SIEMENS

SIMATIC

S7-300
S7-300 Module data

Equipment Manual

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Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Siemens AG
Digital Industries
Postfach 48 48
90026 NÜRNBERG
GERMANY

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M-CPUs	Order number
CPU 315-2 PN/DP	6ES7315-2EG10-0AB0
	6ES7315-2EH13-0AB0
	6ES7315-2EH14-0AB0
CPU 317-2 PN/DP	6ES7317-2EJ10-0AB0
	6ES7317-2EK13-0AB0
	6ES7317-2EK14-0AB0
CPU 319-3 PN/DP	6ES7318-3EL00-0AB0
	6ES7318-3EL01-0AB0

F-CPUs	Order number
CPU 315F-2 DP	6ES7315-6FF0x-0AB0
CPU 317F-2 DP	6ES7317-6FF0x-0AB0
CPU 315F-2 PN/DP	6ES7315-2FH1x-0AB0
	6ES7315-2FJ14-0AB0
CPU 317F-2 PN/DP	6ES7317-2FJ10-0AB0
	6ES7317-2FK13-0AB0
	6ES7317-2FK14-0AB0
CPU 319F-3 PN/DP	6ES7318-3FL00-0AB0
	6ES7318-3FL01-0AB0

T-CPUs	Order number
CPU 315T-2 DP	6ES7315-6TG10-0AB0
CPU315T-3 PN/DP	6ES7315-7TJ10-0AB0
CPU 317T-2 DP	6ES7317-6TJ10-0AB0
CPU317TF-2 DP	6ES7317-6TF14-0AB0
CPU317T-3 PN/DP	6ES7317-7TK10-0AB0
CPU317TF-3 PN/DP	6ES7317-7UL10-0AB0

C7-CPUs	Order number
C7-613	6ES7613-1CA01-0AE3
C7-635 Touch	6ES7635-2EB01-0AE3
C7-635 Key	6ES7635-2EC01-0AE3
C7-636 Touch	6ES7636-2EB00-0AE3
C7-636 Key	6ES7636-2EC00-0AE3

⚠ WARNING

Use of the module

This module must be configured in a STEP 7 project in which the correct address assignment and allocation of the input/output point is ensured. Using the module without having first carried out this configuration work can lead to machines or processes operating in an unexpected manner.

If machines or processes do run in an unexpected manner, this can result in death, serious injury, and/or material damage.

3.7 Digital input module SM 321; DI 32 x DC 24 V; (6ES7321-1BL00-0AA0)

Order number: "Standard module"

6ES7321-1BL00-0AA0

Order number: "SIPLUS S7-300 module"

