

SIMATIC S7-1200, analog I/O SM 1234, 4 AI/2 AO, +/-10 V, 14-bit resolution or 0 (4)-20mA, 13-bit resolution



General information	
Product type designation	SM 1234, AI 4x13 bit/AQ 2x14 bit
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, typ.	60 mA
from backplane bus 5 V DC, typ.	80 mA
Power loss	
Power loss, typ.	2 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.	625 $\mu$ s
Input ranges	
• Voltage	Yes; $\pm 10$ V, $\pm 5$ V, $\pm 2.5$ V

• Current	Yes; 4 to 20 mA, 0 to 20 mA
• Thermocouple	No
• Resistance thermometer	No
• Resistance	No
<b>Input ranges (rated values), voltages</b>	
• -10 V to +10 V	Yes
— Input resistance (-10 V to +10 V)	≥9 MOhm
• -2.5 V to +2.5 V	Yes
— Input resistance (-2.5 V to +2.5 V)	≥9 MOhm
• -5 V to +5 V	Yes
— Input resistance (-5 V to +5 V)	≥9 MOhm
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes
— Input resistance (0 to 20 mA)	280 Ω
• 4 mA to 20 mA	Yes
<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.	12 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz
<b>Smoothing of measured values</b>	
• parameterizable	Yes
• Step: None	Yes
• Step: low	Yes
• Step: Medium	Yes
• Step: High	Yes

## Analog value generation for the outputs

### Integration and conversion time/resolution per channel

- Resolution (incl. overrange) Voltage: 14 bit; Current : 13 bit

## Errors/accuracies

Temperature error (relative to input range), (+/-) 25 °C ±0.1%, to 55 °C ±0.2% total measurement range

Temperature error (relative to output range), (+/-) 25 °C ±0.3%, to 55 °C ±0.6% total measurement range

### Basic error limit (operational limit at 25 °C)

- 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 %

### Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$ , $f_1$ = interference frequency

- Common mode voltage, max. 12 V

## Interrupts/diagnostics/status information

Alarms Yes

Diagnostics function Yes

### Alarms

- Diagnostic alarm Yes

### Diagnoses

- Monitoring the supply voltage Yes
- Wire-break Yes
- Short-circuit Yes

### Diagnostics indication LED

- for status of the inputs Yes
- for status of the outputs Yes
- for maintenance Yes

## Potential separation

### Potential separation analog outputs

- between the channels and the power supply of the electronics No

## Degree and class of protection

IP degree of protection IP20

## Standards, approvals, certificates

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>Pollutant concentrations</b>	
• SO2 at RH < 60% without condensation	SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>	
required front connector	Yes
<b>Mechanics/material</b>	
<b>Enclosure material (front)</b>	
• Plastic	Yes
<b>Dimensions</b>	
Width	45 mm
Height	100 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	220 g
<b>last modified:</b>	08/25/2020