

SIMATIC S7-300 Advanced Controllers

I/O modules

Digital modules

SM 321 digital input modules

Overview



- Digital inputs
- For connecting standard switches and two-wire proximity switches (BEROs)

Technical specifications

Article number	6ES7321-1BH02-0AA0 SM321, 16DI, DC24V	6ES7321-1BH50-0AA0 SM321, 16DI, DC24V, SOURCE INPUT	6ES7321-1BL00-0AA0 SM321, 32DI, DC24V	6ES7321-1BP00-0AA0 SM321, 64 DI, DC 24V, 3MS, SINK/SOURCE	6ES7321-1BH10-0AA0 SM321, 16DI, DC24V, 0.05MS INPUT DELAY.
Supply voltage					
Load voltage L+					
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Input current					
from backplane bus 5 V DC, max.	10 mA	10 mA	15 mA	100 mA	110 mA
Power loss					
Power loss, typ.	3.5 W	3.5 W	6.5 W	7 W	3.8 W
Digital inputs					
Number of digital inputs	16	16	32	64	16
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes	Yes	Yes
Number of simultaneously controllable inputs					
horizontal installation					
- up to 40 °C, max.	16	16	32	64	16
- up to 60 °C, max.	16	16	16	32	16
vertical installation					
- up to 40 °C, max.	16	16	32	32	16
Input voltage					
• Type of input voltage	DC	DC	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V
• for signal "0"	-30 to +5V	-5 to +30V	-30 to +5V	-30 to +5V	-30 to +5V
• for signal "1"	13 to 30V	-13 to -30V	13 to 30V	13 to 30V	13 to 30V
Input current					
• for signal "1", typ.	7 mA	7 mA	7 mA	4.2 mA	7 mA
Input delay (for rated value of input voltage)					
for standard inputs					
- parameterizable	No	No	No	No	No
- at "0" to "1", min.	1.2 ms	1.2 ms	1.2 ms	1.2 ms	25 µs
- at "0" to "1", max.	4.8 ms	4.8 ms	4.8 ms	4.8 ms	75 µs
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

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Technical specifications (continued)

Article number	6ES7321-7BH01-0AB0 SM321, 16DI, 24V DC	6ES7321-1CH00-0AA0 SM321, 16 DI, AC/DC 24-48V, 1CH/COMMON	6ES7321-1CH20-0AA0 SM321, 16DI, DC48-125V	6ES7321-1FH00-0AA0 SM321, 16 DI, 120/230V AC
Supply voltage				
Load voltage L+				
• Rated value (DC)	24 V	24 V	48 V	
Load voltage L1				
• Rated value (AC)		24 V		230 V; 120/230 V AC; all load voltages must have the same phase.
Input current				
from load voltage L+ (without load), max.	90 mA			
from backplane bus 5 V DC, max.	130 mA	100 mA	40 mA	29 mA
Power loss				
Power loss, typ.	4 W	1.5 W; at 24 V; 2,8 W at 48 V	4.3 W	4.9 W
Digital inputs				
Number of digital inputs	16	16	16	16
Input characteristic curve in accordance with IEC 61131, type 1		Yes	Yes	Yes
Input characteristic curve in accordance with IEC 61131, type 2	Yes			
Number of simultaneously controllable inputs				
horizontal installation				
- up to 40 °C, max.	16	16	8	16
- up to 60 °C, max.	16	16	8; 6 to Ue 146 V	16
vertical installation				
- up to 40 °C, max.	16	16	8	16
Input voltage				
• Type of input voltage	DC	AC/DC	DC	AC
• Rated value (DC)	24 V	24 V; DC 24 or 48 V	48 V; 48 V DC to 125 V DC	
• Rated value (AC)		24 V; AC 24 or 48 V		230 V; 120/230V AC
• for signal "0"	-30 to +5V	-5V AC to +5V AC	-146 V DC to +15 V DC	0 to 40V
• for signal "1"	13 to 30V	14V AC to 60V AC	30 V DC to 146 V DC	79 to 264V
• Frequency range		0 to 63 Hz		47 ... 63 Hz
Input current				
• for signal "1", typ.	7 mA	2.7 mA	3.5 mA	6.5 mA; (120V, 60Hz), 16mA (230V, 50Hz)
Input delay (for rated value of input voltage)				
for standard inputs				
- parameterizable	Yes; 0.1 / 0.5 / 3 / 15 / 20 ms	No	No	No
- at "0" to "1", min.		16 ms	0.1 ms	25 ms
- at "0" to "1", max.		16 ms	3.5 ms	25 ms
Cable length				
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	600 m	600 m	600 m
Encoder				
Connectable encoders				
• 2-wire sensor	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	2 mA	1 mA	1 mA	2 mA
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	Yes	No	No	No

Technical specifications (continued)

Article number	6ES7321-7BH01-0AB0 SM321, 16DI, 24V DC	6ES7321-1CH00-0AA0 SM321, 16 DI, AC/DC 24-48V, 1CH/COMMON	6ES7321-1CH20-0AA0 SM321, 16DI, DC48-125V	6ES7321-1FH00-0AA0 SM321, 16 DI, 120/230V AC
Interrupts/diagnostics/status information				
Diagnostic functions	Yes; Parameterizable	No	No	No
Alarms				
• Diagnostic alarm	Yes; Parameterizable	No	No	No
• Hardware interrupt	Yes; Parameterizable	No	No	No
Potential separation				
Potential separation digital inputs				
• between the channels	No	Yes	No	No
• between the channels, in groups of 16	16	1	8	4
• between the channels and backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Isolation				
Isolation tested with	500 V DC	1500 V AC	1500 V DC	4 000 V DC
Connection method				
required front connector	20-pin	40-pin	20-pin	20-pin
Dimensions				
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.	200 g	260 g	200 g	240 g

