

SIMATIC S7-300, ANALOG INPUT SM 331, OPTICALLY ISOLATED, 8 AI, 13 BIT RESOLUTION, U//RESISTANCE/PT100, NI100, NI1000, LG-NI1000, 66 MS MODULE UPDATE, 1 X 40 PIN

Input current

from backplane bus 5 V DC, max.	90 mA
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Power loss

Power loss, typ.	0.4 W
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Analog inputs

Number of analog inputs	8
<ul style="list-style-type: none"> 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

<ul style="list-style-type: none"> Voltage 	Yes
<ul style="list-style-type: none"> Current 	Yes
<ul style="list-style-type: none"> Thermocouple 	No
<ul style="list-style-type: none"> Resistance thermometer 	Yes
<ul style="list-style-type: none"> Resistance 	Yes

Input ranges (rated values), voltages

<ul style="list-style-type: none"> 0 to +10 V 	Yes
<ul style="list-style-type: none"> Input resistance (0 to 10 V) 	100 kΩ
<ul style="list-style-type: none"> 1 V to 5 V 	Yes
<ul style="list-style-type: none"> Input resistance (1 V to 5 V) 	100 kΩ
<ul style="list-style-type: none"> 1 V to 10 V 	No
<ul style="list-style-type: none"> -1 V to +1 V 	Yes
<ul style="list-style-type: none"> Input resistance (-1 V to +1 V) 	100 kΩ
<ul style="list-style-type: none"> -10 V to +10 V 	Yes
<ul style="list-style-type: none"> Input resistance (-10 V to +10 V) 	100 kΩ
<ul style="list-style-type: none"> -2.5 V to +2.5 V 	No
<ul style="list-style-type: none"> -250 mV to +250 mV 	No
<ul style="list-style-type: none"> -5 V to +5 V 	Yes
<ul style="list-style-type: none"> Input resistance (-5 V to +5 V) 	100 kΩ
<ul style="list-style-type: none"> -50 mV to +50 mV 	Yes
<ul style="list-style-type: none"> Input resistance (-50 mV to +50 mV) 	100 kΩ
<ul style="list-style-type: none"> -500 mV to +500 mV 	Yes

• Input resistance (-500 mV to +500 mV)	100 k Ω
• -80 mV to +80 mV	No
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• Input resistance (0 to 20 mA)	50 Ω
• -10 mA to +10 mA	No
• -20 mA to +20 mA	Yes
• Input resistance (-20 mA to +20 mA)	50 Ω
• -3.2 mA to +3.2 mA	No
• 4 mA to 20 mA	Yes
• Input resistance (4 mA to 20 mA)	50 Ω
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 M Ω
• Ni 1000	Yes
• Input resistance (Ni 1000)	100 M Ω
• LG-Ni 1000	Yes; Standard/climate
• Input resistance (LG-Ni 1000)	100 M Ω
• Ni 120	No
• Ni 200	No
• Ni 500	No
• Pt 100	Yes; Standard/climate
• Input resistance (Pt 100)	100 M Ω
• Pt 1000	No
• Pt 200	No
• Pt 500	No
Input ranges (rated values), resistors	

<ul style="list-style-type: none"> • 0 to 150 ohms • 0 to 300 ohms • 0 to 600 ohms • Input resistance (0 to 600 ohms) • 0 to 6000 ohms • Input resistance (0 to 6000 ohms) 	<p>No</p> <p>No</p> <p>Yes</p> <p>100 MΩ</p> <p>Yes</p> <p>100 MΩ</p>
Characteristic linearization	
<ul style="list-style-type: none"> • parameterizable <ul style="list-style-type: none"> — for resistance thermometer 	<p>Yes</p> <p>yes; Pt100 standard/air con.; Ni100 standard/air con.; Ni1000 standard/air con.; LG-Ni1000 standard/air con.</p>
Cable length	
<ul style="list-style-type: none"> • 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	
<ul style="list-style-type: none"> • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Basic conversion time (ms) • Interference voltage suppression for interference frequency f1 in Hz 	<p>13 bit</p> <p>Yes; 60 / 50 ms</p> <p>66 / 55 ms</p> <p>50 / 60 Hz</p>
Encoder	
Connection of signal encoders	
<ul style="list-style-type: none"> • for current measurement as 2-wire transducer • for current measurement as 4-wire transducer • for resistance measurement with two-wire connection • for resistance measurement with three-wire connection • for resistance measurement with four-wire connection 	<p>Yes; with external supply</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>
Errors/accuracies	
Operational error limit in overall temperature range	
<ul style="list-style-type: none"> • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) • Resistance, relative to input range, (+/-) • Resistance thermometer, relative to input range, (+/-) 	<p>0.6 %; ±0.6 % (±5 V, 10 V, 1 to 5 V, 0 to 10 V); ±0.5 % (±50 mV, 500 mV, 1 V)</p> <p>0.5 %; ±20 mA, 0 to 20 mA, 4 to 20 mA</p> <p>0.5 %; 0 to 6 kohms, 0 to 600 kohms</p> <p>1 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic); 1.2 Kelvin (Pt100, Ni100, standard)</p>
Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> • Voltage, relative to input range, (+/-) 	0.4 %; 0.4% (±5 V, 10 V, 1 to 5 V, 0 to 10 V); 0.3% (±50 mV, 500 mV, 1 V)

- Current, relative to input range, (+/-)
- Resistance, relative to input range, (+/-)
- Resistance thermometer, relative to input range, (+/-)

0.3 %; ±20 mA, 0 to 20 mA, 4 to 20 mA

0.3 %; 0 to 6 kohms, 0 to 600 kohms

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

Diagnostics indication LED

- Group error SF (red) No

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 40-pin

Dimensions

Width 40 mm

Height 125 mm

Depth 117 mm

Weights

Weight, approx. 250 g

last modified: 02/07/2019