

SIMATIC S7-300 advanced controller

I/O modules

Digital modules

SM 322 digital output modules**Overview**

- Digital outputs
- For connecting solenoid valves, contactors, low-power motors, lamps and motor starters

Technical specifications

Article number	6ES7322-1BH01-0AA0	6ES7322-1BH10-0AA0	6ES7322-1BL00-0AA0	6ES7322-1BP00-0AA0	6ES7322-1BP50-0AA0	6ES7322-8BF00-0AB0
	SM322, 16DO 24V DC, 0,5A	SM322 HIGH SPEED, 16DO 24V DC, 0,5A	SM322, 32DO 24V DC, 0,5A	SM322 64DA, DC24V, 0,3A P-WRITE	SM322 64DO, DC24V, 0,3A M-WRITE	SM322, 8DO, 24V DC, 0,5A
Product type designation						
Supply voltage						
Load voltage L+						
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V	24 V
Input current						
from load voltage L+ (without load), max.	80 mA	110 mA	160 mA	75 mA	75 mA	90 mA
from backplane bus 5 V DC, max.	80 mA	70 mA	110 mA	100 mA	100 mA	70 mA
Power losses						
Power loss, typ.	4.9 W	5 W	6.6 W	6 W	6 W	5 W
Digital outputs						
Number of digital outputs	16	16	32	64	64	8
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)	L+ (-53 V)	L+ (-53 V)	M+ (45 V)	L+ (-45 V)
Switching capacity of the outputs						
• on lamp load, max.	5 W	5 W	5 W	5 W	5 W	5 W
Load resistance range						
• lower limit	48 Ω	48 Ω	48 Ω	80 Ω	80 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ	10 kΩ	10 kΩ	3 kΩ
Output voltage						
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.5 V)	M+ (0.5 V)	L+ (-0.8 to -1.6 V)
Output current						
• for signal "1" rated value	0.5 A	0.5 A	0.5 A	0.3 A	0.3 A	0.5 A
• for signal "1" permissible range, min.				2.4 mA	2.4 mA	
• for signal "1" permissible range, max.				0.36 A	0.36 A	
• for signal "1" permissible range for 0 to 40 °C, min.	5 mA	5 mA	5 mA			10 mA
• for signal "1" permissible range for 0 to 40 °C, max.	0.6 A	0.6 A	0.6 A			0.6 A
• for signal "1" permissible range for 40 to 60 °C, min.	5 mA	5 mA	5 mA			10 mA
• for signal "1" permissible range for 40 to 60 °C, max.	0.6 A	0.6 A	0.6 A			0.6 A
• for signal "1" minimum load current	5 mA	5 mA	5 mA			10 mA
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA	0.1 mA		0.5 mA

Technical specifications (continued)

Article number	6ES7322-1BH01-0AA0 SM322, 16DO 24V DC, 0,5A	6ES7322-1BH10-0AA0 SM322 HIGH SPEED, 16DO 24V DC, 0,5A	6ES7322-1BL00-0AA0 SM322, 32DO 24V DC, 0,5A	6ES7322-1BP00-0AA0 SM322 64DA, DC24V, 0,3A P-WRITE	6ES7322-1BP50-0AA0 SM322 64DO, DC24V, 0,3A M-WRITE	6ES7322-8BF00-0AB0 SM322, 8DO, 24V DC, 0,5A
Switching frequency						
• with resistive load, max.	100 Hz	1 000 Hz	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz
Aggregate current of outputs (per group)						
horizontal installation						
- up to 40 °C, max.	4 A	4 A	4 A	1.6 A	1.6 A	4 A
- up to 60 °C, max.	3 A	3 A	3 A	1.2 A	1.2 A	3 A
vertical installation						
- up to 40 °C, max.	2 A	2 A	2 A	1.6 A	1.6 A	4 A
Total current of the outputs (per module)						
horizontal installation						
- up to 60 °C, max.				4.8 A	4.8 A	
all other mounting positions						
- up to 40 °C, max.				6.4 A	6.4 A	
Cable length						
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m	600 m	600 m
Interrupts/diagnostics/status information						
Alarms						
• Diagnostic alarm	No	No	No	No	No	Yes; Parameterizable
Diagnostic messages						
• Diagnostics	No	No	No	No	No	Yes
Galvanic isolation						
Galvanic isolation digital outputs						
• between the channels, in groups of	8	8	8	16	16	8
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Isolation						
Isolation checked with	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC	500 V DC
Connection method						
required front connector	20-pin	20-pin	40-pin	Cable: 6ES7 392-4Bxx0-0AA0 Terminal blocks: 6ES7 392-1xN00-0AA0	Cable: 6ES7 392-4Bxx0-0AA0 Terminal blocks: 6ES7 392-1xN00-0AA0	20-pin
Dimensions						
Width	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm	112 mm	112 mm	120 mm
Weights						
Weight, approx.	190 g	200 g	260 g	230 g	230 g	210 g

