



SIMATIC S7-400, analog input SM 431, non-isolated 16 AI, resolution 13 bit, +/-10 V, +/-20 mA, 4 - 20 mA 20 ms conversion time

Figure similar

Supply voltage	
Load voltage L+	
<ul style="list-style-type: none"> <li>Rated value (DC)</li> </ul>	24 V; Only required for supplying 2-wire transmitters
<ul style="list-style-type: none"> <li>Reverse polarity protection</li> </ul>	Yes
Input current	
from load voltage L+ (without load), max.	400 mA; for 16 connected, fully controlled 2-wire transmitters
from backplane bus 5 V DC, max.	100 mA
Power loss	
Power loss, typ.	2 W
Analog inputs	
Number of analog inputs	16
<ul style="list-style-type: none"> <li>For voltage/current measurement</li> </ul>	16
permissible input voltage for voltage input (destruction limit), max.	20 V; 20 V DC permanent, 75 V DC for max. 1 s (duty factor 1:20)
permissible input current for current input (destruction limit), max.	40 mA
Constant measurement current for resistance-type transmitter, typ.	1.67 mA
Input ranges	
<ul style="list-style-type: none"> <li>Voltage</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Current</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Thermocouple</li> </ul>	No
<ul style="list-style-type: none"> <li>Resistance thermometer</li> </ul>	No
<ul style="list-style-type: none"> <li>Resistance</li> </ul>	No
Input ranges (rated values), voltages	
<ul style="list-style-type: none"> <li>1 V to 5 V                             <ul style="list-style-type: none"> <li>Input resistance (1 V to 5 V)</li> </ul> </li> </ul>	Yes 100 kΩ
<ul style="list-style-type: none"> <li>-1 V to +1 V                             <ul style="list-style-type: none"> <li>Input resistance (-1 V to +1 V)</li> </ul> </li> </ul>	Yes 10 MΩ
<ul style="list-style-type: none"> <li>-10 V to +10 V                             <ul style="list-style-type: none"> <li>Input resistance (-10 V to +10 V)</li> </ul> </li> </ul>	Yes 100 kΩ
Input ranges (rated values), currents	
<ul style="list-style-type: none"> <li>-20 mA to +20 mA                             <ul style="list-style-type: none"> <li>Input resistance (-20 mA to +20 mA)</li> </ul> </li> </ul>	Yes 50 Ω
<ul style="list-style-type: none"> <li>4 mA to 20 mA                             <ul style="list-style-type: none"> <li>Input resistance (4 mA to 20 mA)</li> </ul> </li> </ul>	Yes 50 Ω
Cable length	
<ul style="list-style-type: none"> <li>shielded, max.</li> </ul>	200 m
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	

<ul style="list-style-type: none"> <li>• Resolution with overrange (bit including sign), max.</li> <li>• Integration time, parameterizable</li> <li>• Basic conversion time (ms)</li> <li>• Integration time (ms)</li> <li>• Interference voltage suppression for interference frequency <math>f_1</math> in Hz</li> <li>• Basic execution time of the module (all channels released)</li> </ul>	13 bit Yes 55 / 65 ms 50 / 60 ms 50 / 60 Hz 1 040 ms; 880 / 1 040 ms
<b>Encoder</b>	
Connection of signal encoders	
<ul style="list-style-type: none"> <li>• for voltage measurement</li> <li>• for current measurement as 4-wire transducer</li> </ul>	Yes; possible Yes
<b>Errors/accuracies</b>	
Temperature error (relative to input range), (+/-)	0.01 %/K
Operational error limit in overall temperature range	
<ul style="list-style-type: none"> <li>• Voltage, relative to input range, (+/-)</li> <li>• Current, relative to input range, (+/-)</li> </ul>	0.65 %; 1.0 % at 1 to 5 V; 0.65 % at $\pm 1$ V, $\pm 10$ V 0.65 %
Basic error limit (operational limit at 25 °C)	
<ul style="list-style-type: none"> <li>• Voltage, relative to input range, (+/-)</li> <li>• Current, relative to input range, (+/-)</li> </ul>	0.25 %; 0.5% at 1 to 5 V; 0.25% at $\pm 1$ V, $\pm 10$ V 0.25 %; at $\pm 20$ mA, 4 to 20 mA
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	No
<b>Potential separation</b>	
Potential separation analog inputs	
<ul style="list-style-type: none"> <li>• Potential separation analog inputs</li> <li>• between the channels</li> <li>• between the channels and backplane bus</li> <li>• Between the channels and load voltage L+</li> </ul>	No No No No
<b>Isolation</b>	
Isolation tested with	500 V AC/707 V DC, type test
<b>Dimensions</b>	
Width	25 mm
Height	290 mm
Depth	210 mm
<b>Weights</b>	
Weight, approx.	500 g

last modified:

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