MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

6ES7331-7KF02-0AB0

SIMATIC S7 300 ANALOG INPUT

Used with the applicable PLC System configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

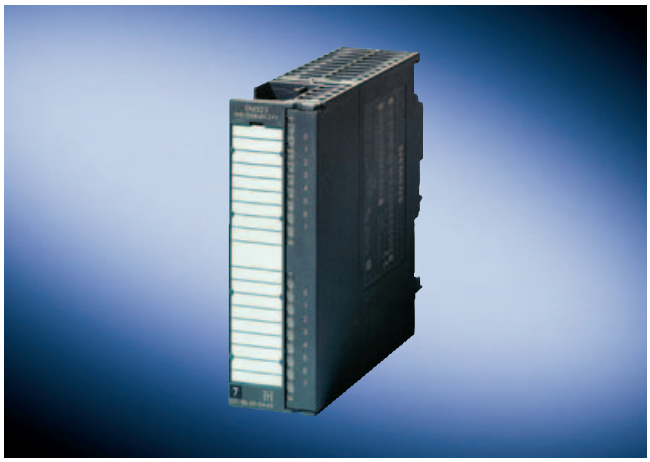
Source: Siemens official manufacturer documentation

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SIPLUS SM 323 digital input/output modules

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Overview



- Digital inputs and outputs
- For connecting standard switches, two-wire proximity switches (BERO), solenoid valves, contactors, low-power motors, lamps and motor starters

SIPLUS SM 323	**8 DI/8 DO**
Order No.	**6AG1 323-1BH01-2AA0**
Order No. based on	**6ES7 323-1BH01-0AA0**
Ambient temperature range	-25 °C to +60 °C, condensation permissible
Ambient conditions	Suitable for extraordinary medial load (for example by chloric and sulphuric atmospheres).
Conformity with standard for electronic devices on rail vehicles (EN 50155, temperature T1, category 1)	Yes
Technical data	The technical data are identical with the technical data of the based on modules.

Ordering data

		Order No.
Digital input/output modules SIPLUS SM 323		
(extended temperature range and medial load)		
incl. labeling strips, bus connector		
8 inputs, 8 outputs	A)	**6AG1 323-1BH01-2AA0**

A) Subject to export regulations: AL: N and ECCN: EAR99H

	Order No.
Accessories	see S7-300 digital input/output modules, page 4/107

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Overview



- Analog inputs
- For connection of voltage and current sensors, thermocouples, resistors and resistance thermometers

Technical specifications

	6ES7 331-7KF02-0AB0	6ES7 331-7HF01-0AB0	6ES7 331-1KF01-0AB0	6ES7 331-7KB02-0AB0
Voltages and currents				
Load voltage L+				
• Rated value (DC)	24 V	24 V		24 V
• reverse polarity protection	Yes	Yes		Yes
Current consumption				
from load voltage L+ (without load), max.	200 mA	50 mA		80 mA
from backplane bus DC 5 V, max.	50 mA	60 mA	90 mA	50 mA
Power loss, typ.	1 W	1.5 W	0.4 W	1.3 W
Connection point				
required front connectors	20-pin	20-pin	40-pin	20-pin
Isochronous mode				
Isochronouos mode	No	Yes	No	No
Analog inputs				
Number of analog inputs	8	8	8	2
Number of analog inputs for resistance measurement	4		8	1
Cable length, shielded, max.	200 m; 50 m at 80 mV and with thermocouples	200 m	200 m; max. 50 m at 50 mV	200 m; 50 m at 80 mV and with thermocouples
permissible input frequency for voltage input (destruction limit), max.	20 V; continuous; 75 V for max. 1s (mark to space ratio 1:20)	20 V; 20 V continuous, 75 V for max. 1s (mark to space ratio 1:20)	30 V; 12 V continuous, 30 V for max. 1 s	20 V; continuous; 75 V for max. 1s (mark to space ratio 1:20)
permissible input current for current input (destruction limit), max.	40 mA	40 mA	40 mA	40 mA
Input ranges (rated values), voltages				
• 0 to +10 V			Yes	
• 1 to 5 V	Yes	Yes	Yes	Yes
• 1 to 10 V		Yes	No	
• -1 V to +1 V	Yes	Yes	Yes	Yes
• -10 V to +10 V	Yes	Yes	Yes	Yes
• -2.5 V to +2.5 V	Yes		No	Yes
• -250 mV to +250 mV	Yes		No	Yes
• -5 V to +5 V	Yes	Yes	Yes	Yes