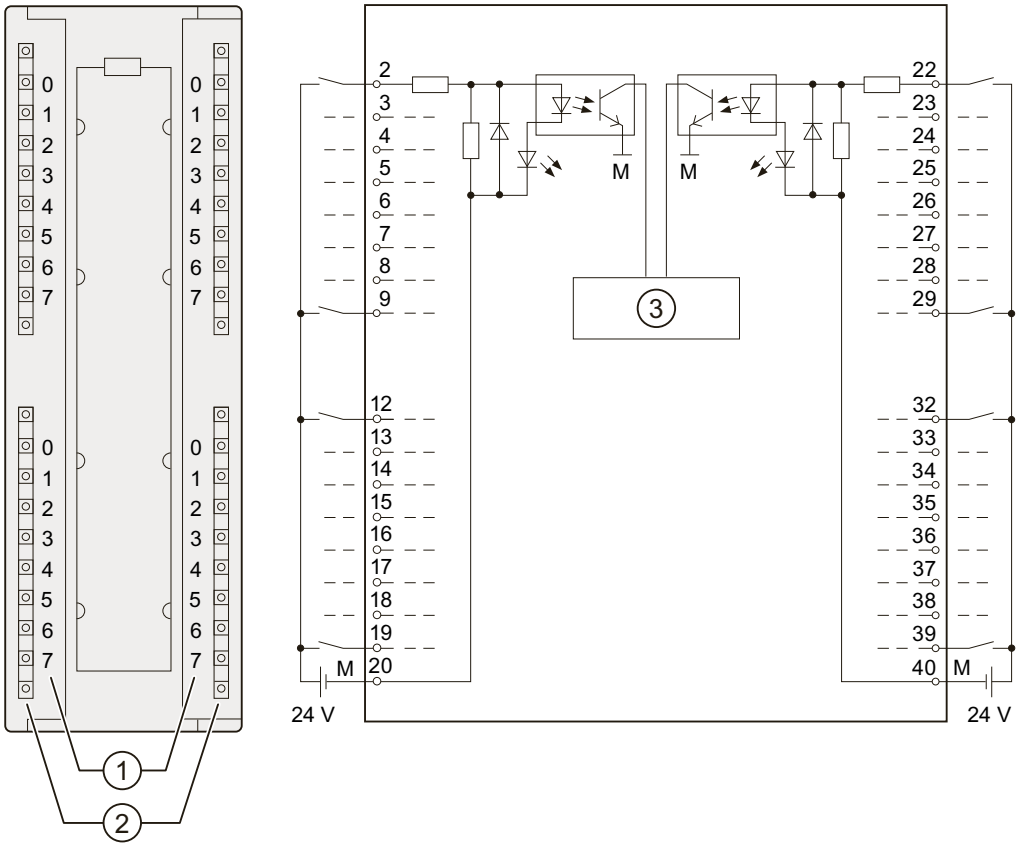
6AG1321-1BL00-2AA0

Properties

Properties of SM 321; DI 32 x DC 24 V:

- 32 inputs, isolated in groups of 16
- Rated input voltage 24 V DC
- Suitable for switches and 2-/3-/4-wire proximity switches (BEROs)

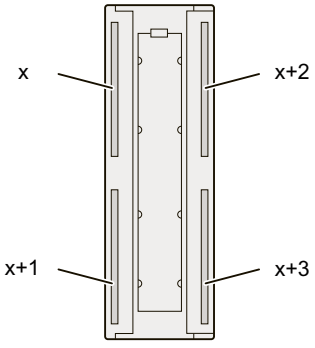
Wiring and block diagram of SM 321; DI 32 x DC 24 V



① Channel number
② Status display - green
③ Backplane bus interface

Terminal assignment of SM 321; DI 32 x DC 24 V

The figure below shows how channels are assigned to addresses (input byte x up to input byte x+3).



Technical specifications of SM 321; DI 32 x DC 24 V

Technical specifications	
Dimensions and weight	
Dimensions W x H x D (mm)	40 x 125 x 120
Weight	ca. 260 g
Module-specific data	
Supports isochronous mode	No
Number of inputs	32
Cable length • Unshielded • Shielded	 Max. 600 m Max. 1000 m
Front connector	40-pin
Voltages, currents, potentials	
Number of simultaneously controlled inputs • Horizontal mounting position to 40 °C to 60 °C • Vertical arrangement to 40 °C	 32 16 32
Electrical isolation • between channels and the backplane bus • Between channels – in groups of	 yes Yes 16
Isolation test voltage	500 V DC
Current consumption • From the backplane bus	 Max. 15 mA
Power loss of the module	Typ. 6.5 W
Status, interrupts, diagnostics	
Status display	Green LED per channel
Interrupts	None
Diagnostic functions	None
Encoder selection data	
Input voltage • Rated value • "1" signal • "0" signal	 24 V DC 13 to 30 V - 30 to + 5 V
Input current • "1" signal	 Typ. 7 mA
Input delay • "0" to "1" transition • "1" to "0" transition	 1.2 ms to 4.8 ms 1.2 ms to 4.8 ms

