

SIMATIC S7-300, Analog input SM 331, Isolated 8 AI, resolution 13 bits U/I/resistor/Pt100, NI100, NI1000, LG-NI1000, PTC/KTY, 66 ms conversion time; 1x 40-pole



Figure similar

Input current	
from backplane bus 5 V DC, max.	90 mA
Power loss	
Power loss, typ.	0.4 W
Analog inputs	
Number of analog inputs	8
• For resistance measurement	8
permissible input voltage for voltage input (destruction limit), max.	30 V; 12 V continuous, 30 V for max. 1 s
permissible input current for current input (destruction limit), max.	40 mA
Input ranges	
• Voltage	Yes
• Current	Yes
• Thermocouple	No
• Resistance thermometer	Yes
• Resistance	Yes

#### Input ranges (rated values), voltages

• 0 to +10 V	Yes
• Input resistance (0 to 10 V)	100 k $\Omega$
• 1 V to 5 V	Yes
• Input resistance (1 V to 5 V)	100 k $\Omega$
• 1 V to 10 V	No
• -1 V to +1 V	Yes
• Input resistance (-1 V to +1 V)	100 k $\Omega$
• -10 V to +10 V	Yes
• Input resistance (-10 V to +10 V)	100 k $\Omega$
• -2.5 V to +2.5 V	No
• -250 mV to +250 mV	No
• -5 V to +5 V	Yes
• Input resistance (-5 V to +5 V)	100 k $\Omega$
• -50 mV to +50 mV	Yes
• Input resistance (-50 mV to +50 mV)	100 k $\Omega$
• -500 mV to +500 mV	Yes
• Input resistance (-500 mV to +500 mV)	100 k $\Omega$
• -80 mV to +80 mV	No

#### Input ranges (rated values), currents

• 0 to 20 mA	Yes
• Input resistance (0 to 20 mA)	100 $\Omega$
• -10 mA to +10 mA	No
• -20 mA to +20 mA	Yes
• Input resistance (-20 mA to +20 mA)	100 $\Omega$
• -3.2 mA to +3.2 mA	No
• 4 mA to 20 mA	Yes
• Input resistance (4 mA to 20 mA)	100 $\Omega$

#### Input ranges (rated values), thermocouples

• Type B	No
• Type C	No
• Type E	No
• Type J	No
• Type K	No
• Type L	No
• Type N	No
• 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; Standard/climate
• Input resistance (Ni 100)	100 MΩ
• Ni 1000	Yes
• Input resistance (Ni 1000)	100 MΩ
• LG-Ni 1000	Yes; Standard/climate
• Input resistance (LG-Ni 1000)	100 MΩ
• Ni 120	No
• Ni 200	No
• Ni 500	No
• Pt 100	Yes; Standard/climate
• Input resistance (Pt 100)	100 MΩ
• Pt 1000	No
• Pt 200	No
• Pt 500	No
Input ranges (rated values), resistors	
• 0 to 150 ohms	No
• 0 to 300 ohms	No
• 0 to 600 ohms	Yes
• Input resistance (0 to 600 ohms)	100 MΩ
• 0 to 6000 ohms	Yes
• Input resistance (0 to 6000 ohms)	100 MΩ
Thermocouple (TC)	
Temperature compensation	
— parameterizable	No
— internal temperature compensation	No
— external temperature compensation with compensations socket	No
Characteristic linearization	
• parameterizable	Yes
— for thermocouples	No
— for resistance thermometer	yes; Pt100 standard/air con.; Ni100 standard/air con.; Ni1000 standard/air con.; LG-Ni1000 standard/air con.
Cable length	
• shielded, max.	200 m; max. 50 m at 50 mV
Analog value generation for the inputs	
Measurement principle	integrating
Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	13 bit
• Integration time, parameterizable	Yes; 60 / 50 ms

• Basic conversion time (ms)	66 / 55 ms
• Interference voltage suppression for interference frequency f1 in Hz	50 / 60 Hz

## Encoder

### Connection of signal encoders

• for current measurement as 2-wire transducer	Yes; with external supply
• for current measurement as 4-wire transducer	Yes
• for resistance measurement with two-wire connection	Yes
• for resistance measurement with three-wire connection	Yes
• for resistance measurement with four-wire connection	Yes

## Errors/accuracies

### Operational error limit in overall temperature range

• Voltage, relative to input range, (+/-)	0.6 %; $\pm 0.6$ % ( $\pm 5$ V, 10 V, 1 to 5 V, 0 to 10 V); $\pm 0.5$ % ( $\pm 50$ mV, 500 mV, 1 V)
• Current, relative to input range, (+/-)	0.5 %; $\pm 20$ mA, 0 to 20 mA, 4 to 20 mA
• Resistance, relative to input range, (+/-)	0.5 %; 0 to 6 kohms, 0 to 600 kohms
• Resistance thermometer, relative to input range, (+/-)	1 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic); 1.2 Kelvin (Pt100, Ni100, standard)

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

• Voltage, relative to input range, (+/-)	0.4 %; 0.4% ( $\pm 5$ V, 10 V, 1 to 5 V, 0 to 10 V); 0.3% ( $\pm 50$ mV, 500 mV, 1 V)
• Current, relative to input range, (+/-)	0.3 %; $\pm 20$ mA, 0 to 20 mA, 4 to 20 mA
• Resistance, relative to input range, (+/-)	0.3 %; 0 to 6 kohms, 0 to 600 kohms
• Resistance thermometer, relative to input range, (+/-)	1 Kelvin (Pt100, Ni100, standard); 0.8 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic)

## Interrupts/diagnostics/status information

Diagnostics function No

### Alarms

• Diagnostic alarm	No
• Limit value alarm	No

### Diagnostic messages

• Diagnostic information readable	No
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### Diagnostics indication LED

• Group error SF (red)	No
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## Potential separation

### Potential separation analog inputs

• between the channels and backplane bus	Yes
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## Isolation

Isolation tested with	500 V DC
<b>Connection method</b>	
required front connector	40-pin
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	117 mm
<b>Weights</b>	
Weight, approx.	250 g
<b>last modified:</b>	12/13/2018