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Technical specifications (continued)

	6ES7 331-7KF02-0AB0	6ES7 331-7HF01-0AB0	6ES7 331-1KF01-0AB0	6ES7 331-7KB02-0AB0
Input ranges (rated values), voltages (continued)				
• -50 mV to +50 mV			Yes	
• -500 mV to +500 mV	Yes		Yes	Yes
• -80 mV to +80 mV	Yes			Yes
Input ranges (rated values), currents				
• 0 to 20 mA	Yes	Yes	Yes	Yes
• -10 to +10 mA	Yes			Yes
• -20 to +20 mA	Yes	Yes	Yes	Yes
• -3.2 to +3.2 mA	Yes			Yes
• 4 to 20 mA	Yes	Yes	Yes	Yes
Input ranges (rated values), thermoelements				
• Type E	Yes			Yes
• Type J	Yes			Yes
• Type K	Yes			Yes
• Type N	Yes			Yes
Input ranges (rated values), resistors				
• 0 to 150 Ohm	Yes			Yes
• 0 to 300 Ohm	Yes			Yes
• 0 to 600 Ohm	Yes		Yes	Yes
• 0 to 6000 Ohm			Yes	
Input ranges (rated values), resistance thermometers				
• Ni 100	Yes; Standard		Yes; Standard/AirCon	Yes
• LG-Ni 1000			Yes; Standard/AirCon	
• Pt 100	Yes; Standard		Yes; Standard/AirCon	Yes
Characteristic linearization				
• programmable	Yes		Yes	Yes
• for thermoelements	Type N, E, J, K, L			Type N, E, J, K, L
• for thermoresistor	Pt 100 (Standard, climatic range), Ni 100 (Standard, climatic range)		yes; Pt100 standard/air con.; Ni100 standard/air con.; Ni1000 standard/air con.; LG-Ni1000 standard/air con.	Pt 100 (Standard, climatic range), Ni 100 (Standard, climatic range)
Temperature compensation				
• programmable	Yes			Yes
• external temperature compensation with compensations socket	Yes			Yes
• internal temperature compensation	Yes			Yes
Analog value creation				
Measurement principle	integrating	Conversion of instantaneous values	integrating	integrating
Integrations and conversion time/resolution per channel				
• Resolution with overload area (bit including sign), max.	15 Bit; unipolar: 9 / 12 / 12 / 14 bit, bipolar: 9 + sign/ 12 + sign/12 + sign/ 14 + sign bit	14 Bit; unipolar: 14 bit; bipolar: 13+sign bit	13 Bit	15 Bit; unipolar: 9 / 12 / 12 / 14 bit, bipolar: 9 + sign/ 12 + sign/12 + sign/ 14 + sign bit

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Technical specifications (continued)

