## **SIEMENS**

## Product data sheet 6ES7431-1KF20-0AB0



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 ΜΩ
-1 V to +1 V	Yes
Input resistance (-1 V to +1 V)	10 ΜΩ
-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 for reurent measurement as 4-wire transducer for resistance measurement with 2-conductor connection for resistance measurement with 3-conductor connection for resistance measurement with 4-conductor connection for resistance measurement with 4-conductor connection  Errors/accuracles  Operational limit in overall temperature range  Voltage, relative to input area  4/- 0,7 %; +/-0,7% at +/-1 V; +/-0.9% at +/-10 V, 1 to 5  Current, relative to input area  4/- 0,8 %; at +/-20 mA, 4 to 20 mA  Impedance, relative to input area  4/- 0,6 %; 0.6% at +/-1 V; 0.75% at +/-10 V, 1 to 5 V  Current, relative to input area  4/- 0,7 %; at +/-20 mA, 4 to 20 mA  Impedance, relative to input area  4/- 0,7 %; at +/-20 mA, 4 to 20 mA  Impedance, relative to input area  4/- 0,7 %; 0 to 600 ohms  Calvanic isolation  Galvanic isolation analog inputs  Galvanic isolation analog inputs  Yes; internal/external  between the channels  No  Permissible potential difference  between the inputs (UCM)  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 local ground; 2120 V DC between L+/M and local ground  Dimensions  Width  Height  290 mm  Depth  Required slots		_
for resistance measurement with 2-conductor connection  for resistance measurement with 3-conductor connection  for resistance measurement with 4-conductor connection  Ferrors/accuracies  Operational limit in overall temperature range  Voltage, relative to input area  Voltage, relative to input area  Impedance, relative to input area  Polytage, relative to input area  H/- 0,7 %; +/-0,7% at +/-1 V; +/-0,9% at +/-10 V, 1 to 5 V  Current, relative to input area  H/- 0,8 %; at +/-20 mA, 4 to 20 mA  Impedance, relative to input area  H/- 0,7 %; at +/-20 mA, 4 to 20 mA  Impedance, relative to input area  H/- 0,7 %; at +/-20 mA, 4 to 20 mA  Impedance, relative to input area  H/- 0,7 %; at +/-20 mA, 4 to 20 mA  Impedance, relative to input area  H/- 0,7 %; 0 to 600 ohms  Galvanic isolation  Galvanic isolation analog inputs  Galvanic isolation analog inputs  Permissible potential difference  between the channels  No  Permissible potential difference  between the inputs (UCM)  S V AC  Isolation  Jingulary (JON) (JO	for current measurement as 2-wire transducer	Yes
connection for resistance measurement with 3-conductor connection for resistance measurement with 4-conductor connection  Frors/accuracies  Operational limit in overall temperature range  Voltage, relative to input area	for current measurement as 4-wire transducer	Yes
connection for resistance measurement with 4-conductor connection  Errors/accuracies  Operational limit in overall temperature range  Voltage, relative to input area		Yes ; Line resistances are also measured
Errors/accuracies  Operational limit in overall temperature range  Voltage, relative to input area		Yes ; Line resistances are also measured
Voltage, relative to input area		Yes
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 %; at +/-20 mA, 4 to 20 mA  Impedance, relative to input area +/- 0,7 %; o to 600 ohms  Galvanic isolation  Galvanic isolation analog inputs  Galvanic isolation analog inputs  Permissible potential difference 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	Errors/accuracies	
Current, relative to input area	Operational limit in overall temperature range	
Impedance, relative to input area	Voltage, relative to input area	
Basic error limit (operational limit at 25 °C)  Voltage, relative to input area	Current, relative to input area	+/- 0,8 % ; at +/-20 mA, 4 to 20 mA
Voltage, relative to input area	Impedance, relative to input area	+/- 1 %
Current, relative to input area	Basic error limit (operational limit at 25 °C)	
Impedance, relative to input area   #/- 0,7 %; 0 to 600 ohms  Galvanic isolation  Galvanic isolation analog inputs  Galvanic isolation analog inputs    between the channels    Permissible potential difference  between the inputs (UCM)    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  210 mm	Voltage, relative to input area	+/- 0,6 % ; 0.6% at +/-1 V; 0.75% at +/-10 V, 1 to 5 V
Galvanic isolation analog inputs  Galvanic isolation analog inputs  Permissible potential difference  between the inputs (UCM)  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  210 mm	Current, relative to input area	+/- 0,7 % ; at +/-20 mA, 4 to 20 mA
Galvanic isolation analog inputs  Galvanic isolation analog inputs  between the channels  No  Permissible potential difference  between the inputs (UCM)  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	Impedance, relative to input area	+/- 0,7 % ; 0 to 600 ohms
Galvanic isolation analog inputs  between the channels  No  Permissible potential difference  between the inputs (UCM)  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 local ground; 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	Galvanic isolation	
between the channels  Permissible potential difference  between the inputs (UCM)  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	Galvanic isolation analog inputs	
Permissible potential difference  between the inputs (UCM)  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	Galvanic isolation analog inputs	Yes ; internal/external
between the inputs (UCM)  Isolation  Isolation checked with  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	between the channels	No
Isolation checked with  Isolat	Permissible potential difference	
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   2120 V DC between L+/M and local ground   25 mm	between the inputs (UCM)	8 V AC
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	Isolation	
Width         25 mm           Height         290 mm           Depth         210 mm	Isolation checked with	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
Height 290 mm Depth 210 mm	Dimensions	
Depth 210 mm	Width	25 mm
·	Height	290 mm
Required slots 1	Depth	210 mm
	Required slots	1
	Required slots	1

Weight	
Weight, approx.	500 g
Status	Jul 17, 2012