

SIMATIC S7-1200, ANALOG INPUT, SM 1231 TC, 8 AI  
THERMOCOUPLE



Supply voltage	
Rated value (DC)	
<ul style="list-style-type: none"> <li>24 V DC</li> </ul>	Yes
Input current	
Current consumption, typ.	40 mA
from backplane bus 5 V DC, typ.	80 mA
Power losses	
Power loss, typ.	1.5 W
Analog inputs	
Number of analog inputs	8; Thermocouples
permissible input frequency for current input (destruction limit), max.	± 35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit
Input ranges	
<ul style="list-style-type: none"> <li>Thermocouple</li> </ul>	Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: ±80 mV
<ul style="list-style-type: none"> <li>Resistance thermometer</li> </ul>	No
<ul style="list-style-type: none"> <li>Resistance</li> </ul>	No
Input ranges (rated values), voltages	
<ul style="list-style-type: none"> <li>-80 mV to +80 mV</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Input resistance (-80 mV to +80 mV)</li> </ul>	≥ 1 MOhm
Input ranges (rated values), thermoelements	
<ul style="list-style-type: none"> <li>Type B</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Type C</li> </ul>	Yes

• Type E	Yes
• Type J	Yes
• Type K	Yes
• Type N	Yes
• Type R	Yes
• Type S	Yes
• Type T	Yes
• Type TXK/TXK(L) to GOST	Yes
<b>Thermocouple (TC)</b>	
• permissible input voltage for voltage input (destruction limit), max.	+35 V
<b>Temperature compensation</b>	
— Parameterizable	No
<b>Analog outputs</b>	
Number of analog outputs	0
<b>Analog value creation</b>	
Measurement principle	integrating
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	15 bit; + sign
• Integration time, parameterizable	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 50 / 60 / 400 Hz
<b>Analog value generation (in isochronous mode)</b>	
<b>Smoothing of measured values</b>	
• Parameterizable	Yes
<b>Errors/accuracies</b>	
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output area), (+/-)	0.5 %
<b>Interference voltage suppression for <math>f = n \times (f_1 \pm 1 \%)</math>, <math>f_1</math> = interference frequency</b>	
• Common mode interference, min.	120 dB
<b>Interrupts/diagnostics/status information</b>	
<b>Alarms</b>	
• Alarms	Yes
• Diagnostic alarm	Yes
<b>Diagnostic messages</b>	
• Diagnostic functions	Yes; Can be read out
• Monitoring the supply voltage	Yes
• Wire break	Yes
<b>Diagnostics indication LED</b>	

• for status of the inputs	Yes
• for maintenance	Yes
<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>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>	
— SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>	
required front connector	Yes
<b>Mechanics/material</b>	
Type of housing (front)	
• 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>	20.04.2015