	6ES7 331-7KF02-0AB0	6ES7 331-7HF01-0AB0	6ES7 331-1KF01-0AB0	6ES7 331-7KB02-0AB0
Integrations and conversion time/resolution per channel (continued)				
• Integration time, parameterizable	Yes; 2.5 / 16.67 / 20 / 100 ms	Yes	Yes; 60 / 50 ms	Yes; 2.5 / 16.67 / 20 / 100 ms
• Basic conversion time, including integration time, ms	3/ 17/ 22/ 102 ms		66 / 55 ms	6/ 34/ 44/ 204 ms
• Basic conversion time, ms		52 µs per channel	66 / 55 ms	
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10 Hz	400 / 60 / 50 / 10 Hz	50 / 60 Hz	400 / 60 / 50 / 10 Hz
Encoder				
Connection of signal encoders				
• for current measurement as 2-wire transducer	Yes	Yes	Yes; with external supply	Yes
• for current measurement as 4-wire transducer	Yes	Yes	Yes	Yes
• for resistance measurement with 2-conductor connection	Yes		Yes	Yes
• for resistance measurement with 3-conductor connection	Yes		Yes	Yes
• for resistance measurement with 4-conductor connection	Yes		Yes	Yes
Errors/accuracies				
Operational limit in overall temperature range				
• Voltage, relative to input area	+/- 1 %; +/-1% (80mV), +/-0.6% (250-1000mV), +/-0.8% (2.5-10mV)	+/- 0.4 %	+/- 0.6 %; +/-0.6% (+/-5V,10V,1-5V,0-10V; +/-0,5% (+/-50 mV, 500 mV, 1 V	+/- 1 %; +/-1% (80mV), +/- 0.6% (250-1000mV), +/- 0.8% (2.5-10V)
• Current, relative to input area	+/- 0.7 %; from 3.2 to 20mA	+/- 0.3 %	+/- 0.5 %; +/-20mA, 0-20mA, 4-20mA	+/- 0.7 %; from 3.2 to 20mA
• Impedance, relative to input area	+/- 0.7 %; 150, 300, 600 Ohm		+/- 0.5 %; 0-6kOhm, 0-600kOhm	+/- 0.7 %; 150, 300, 600 Ohm
• Resistance-type thermometer, relative to input area	+/- 0.7 %; +/-0.7% (Pt100/ Ni100); +/-0.8% (Pt100 climat)			+/- 0.7 %; +/-0.7% (Pt100/ Ni100); +/-0.8% (Pt100 climat)
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to input area	+/- 0.6 %; +/-0.4% (250-1000mV); +/-0.6% (2.5-10mV); +/-0.7% (80mV)	+/- 0.25 %	+/- 0.4 %; 0.4% (+/-5V,10V,1-5V, 0-10V); 0.3% (+/-50mV,500mV,1V)	+/- 0.6 %; +/-0.6% (80mV, 2.5-10V); +/-0.4% (250-1000mV)
• Current, relative to input area	+/- 0.5 %; 3,2 to 20mA	+/- 0.2 %	+/- 0.3 %; +/-20mA, 0-20mA,4-20mA	+/- 0.5 %; 3,2 to 20mA
• Impedance, relative to input area	+/- 0.5 %; 150, 300, 600 Ohm		+/- 0.3 %; 0-6kOhm, 0-600kOhm	+/- 0.5 %; 150, 300, 600 Ohm
• Resistance-type thermometer, relative to input area	+/- 0.6 %; +/-0.5% (Pt100/ Ni100); +/-0.6% (Pt100 climatic)			+/- 0.6 %; +/-0.5% (Pt100/ Ni100); +/-0.6% (Pt100 climatic)
Status information/ alarms/diagnostics				
Alarms				
• Diagnostic alarm	Yes; parameterizable channels 0 and 2	Yes; parameterizable	No	Yes
• Limit value alarm	Yes; parameterizable	Yes; parameterizable channels 0 and 2	No	Yes; parameterizable; Channel 0
Diagnoses				
• Diagnostic information readable	Yes	Yes	No	Yes

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Technical specifications (continued)

	6ES7 331-7KF02-0AB0	6ES7 331-7HF01-0AB0	6ES7 331-1KF01-0AB0	6ES7 331-7KB02-0AB0
Isolation				
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC
Isolation				
Isolation, analog inputs				
• between the channels	Yes	No	No	No
• between the channels, in groups of	2			
• between the channels and the backplane bus	Yes	Yes	Yes	Yes
Dimensions and weight				
Width	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	117 mm	120 mm
Weights				
Weight, approx.	250 g	200 g	250 g	250 g

