



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

Figure similar

Supply voltage	
Load voltage L+	
<ul style="list-style-type: none"> <li>Rated value (DC)</li> </ul>	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"> <li>For voltage/current measurement</li> </ul>	8
<ul style="list-style-type: none"> <li>For resistance measurement</li> </ul>	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"> <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>	Yes
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 200 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 200 kΩ
<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 200 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 80 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 80 Ω
Input ranges (rated values), resistors	
<ul style="list-style-type: none"> <li>0 to 600 ohms</li> </ul>	Yes

— Input resistance (0 to 600 ohms)	usable up to 500 ohms
<b>Cable length</b>	
• shielded, max.	200 m
<b>Analog value generation for the inputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	13 bit
• Integration time, parameterizable	Yes
• Basic conversion time (ms)	23 / 25 ms
• Integration time (ms)	16,7 / 20 ms
• Interference voltage suppression for interference frequency f1 in Hz	50 / 60 Hz
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
• for voltage measurement	Yes; possible
• for current measurement as 2-wire transducer	Yes; with external transmitter supply
• for current measurement as 4-wire transducer	Yes
• for resistance measurement with two-wire connection	Yes; Line resistances are also measured
• for resistance measurement with three-wire connection	Yes; Line resistances are also measured
• for resistance measurement with four-wire connection	Yes
<b>Errors/accuracies</b>	
<b>Operational error limit in overall temperature range</b>	
• Voltage, relative to input range, (+/-)	1 %; ±1.0 % at ±1 V; ±0.6 % at ±10 V; ±0.7 % at 1 to 5 V
• Current, relative to input range, (+/-)	1 %; at ±20 mA, 4 to 20 mA
• Resistance, relative to input range, (+/-)	1.25 %; 0 to 500 ohms (4-conductor measurement, in range of 600 ohms)
<b>Basic error limit (operational limit at 25 °C)</b>	
• Voltage, relative to input range, (+/-)	0.7 %; 0.7% at ±1 V; 0.4% at ±10 V; 0.5% at 1 to 5 V
• Current, relative to input range, (+/-)	0.7 %; at ±20 mA, 4 to 20 mA
• Resistance, relative to input range, (+/-)	0.8 %; 0 to 500 ohms (4-conductor measurement, in range of 600 ohms)
<b>Interrupts/diagnostics/status information</b>	
Diagnostics function	No
<b>Potential separation</b>	
<b>Potential separation analog inputs</b>	
• Potential separation analog inputs	Yes; internal/external
• between the channels	No
• between the channels and backplane bus	Yes
<b>Isolation</b>	
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
<b>Dimensions</b>	
Width	25 mm
Height	290 mm
Depth	210 mm
<b>Weights</b>	
Weight, approx.	500 g
<b>last modified:</b>	12/16/2020 