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Technical specifications (continued)

Article number	**6ES7431-0HH00-0AB0** SM431, 16AE, +/-10V, +/-20MA, 4-20MA	**6ES7431-1KF20-0AB0** SM431, 8AE, U/I/R, 14BIT, 0,416MS ZYKL	**6ES7431-1KF00-0AB0** SM431, 8AE, U/I/R, 13BIT	**6ES7431-1KF10-0AB0** SM431, 8AE, U/I/R, 14BIT
• Resistance, relative to input area, (+/-)		0.7 %; 0 to 600 ohms	0.8 %; 0 to 500 ohms (4-conductor measurement, in range of 600 ohms)	0.15 %; +/-0.15 % at 0 to 48 ohms (4-conductor measurement), 0 to 150 ohms (4-conductor measurement), 0 to 300 ohms (4-conductor measurement), 0 to 600 ohms (4-conductor measurement), 0 to 5000 ohms (4-conductor measurement, in range of 6000 ohms); +/-0.3 % at 0 to 300 ohms (3-conductor measurement), 0 to 600 ohms (3-conductor measurement), 0 to 5000 ohms (3-conductor measurement, in range of 6000 ohms)
• Resistance thermometer, relative to input area, (+/-)				0.3 %
Galvanic isolation				
Galvanic isolation analog inputs				
• Galvanic isolation analog inputs	No	Yes; internal / external	Yes; internal / external	Yes; internal / external
• between the channels	No	No	No	No
Permissible potential difference				
between the inputs (UCM)	2 V DC / 2 Vpp AC	8 V AC	30 V AC	120 V AC
Isolation				
Isolation checked with	500 V DC between bus and local ground	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 bus and analog part; 500 V DC between bus and local ground; 2120 V DC between analog part and local ground	2120 V DC between bus and L+/M; 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	25 mm	25 mm	25 mm
Height	290 mm	290 mm	290 mm	290 mm
Depth	210 mm	210 mm	210 mm	210 mm
Weights				
Weight, approx.	500 g	500 g	500 g	500 g

Article number	**6ES7431-7QH00-0AB0** SM 431, 16AE, U/I/R/PT100, 16BIT	**6ES7431-7KF00-0AB0** SM 431, 8AI, U/I/THERMO, 16BIT	**6ES7431-7KF10-0AB0** SM 431, 8AI, RESIST./PT100, 16BIT
Product type designation			
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	400 mA	400 mA
from backplane bus 5 V DC, max.	700 mA	1 200 mA	650 mA
Power losses			
Power loss, typ.	4.5 W	4.6 W	3.3 W
Hardware configuration			
Slots			
• Required slots	1	1	1

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Technical specifications (continued)

Article number	6ES7431-7QH00-0AB0 SM 431, 16AE, U/I/R/PT100, 16BIT	6ES7431-7KF00-0AB0 SM 431, 8AI, U/I/THERMO, 16BIT	6ES7431-7KF10-0AB0 SM 431, 8AI, RESIST./PT100, 16BIT
Analog inputs			
Number of analog inputs	16	8	8
• For voltage/current measurement	16	8	
• For resistance measurement	8		8
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)	35 V; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20)	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.	40 mA	32 mA	
Input ranges (rated values), voltages			
• 1 V to 5 V	Yes	Yes	
• -1 V to +1 V	Yes	Yes	
• -10 V to +10 V	Yes	Yes	
• -100 mV to +100 mV		Yes	
• -2.5 V to +2.5 V	Yes	Yes	
• -20 mV to +20 mV		Yes	
• -25 mV to +25 mV	Yes		
• -250 mV to +250 mV	Yes	Yes	
• -5 V to +5 V	Yes	Yes	
• -50 mV to +50 mV	Yes	Yes	
• -500 mV to +500 mV	Yes	Yes	
• -80 mV to +80 mV	Yes	Yes	
Input ranges (rated values), currents			
• 0 to 20 mA	Yes	Yes	
• -10 mA to +10 mA	Yes	Yes	
• -20 mA to +20 mA	Yes	Yes	
• -3.2 mA to +3.2 mA		Yes	
• 4 mA to 20 mA	Yes	Yes	
• -5 mA to +5 mA	Yes	Yes	
Input ranges (rated values), thermoelements			
• Type B	Yes	Yes	
• Type E	Yes	Yes	
• Type J	Yes	Yes	
• Type K	Yes	Yes	
• Type L	Yes	Yes	
• Type N	Yes	Yes	
• Type R	Yes	Yes	
• Type S	Yes	Yes	
• Type T	Yes	Yes	
• Type U	Yes	Yes	
Input ranges (rated values), resistance thermometer			
• Ni 100	Yes		Yes
• Ni 1000	Yes		Yes; Different characteristics selectable: Europe/U.S.
• Pt 100	Yes		Yes
• Pt 1000	Yes		Yes
• Pt 200	Yes		Yes
• Pt 500	Yes		Yes

