MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

6ES7332-5HF00-0AB0

SIMATIC S7 300 ANALOG OUTPUT

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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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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Overview



- Analog outputs
- For the connection of analog actuators

Technical specifications

	6ES7 332-5HB01-0AB0	6ES7 332-5HD01-0AB0	6ES7 332-5HF00-0AB0	6ES7 332-7ND02-0AB0
Voltages and currents				
Load voltage L+				
• Rated value (DC)	24 V	24 V	24 V	24 V
Current consumption				
from load voltage L+ (without load), max.	135 mA	240 mA	340 mA	290 mA
from backplane bus DC 5 V, max.	60 mA	60 mA	100 mA	120 mA
Power loss, typ.	3 W	3 W	6 W	3 W
Connection point				
required front connectors	20-pin	20-pin	40-pin	20-pin
Analog outputs				
Number of analog outputs	2	4	8	4; isochronous mode
Cable length, shielded, max.	200 m	200 m	200 m	200 m
Voltage output, short-circuit protection	Yes	Yes	Yes	Yes
Voltage output, short-circuit current, max.	25 mA	25 mA	25 mA	40 mA
Current output, no-load voltage, max.	18 V	18 V	18 V	18 V
Output ranges, voltage				
• 0 to 10 V	Yes	Yes	Yes	Yes
• 1 to 5 V	Yes	Yes	Yes	Yes
• -10 to +10 V	Yes	Yes	Yes	Yes
Output ranges, current				
• 0 to 20 mA	Yes	Yes	Yes	Yes
• -20 to +20 mA	Yes	Yes	Yes	Yes
• 4 to 20 mA	Yes	Yes	Yes	Yes
Load impedance (in rated range of output)				
• with voltage outputs, min.	1 kΩ	1 kΩ	1 kΩ	1 kΩ
• with voltage outputs, capacitive load, max.	1 µF	1 µF	1 µF	1 µF
• with current outputs, max.	500 Ω	500 Ω	500 Ω	500 Ω
• with current outputs, inductive load, max.	10 mH	10 mH	10 mH	1 mH

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Technical specifications (continued)

	6ES7 332-5HB01-0AB0	6ES7 332-5HD01-0AB0	6ES7 332-5HF00-0AB0	6ES7 332-7ND02-0AB0
Analog value creation				
Integrations and conversion time/resolutionper channel				
• Resolution with overload area (bit including sign), max.	12 Bit; +/- 10 V, +/-20mA, 4 to 20 mA, 1 to 5 V: 11 bit + sign, 0 to 10 V, 0 to 20 mA: 12 bit	12 Bit; +/- 10 V, +/- 20mA, 4 to 20 mA, 1 to 5 V: 11 bit + sign, 0 to 10 V, 0 to 20 mA: 12 bit	12 Bit; +/- 10 V, +/- 20mA, 4 to 20 mA, 1 to 5 V: 11 bit + sign, 0 to 10 V, 0 to 20 mA: 12 bit	16 Bit
• Conversion time (per channel)	0,8 ms	0,8 ms	0,8 ms	200 µs; in clocked mode 640µs
Settling time				
• for resistive load	0.2 ms	0.2 ms	0.2 ms	0.2 ms
• for capacitive load	3.3 ms	3.3 ms	3.3 ms	3.3 ms
• for inductive load	0.5 ms; 0.5 ms (1mH); 3.3ms (10mH)	0.5 ms; 0.5ms (1mH); 3.3ms (10mH)	0.5 ms; 0.5ms (1mH); 3.3ms (10mH)	0.5 ms
Errors/accuracies				
Operational limit in overall temperature range				
• Voltage, relative to output area	+/- 0.5 %	+/- 0.5 %	+/- 0.5 %	+/- 0.12 %
• Current, relative to output area	+/- 0.6 %	+/- 0.6 %	+/- 0.6 %	+/- 0.18 %
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to output area	+/- 0.4 %	+/- 0.4 %	+/- 0.4 %	+/- 0.02 %
• Current, relative to output area	+/- 0.5 %	+/- 0.5 %	+/- 0.5 %	+/- 0.02 %
Status information/ alarms/diagnostics				
Substitute values connectable	Yes; parameterizable	Yes; parameterizable	Yes; parameterizable	Yes; parameterizable
Alarms				
• Diagnostic alarm	Yes; parameterizable	Yes; parameterizable	Yes; parameterizable	Yes
Diagnoses				
• Diagnostic information readable	Yes	Yes	Yes	
Isolation				
Isolation checked with	500 V DC	500 V DC	500 V DC	1500 V DC
Isolation				
Isolation, analog outputs				
• 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.	220 g	220 g	272 g	220 g

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Ordering data		Order No.
SM 332 analog output modules		
incl. labeling strips, bus connector		
4 outputs, 11/12 bit		**6ES7 332-5HD01-0AB0**
4 outputs, 16 bit	A)	**6ES7 332-7ND02-0AB0**
2 outputs, 11/12 bit		**6ES7 332-5HB01-0AB0**
8 outputs, 11/12 bit		**6ES7 332-5HF00-0AB0**
Front connectors		
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		
1 unit (spare part)		**6ES7 390-0AA00-0AA0**
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**
Label cover		**6ES7 392-2XY00-0AA0**
10 units (spare part), for modules with 20-pin front connector		

		Order No.
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		
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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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SM 334 analog input/output modules

