

Siemens  
EcoTech



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

Figure similar

General information	
Product type designation	SM 1233, AI 4x 14 bit/AQ 4x 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.	40 mA
from backplane bus 5 V DC, typ.	80 mA
Power loss	
Power loss, typ.	4.7 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.	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</li> </ul>	Yes $< 290 \Omega$ , $> 270 \Omega$ Yes

— Input resistance (4 mA to 20 mA)	< 290 Ω, > 270 Ω
<b>Cable length</b>	
• shielded, max.	100 m; shielded, twisted pair
<b>Analog outputs</b>	
Number of analog outputs	4; 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	successive approximation
<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 (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	No

electronics

### 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

• environmental product declaration Yes; type 2 acc. to ISO 14021

#### Global warming potential

— global warming potential, (total) [CO2 eq] 32.2 kg

— global warming potential, (during production) [CO2 eq] 7.96 kg

— global warming potential, (during operation) [CO2 eq] 24.5 kg

— global warming potential, (after end of life cycle) [CO2 eq] -0.358 kg

### 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

### Mechanics/material

Enclosure material (front)

• Plastic Yes

Dimensions	
Width	30 mm
Height	125 mm
Depth	100 mm

Weights	
Weight, approx.	174 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	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
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[CCC-Ex](#)

[Type Test Certificates/Test Report](#)

Maritime application	Environment
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