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Technical specifications (continued)

Article number	**6ES7431-7QH00-0AB0** SM 431, 16AE, U/I/R/PT100, 16BIT	**6ES7431-7KF00-0AB0** SM 431, 8AI, U/I/THERMO, 16BIT	**6ES7431-7KF10-0AB0** SM 431, 8AI, RESIST./PT100, 16BIT
Input ranges (rated values), resistors			
• 0 to 150 ohms	Yes		
• 0 to 300 ohms	Yes		
• 0 to 48 ohms	Yes		
• 0 to 600 ohms	Yes		
• 0 to 6000 ohms	Yes; Usable up to 5000 ohms		
Thermocouple (TC)			
Temperature compensation			
- internal temperature compensation		Yes	
- external temperature compensation with compensations socket	Yes	Yes	
- external temperature compensation with Pt100	Yes		
- dynamic reference temperature value	Yes	Yes	
Characteristic linearization			
• Parameterizable	Yes	Yes	Yes
- for thermocouples	Type B, E, J, K, L, N, R, S, T, U	Type B, E, J, K, L, N, R, S, T, U	
- for resistance thermometer	Pt100, Pt200, Pt500, Pt1000, Ni100, Ni1000		Pt100, Pt200, Pt500, Pt1000, Ni100, Ni1000; different characteristics selectable (Europe/U.S.)
Cable length			
• shielded, max.	200 m; 50 m with thermocouples and input ranges <= 80 mV	200 m	200 m; 50 m with thermocouples and input ranges +/-80 mV
Analog value creation			
Integration and conversion time/ resolution per channel			
• Resolution with overrange (bit including sign), max.	16 bit; 16 / 16 / 16	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	Yes
• Basic conversion time (ms)	6 / 20,1 / 23,5 ms	10 / 16,7 / 20 / 100	8 / 23 / 25 ms
• Integration time (ms)	2,5 / 16,7 / 20 ms	2,5 / 16,7 / 20 / 100	20 ms at 50 Hz (entire module incl. wire break)
• Basic conversion time, including integration time (ms)			
- additional conversion time for wire break monitoring	4.3 / 4.3 / 4.3 ms		110 ms / 4 ms
- additional conversion time for resistance measurement	12 / 40,2 / 47 ms		
- additional conversion time for wire break monitoring and resistance measurement	5,5 ms	1 ms (module)	none
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 Hz		none/ 60 / 50 Hz
Encoder			
Connection of signal encoders			
• for current measurement as 2-wire transducer	Yes		
• for current measurement as 4-wire transducer	Yes	Yes	
• for resistance measurement with two-wire connection	Yes; Line resistances are also measured		
• for resistance measurement with three-wire connection	Yes		Yes
• for resistance measurement with four-wire connection	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7431-7QH00-0AB0 SM 431, 16AE, U/I/R/PT100, 16BIT	6ES7431-7KF00-0AB0 SM 431, 8AI, U/I/THERMO, 16BIT	6ES7431-7KF10-0AB0 SM 431, 8AI, RESIST./PT100, 16BIT
Errors/accuracies			
Operational limit in overall temperature range			
• Voltage, relative to input area, (+/-)	0.3 %; +/-0.3 % at +/-250 mV, +/-500 mV, +/-1 V, +/-2.5 V, +/-5 V, 1 to 5 V, +/- 10 V; +/-0.31 % at +/-80 mV; +/-0.32 % at +/-50 mV; +/-0.35 % at +/-25 mV;	0.3 %	
• Current, relative to input area, (+/-)	0.3 %; at 0 to 20 mA, +/-5 mA, +/-10 mA, +/- 20 mA, 4 to 20 mA	0.5 %	
• Resistance, relative to input area, (+/-)	0.3 %; +/-0.3 % at 0 to 48 Ohm (4-conductor measurement), 0 to 150 Ohm (4-conductor measurement), 0 to 300 Ohm (4-conductor measurement), 0 to 600 Ohm (4-conductor measurement), 0 to 5000 Ohm (4-conductor measurement, in range of 6000 Ohm); +/-0.4 % at 0 to 300 Ohm (3-conductor measurement), 0 to 600 Ohm (3-conductor measurement), 0 to 5000 Ohm (3-conductor measurement, in range of 6000 Ohm);		
• Resistance thermometer, relative to input area, (+/-)	0.4 %		+/-1 °C
Basic error limit (operational limit at 25 °C)			
• Voltage, relative to input area, (+/-)	0.15 %; +/-0.15 % at +/-250 mV, +/-500 mV, +/-1 V, +/-2.5 V, +/-5 V, 1 to 5 V, +/-10 V; +/-0.17 % at +/-80 mV; +/-0.19 % at +/-50 mV; +/-0.23 % at +/-25 mV;	0.1 %	
• Current, relative to input area, (+/-)	0.15 %; at 0 to 20 mA, +/-5 mA, +/-10 mA, +/- 20 mA, 4 to 20 mA	0.17 %	
• Resistance, relative to input area, (+/-)	0.15 %; +/-0.15 % at 0 to 48 ohms (4-conductor measurement), 0 to 150 ohms (4-conductor measurement), 0 to 300 ohms (4-conductor measurement), 0 to 5000 ohms (4-conductor measurement, in range of 6000 ohms); +/-0.3 % at 0 to 300 ohms (3-conductor measurement), 0 to 600 ohms (3-conductor measurement), 0 to 5000 ohms (3-conductor measurement, in range of 6000 ohms)		
• Resistance thermometer, relative to input area, (+/-)	0.3 %		+/-0,2 °C
Interrupts/diagnostics/ status information			
Alarms			
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
• Limit value alarm	Yes; Parameterizable	Yes	Yes
Diagnostic messages			
• Diagnostics	Yes; Parameterizable	Yes	Yes
Galvanic isolation			
Galvanic isolation analog inputs			
• Galvanic isolation analog inputs	Yes; internal / external	Yes; internal / external	Yes; internal / external
• between the channels	No	Yes	No
Permissible potential difference			
between the inputs (UCM)	120 V AC	120 V AC	none

