



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

Figure similar

Supply voltage	
Load voltage L+	
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> For voltage/current measurement 	8
<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> Voltage 	Yes
<ul style="list-style-type: none"> Current 	Yes
<ul style="list-style-type: none"> Thermocouple 	No
<ul style="list-style-type: none"> Resistance thermometer 	No
<ul style="list-style-type: none"> Resistance 	Yes
Input ranges (rated values), voltages	
<ul style="list-style-type: none"> 1 V to 5 V — Input resistance (1 V to 5 V) 	Yes 200 kΩ
<ul style="list-style-type: none"> -1 V to +1 V — Input resistance (-1 V to +1 V) 	Yes 200 kΩ
<ul style="list-style-type: none"> -10 V to +10 V — Input resistance (-10 V to +10 V) 	Yes 200 kΩ
Input ranges (rated values), currents	
<ul style="list-style-type: none"> -20 mA to +20 mA — Input resistance (-20 mA to +20 mA) 	Yes 80 Ω
<ul style="list-style-type: none"> 4 mA to 20 mA — Input resistance (4 mA to 20 mA) 	Yes 80 Ω
Input ranges (rated values), resistors	
<ul style="list-style-type: none"> 0 to 600 ohms — Input resistance (0 to 600 ohms) 	Yes usable up to 500 ohms
Cable length	
<ul style="list-style-type: none"> 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. Integration time, parameterizable Basic conversion time (ms) Integration time (ms) Interference voltage suppression for interference frequency f_1 in Hz Basic execution time of the module (all channels released) 	13 bit Yes 23 / 25 ms 16,7 / 20 ms 50 / 60 Hz 200 ms; 184 / 200 ms
Encoder	
Connection of signal encoders	
<ul style="list-style-type: none"> for voltage measurement for current measurement as 2-wire transducer for current measurement as 4-wire transducer for resistance measurement with two-wire connection for resistance measurement with three-wire connection for resistance measurement with four-wire connection 	Yes; possible Yes; with external transmitter supply Yes Yes; Line resistances are also measured Yes; Line resistances are also measured 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, (+/-) Current, relative to input range, (+/-) Resistance, relative to input range, (+/-) 	1 %; ± 1.0 % at ± 1 V; ± 0.6 % at ± 10 V; ± 0.7 % at 1 to 5 V 1 %; at ± 20 mA, 4 to 20 mA 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, (+/-) Current, relative to input range, (+/-) Resistance, relative to input range, (+/-) 	0.7 %; 0.7% at ± 1 V; 0.4% at ± 10 V; 0.5% at 1 to 5 V 0.7 %; at ± 20 mA, 4 to 20 mA 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 between the channels between the channels and backplane bus 	Yes; internal/external No 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: 8/7/2023 