

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

S7-400

6ES7431-1KF20-0AB0

SM 431 ANALOG INPUT MODULE

Used with the applicable SIMATIC S7-400 configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens official manufacturer documentation



SIMATIC S7-400,
SM 431 ANALOG INPUT MODULE OPTIC. ISOLATED,
8 AI, 14 BIT RESOLUTION,
U/I/RESIST. 0.416 MS SCAN 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.	200 mA ; for 8 connected, fully controlled 2-wire transmitters
from backplane bus 5 V DC, max.	1000 mA
Power losses	
Power loss, typ.	4.9 W
Analog inputs	
Number of analog inputs	8
Number of analog inputs for voltage/current measurement	8
Number of analog inputs for resistance measurement	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
Input ranges	
Voltage	Yes
Current	Yes
Resistance	Yes

Input ranges (rated values), voltages	
1 to 5 V	Yes
Input resistance (1 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
Input ranges (rated values), currents	
-20 to +20 mA	Yes
Input resistance (-20 to +20 mA)	50 Ω
4 to 20 mA	Yes
Input resistance (4 to 20 mA)	50 kΩ
Input ranges (rated values), resistors	
0 to 600 ohms	Yes
Cable length	
Cable length, shielded, max.	200 m
Analog value creation	
Integrations and conversion time/ resolution per channel	
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
Encoder	
Connection of signal encoders	
for current measurement as 2-wire transducer	Yes
for current measurement as 4-wire transducer	Yes
for resistance measurement with 2-conductor connection	Yes ; Line resistances are also measured
for resistance measurement with 3-conductor connection	Yes ; Line resistances are also measured
for resistance measurement with 4-conductor connection	Yes
Errors/accuracies	
Operational limit in overall temperature range	
Voltage, relative to input area	+/- 0,7 % ; +/-0.7% at +/-1 V; +/-0.9% at +/-10 V, 1 to 5 V
Current, relative to input area	+/- 0,8 % ; at +/-20 mA, 4 to 20 mA
Impedance, relative to input area	+/- 1 %
Basic error limit (operational limit at 25 °C)	
Voltage, relative to input area	+/- 0,6 % ; 0.6% at +/-1 V; 0.75% at +/-10 V, 1 to 5 V
Current, relative to input area	+/- 0,7 % ; at +/-20 mA, 4 to 20 mA
Impedance, relative to input area	+/- 0,7 % ; 0 to 600 ohms

Galvanic isolation	
Galvanic isolation analog inputs	
Galvanic isolation analog inputs	Yes ; internal/external
between the channels	No
Permissible potential difference	
between the inputs (UCM)	8 V AC
Isolation	
Isolation checked with	2120 V DC between bus and analog part; 500 V DC between bus and local ground; 707 V DC between analog part and L+/M; 2120 V DC between analog part and local ground; 2120 V DC between L+/M and local ground
Dimensions	
Width	25 mm
Height	290 mm
Depth	210 mm
Required slots	1
Weight	
Weight, approx.	500 g
Status	Feb 25, 2013