

SIMATIC S7-300, ANALOG INPUT SM 331, OPTICALLY ISOLATED, 2 AI, 9/12/14 BITS RESOLUTION, U/I/THERMOCOUPLE/RESISTANCE, ALERT, DIAGNOSTICS, 1 X 20 PIN, REMOVE/INSERT W. BACKPLANE BUS



Figure similar

Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Input current	
from load voltage L+ (without load), max.	30 mA
from backplane bus 5 V DC, max.	50 mA
Power loss	
Power loss, typ.	1 W
Analog inputs	
Number of analog inputs	2
• For resistance measurement	1
permissible input voltage for voltage input (destruction limit), max.	20 V; continuous; 75 V for max. 1 s (mark to space ratio 1:20)
permissible input current for current input (destruction limit), max.	40 mA

Input ranges	
• Voltage	Yes
• Current	Yes
• Thermocouple	Yes
• Resistance thermometer	Yes
• Resistance	Yes
Input ranges (rated values), voltages	
• 0 to +10 V	No
• 1 V to 5 V	Yes
• Input resistance (1 V to 5 V)	100 k Ω
• 1 V to 10 V	No
• -1 V to +1 V	Yes
• Input resistance (-1 V to +1 V)	10 M Ω
• -10 V to +10 V	Yes
• Input resistance (-10 V to +10 V)	100 k Ω
• -2.5 V to +2.5 V	Yes
• Input resistance (-2.5 V to +2.5 V)	100 k Ω
• -250 mV to +250 mV	Yes
• Input resistance (-250 mV to +250 mV)	10 M Ω
• -5 V to +5 V	Yes
• Input resistance (-5 V to +5 V)	100 k Ω
• -50 mV to +50 mV	No
• -500 mV to +500 mV	Yes
• Input resistance (-500 mV to +500 mV)	10 M Ω
• -80 mV to +80 mV	Yes
• Input resistance (-80 mV to +80 mV)	10 M Ω
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• Input resistance (0 to 20 mA)	25 Ω
• -10 mA to +10 mA	Yes
• Input resistance (-10 mA to +10 mA)	25 Ω
• -20 mA to +20 mA	Yes
• Input resistance (-20 mA to +20 mA)	25 Ω
• -3.2 mA to +3.2 mA	Yes
• Input resistance (-3.2 mA to +3.2 mA)	25 Ω
• 4 mA to 20 mA	Yes
• Input resistance (4 mA to 20 mA)	25 Ω
Input ranges (rated values), thermocouples	
• Type B	No
• Type E	Yes
• Input resistance (Type E)	10 M Ω

• Type J	Yes
• Input resistance (type J)	10 MΩ
• Type K	Yes
• Input resistance (Type K)	10 MΩ
• Type L	No
• Type N	Yes
• Input resistance (Type N)	10 MΩ
• Type R	No
• Type S	No
• Type T	No
• Type U	No
• Type TXK/TXK(L) to GOST	No
Input ranges (rated values), resistance thermometer	
• Cu 10	No
• Ni 100	Yes
• Input resistance (Ni 100)	10 MΩ; Standard
• Ni 1000	No
• LG-Ni 1000	No
• Ni 120	No
• Ni 200	No
• Ni 500	No
• Pt 100	Yes
• Input resistance (Pt 100)	10 kΩ; Standard
• Pt 1000	No
• Pt 200	No
• Pt 500	No
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
• Input resistance (0 to 150 ohms)	10 MΩ
• 0 to 300 ohms	Yes
• Input resistance (0 to 300 ohms)	10 MΩ
• 0 to 600 ohms	Yes
• Input resistance (0 to 600 ohms)	10 MΩ
• 0 to 6000 ohms	No
Thermocouple (TC)	
Temperature compensation	
— parameterizable	Yes
— internal temperature compensation	Yes
— external temperature compensation with compensations socket	Yes
Characteristic linearization	

<ul style="list-style-type: none"> • parameterizable <ul style="list-style-type: none"> — for thermocouples — for resistance thermometer 	Yes Type E, J, K, L, N Pt100 (standard, climatic range), Ni100 (standard, climatic range)
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Cable length	
<ul style="list-style-type: none"> • shielded, max. 	200 m; 50 m at 80 mV and thermocouples

Analog value generation for the inputs

Measurement principle	integrating
Integration and conversion time/resolution per channel	
<ul style="list-style-type: none"> • Resolution with overrange (bit including sign), max. 	15 bit; Unipolar: 9/12/12/14 bit; bipolar: 9 bit + sign/12 bit + sign/12 bit + sign/14 bit + sign
<ul style="list-style-type: none"> • Integration time, parameterizable 	Yes; 2,5 / 16,67 / 20 / 100 ms
<ul style="list-style-type: none"> • Basic conversion time (ms) 	3 / 17 / 22 / 102 ms
<ul style="list-style-type: none"> • Interference voltage suppression for interference frequency f1 in Hz 	400 / 60 / 50 / 10 Hz

Encoder

Connection of signal encoders	
<ul style="list-style-type: none"> • for current measurement as 2-wire transducer 	Yes
<ul style="list-style-type: none"> • for current measurement as 4-wire transducer 	Yes
<ul style="list-style-type: none"> • for resistance measurement with two-wire connection 	Yes
<ul style="list-style-type: none"> • for resistance measurement with three-wire connection 	Yes
<ul style="list-style-type: none"> • for resistance measurement with four-wire connection 	Yes

Errors/accuracies

Operational error limit in overall temperature range	
<ul style="list-style-type: none"> • Voltage, relative to input range, (+/-) 	1 %; ±1% (80 mV); ±0.6% (250 mV to 1 000 mV); ±0.8% (2.5 V to 10 V)
<ul style="list-style-type: none"> • Current, relative to input range, (+/-) 	0.7 %; From 3.2 to 20 mA
<ul style="list-style-type: none"> • Resistance, relative to input range, (+/-) 	0.7 %; 150, 300, 600 Ohm
<ul style="list-style-type: none"> • Resistance thermometer, relative to input range, (+/-) 	0.7 %; +/-0.7% (Pt100/ Ni100); +/-0.8% (Pt100 climate)
Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> • Voltage, relative to input range, (+/-) 	0.6 %; ±0.6% (80 mV, 2.5 V to 10 V); ±0.4% (250 mV to 1 000 mV)
<ul style="list-style-type: none"> • Current, relative to input range, (+/-) 	0.5 %; 3.2 to 20 mA
<ul style="list-style-type: none"> • Resistance, relative to input range, (+/-) 	0.5 %; 150, 300, 600 Ohm
<ul style="list-style-type: none"> • Resistance thermometer, relative to input range, (+/-) 	0.6 %; ±0.5% (Pt100/ Ni100), ±0.6% (Pt100 climate)

Interrupts/diagnostics/status information

Diagnostic functions	Yes; Parameterizable
Alarms	

• Diagnostic alarm	Yes
• Limit value alarm	Yes; Parameterizable, channel 0
Diagnostic messages	
• Diagnostic information readable	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
Potential separation	
Potential separation analog inputs	
• between the channels and backplane bus	Yes
Isolation	
Isolation tested with	500 V DC
Connection method	
required front connector	20-pin
Dimensions	
Width	40 mm
Height	125 mm
Depth	120 mm
Weights	
Weight, approx.	250 g
last modified:	03/24/2017