M-CPUs	Order number
CPU 315-2 DP	6ES7315-2AF0x-0AB0
	6ES7315-2AG10-0AB0
	6ES7315-2AH14-0AB0
CPU 316-2 DP	6ES7316-2AG00-0AB0
CPU 317-2 DP	6ES7317-2AJ10-0AB0
	6ES7317-2AK14-0AB0
CPU315-2 PN/DP	6ES7315-2EG10-0AB0
	6ES7315-2EH13-0AB0
	6ES7315-2EH14-0AB0
CPU317-2 PN/DP	6ES7317-2EJ10-0AB0
	6ES7317-2EK13-0AB0
	6ES7317-2EK14-0AB0
CPU 319-3 PN/DP	6ES7318-3EL00-0AB0
	6ES7318-3EL01-0AB0

F-CPUs	Order number
CPU 315F-2 DP	6ES7315-6FF0x-0AB0
CPU 317F-2 DP	6ES7317-6FF0x-0AB0
CPU315F-2 PN/DP	6ES7315-2FH1x-0AB0
	6ES7315-2FJ14-0AB0
CPU 317F-2 PN/DP	6ES7317-2FJ10-0AB0
	6ES7317-2FK13-0AB0
	6ES7317-2FK14-0AB0
CPU 319F-3 PN/DP	6ES7318-3FL00-0AB0
	6ES7318-3FL01-0AB0

T-CPUs	Order number
CPU 315T-2 DP	6ES7315-6TG10-0AB0
CPU315T-3 PN/DP	6ES7315-7TJ10-0AB0
CPU317T-2 DP	6ES7317-6TJ10-0AB0
CPU317TF-2 DP	6ES7317-6TF14-0AB0
CPU317T-3 PN/DP	6ES7317-7TK10-0AB0
CPU317TF-3 PN/DP	6ES7317-7UL10-0AB0

C7-CPUs	Order number
C7-613	6ES7613-1CA01-0AE3
C7-635 Touch	6ES7635-2EB01-0AE3

C7-CPUs	Order number
C7-635 Key	6ES7635-2EC01-0AE3
C7-636 Touch	6ES7636-2EB00-0AE3
C7-636 Key	6ES7636-2EC00-0AE3

⚠ WARNING

Use of the module

This module must be configured in a STEP 7 project in which the correct address assignment and allocation of the input/output point is ensured. Using the module without having first carried out this configuration work can lead to machines or processes operating in an unexpected manner.

If machines or processes do run in an unexpected manner, this can result in death, serious injury, and/or material damage.

3.21 Digital output module SM 322; DO 32 x DC 24 V/ 0.5 A; (6ES7322-1BL00-0AA0)

Order number

6ES7322-1BL00-0AA0

Properties

Properties of SM 322; DO 32 **x** DC 24 V/0.5 A:

- 32 outputs, electrically isolated in groups of 8
- Output current 0.5 A
- Rated load voltage 24 V DC
- Suitable for solenoid valves, DC contactors and signal lamps