Article number	6ES7321-1EL00-0AA0 SM321, 32DI, AC120V	6ES7321-1FF01-0AA0 SM321, 8DI, AC120/230V	6ES7321-1FF10-0AA0 SM321, 8 DI, AC/DC 120/230V, 1CH/COMMON
Load voltage L1			
• Rated value (AC)	120 V	230 V; 120/230V AC	230 V; 120/230 V AC; all load voltages must have the same phase.
Input current			
from backplane bus 5 V DC, max.	16 mA	29 mA	100 mA
Power loss			
Power loss, typ.	4 W	4.9 W	4.9 W
Digital inputs			
Number of digital inputs	32	8	8
Input characteristic curve in accordance with IEC 61131, type 1		Yes	Yes
Input characteristic curve in accordance with IEC 61131, type 2	Yes		
Number of simultaneously controllable inputs			
horizontal installation			
- up to 40 °C, max.	32		
- up to 60 °C, max.	24	8	8
vertical installation			
- up to 40 °C, max.	32	8	8
Input voltage			
• Type of input voltage	AC	AC	AC
• Rated value (AC)	120 V	230 V; 120/230V AC	120 V; 120/230V AC
• for signal "0"	0 to 20V	0 to 40V	0 to 40V
• for signal "1"	74 to 132V	79 to 264V	79 to 264V
• Frequency range	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz
Input current			
• for signal "1", typ.	21 mA	6.5 mA; (120 V); 11 mA (230 V)	7.5 mA; (120 V); 17.3 mA (230 V)

Ordering data	Article No.		Article No.
SM 321 digital input modules		Front door, elevated design	6ES7328-0AA00-7AA0
incl. labeling strips, bus connector		e.g. for 32-channel modules; for connecting 1.3 mm ² /16 AWG conductors; circuit diagram and nameplates in petrol	
16 inputs, 24 V DC	6ES7321-1BH02-0AA0	SIMATIC TOP connect	See page 5/248
16 inputs, 24 V DC, active low	6ES7321-1BH50-0AA0	Bus connectors	6ES7390-0AA00-0AA0
32 inputs, 24 V DC	6ES7321-1BL00-0AA0	1 unit (spare part)	
64 inputs, 24 V DC, active high/low	6ES7321-1BP00-0AA0	Labeling strips	
Note: 6ES7392-4...0-0AA0 connecting cable and 6ES7392-1.N00-0AA0 terminal blocks necessary.		10 units (spare part)	
16 inputs, 24 to 48 V DC	6ES7321-1CH00-0AA0	for modules with 20-pin front connector	6ES7392-2XX00-0AA0
16 inputs, 48 to 125 V DC	6ES7321-1CH20-0AA0	for modules with 40-pin front connector	6ES7392-2XX10-0AA0
16 inputs, 24 V DC, for isochronous mode	6ES7321-1BH10-0AA0	Label cover	
32 inputs, 120 V AC	6ES7321-1EL00-0AA0	10 units (spare part)	
8 inputs, 120/230 V AC	6ES7321-1FF01-0AA0	for modules with 20-pin front connector	6ES7392-2XY00-0AA0
8 inputs, 120/230 V AC, single root	6ES7321-1FF10-0AA0	for modules with 40-pin front connector	6ES7392-2XY10-0AA0
16 inputs, 120/230 V AC	6ES7321-1FH00-0AA0	Labeling sheets for machine inscription	
16 inputs, 24 V DC, for isochronous mode, diagnostics-capable	6ES7321-7BH01-0AB0	for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Front connector		Petrol	6ES7392-2AX00-0AA0
20-pin, with screw contacts		Light beige	6ES7392-2BX00-0AA0
• 1 unit	6ES7392-1AJ00-0AA0	Yellow	6ES7392-2CX00-0AA0
• 100 units	6ES7392-1AJ00-1AB0	Red	6ES7392-2DX00-0AA0
20-pin, with spring-loaded contacts		for modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units	
• 1 unit	6ES7392-1BJ00-0AA0	Petrol	6ES7392-2AX10-0AA0
• 100 units	6ES7392-1BJ00-1AB0	Light beige	6ES7392-2BX10-0AA0
40-pin, with screw contacts		Yellow	6ES7392-2CX10-0AA0
• 1 unit	6ES7392-1AM00-0AA0	Red	6ES7392-2DX10-0AA0
• 100 units	6ES7392-1AM00-1AB0	SIMATIC Manual Collection	6ES7998-8XC01-8YE0
40-pin, with spring-loaded contacts		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	
• 1 unit	6ES7392-1BM01-0AA0	SIMATIC Manual Collection update service for 1 year	6ES7998-8XC01-8YE2
• 100 units	6ES7392-1BM01-1AB0	Current "Manual Collection" DVD and the three subsequent updates	
S7-300 connecting cable			
For 64-channel modules; 2 units			
1 m	6ES7392-4BB00-0AA0		
2.5 m	6ES7392-4BC50-0AA0		
5 m	6ES7392-4BF00-0AA0		
Terminal block			
For 64-channel modules; 2 units			
With screw contacts	6ES7392-1AN00-0AA0		
With spring-loaded contacts	6ES7392-1BN00-0AA0		