	6ES7 331-7PF01-0AB0	6ES7 331-7PF11-0AB0	6ES7 331-7NF00-0AB0	6ES7 331-7NF10-0AB0
Voltages and currents				
Load voltage L+				
• Rated value (DC)	24 V	24 V		24 V
• reverse polarity protection	Yes	Yes		Yes
Current consumption				
from load voltage L+ (without load), max.	240 mA	200 mA		200 mA
from backplane bus DC 5 V, max.	100 mA	100 mA	130 mA	100 mA
Power loss, typ.	4.6 W	3 W	0.6 W	3 W
Connection point				
required front connectors	40-pin	40-pin	40-pin	40-pin
Isochronous mode				
Isochronouos mode	No	No	No	No
Analog inputs				
Number of analog inputs	8	8	8	8
Number of analog inputs for resistance measurement	8			
Cable length, shielded, max.	200 m	100 m	200 m	200 m
permissible input frequency for voltage input (destruction limit), max.	75 V; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20)	75 V; 20 V DC permanent, 75 V DC for max. 1 s (pulse duty factor 1:20)	50 V; permanent	75 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	40 mA
Input ranges (rated values), voltages				
• 1 to 5 V			Yes	Yes
• -10 V to +10 V			Yes	Yes
• -5 V to +5 V			Yes	Yes
Input ranges (rated values), currents				
• 0 to 20 mA			Yes	Yes
• -20 to +20 mA			Yes	Yes
• 4 to 20 mA			Yes	Yes

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Technical specifications (continued)

	6ES7 331-7PF01-0AB0	6ES7 331-7PF11-0AB0	6ES7 331-7NF00-0AB0	6ES7 331-7NF10-0AB0
Input ranges (rated values), thermoelements				
• Type B		Yes		
• Type E		Yes		
• Type J		Yes		
• Type K		Yes		
• Type L		Yes		
• Type N		Yes		
• Type R		Yes		
• Type S		Yes		
• Type T		Yes		
• Type U		Yes		
• Typ TXK/TXK(L) to GOST		Yes		
Input ranges (rated values), resistors				
• 0 to 150 Ohm	Yes			
• 0 to 300 Ohm	Yes			
• 0 to 600 Ohm	Yes			
Input ranges (rated values), resistance thermometers				
• Cu 10	Yes			
• Ni 100	Yes			
• Ni 1000	Yes			
• Ni 120	Yes			
• Ni 200	Yes			
• Ni 500	Yes			
• Pt 100	Yes			
• Pt 1000	Yes			
• Pt 200	Yes			
• Pt 500	Yes			
Characteristic linearization				
• programmable	Yes	Yes		
• for thermoelements		Type B, E, J, K, L, N, R, S. T, U, C		
• for thermoresistor	Pt 100, Pt 200, Pt 500, Pt 1000, Ni 100, Ni 120, Ni 200, Ni 500, Ni 1000, Cu 10 (Standard/AirCon)			
Temperature compensation				
• programmable		Yes		
• external temperature compensation with compensations socket		Yes		
• external temperature compensation with Pt100		Yes		
• internal temperature compensation		Yes		

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Technical specifications (continued)

	6ES7 331-7PF01-0AB0	6ES7 331-7PF11-0AB0	6ES7 331-7NF00-0AB0	6ES7 331-7NF10-0AB0
Status information/ alarms/diagnostics				
Alarms				
• Diagnostic alarm	Yes; parameters can be set per group	Yes; parameters can be set per group	Yes; parameterizable	Yes; parameterizable
• Limit value alarm	Yes; parameterizable	Yes; parameterizable	Yes; parameterizable channels 0 and 2	Yes; parameterizable all channels (end of cycle interrupt is also supported across modules)
Diagnoses				
• Diagnostic information readable	Yes	Yes	Yes	Yes
Isolation				
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V AC
Isolation				
Isolation, analog inputs				
• between the channels	Yes	Yes		Yes
• between the channels, in groups of	2	2		2
• between the channels and the backplane bus	Yes	Yes	Yes	Yes
Dimensions and weight				
Width	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm	120 mm
Weights				
Weight, approx.	272 g	272 g	272 g	272 g

