



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<br>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<br>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<br>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<br>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<br>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 f1 in Hz</li> <li>• Basic execution time of the module (all channels released)</li> </ul> | 13 bit<br>Yes<br>55 / 65 ms<br>50 / 60 ms<br>50 / 60 Hz<br>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<br>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 ±1 V, ±10 V<br>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 ±1 V, ±10 V<br>0.25 %; at ±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<br>No<br>No<br>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:

8/30/2023 