

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
• 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
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes
• Input resistance (0 to 20 mA)	50 $\Omega$
• -10 mA to +10 mA	No
• -20 mA to +20 mA	Yes
• Input resistance (-20 mA to +20 mA)	50 $\Omega$
• -3.2 mA to +3.2 mA	No
• 4 mA to 20 mA	Yes
• Input resistance (4 mA to 20 mA)	50 $\Omega$
<b>Input ranges (rated values), thermocouples</b>	
• 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
<b>Input ranges (rated values), resistance thermometer</b>	
• Cu 10	No
• Ni 100	Yes; Standard/climate
• Input resistance (Ni 100)	100 M $\Omega$
• Ni 1000	Yes
• Input resistance (Ni 1000)	100 M $\Omega$
• LG-Ni 1000	Yes; Standard/climate
• Input resistance (LG-Ni 1000)	100 M $\Omega$
• Ni 120	No
• Ni 200	No
• Ni 500	No
• Pt 100	Yes; Standard/climate
• Input resistance (Pt 100)	100 M $\Omega$
• Pt 1000	No
• Pt 200	No
• Pt 500	No
<b>Input ranges (rated values), resistors</b>	

<ul style="list-style-type: none"> <li>• 0 to 150 ohms</li> <li>• 0 to 300 ohms</li> <li>• 0 to 600 ohms</li> <li>• Input resistance (0 to 600 ohms)</li> <li>• 0 to 6000 ohms</li> <li>• Input resistance (0 to 6000 ohms)</li> </ul>	<p>No</p> <p>No</p> <p>Yes</p> <p>100 MΩ</p> <p>Yes</p> <p>100 MΩ</p>
<b>Characteristic linearization</b>	
<ul style="list-style-type: none"> <li>• parameterizable <ul style="list-style-type: none"> <li>— for resistance thermometer</li> </ul> </li> </ul>	<p>Yes</p> <p>yes; Pt100 standard/air con.; Ni100 standard/air con.; Ni1000 standard/air con.; LG-Ni1000 standard/air con.</p>
<b>Cable length</b>	
<ul style="list-style-type: none"> <li>• shielded, max.</li> </ul>	200 m; max. 50 m at 50 mV
<b>Analog value generation for the inputs</b>	
Measurement principle	integrating
<b>Integration and conversion time/resolution per channel</b>	
<ul style="list-style-type: none"> <li>• Resolution with overrange (bit including sign), max.</li> <li>• Integration time, parameterizable</li> <li>• Basic conversion time (ms)</li> <li>• Interference voltage suppression for interference frequency f1 in Hz</li> </ul>	<p>13 bit</p> <p>Yes; 60 / 50 ms</p> <p>66 / 55 ms</p> <p>50 / 60 Hz</p>
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
<ul style="list-style-type: none"> <li>• for current measurement as 2-wire transducer</li> <li>• for current measurement as 4-wire transducer</li> <li>• for resistance measurement with two-wire connection</li> <li>• for resistance measurement with three-wire connection</li> <li>• for resistance measurement with four-wire connection</li> </ul>	<p>Yes; with external supply</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>
<b>Errors/accuracies</b>	
<b>Operational error limit in overall temperature range</b>	
<ul style="list-style-type: none"> <li>• Voltage, relative to input range, (+/-)</li> <li>• Current, relative to input range, (+/-)</li> <li>• Resistance, relative to input range, (+/-)</li> <li>• Resistance thermometer, relative to input range, (+/-)</li> </ul>	<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>
<b>Basic error limit (operational limit at 25 °C)</b>	
<ul style="list-style-type: none"> <li>• Voltage, relative to input range, (+/-)</li> </ul>	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, (+/-) 0.3 %; ±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

Diagnosics function	No
<b>Alarms</b>	
• Diagnostic alarm	No
• Limit value alarm	No
<b>Diagnostic messages</b>	
• Diagnostic information readable	No
<b>Diagnostics indication LED</b>	
• Group error SF (red)	No

### Potential separation

<b>Potential separation analog inputs</b>	
• between the channels and backplane bus	Yes

### Isolation

Isolation tested with	500 V DC
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### Connection method

required front connector	40-pin
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### Dimensions

Width	40 mm
Height	125 mm
Depth	117 mm

### Weights

Weight, approx.	250 g
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**last modified:** 02/07/2019