

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	
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 voltage measurement                               | Yes                       |
| • 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
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### Alarms

- |                     |    |
|---------------------|----|
| • Diagnostic alarm  | No |
| • Limit value alarm | No |

### Diagnoses

- |                                   |    |
|-----------------------------------|----|
| • Diagnostic information readable | No |
|-----------------------------------|----|

### Diagnostics indication LED

- |                        |    |
|------------------------|----|
| • Group error SF (red) | No |
|------------------------|----|

## Potential separation

### Potential separation analog inputs

- |  |     |
|--|-----|
| • between the channels                   | No  |
| • 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
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Height	125 mm
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Depth	117 mm
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## Weights

Weight, approx.	250 g
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<b>last modified:</b>	12/10/2020
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