

[China RoHS](#)



**EMV For use in hazardous locations Test Certificates**



[CCC-Ex](#)

[Type Test Certificates/Test Report](#)

**Maritime application Environment**



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