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SM 331 analog input modules

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Ordering data		Order No.
SM 331 analog input modules		
Including labeling strips, bus connector, measuring range modules		
8 inputs, 13-bit resolution		**6ES7 331-1KF01-0AB0**
8 inputs, resolution 9/12/14 bits		**6ES7 331-7KF02-0AB0**
2 inputs, resolution 9/12/14 bits	A)	**6ES7 331-7KB02-0AB0**
8 inputs, enhanced resolution 16 bits	A)	**6ES7 331-7NF00-0AB0**
8 inputs, enhanced resolution 16 bits, 4-channel mode	A)	**6ES7 331-7NF10-0AB0**
8 inputs, resolution 14 bits, for isochronous mode		**6ES7 331-7HF01-0AB0**
8 inputs, for thermal resistors	A)	**6ES7 331-7PF01-0AB0**
8 inputs, for thermoelements		**6ES7 331-7PF11-0AB0**
Measuring range module for analog inputs		**6ES7 974-0AA00-0AA0**
1 module for 2 analog inputs; 2 units (spare part)		
Front connectors		
1 unit		
20-pin, with screw contacts		
• 1 unit		**6ES7 392-1AJ00-0AA0**
• 100 units		**6ES7 392-1AJ00-1AB0**
20-pin, with cage clamp terminals		
• 1 unit		**6ES7 392-1BJ00-0AA0**
• 100 units		**6ES7 392-1BJ00-1AB0**
40-pin, with screw contacts		
• 1 unit		**6ES7 392-1AM00-0AA0**
• 100 units		**6ES7 392-1AM00-1AB0**
40-pin, with cage clamp terminals		
• 1 unit		**6ES7 392-1BM01-0AA0**
• 100 units		**6ES7 392-1BM01-1AB0**
Front door, elevated design	A)	**6ES7 328-0AA00-7AA0**
e.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG wires		
SIMATIC TOP connect		See page 4/225; Information about which components can be used for the respective module, see A&D Mall or Catalog KT 10.2
Bus connectors		**6ES7 390-0AA00-0AA0**
1 unit (spare part)		
Shield connecting element		**6ES7 390-5AA00-0AA0**
80 mm wide, with 2 rows for 4 shielding connection clamps each		
Shielding connection clamps		
2 units		
For 2 cables with 2 mm to 6 mm diameter		**6ES7 390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter		**6ES7 390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter		**6ES7 390-5CA00-0AA0**

		Order No.
Label cover		**6ES7 392-2XY00-0AA0**
10 units (spare part), for modules with 20-pin front connector		
Labeling strips		**6ES7 392-2XX00-0AA0**
10 units (spare part), for modules with 20-pin front connector		
S7 SmartLabel		**2XV9 450-1SL01-0YX0**
Software for automatic labeling of modules based on data of the STEP 7 project		
Labeling sheets for machine labeling		
For 16-channel signal modules, DIN A4, for printing with laser printer; 10 units		
petrol		**6ES7 392-2AX00-0AA0**
light-beige		**6ES7 392-2BX00-0AA0**
yellow		**6ES7 392-2CX00-0AA0**
red		**6ES7 392-2DX00-0AA0**
For 32-channel signal modules, DIN A4, for printing with laser printer; 10 units		
petrol		**6ES7 392-2AX10-0AA0**
light-beige		**6ES7 392-2BX10-0AA0**
yellow		**6ES7 392-2CX10-0AA0**
red		**6ES7 392-2DX10-0AA0**
SIMATIC Manual Collection	D)	**6ES7 998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: S7-200, S7-300, C7, S7-400, SIMATIC DP (Distributed I/O), SIMATIC PC, SIMATIC PG, STEP 7, Engineering Tools, Runtime Software, SIMATIC PCS 7, SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication), SIMATIC Machine Vision, SIMATIC Sensors		
SIMATIC Manual Collection update service for 1 year	D)	**6ES7 998-8XC01-8YE2**
Current S7 Manual Collection DVD and the three subsequent updates		
S7-300 manual		
Design, CPU data, module data, instruction list		
German		**6ES7 398-8FA10-8AA0**
English		**6ES7 398-8FA10-8BA0**
French		**6ES7 398-8FA10-8CA0**
Spanish		**6ES7 398-8FA10-8DA0**
Italian		**6ES7 398-8FA10-8EA0**

A) Subject to export regulations: AL: N and ECCN: EAR99H

D) Subject to export regulations: AL: N and ECCN: 5D992B1

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