

SIMATIC S7-400, ANALOG INPUT SM 431, 8AI; 16 BIT
RESOLUTION, U/I/THERMOEL., OPTIC. ISOLATED W. 1 POINT
PER COMMON, DIAGN., ALARM, 20 MS MODULE UPDATE



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	
• Type B	Yes
• Type E	Yes
• Type J	Yes
• Type K	Yes
• Type L	Yes
• Type N	Yes
• Type R	Yes
• Type S	Yes
• Type T	Yes
• Type U	Yes
Thermocouple (TC)	
Temperature compensation	
— internal temperature compensation	Yes
— external temperature compensation with compensations socket	Yes
— dynamic reference temperature value	Yes
Characteristic linearization	
• parameterizable	Yes
— for thermocouples	Type B, E, J, K, L, N, R, S, T, U
Cable length	

- shielded, max.

200 m

Analog value generation for the inputs

Integration and conversion time/resolution per channel

- | | |
|---|-----------------------|
| • Resolution with overrange (bit including sign), max. | 16 bit |
| • Integration time, parameterizable | Yes |
| • Basic conversion time (ms) | 10 / 16,7 / 20 / 100 |
| • Integration time (ms) | 2,5 / 16,7 / 20 / 100 |
| • Basic conversion time, including integration time (ms) | |
| — additional conversion time for wire-break monitoring and resistance measurement | 1 ms (module) |
| • Interference voltage suppression for interference frequency f1 in Hz | 400 / 60 / 50 / 10 Hz |

Encoder

Connection of signal encoders

- | | |
|--|---------------|
| • for voltage measurement | Yes; possible |
| • for current measurement as 4-wire transducer | Yes |
| • for resistance measurement with four-wire connection | Yes |

Errors/accuracies

Operational error limit in overall temperature range

- | | |
|---|-------|
| • Voltage, relative to input range, (+/-) | 0.3 % |
| • Current, relative to input range, (+/-) | 0.5 % |

Basic error limit (operational limit at 25 °C)

- | | |
|---|--------|
| • Voltage, relative to input range, (+/-) | 0.1 % |
| • Current, relative to input range, (+/-) | 0.17 % |

Interrupts/diagnostics/status information

- | | |
|-------------|-----|
| Diagnostics | Yes |
|-------------|-----|

Alarms

- | | |
|---------------------|----------------------|
| • Diagnostic alarm | Yes; Parameterizable |
| • Limit value alarm | Yes |

Potential separation

Potential separation analog inputs

- | | |
|--------------------------------------|------------------------|
| • Potential separation analog inputs | Yes; internal/external |
| • between the channels | Yes |

Isolation

- | | |
|-----------------------|-----------|
| Isolation tested with | 1500 V DC |
|-----------------------|-----------|

Dimensions

- | | |
|-------|-------|
| Width | 25 mm |
|-------|-------|

Height	290 mm
Depth	210 mm
Weights	
Weight, approx.	650 g
last modified:	10/28/2016