

SIMATIC S7-400, SM 431 ANALOG INPUT MODULE OPTIC.  
ISOLATED, 8 AI, 14 BIT RESOLUTION, U//RESIST. 0.416 MS  
SCAN 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.	200 mA; for 8 connected, fully controlled 2-wire transmitters
from backplane bus 5 V DC, max.	1 000 mA
Power loss	
Power loss, typ.	4.9 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.	18 V; 18 V continuous, 75 V for 1 ms (mark to space ratio 1:20)

permissible input current for current input (destruction limit), max.	40 mA; Permanent
<b>Input ranges</b>	
• Voltage	Yes
• Current	Yes
• Thermocouple	No
• Resistance thermometer	No
• Resistance	Yes
<b>Input ranges (rated values), voltages</b>	
• 1 V to 5 V	Yes
• Input resistance (1 V to 5 V)	10 MΩ
• -1 V to +1 V	Yes
• Input resistance (-1 V to +1 V)	10 MΩ
• -10 V to +10 V	Yes
• Input resistance (-10 V to +10 V)	100 kΩ
<b>Input ranges (rated values), currents</b>	
• -20 mA to +20 mA	Yes
• Input resistance (-20 mA to +20 mA)	50 Ω
• 4 mA to 20 mA	Yes
• Input resistance (4 mA to 20 mA)	50 kΩ
<b>Input ranges (rated values), resistors</b>	
• 0 to 600 ohms	Yes
<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.	14 bit; 14 / 14 / 14
• Integration time, parameterizable	Yes
• Basic conversion time (ms)	52 μs
• Interference voltage suppression for interference frequency f1 in Hz	none / 400 / 60 / 50 Hz
<b>Encoder</b>	
<b>Connection of signal encoders</b>	
• for voltage measurement	Yes; possible
• for current measurement as 2-wire transducer	Yes
• 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

## Errors/accuracies

### Operational error limit in overall temperature range

- Voltage, relative to input range, (+/-) 0.7 %; +/-0.7% at +/-1 V; +/-0.9% at +/-10 V, 1 to 5 V
- Current, relative to input range, (+/-) 0.8 %; at +/-20 mA, 4 to 20 mA
- Resistance, relative to input range, (+/-) 1 %

### Basic error limit (operational limit at 25 °C)

- Voltage, relative to input range, (+/-) 0.6 %; 0.6% at +/-1 V; 0.75% at +/-10 V, 1 to 5 V
- Current, relative to input range, (+/-) 0.7 %; at +/-20 mA, 4 to 20 mA
- Resistance, relative to input range, (+/-) 0.7 %; 0 to 600 ohms

## Potential separation

### Potential separation analog inputs

- Potential separation analog inputs Yes; internal/external
- between the channels No

## Isolation

### Isolation tested with

2 120 V DC between bus and analog section; 500 V DC between bus and local ground; 500 V DC between analog part and L+/M; 2 120 V DC between analog part and local ground; 2 120 V DC between L+/M and local ground

## Dimensions

Width	25 mm
Height	290 mm
Depth	210 mm

## Weights

Weight, approx. 500 g

**last modified:** 03/24/2017