



Figure similar

SIMATIC S7-400, analog input SM 431, isolated 8 AI, resolution 13 bit, U/I/Resistor

Supply voltage	
Load voltage L+	
• Rated value (DC)	not necessary
Input current	
from backplane bus 5 V DC, max.	350 mA
Power loss	
Power loss, typ.	1.8 W
Analog inputs	
Number of analog inputs	8
• For voltage/current measurement	8
• For resistance measurement	4
permissible input voltage for voltage input (destruction limit), max.	50 V
permissible input current for current input (destruction limit), max.	50 mA; 40 mA continuous
Constant measurement current for resistance-type transmitter, typ.	1.67 mA
Input ranges	
• Voltage	Yes
• Current	Yes
• Thermocouple	No
• Resistance thermometer	No
• Resistance	Yes
Input ranges (rated values), voltages	
• 1 V to 5 V	Yes
— Input resistance (1 V to 5 V)	200 kΩ
• -1 V to +1 V	Yes
— Input resistance (-1 V to +1 V)	200 kΩ
• -10 V to +10 V	Yes
— Input resistance (-10 V to +10 V)	200 kΩ
Input ranges (rated values), currents	
• -20 mA to +20 mA	Yes
— Input resistance (-20 mA to +20 mA)	80 Ω
• 4 mA to 20 mA	Yes
— Input resistance (4 mA to 20 mA)	80 Ω
Input ranges (rated values), resistors	
• 0 to 600 ohms	Yes
— Input resistance (0 to 600 ohms)	usable up to 500 ohms
Cable length	
• shielded, max.	200 m

Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
<ul style="list-style-type: none"> Resolution with overrange (bit including sign), max. 	13 bit
<ul style="list-style-type: none"> Integration time, parameterizable 	Yes
<ul style="list-style-type: none"> Basic conversion time (ms) 	23 / 25 ms
<ul style="list-style-type: none"> Integration time (ms) 	16,7 / 20 ms
<ul style="list-style-type: none"> Interference voltage suppression for interference frequency f1 in Hz 	50 / 60 Hz
<ul style="list-style-type: none"> Basic execution time of the module (all channels released) 	200 ms; 184 / 200 ms
Encoder	
Connection of signal encoders	
<ul style="list-style-type: none"> for voltage measurement 	Yes; possible
<ul style="list-style-type: none"> for current measurement as 2-wire transducer 	Yes; with external transmitter supply
<ul style="list-style-type: none"> for current measurement as 4-wire transducer 	Yes
<ul style="list-style-type: none"> for resistance measurement with two-wire connection 	Yes; Line resistances are also measured
<ul style="list-style-type: none"> for resistance measurement with three-wire connection 	Yes; Line resistances are also measured
<ul style="list-style-type: none"> for resistance measurement with four-wire connection 	Yes
Errors/accuracies	
Temperature error (relative to input range), (+/-)	0.02 %/K; ± 0.02 %/K in impedance measuring range; ± 0.007 % in all other measuring ranges
Operational error limit in overall temperature range	
<ul style="list-style-type: none"> Voltage, relative to input range, (+/-) 	1 %; ± 1.0 % at ± 1 V; ± 0.6 % at ± 10 V; ± 0.7 % at 1 to 5 V
<ul style="list-style-type: none"> Current, relative to input range, (+/-) 	1 %; at ± 20 mA, 4 to 20 mA
<ul style="list-style-type: none"> Resistance, relative to input range, (+/-) 	1.25 %; 0 to 500 ohms (4-conductor measurement, in range of 600 ohms)
Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> Voltage, relative to input range, (+/-) 	0.7 %; 0.7% at ± 1 V; 0.4% at ± 10 V; 0.5% at 1 to 5 V
<ul style="list-style-type: none"> Current, relative to input range, (+/-) 	0.7 %; at ± 20 mA, 4 to 20 mA
<ul style="list-style-type: none"> Resistance, relative to input range, (+/-) 	0.8 %; 0 to 500 ohms (4-conductor measurement, in range of 600 ohms)
Interrupts/diagnostics/status information	
Diagnostics function	No
Potential separation	
Potential separation analog inputs	
<ul style="list-style-type: none"> Potential separation analog inputs 	Yes; internal/external
<ul style="list-style-type: none"> between the channels 	No
<ul style="list-style-type: none"> between the channels and backplane bus 	Yes
Isolation	
Isolation tested with	2 120 V DC between bus and analog part; 500 V DC between bus and local ground; 2 120 V DC between analog part and local ground
Dimensions	
Width	25 mm
Height	290 mm
Depth	210 mm
Weights	
Weight, approx.	500 g

last modified: 3/12/2024 