



SIMATIC S7-1200, ANALOG INPUT, SM 1231, 8 AI, +/-10V, +/-5V, +/-2.5V, OR 0-20mA/4-20 MA, 12 BIT + SIGN OR (13 BIT ADC)

### Supply voltage

Rated value (DC)

- 24 V DC

Yes

### Input current

Current consumption, typ.

45 mA

from backplane bus 5 V DC, typ.

90 mA

### Power losses

Power loss, typ.

1.5 W

### Analog inputs

Number of analog inputs

8; Current or voltage differential inputs

permissible input frequency for current input (destruction limit), max.

$\pm 35$  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.

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	Yes
<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
<b>Thermocouple (TC)</b>	
<b>Temperature compensation</b>	
— Parameterizable	No
<b>Analog outputs</b>	
Number of analog outputs	0
<b>Analog value creation</b>	
<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
<b>Errors/accuracies</b>	
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
<b>Basic error limit (operational limit at 25 °C)</b>	
• Voltage, relative to input area, (+/-)	0.1 %
• Current, relative to input area, (+/-)	0.1 %
<b>Interference voltage suppression for <math>f = n \times (f1 \pm 1 \%)</math>, f1 = interference frequency</b>	
• common mode voltage, max.	12 V
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Alarms	Yes
• Diagnostic alarm	Yes
<b>Diagnostic messages</b>	

• Diagnostic functions	Yes
• Monitoring the supply voltage	Yes
• Wire break	Yes
<b>Diagnostics indication LED</b>	
• for status of the inputs	Yes
• for maintenance	Yes
<b>Galvanic isolation analog outputs</b>	
• between the channels and the power supply of the electronics	No
<b>Degree and class of protection</b>	
Degree of protection to EN 60529	
• IP20	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
<b>Marine approval</b>	
• Marine approval	Yes
<b>Highest safety class achievable in safety mode</b>	
• SIL acc. to IEC 61508	none
<b>Ambient conditions</b>	
<b>Free fall</b>	
• Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
<b>Ambient temperature in operation</b>	
• Permissible temperature range	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting, 95% humidity, non-condensing
• Min.	-20 °C
• max.	60 °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>	
• Permissible range (without condensation) at 25 °C	95 %
<b>Pollutant concentrations</b>	

— SO2 at RH < 60% without condensation

S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free

#### Connection method

required front connector Yes

#### Mechanics/material

Type of housing (front)

- plastic

Yes

#### Dimensions

Width 45 mm

Height 100 mm

Depth 75 mm

#### Weights

Weight, approx. 180 g

**last modified:** 20.04.2015