SIMATIC S7-300 advanced controller

I/O modules

Digital modules

SM 322 digital output modules**Technical specifications** (continued)

Article number	6ES7322-5GH00-0AB0 SM322, 16DO, AC120/230V, 2A	6ES7322-1CF00-0AA0 SM322, 8DO, 48-125V DC, 1,5A	6ES7322-1BF01-0AA0 SM322, 8DO, 24V DC, 2A	6ES7322-1FF01-0AA0 SM322, 8DO, 120/230V AC, 1A	6ES7322-5FF00-0AB0 SM322, 8DO, AC120/230V, 2A	6ES7322-1FH00-0AA0 SM322, 16DO, 120/230V AC, 1A
Product type designation						
Supply voltage						
Load voltage L+						
• Rated value (DC)	24 V; 24 / 48	48 V; 48V DC to 125V DC	24 V			
Load voltage L1						
• Rated value (AC)				230 V; 120/230V AC	230 V; 120/230V AC	230 V; 120/230V AC
Input current						
from load voltage L+ (without load), max.	200 mA	2 mA	60 mA			2 mA
from load voltage L1 (without load), max.				2 mA	2 mA	3 mA
from backplane bus 5 V DC, max.	100 mA	100 mA	40 mA	100 mA	100 mA	200 mA
Power losses						
Power loss, typ.	2.8 W	7.2 W	6.8 W	8.6 W	8.6 W	8.6 W
Digital outputs						
Number of digital outputs	16	8	8	8	8	16
Limitation of inductive shutdown voltage to		M (-1 V)	L+ (-48 V)			
Switching capacity of the outputs						
• on lamp load, max.	2.5 W	15 W; 15 W (48 V) or 40 W (125 V)	10 W	50 W	50 W	50 W
Load resistance range						
• lower limit			12 Ω			
• upper limit			4 kΩ			
Output voltage						
• for signal "1", min.	L+ (-0.25 V)	L+ (-1.2 V)	L+ (-0.8 V)	L1 (-1.5 V)	L1 (-8.5 V)	
Output current						
• for signal "1" rated value	0.5 A	1.5 A	2 A	2 A	2 A	1 A
• for signal "1" permissible range for 0 to 40 °C, min.		10 mA	5 mA	10 mA	10 mA	10 mA
• for signal "1" permissible range for 0 to 40 °C, max.	0.5 A	1.5 A	2.4 A	2 A	2 A	1 A
• for signal "1" permissible range for 40 to 60 °C, min.		10 mA	5 mA	10 mA	10 mA	10 mA
• for signal "1" permissible range for 40 to 60 °C, max.	0.5 A	1.5 A	2.4 A	1 A	1 A	0.5 A
• for signal "1" minimum load current		10 mA	5 mA	10 mA	10 mA	10 mA
• for signal "1" permissible surge current, max.	1.5 A; for 50 ms, 1 A 2 s one-time	3 A; for 10 ms		20 A; max. 1 AC cycle	20 A; with 2 half waves	20 A; with 2 half waves
• for signal "0" residual current, max.	10 μA	0.5 mA	0.5 mA	2 mA	2 mA	2 mA
Switching frequency						
• with resistive load, max.	10 Hz	25 Hz	100 Hz	10 Hz	10 Hz	10 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	0.5 Hz	10 Hz	10 Hz	1 Hz	1 Hz	1 Hz

Technical specifications (continued)

