



Figure similar

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

Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V; Only required for supplying 2-wire transmitters
• Reverse polarity protection	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
• For voltage/current measurement	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	
• Voltage	Yes
• Current	Yes
• Thermocouple	No
• Resistance thermometer	No
• Resistance	No
Input ranges (rated values), voltages	
• 1 V to 5 V	Yes
— Input resistance (1 V to 5 V)	100 kΩ
• -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
Input ranges (rated values), currents	
• -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 Ω
Cable length	
• shielded, max.	200 m
Analog value generation for the inputs	

Integration and conversion time/resolution per channel			
<ul style="list-style-type: none">• Resolution with overrange (bit including sign), max.		13 bit	
<ul style="list-style-type: none">• Integration time, parameterizable		Yes	
<ul style="list-style-type: none">• Basic conversion time (ms)		55 / 65 ms	
<ul style="list-style-type: none">• Integration time (ms)		50 / 60 ms	
<ul style="list-style-type: none">• Interference voltage suppression for interference frequency f1 in Hz		50 / 60 Hz	
<ul style="list-style-type: none">• Basic execution time of the module (all channels released)		1 040 ms; 880 / 1 040 ms	
Encoder			
Connection of signal encoders			
<ul style="list-style-type: none">• for voltage measurement		Yes; possible	
<ul style="list-style-type: none">• for current measurement as 4-wire transducer		Yes	
Errors/accuracies			
Temperature error (relative to input range), (+/-)		0.01 %/K	
Operational error limit in overall temperature range			
<ul style="list-style-type: none">• Voltage, relative to input range, (+/-)		0.65 %; 1.0 % at 1 to 5 V; 0.65 % at ±1 V, ±10 V	
<ul style="list-style-type: none">• Current, relative to input range, (+/-)		0.65 %	
Basic error limit (operational limit at 25 °C)			
<ul style="list-style-type: none">• Voltage, relative to input range, (+/-)		0.25 %; 0.5% at 1 to 5 V; 0.25% at ±1 V, ±10 V	
<ul style="list-style-type: none">• Current, relative to input range, (+/-)		0.25 %; at ±20 mA, 4 to 20 mA	
Interrupts/diagnostics/status information			
Diagnostics function		No	
Potential separation			
Potential separation analog inputs			
<ul style="list-style-type: none">• Potential separation analog inputs		No	
<ul style="list-style-type: none">• between the channels		No	
<ul style="list-style-type: none">• between the channels and backplane bus		No	
<ul style="list-style-type: none">• Between the channels and load voltage L+		No	
Isolation			
Isolation tested with		500 V AC/707 V DC, type test	
Dimensions			
Width		25 mm	
Height		290 mm	
Depth		210 mm	
Weights			
Weight, approx.		500 g	
Classifications			
		Version	Classification
	eClass	16	27-24-22-01
	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	10	EC001420
	ETIM	9	EC001420
	ETIM	8	EC001420
	ETIM	7	EC001420
	IDEA	4	3562
	UNSPSC	15	32-15-17-05
Approvals / Certificates			
General Product Approval			



[Miscellaneous](#)



[Metrological Approval](#)

General Product Approval

EMV



[China RoHS](#)

[Miscellaneous](#)

[Manufacturer Declaration](#)



For use in hazardous locations



[FM](#)



[Type Examination Certificate](#)

For use in hazardous locations

Maritime application



[NK / Nippon Kaiji Kyokai](#)

Maritime application



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

last modified:

10/23/2025