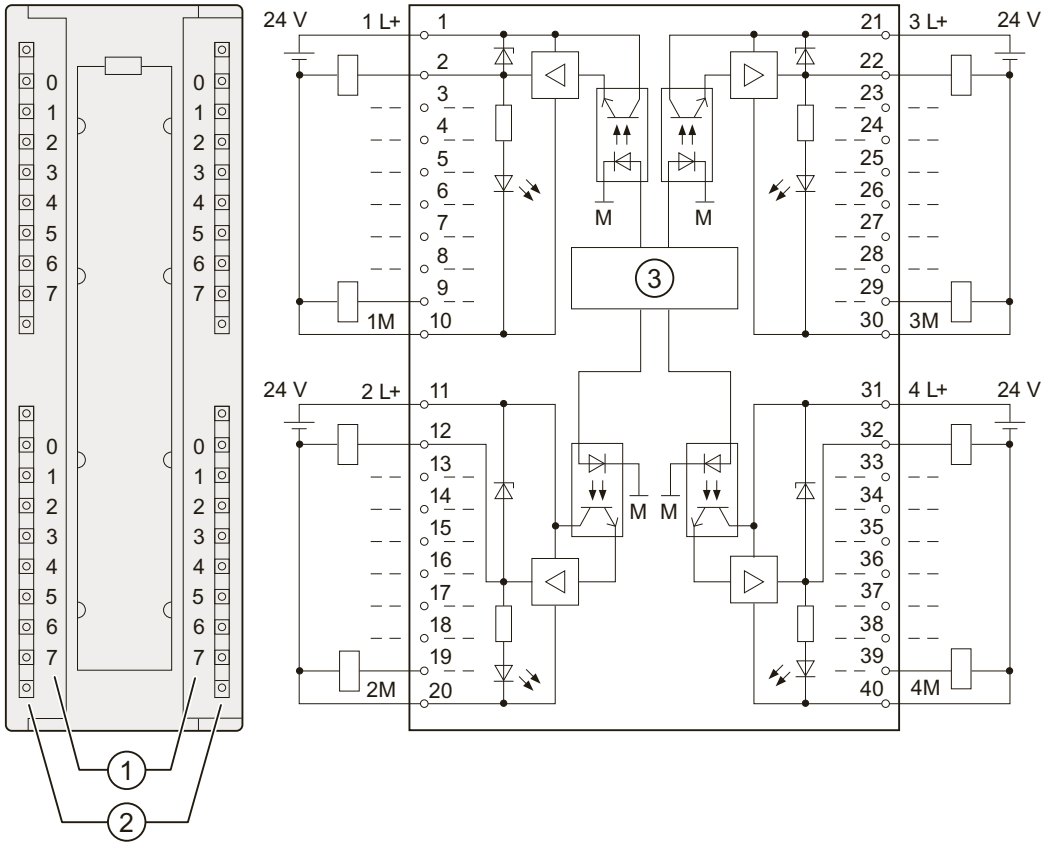
Use of the module with high-speed counters

Please note when using the module in combination with high-speed counters:

NOTE

When using a mechanical contact to switch on the 24-V power supply to SM 322; DO 32 x DC 24 V/0.5 A, its outputs will carry "1" signal for the duration of ca. 50 µs due to the circuit structure.

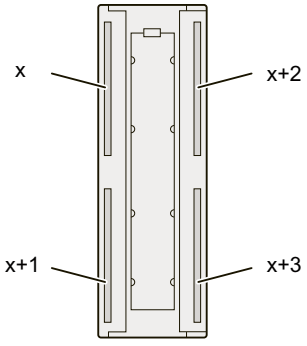
Wiring and block diagram of SM 322; DO 32 x DC 24 V/ 0.5 A



① Channel number
② Status display - green
③ Backplane bus interface

Terminal assignment

The figure below shows the channel addressing (output byte x to output byte x+3).



SM 322; DO 32 x DC 24 V/ 0.5 A - Technical specifications

Technical specifications	
Dimensions and weight	
Dimensions W x H x D (mm)	40 x 125 x 117
Weight	ca. 260 g
Module-specific data	
Supports isochronous mode	no
Number of outputs	32
Cable length • unshielded • shielded	 max. 600 m max. 1000 m
Voltages, currents, electrical potentials	
Rated load voltage L+	24 V DC
Total current of outputs (per group)	
• horizontal mounting position to 40 °C to 60 °C	 max. 4 A max. 3 A
• vertical mounting position to 40 °C	max. 2 A
Electrical isolation • between channels and the backplane bus	 yes
• between channels in groups of	yes 8
Isolation test voltage	500 V DC
Current consumption • from the backplane bus • from load voltage L+ (no-load)	 max. 110 mA max. 160 mA
Power loss of the module	typ. 6.6 W
Status, interrupts, diagnostics	
Status display	green LED per channel
Interrupts	none
Diagnostic functions	none
Actuator selection data	
Output voltage • "1" signal	 min. L + (- 0.8 V)
Output current	
• "1" signal Rated value Permitted range	 0.5 A 5 mA to 0.6 A
• "0" signal (residual current)	max. 0.5 mA
Output delay (resistive load)	
• "0" to "1" transition	max. 100 µs
• "1" to "0" transition	max. 500 µs

