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6ES7331-1KF01-0AB0

SM331, 8AI, 13BIT

Technical data

()	SIMATIC S7-300, ANALOG INPUT SM 331, OPTICALLY ISOLATED, 8 AI, 13 BIT RESOLUTION, U/I/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
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 kΩ
● 1 V to 5 V	Yes
— Input resistance (1 V to 5 V)	100 kΩ
● 1 V to 10 V	No
● -1 V to +1 V	Yes
— Input resistance (-1 V to +1 V)	100 kΩ
● -10 V to +10 V	Yes
— Input resistance (-10 V to +10 V)	100 kΩ
● -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 kΩ
● -50 mV to +50 mV	Yes
— Input resistance (-50 mV to +50 mV)	100 kΩ
● -500 mV to +500 mV	Yes
— Input resistance (-500 mV to +500 mV)	100 kΩ
● -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

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— 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
Characteristic linearization	
● parameterizable	Yes
— 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 %; ±0.6 % (±5 V, 10 V, 1 to 5 V, 0 to 10 V); ±0.5 % (±50 mV, 500 mV, 1 V)
● Current, relative to input range, (+/-)	0.5 %; ±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% (±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	
Diagnostics function	No
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
Connection method	
required front connector	40-pin
Dimensions	
Width	40 mm
Height	125 mm
Depth	117 mm
Weights	
Weight, approx.	250 g
last modified:	12/10/2020

Last changes: 12/10/2020

Technical data for the product is also available in the following languages:
› German
› French
› Italian
› Spanish

› Chinese (simplified)
› Dutch
› Greek
› Russian
› Portuguese
› Turkish
› Japanese

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