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Overview



- Analog inputs and outputs
- For the connection of analog sensors and actuators

Technical specifications

	6ES7 334-0CE01-0AA0	6ES7 334-0KE00-0AB0
Voltages and currents		
Load voltage L+		
• Rated value (DC)	24 V	24 V
Current consumption		
from load voltage L+ (without load), max.	110 mA	80 mA
from backplane bus DC 5 V, max.	55 mA	60 mA
Power loss, typ.	3 W	2 W
Connection point		
required front connectors	20-pin	20-pin
Analog inputs		
Number of analog inputs	4	4
Number of analog inputs for voltage measurement	4	2
Number of analog inputs for resistance measurement		4
permissible input frequency for voltage input (destruction limit), max.	20 V	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	
Cycle time (all channels) max.	5 ms	85 ms
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
Input ranges (rated values), resistors		
• 0 to 10000 Ohm		Yes
Input ranges (rated values), resistance thermometers		
• Pt 100		Yes; only climatic range

	6ES7 334-0CE01-0AA0	6ES7 334-0KE00-0AB0
Analog outputs		
Number of analog outputs	2	2
Cable length, shielded, max.	200 m	100 m
Voltage output, short-circuit protection	Yes	Yes
Voltage output, short-circuit current, max.	11 mA	10 mA
Current output, no-load voltage, max.	15 V	
Output ranges, voltage		
• 0 to 10 V	Yes	Yes
Output ranges, current		
• 0 to 20 mA	Yes	
Load impedance (in rated range of output)		
• with voltage outputs, min.	5 kΩ	2,5 kΩ
• with voltage outputs, capacitive load, max.	1 µF	1 µF
• with current outputs, max.	300 Ω	
• with current outputs, inductive load, max.	1 mH	
Analog value creation		
Integrations and conversion time/resolution per channel		
• Resolution with overload area (bit including sign), max.	8 Bit	12 Bit
• Integration time, ms		16.67; 20
Settling time		
• for resistive load	0.3 ms	0.8 ms
• for capacitive load	3 ms	0.8 ms
• for inductive load	0.3 ms	

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Overview



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

SIPLUS SM 321	2 AI	8 AI	8 AI, 16 bits	8 AI, 16 bits	8 AI, 40-pole
Order No.	**6AG1 331-7KB02-2AB0**	**6AG1 331-7KF02-2AB0**	**6AG1 331-7NF00-2AB0**	**6AG1 331-7NF10-2AB0**	**6AG1 331-7PF01-2AB0**
Order No. based on	**6ES7 331-7KB02-0AB0**	**6ES7 331-7KF02-0AB0**	**6ES7 331-7NF00-0AB0**	**6ES7 331-7NF10-0AB0**	**6ES7 331-7PF01-0AB0**
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	No	Yes	No	No
Technical data	The technical data are identical with the technical data of the based on modules.				

Ordering data

		Order No.
SIPLUS SM 331 analog input modules		
(extended temperature range and medial load)		
Including labeling strips, bus connector, measuring range modules		
2 inputs, resolution 9/12/14 bit	A)	**6AG1 331-7KB02-2AB0**
8 inputs, resolution 9/12/14 bit		**6AG1 331-7KF02-2AB0**
8 inputs, enhanced resolution 16 bit	A)	**6AG1 331-7NF00-2AB0**
8 inputs, enhanced resolution 16 bit 4-channel mode	A)	**6AG1 331-7NF10-2AB0**
8 inputs, for thermal resistors	A)	**6AG1 331-7PF01-2AB0**
Accessories		see S7-300 analog input modules, page 4/118

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

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SIPLUS SM 332 analog output modules

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Overview



- Analog outputs
- For the connection of analog actuators

SIPLUS SM 321	2 AO	8 AO
Order No.	**6AG1 332-5HB01-2AB0**	**6AG1 332-5HF00-2AB0**
Order No. based on	**6ES7 332-5HB01-0AB0**	**6ES7 332-5HF00-0AB0**
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	No
Technical specifications	The technical data are identical with the technical data of the based on modules.	

Ordering data

		Order No.
SIPLUS SM 332 analog output modules		
(extended temperature range and medial load)		
incl. labeling strips, bus connector		
2 outputs, 11/12 bit	A)	**6AG1 332-5HB01-2AB0**
8 outputs, 11/12 bit		**6AG1 332-5HF00-2AB0**
Accessories		see S7-300 analog output modules, page 4/121

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

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SIPLUS SM 334 analog input/output module

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Overview



- Analog inputs and outputs
- For the connection of analog sensors and actuators

SIPLUS SM 334	**4 AI/2 AO**
Order No.	**6AG1 334-0KE00-2AB0**
Order No. based on	**6ES7 334-0KE00-0AB0**
Ambient temperature range	-25 °C to +60 °C, condensation permissible
Ambient conditions	Suitable for extraordinary medial load (for example by chloric and sulphuric atmospheres).
Technical data	The technical data are identical with the technical data of the based on modules.

Ordering data

		Order No.
SIPLUS SM 334 analog input/output modules		
(extended temperature range and medial load)		
incl. labeling strips, bus connector		
4 inputs, 2 outputs, resistance measurement, Pt 100	A)	**6AG1 334-0KE00-2AB0**
Accessories		see S7-300 analog input/ouput modules, page 4/124

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