Article number	6ES7322-5GH00-0AB0 SM322, 16DO, AC120/230V, 2A	6ES7322-1CF00-0AA0 SM322, 8DO, 48-125V DC, 1,5A	6ES7322-1BF01-0AA0 SM322, 8DO, 24V DC, 2A	6ES7322-1FF01-0AA0 SM322, 8DO, 120/230V AC, 1A	6ES7322-5FF00-0AB0 SM322, 8DO, AC120/230V, 2A	6ES7322-1FH00-0AA0 SM322, 16DO, 120/230V AC, 1A
Aggregate current of outputs (per group)						
horizontal installation						
- up to 40 °C, max.	0.5 A; 8 A per module	6 A	4 A	4 A	8 A	4 A
- up to 50 °C, max.		4 A				
- up to 60 °C, max.	0.5 A; 8 A per module	3 A	4 A	2 A	4 A	2 A
vertical installation						
- up to 40 °C, max.	0.5 A; 8 A per module	4 A	4 A	2 A	4 A	2 A
Cable length						
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m	600 m	600 m
Interrupts/diagnostics/status information						
Alarms						
• Diagnostic alarm	Yes; Parameterizable	No	No	No	Yes; Parameterizable	No
Diagnostic messages						
• Diagnostics	Yes; Parameters can be assigned	No	No	Yes	Yes	Yes
Galvanic isolation						
Galvanic isolation digital outputs						
• between the channels, in groups of	1	4	4	4	1	8
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Isolation						
Isolation checked with	1500 V AC	1500 V AC	500 V DC	1500 V AC	1500 V AC	4000 VDC
Connection method						
required front connector	40-pin	20-pin	20-pin	20-pin	40-pin	20-pin
Dimensions						
Width	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm	120 mm	120 mm	120 mm
Weights						
Weight, approx.	260 g	250 g	190 g	275 g	275 g	275 g

SIMATIC S7-300 advanced controller

I/O modules

Digital modules

SM 322 digital output modules**Technical specifications** (continued)

Article number	6ES7322-1FL00-0AA0	6ES7322-1HF01-0AA0	6ES7322-1HF10-0AA0	6ES7322-5HF00-0AB0	6ES7322-1HH01-0AA0
	SM322, 32DO, 120/230V AC, 1A	SM322, 8DA, 24V DC/2A OR 230V AC/2A	SM322, 8DA, 24V DC/5A OR 230V AC/5A	SM322, 8DO RELAY, 24VDC, 120-230V AC, 5A	SM322, 16DO RELAY
Product type designation					
Supply voltage					
Load voltage L+					
• Rated value (DC)		24 V	120 V	24 V	120 V
Load voltage L1					
• Rated value (AC)	120 V; 120/230V AC		230 V	230 V	230 V
Input current					
from load voltage L+ (without load), max.		110 mA; Current consumption of relay			
from load voltage L1 (without load), max.	10 mA	110 mA			
from backplane bus 5 V DC, max.	190 mA	40 mA	40 mA	100 mA	100 mA
Power losses					
Power loss, typ.	25 W	3.2 W	4.2 W	3.5 W	4.5 W
Digital outputs					
Number of digital outputs	32	8; Relays	8; Relays	8; Relays	16; Relays
Switching capacity of the outputs					
• on lamp load, max.	50 W	50 W	1 500 W; 230 V AC	1 500 W; 230 V AC	50 W; 230 V AC
Output voltage					
• for signal "1", min.	L1 (-0.8 V)				
Output current					
• for signal "1" rated value	1 A	2 A	5 A	5 A	2 A
• for signal "1" permissible range for 0 to 40 °C, min.	10 mA				
• for signal "1" permissible range for 0 to 40 °C, max.	1 A				
• for signal "1" permissible range for 40 to 60 °C, min.	10 mA				
• for signal "1" permissible range for 40 to 60 °C, max.	1 A				
• for signal "1" minimum load current	10 mA	5 mA	5 mA	10 mA	10 mA
• for signal "1" permissible surge current, max.	10 A; per group (for 2 AC cycles)				
• for signal "0" residual current, max.	2 mA				
Switching frequency					
• with resistive load, max.	10 Hz	2 Hz	2 Hz	2 Hz	1 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	2 Hz	2 Hz	2 Hz	1 Hz
• mechanical, max.		10 Hz	10 Hz	10 Hz	10 Hz
Aggregate current of outputs (per group)					
horizontal installation					
- up to 40 °C, max.	4 A				
- up to 60 °C, max.	3 A		5 A	5 A	8 A
vertical installation					
- up to 40 °C, max.	4 A		5 A	5 A	8 A

Technical specifications (continued)

