



Figure similar

SIMATIC S7-400, analog input SM 431, 8 AI, resolution 16 bit, U/I/Thermocouple, isolated with single routing, diagnostics, alarm, 20 ms conversion time

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 — Input resistance (Type B) • Type E • Type J • Type K • Type L • Type N — Input resistance (Type N) • Type R • Type S • Type T • Type U	Yes > 2 000 ohms Yes Yes Yes Yes Yes > 2 000 ohms Yes Yes Yes Yes
Thermocouple (TC)	
Temperature compensation	
— connection for compensating the cold junction	6ES7431-7KF00-6AA0
— Parameterizable	Yes
— 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
• 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 function	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Limit value alarm	Yes
• Hardware interrupt	Yes; Parameterizable
Diagnoses	
• Diagnostic information readable	Yes; possible
Potential separation	
Potential separation analog inputs	
• Potential separation analog inputs	Yes; internal/external
• between the channels	Yes
• between the channels and backplane bus	Yes
Isolation	

Isolation tested with	1 500 V DC
Dimensions	
Width	25 mm
Height	290 mm
Depth	210 mm
Weights	
Weight, approx.	650 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



[Manufacturer Declaration](#)

[Miscellaneous](#)



[Metrological Approval](#)

General Product Approval

EMV



[China RoHS](#)

[Miscellaneous](#)

[Manufacturer Declaration](#)



EMV

For use in hazardous locations



[FM](#)



For use in hazardous locations

Maritime application

[Type Examination Certificate](#)



Maritime application

[NK / Nippon Kaiji Kyokai](#)



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

last modified:

6/7/2025 