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Technical specifications (continued)

Article number	**6ES7431-7QH00-0AB0** SM 431, 16AE, U/I/R/PT100, 16BIT	**6ES7431-7KF00-0AB0** SM 431, 8AI, U/I/THERMO, 16BIT	**6ES7431-7KF10-0AB0** SM 431, 8AI, RESIST./PT100, 16BIT
Isolation			
Isolation checked with	2120 V DC between bus and L+/M; 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	1500 V DC	1500 V DC
Dimensions			
Width	25 mm	25 mm	25 mm
Height	290 mm	290 mm	290 mm
Depth	210 mm	210 mm	210 mm
Weights			
Weight, approx.	500 g	650 g	650 g

Ordering data

	Article No.
SM 431 analog output modules	
16 inputs, non-isolated, 13 bit	**6ES7431-0HH00-0AB0**
8 inputs, isolated, 13 bit	**6ES7431-1KF00-0AB0**
8 inputs, isolated, 14 bit, with linearization	**6ES7431-1KF10-0AB0**
8 inputs, isolated, 14 bit	**6ES7431-1KF20-0AB0**
16 inputs, isolated, 16 bit, process interrupt capability	**6ES7431-7QH00-0AB0**
8 inputs, isolated, 16 bit, process interrupt capability, for thermocouples (I, U)	**6ES7431-7KF00-0AB0**
8 inputs, isolated, 16 bit, process interrupt capability, for thermal resistors	**6ES7431-7KF10-0AB0**
Front connector	
48-pin	
• with screw contacts, 1 unit	**6ES7492-1AL00-0AA0**
• with screw contacts, 84 units	**6ES7492-1AL00-1AB0**
• with spring-loaded terminals, 1 unit	**6ES7492-1BL00-0AA0**
• with crimp contacts, 1 unit	**6ES7492-1CL00-0AA0**
• with crimp contacts, 84 units	**6ES7492-1CL00-1AB0**
1 unit; for 6ES7431-7KF00-0AB0; spare part, included in scope of delivery	**6ES7431-7KF00-6AA0**
Measuring range module for analog inputs	**6ES7974-0AA00-0AA0**
1 module for 2 inputs (spare part)	

	Article No.
Cover film for labeling strips	**6ES7492-2XX00-0AA0**
Spare part	
Labeling sheets for machine inscription	
DIN A4, for printing using laser printer; pack of 10	
petrol	**6ES7492-2AX00-0AA0**
light-beige	**6ES7492-2BX00-0AA0**
yellow	**6ES7492-2CX00-0AA0**
red	**6ES7492-2DX00-0AA0**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC Based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
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