



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 $< 290 \Omega$ , $> 270 \Omega$
Cable length	
<ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>	100 m; shielded, twisted pair
Analog outputs	
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 f1 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 (f1 \pm 1 \%)</math>, f1 = 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
<b>Degree and class of protection</b>	
IP degree of protection	IP20
<b>Standards, approvals, certificates</b>	
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

- Fall height, max. 0.3 m; five times, in product package

#### Ambient temperature during operation

- min. -20 °C
- max. 40 °C; at max. voltages and max. specifications
- horizontal installation, min. -20 °C
- horizontal installation, max. 60 °C; at rated voltages, 50 % of max. specification and alternate IO active
- vertical installation, min. -20 °C
- vertical installation, max. 50 °C; at rated voltages, 50 % of max. specification and alternate IO active

#### Ambient temperature during storage/transportation

- min. -40 °C
- max. 70 °C

#### Air pressure acc. to IEC 60068-2-13

- Operation, min. 540 hPa
- Operation, max. 1 140 hPa
- Storage/transport, min. 540 hPa
- Storage/transport, max. 1 140 hPa

#### Altitude during operation relating to sea level

- Installation altitude, min. -1 000 m
- Installation altitude, max. 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
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### Mechanics/material

Enclosure material (front)	
• Plastic	Yes

### Dimensions

Width	15 mm
Height	62 mm
Depth	63 mm

### Weights

Weight, approx.	30 g
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### 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

Approvals / Certificates

General Product Approval	EMV	For use in hazardous locations
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[KC](#)



[KC](#)



For use in hazardous locations	Environment
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[CCC-Ex](#)



last modified:

1/22/2025