

SIMATIC S7-300, Analog input SM 331, isolated, 8 AI; +/-5/10V, 1-5 V, +/-20 mA, 0/4 to 20 mA, 16 bit, Single rooting (60 V COM.), 4-channel operation: 10 ms, 8-channel operation: 23-95ms, 1x 40-pole



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.	200 mA
from backplane bus 5 V DC, max.	100 mA
Power loss	
Power loss, typ.	3 W
Analog inputs	
Number of analog inputs	8
permissible input voltage for voltage input (destruction limit), max.	75 V; 35 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	No
• Resistance thermometer	No
• Resistance	No
<b>Input ranges (rated values), voltages</b>	
• 0 to +10 V	No
• 1 V to 5 V	Yes
— Input resistance (1 V to 5 V)	10 M $\Omega$
• 1 V to 10 V	No
• -1 V to +1 V	No
• -10 V to +10 V	Yes
— Input resistance (-10 V to +10 V)	10 M $\Omega$
• -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)	10 M $\Omega$
• -50 mV to +50 mV	No
• -500 mV to +500 mV	No
• -80 mV to +80 mV	No
<b>Input ranges (rated values), currents</b>	
• 0 to 20 mA	Yes
— Input resistance (0 to 20 mA)	250 $\Omega$
• -10 mA to +10 mA	No
• -20 mA to +20 mA	Yes
— Input resistance (-20 mA to +20 mA)	250 $\Omega$
• -3.2 mA to +3.2 mA	No
• 4 mA to 20 mA	Yes
— Input resistance (4 mA to 20 mA)	250 $\Omega$
<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	No
• Ni 1000	No
• LG-Ni 1000	No
• Ni 120	No
• Ni 200	No
• Ni 500	No
• Pt 100	No
• Pt 1000	No
• Pt 200	No
• Pt 500	No
<b>Input ranges (rated values), resistors</b>	
• 0 to 150 ohms	No
• 0 to 300 ohms	No
• 0 to 600 ohms	No
• 0 to 6000 ohms	No
<b>Cable length</b>	
• shielded, max.	200 m
<b>Analog value generation for the inputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	16 bit; Unipolar: 15/15/15/15 bit; bipolar: 15 bit + sign/15 bit + sign/15 bit + sign/15 bit + sign
• Integration time, parameterizable	Yes; 23 / 72 / 83 / 95 ms
• Basic conversion time (ms)	10 ms (4-channel mode); 95/83/72/23 ms (8-channel mode)
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 Hz, combinations of 400, 60, 50 Hz
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
• for voltage measurement	Yes
• for current measurement as 2-wire transducer	Yes; with external transmitter, current supply; possible with separate supply for transmitter
• for current measurement as 4-wire transducer	Yes
<b>Errors/accuracies</b>	
<b>Operational error limit in overall temperature range</b>	
• Voltage, relative to input range, (+/-)	0.1 %
• Current, relative to input range, (+/-)	0.1 %
<b>Basic error limit (operational limit at 25 °C)</b>	
• Voltage, relative to input range, (+/-)	0.05 %
• Current, relative to input range, (+/-)	0.05 %

## Interrupts/diagnostics/status information

Diagnostics function	Yes; Parameterizable
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## Alarms

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|----------------------|---|
| • Diagnostic alarm   | Yes; Parameterizable  |
| • Limit value alarm  | Yes; Parameterizable all channels (end of cycle interrupt is also supported across modules) |
| • Hardware interrupt | Yes; Parameterizable, channels 0 to 7 (on exceeding limit value), at end of cycle           |

## Diagnostic messages

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|-----------------------------------|-----|
| • Diagnostic information readable | Yes |
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## Diagnostics indication LED

- |                        |     |
|------------------------|-----|
| • Group error SF (red) | Yes |
|------------------------|-----|

## Potential separation

### Potential separation analog inputs

- |  |     |
|--|-----|
| • between the channels   | Yes |
| • between the channels, in groups of                           | 2   |
| • between the channels and backplane bus                       | Yes |
| • between the channels and the power supply of the electronics | Yes |

## Isolation

Isolation tested with	500 V AC
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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.	272 g
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<b>last modified:</b>	05/09/2020
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