



SIMATIC S7-400, analog input SM 431, 8 AI, resolution 16 bit, U/I/Thermocouple, isolated with single rooting, diagnostics, alarm, 20 ms conversion time

Figure similar

Input current	
from backplane bus 5 V DC, max.	1 200 mA
Power loss	
Power loss, typ.	4.6 W
Analog inputs	
Number of analog inputs	8
• For voltage/current measurement	8
permissible input voltage for voltage input (destruction limit), max.	35 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.	32 mA
Input ranges	
• Voltage	Yes
• Current	Yes
• Thermocouple	Yes
• Resistance thermometer	No
• Resistance	No
Input ranges (rated values), voltages	
• 1 V to 5 V	Yes
— Input resistance (1 V to 5 V)	> 2 000 ohms
• -1 V to +1 V	Yes
• -10 V to +10 V	Yes
• -100 mV to +100 mV	Yes
• -2.5 V to +2.5 V	Yes
• -20 mV to +20 mV	Yes
• -250 mV to +250 mV	Yes
• -5 V to +5 V	Yes
• -50 mV to +50 mV	Yes
• -500 mV to +500 mV	Yes
• -80 mV to +80 mV	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• -10 mA to +10 mA	Yes
• -20 mA to +20 mA	Yes
• -3.2 mA to +3.2 mA	Yes
• 4 mA to 20 mA	Yes
— Input resistance (4 mA to 20 mA)	50 Ω
• -5 mA to +5 mA	Yes
Input ranges (rated values), thermocouples	

<ul style="list-style-type: none"> • Type B <ul style="list-style-type: none"> — Input resistance (Type B) • Type E • Type J • Type K • Type L • Type N <ul style="list-style-type: none"> — Input resistance (Type N) • Type R • Type S • Type T • Type U 	<p>Yes</p> <p>> 2 000 ohms</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>> 2 000 ohms</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>
Thermocouple (TC)	
Temperature compensation	
<ul style="list-style-type: none"> — parameterizable — internal temperature compensation — external temperature compensation with compensations socket — dynamic reference temperature value 	<p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>
Characteristic linearization	
<ul style="list-style-type: none"> • parameterizable <ul style="list-style-type: none"> — for thermocouples 	<p>Yes</p> <p>Type B, E, J, K, L, N, R, S, T, U</p>
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 f1 in Hz 	<p>16 bit</p> <p>Yes</p> <p>10 / 16,7 / 20 / 100</p> <p>2,5 / 16,7 / 20 / 100</p> <p>400 / 60 / 50 / 10 Hz</p>
Encoder	
Connection of signal encoders	
<ul style="list-style-type: none"> • for voltage measurement • for current measurement as 4-wire transducer • for resistance measurement with four-wire connection 	<p>Yes; possible</p> <p>Yes</p> <p>Yes</p>
Errors/accuracies	
Operational error limit in overall temperature range	
<ul style="list-style-type: none"> • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) 	<p>0.3 %</p> <p>0.5 %</p>
Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> • Voltage, relative to input range, (+/-) • Current, relative to input range, (+/-) 	<p>0.1 %</p> <p>0.17 %</p>
Interrupts/diagnostics/status information	
Diagnostics function	Yes; Parameterizable
Alarms	
<ul style="list-style-type: none"> • Diagnostic alarm • Limit value alarm • Hardware interrupt 	<p>Yes; Parameterizable</p> <p>Yes</p> <p>Yes; Parameterizable</p>
Diagnoses	
<ul style="list-style-type: none"> • Diagnostic information readable 	Yes; possible
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 	<p>Yes; internal/external</p> <p>Yes</p> <p>Yes</p>
Isolation	
Isolation tested with	1 500 V DC

Dimensions	
Width	25 mm
Height	290 mm
Depth	210 mm
Weights	
Weight, approx.	650 g
last modified:	3/2/2021 