Article number	6ES7322-1FL00-0AA0	6ES7322-1HF01-0AA0	6ES7322-1HF10-0AA0	6ES7322-5HF00-0AB0	6ES7322-1HH01-0AA0
	SM322, 32DO, 120/230V AC, 1A	SM322, 8DA, 24V DC/2A OR 230V AC/2A	SM322, 8DA, 24V DC/5A OR 230V AC/5A	SM322, 8DO RELAY, 24VDC, 120-230V AC, 5A	SM322, 16DO RELAY
Relay outputs					
• Rated input voltage of relay coil L+ (DC)		24 V; 110 mA	24 V		24 V
• Number of operating cycles, max.		300 000; 230 V AC: 100000; 120 V AC: 200000; 24 V DC: 300000 (at 2 A)	300 000; 300000 (24 V DC, at 2 A); 200000 (120 V AC, at 3 A); 100000 (230 V AC, at 3 A)	100 000; 100000 (24 V DC, at 5 A); 100000 (230 V AC, at 5 A)	100 000; 50000 (24 V DC, at 2 A); 700000 (120 V AC, at 2 A); 100000 (230 V AC, at 2 A)
Switching capacity of contacts					
- with inductive load, max.		2 A; 2 A (230 V AC), 2 A (24 V DC)	3 A; 3 A (230 V DC); 2 A (24 V AC)	5 A; 5 A (230 V DC); 5 A (24 V AC)	2 A; 2 A (230 V AC), 2 A (24 V DC)
- with resistive load, max.		2 A	8 A; 8 A (230 V DC); 5 A (24 V AC)	5 A; 5 A (230 V DC); 5 A (24 V AC)	2 A; 2 A (230 V AC), 2 A (24 V DC)
Cable length					
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m	600 m	600 m
Interrupts/diagnostics/ status information					
Alarms					
• Diagnostic alarm	No	No	No	Yes; Parameterizable	No
Diagnostic messages					
• Diagnostics	Yes	No	No	Yes	No
Galvanic isolation					
Galvanic isolation digital outputs					
• between the channels, in groups of	8	2	1	1	8
• between the channels and the backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Isolation					
Isolation checked with	4000 VDC	1500 V AC	2000 V AC	1500 V AC	1500 V AC
Connection method					
required front connector	20-pin	20-pin	40-pin	40-pin	20-pin
Dimensions					
Width	80 mm	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	117 mm	120 mm	120 mm	120 mm	120 mm
Weights					
Weight, approx.	500 g	190 g	320 g	320 g	250 g

SIMATIC S7-300 advanced controller

I/O modules

Digital modules

SM 322 digital output modules**Ordering data****Article No.****Article No.****SM 322 digital output modules**

incl. labeling strips, bus connector

8 outputs, 24 V DC, 2 A

6ES7322-1BF01-0AA0

16 outputs, 24 V DC, 0.5 A

6ES7322-1BH01-0AA016 outputs, 24 V DC, 0.5 A,
high speed**6ES7322-1BH10-0AA0**

32 outputs, 24 V DC, 0.5 A

6ES7322-1BL00-0AA0

64 outputs, 24 V DC, 0.3 A

6ES7322-1BP00-0AA0

Note:

6ES7392-4...0-0AA0 connection
cable and 6ES7392-1.N00-0AA0
terminal blocks necessary.64 outputs, 24 V DC, 0.3 A,
sink output**6ES7322-1BP50-0AA0**

Note:

6ES7392-4...0-0AA0 connection
cable and 6ES7392-1.N00-0AA0
terminal blocks necessary.8 outputs, 24 V DC, 0.5 A,
diagnostics-capable**6ES7322-8BF00-0AB0**

16 outputs, 24/48 V DC, 0.5 A

6ES7322-5GH00-0AB0

8 outputs, 48 to 125 V DC, 1.5 A

6ES7322-1CF00-0AA0

8 outputs, 120/230 V AC, 1 A

6ES7322-1FF01-0AA0

8 outputs, 120/230 V AC, 2 A

6ES7322-5FF00-0AB0

16 outputs, 120/230 V AC, 1 A

6ES7322-1FH00-0AA0

32 outputs, 120 V AC, 1 A

6ES7322-1FL00-0AA0

8 outputs, relay contacts, 2 A

6ES7322-1HF01-0AA0

8 outputs, relay contacts, 5 A

6ES7322-1HF10-0AA08 outputs, relay contacts, 5 A, with
RC filter, overvoltage protection**6ES7322-5HF00-0AB0**

