

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



Figure similar

Supply voltage	
Load voltage L+	
• Rated value (DC)	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
• For voltage/current measurement	8
• For resistance measurement	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	
• Voltage	Yes
• Current	Yes
• Thermocouple	No
• Resistance thermometer	No
• Resistance	Yes
Input ranges (rated values), voltages	
• 1 V to 5 V	Yes
— Input resistance (1 V to 5 V)	200 kΩ
• -1 V to +1 V	Yes
— Input resistance (-1 V to +1 V)	200 kΩ
• -10 V to +10 V	Yes
— Input resistance (-10 V to +10 V)	200 kΩ
Input ranges (rated values), currents	
• -20 mA to +20 mA	Yes
— Input resistance (-20 mA to +20 mA)	80 Ω
• 4 mA to 20 mA	Yes
— Input resistance (4 mA to 20 mA)	80 Ω
Input ranges (rated values), resistors	
• 0 to 600 ohms	Yes
— Input resistance (0 to 600 ohms)	usable up to 500 ohms
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.	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 f_1 in Hz	50 / 60 Hz
• Basic execution time of the module (all channels released)	200 ms; 184 / 200 ms

Encoder

Connection of signal encoders	
• 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

Errors/accuracies

Temperature error (relative to input range), (+/-)	0.02 %/K; ± 0.02 %/K in impedance measuring range; ± 0.007 % in all other measuring ranges
Operational error limit in overall temperature range	
• 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)
Basic error limit (operational limit at 25 °C)	
• 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)

Interrupts/diagnostics/status information

Diagnostics function	No
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Potential separation

Potential separation analog inputs	
• Potential separation analog inputs	Yes; internal/external
• between the channels	No
• between the channels and backplane bus	Yes

Isolation

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
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Dimensions

Width	25 mm
Height	290 mm
Depth	210 mm

Weights

Weight, approx.	500 g
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Classifications

	Version	Classification
eClass	14	27-24-22-01
eClass	12	27-24-22-01
eClass	9.1	27-24-22-01
eClass	9	27-24-22-01
eClass	8	27-24-22-01
eClass	7.1	27-24-22-01
eClass	6	27-24-22-01
ETIM	9	EC001420
ETIM	8	EC001420
ETIM	7	EC001420
IDEA	4	3562
UNSPSC	15	32-15-17-05

Approvals / Certificates

General Product Approval



EG-Konf.

[Miscellaneous](#)



UL

[Metrological Approval](#)

[KC](#)

General Product Approval

EMV

For use in hazardous locations



RCM



RCM



RCM



ATEX

[EM](#)



CCC

For use in hazardous locations

Marine / Shipping



IECEX

[Type Examination Certificate](#)



ATEX



ABS



BUREAU VERITAS



DNV

Marine / Shipping



LRS

[NK / Nippon Kaiji Kyokai](#)



PRS



RINA



RMRS

[CCS \(China Classification Society\)](#)

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