

SIMATIC S7, ANALOG INPUT SM 331, OPTICALLY ISOLATED, 8 AI THERMOCOUPLE/4 AI PT100, F. SIGNALS F. HAZARDOUS AREAS, CAPABLE OF DIAGNOST.,PTB-TESTED 1 X 20 PIN



Supply voltage	
Load voltage L+	
<ul style="list-style-type: none"> Rated value (DC) 	24 V
Input current	
from backplane bus 5 V DC, max.	120 mA
Power loss	
Power loss, typ.	0.6 W
Analog inputs	
Number of analog inputs	8; 8x thermocouples; 4x RTD thermoresistors
Input ranges	
<ul style="list-style-type: none"> Voltage Current Thermocouple Resistance thermometer Resistance 	<ul style="list-style-type: none"> Yes No Yes Yes Yes
Input ranges (rated values), thermocouples	
<ul style="list-style-type: none"> Type B 	Yes

• Input resistance (Type B)	10 MΩ
• Type E	Yes
• Input resistance (Type E)	10 MΩ
• Type J	Yes
• Input resistance (type J)	10 MΩ
• Type K	Yes
• Input resistance (Type K)	10 MΩ
• Type L	Yes
• Input resistance (Type L)	10 MΩ
• Type N	Yes
• Input resistance (Type N)	10 MΩ
• Type R	Yes
• Input resistance (Type R)	10 MΩ
• Type S	Yes
• Input resistance (Type S)	10 MΩ
• Type T	Yes
• Input resistance (Type T)	10 MΩ
• Type U	Yes
• Input resistance (Type U)	10 MΩ

Input ranges (rated values), resistance thermometer

• Ni 100	Yes
• Input resistance (Ni 100)	10 MΩ
• Pt 100	Yes
• Input resistance (Pt 100)	10 MΩ
• Pt 200	Yes
• Input resistance (Pt 200)	10 MΩ

Cable length

• shielded, max.	200 m; TC: 50 m
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Analog value generation for the inputs

Measurement principle	Sigma Delta
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Integration and conversion time/resolution per channel

• Resolution with overrange (bit including sign), max.	16 bit; 10 bit to 15 bit + sign
• Integration time, parameterizable	Yes; 2.5 to 100 ms
• Interference voltage suppression for interference frequency f1 in Hz	10 to 400 Hz

Encoder

Connection of signal encoders

• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes

Errors/accuracies

Temperature error (relative to input range), (+/-)	0.001 %/K; Temperature error: 0.001 to 0.002 %/K
Operational error limit in overall temperature range	
• Resistance thermometer, relative to input range, (+/-)	0.04 %; 0.09 to 0.04%
Basic error limit (operational limit at 25 °C)	
• Resistance thermometer, relative to input range, (+/-)	0.008 %; 0.018 ... 0.008%
Interference voltage suppression for $f = n \times (f_1 \pm 1 \%)$, f_1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	60 dB
• Common mode interference, min.	130 dB
Interrupts/diagnostics/status information	
Diagnostic functions	Yes
Diagnostic messages	
• Diagnostic information readable	Yes
• Overrange	Yes
• Wire-break in signal transmitter cable	Yes
• Short-circuit of the signal encoder cable	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
• Channel fault indicator F (red)	Yes
Ex(i) characteristics	
Module for Ex(i) protection	Yes
Maximum values of input circuits (per channel)	
• Co (permissible external capacity), max.	43 μ F
• Io (short-circuit current), max.	28.8 mA
• Lo (permissible external inductivity), max.	40 mH
• Po (power of load), max.	41.4 mW
• Uo (output no-load voltage), max.	5.9 V
Potential separation	
Potential separation analog inputs	
• Potential separation analog inputs	Yes
Permissible potential difference	
between the inputs (UCM)	60 V DC/30 V AC when used in the hazardous area; 400 V DC/250 V AC when used in NON-hazardous area
Between the inputs and MANA (UCM)	60 V DC/30 V AC when used in the hazardous area; 400 V DC/250 V AC when used in NON-hazardous area
Standards, approvals, certificates	
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	[Ex ib] IIC

- Type of protection acc. to FM
- Test number PTB

Class I, Division 2, Group A, B, C, D T4
Ex-96.D.2108X

Ambient conditions

Ambient temperature during operation

- max.

60 °C

Connection method

required front connector

20-pin

Weights

Weight, approx.

210 g

last modified:

03/24/2017