16 outputs, relay contacts, 8 A

6ES7322-1HH01-0AA0**Front connectors**

20-pin, with screw contacts

- 1 unit
- 100 units

6ES7392-1AJ00-0AA0
6ES7392-1AJ00-1AB0

20-pin, with spring-loaded contacts

- 1 unit
- 100 units

6ES7392-1BJ00-0AA0
6ES7392-1BJ00-1AB0

40-pin, with screw contacts

- 1 unit
- 100 units

6ES7392-1AM00-0AA0
6ES7392-1AM00-1AB0

40-pin, with spring-loaded contacts

- 1 unit
- 100 units

6ES7392-1BM01-0AA0
6ES7392-1BM01-1AB0**S7-300 connecting cables**

For 64-channel modules; 2 units

1 m

6ES7392-4BB00-0AA0

2.5 m

6ES7392-4BC50-0AA0

5 m

6ES7392-4BF00-0AA0**Terminal blocks**

For 64-channel modules; 2 units

With screw contacts

6ES7392-1AN00-0AA0

With spring-loaded contacts

6ES7392-1BN00-0AA0**Front door, elevated design**e.g. for 32-channel modules;
for connecting 1.3 mm²/
16 AWG conductors**6ES7328-0AA00-7AA0****SIMATIC TOP connect**

See page 5/247

Bus connectors

1 unit (spare part)

6ES7390-0AA00-0AA0**Set of fuses for SM 322**10 fuses 8 A quick-response,
2 fuse holders;
for 6ES7 322-1FF01-0AA0,
6ES7 322-1FH00-0AA0**6ES7973-1HD00-0AA0**10 fuses 6.3 A;
for 6ES7 322-1CF00-0AA0**6ES7973-1GC00-0AA0****Labeling strips**

10 units (spare part)

for modules with 20-pin
front connector**6ES7392-2XX00-0AA0**for modules with 40-pin
front connector**6ES7392-2XX10-0AA0****Label cover**

10 units (spare part)

for modules with 20-pin
front connector**6ES7392-2XY00-0AA0**for modules with 40-pin
front connector**6ES7392-2XY10-0AA0****Labeling sheets for machine
inscription**for modules with 20-pin front
connector, DIN A4, for printing with
laser printer; 10 units

petrol

6ES7392-2AX00-0AA0

light-beige

6ES7392-2BX00-0AA0

yellow

6ES7392-2CX00-0AA0

red

6ES7392-2DX00-0AA0for modules with 40-pin front
connector, DIN A4, for printing with
laser printer; 10 units

petrol

6ES7392-2AX10-0AA0

light-beige

6ES7392-2BX10-0AA0

yellow

6ES7392-2CX10-0AA0

red

6ES7392-2DX10-0AA0**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**Current "Manual Collection" DVD
and the three subsequent updates

Overview

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

Technical specifications

Article number	6ES7323-1BH01-0AA0 SM323, 8DI/8DO, DC24V, 0,5A	6ES7323-1BL00-0AA0 SM323, 16DI/DO, DC24V, 0,5A	6ES7327-1BH00-0AB0 SM327, 8DI/8DX, DC24V, 0,5A
Product type designation			
Supply voltage			
Load voltage L+			
• Rated value (DC)	24 V	24 V	24 V
Input current			
from load voltage L+ (without load), max.	40 mA	80 mA	20 mA
from backplane bus 5 V DC, max.	40 mA	80 mA	60 mA
Power losses			
Power loss, typ.	3,5 W	6,5 W	3 W
Digital inputs			
Number of digital inputs	8	16	8; 8 hard-wired, 8 others individually parameterizable
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes
Number of simultaneously controllable inputs			
all mounting positions			
- up to 40 °C, max.	8	16	16
- up to 60 °C, max.	8	8	16
Input voltage			
• Type of input voltage	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-30 to +5V	-30 to +5V	-30 to +5V
• for signal "1"	13 to 30V	13 to 30V	
Input current			
• for signal "1", typ.	7 mA	7 mA	6 mA
Input delay (for rated value of input voltage)			
for standard inputs			
- at "0" to "1", min.	1,2 ms	1,2 ms	1,2 ms
- at "0" to "1", max.	4,8 ms	4,8 ms	4,8 ms
- at "1" to "0", min.	1,2 ms	1,2 ms	1,2 ms
- at "1" to "0", max.	4,8 ms	4,8 ms	4,8 ms
Cable length			
• shielded, max.	1 000 m	1 000 m	1 000 m
• Unshielded, max.	600 m	600 m	600 m