



SIMATIC S7-300, ANALOG INPUT SM 331, OPTICALLY ISOLATED, 8AI, RESOLUTION 9/12/14 BITS, U/I/THERMOCOUPLE/RESISTANCE INTERRUPT, DIAGNOSTICS; 1X20PIN REMOVE/INSERT W. BACKPLANE BUS

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.	30 mA
from backplane bus 5 V DC, max.	50 mA
Power losses	
Power loss, typ.	1 W
Analog inputs	
Number of analog inputs	8
• For resistance measurement	4
permissible input voltage for voltage input (destruction limit), max.	20 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	Yes
• Resistance thermometer	Yes
• Resistance	Yes
Input ranges (rated values), voltages	
• 0 to +10 V	No

• 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)	10 MΩ
• -10 V to +10 V	Yes
• Input resistance (-10 V to +10 V)	100 kΩ
• -2.5 V to +2.5 V	Yes
• Input resistance (-2.5 V to +2.5 V)	100 kΩ
• -250 mV to +250 mV	Yes
• Input resistance (-250 mV to +250 mV)	10 MΩ
• -5 V to +5 V	Yes
• Input resistance (-5 V to +5 V)	100 kΩ
• -50 mV to +50 mV	No
• -500 mV to +500 mV	Yes
• Input resistance (-500 mV to +500 mV)	10 MΩ
• -80 mV to +80 mV	Yes
• Input resistance (-80 mV to +80 mV)	10 MΩ

#### Input ranges (rated values), currents

• 0 to 20 mA	Yes
• Input resistance (0 to 20 mA)	25 Ω
• -10 mA to +10 mA	Yes
• Input resistance (-10 mA to +10 mA)	25 Ω
• -20 mA to +20 mA	Yes
• Input resistance (-20 mA to +20 mA)	25 Ω
• -3.2 mA to +3.2 mA	Yes
• Input resistance (-3.2 mA to +3.2 mA)	25 Ω
• 4 mA to 20 mA	Yes
• Input resistance (4 mA to 20 mA)	25 Ω

#### Input ranges (rated values), thermoelements

• Type B	No
• Type E	Yes
• Input resistance (Type E)	10 MΩ
• Type J	Yes
• Input resistance (type J)	10 MΩ
• Type K	Yes
• Input resistance (Type K)	10 MΩ
• Type L	Yes
• Input resistance (Type L)	10 MΩ
• Type N	Yes
• Input resistance (Type N)	10 MΩ

• 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
• Input resistance (Ni 100)	10 M $\Omega$
• Ni 1000	No
• LG-Ni 1000	No
• Ni 120	No
• Ni 200	No
• Ni 500	No
• Pt 100	Yes; Standard
• Input resistance (Pt 100)	10 M $\Omega$
• Pt 1000	No
• Pt 200	No
• Pt 500	No
<b>Input ranges (rated values), resistors</b>	
• 0 to 150 ohms	Yes
• Input resistance (0 to 150 ohms)	10 M $\Omega$
• 0 to 300 ohms	Yes
• Input resistance (0 to 300 ohms)	10 M $\Omega$
• 0 to 600 ohms	Yes
• Input resistance (0 to 600 ohms)	10 M $\Omega$
• 0 to 6000 ohms	No
<b>Thermocouple (TC)</b>	
<b>Temperature compensation</b>	
— Parameterizable	Yes
— internal temperature compensation	Yes
— external temperature compensation with compensations socket	Yes
<b>Characteristic linearization</b>	
• Parameterizable	Yes
— for thermocouples	Type E, J, K, L, N
— for resistance thermometer	Pt100 (standard, climatic range), Ni100 (standard, climatic range)
<b>Cable length</b>	
• shielded, max.	200 m; 50 m at 80 mV and thermocouples
<b>Analog value creation</b>	
Measurement principle	integrating

Integration and conversion time/resolution per channel	
• Resolution with overrange (bit including sign), max.	15 bit; Unipolar: 9/12/12/14 bits; bipolar: 9 bits + sign/12 bits + sign/12 bits + sign/14 bits + sign
• Integration time, parameterizable	Yes; 2,5 / 16,67 / 20 / 100 ms
• Basic conversion time (ms)	3 / 17 / 22 / 102 ms
• Interference voltage suppression for interference frequency f1 in Hz	10 / 50 / 60 / 400 Hz

Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
• 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 limit in overall temperature range	
• Voltage, relative to input area, (+/-)	1 %; ±1% (80 mV); ±0.6% (250 mV to 1 000 mV); ±0.8% (2.5 V to 10 V)
• Current, relative to input area, (+/-)	0.7 %; From 3.2 to 20 mA
• Resistance, relative to input area, (+/-)	0.7 %; 150, 300, 600 Ohm
• Resistance thermometer, relative to input area, (+/-)	0.7 %; +/-0.7% (Pt100/ Ni100); +/-0.8% (Pt100 climate)
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input area, (+/-)	0.6 %; +/-0.4% (250 to 1000 mV); +/-0.6 % (2.5 to 10 mV); +/-0.7 % (80 mV)
• Current, relative to input area, (+/-)	0.5 %; 3.2 to 20 mA
• Resistance, relative to input area, (+/-)	0.5 %; 150, 300, 600 Ohm
• Resistance thermometer, relative to input area, (+/-)	0.6 %; ±0.5% (Pt100/ Ni100), ±0.6% (Pt100 climate)

Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No

Interrupts/diagnostics/status information	
Alarms	
• Diagnostic alarm	Yes; Parameterizable, channels 0 and 2
• Limit value alarm	Yes; Parameterizable
Diagnostic messages	
• Diagnostic functions	Yes; Parameterizable
• Diagnostic information readable	Yes

• Diagnostics	Yes
<b>Diagnostics indication LED</b>	
• Group error SF (red)	Yes
<b>Galvanic isolation</b>	
<b>Galvanic isolation analog inputs</b>	
• between the channels	No
• between the channels and the backplane bus	Yes
<b>Isolation</b>	
Isolation checked with	500 V DC
<b>Connection method</b>	
required front connector	20-pin
<b>Dimensions</b>	
Width	40 mm
Height	125 mm
Depth	120 mm
<b>Weights</b>	
Weight, approx.	250 g
<b>last modified:</b>	12.03.2015