3.37 Digital IO module SM 323; DI 16/DO 16 x DC 24 V/0.5 A; (6ES7323-1BL00-0AA0)

Order number

6ES7323-1BL00-0AA0

Properties

Properties of SM 323; DI 16/DO 16 x DC 24 V/0.5 A:

- 16 inputs, electrically isolated in groups of 16
- 16 outputs, electrically isolated in groups of 8
- Rated input voltage 24 V DC
- Rated load voltage 24 V DC
- Inputs suitable for switches and 2-/3-/4-wire proximity switches (BEROs)
- Outputs capable of driving solenoid valves, DC contactors and indicator lights

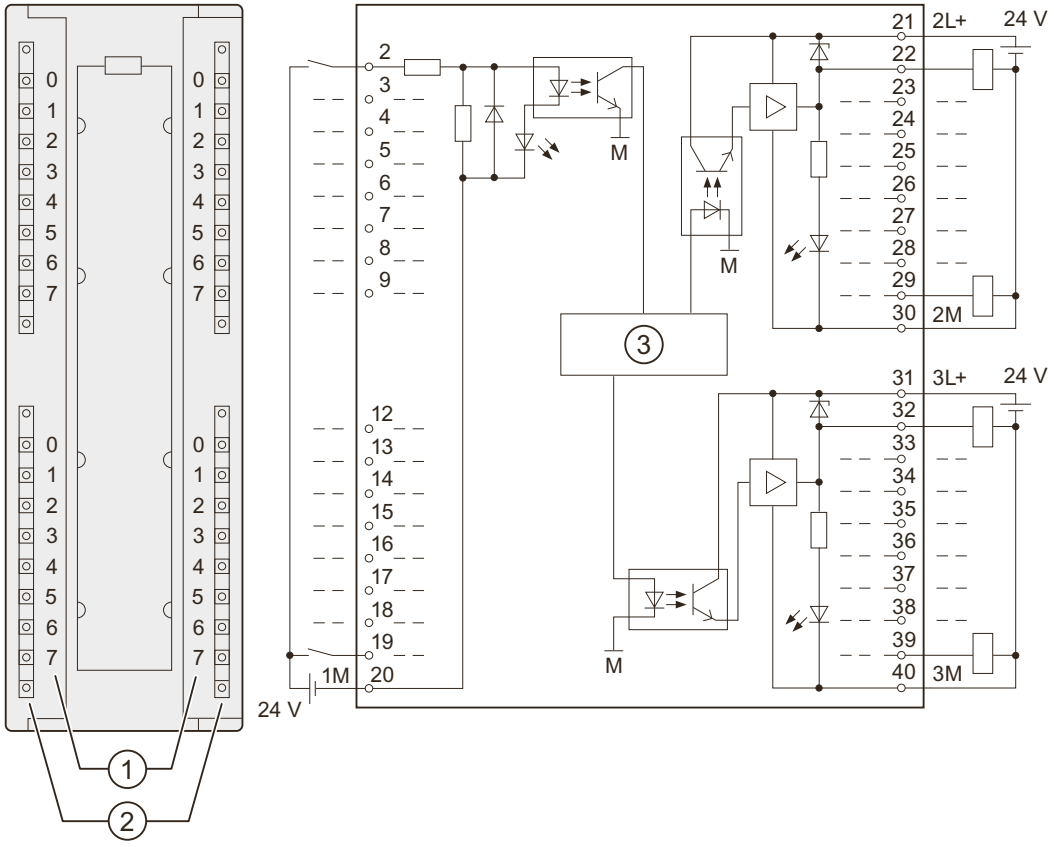
Use of the module with high-speed counters

Please note when using the module in combination with high-speed counters:

NOTE

When using a mechanical contact to switch on the 24-V power supply to SM 323; DI 16/DO 16 x DC 24 V/0.5 A, its outputs will carry "1" signal for the duration of ca. 50 µs, due to the circuit structure.

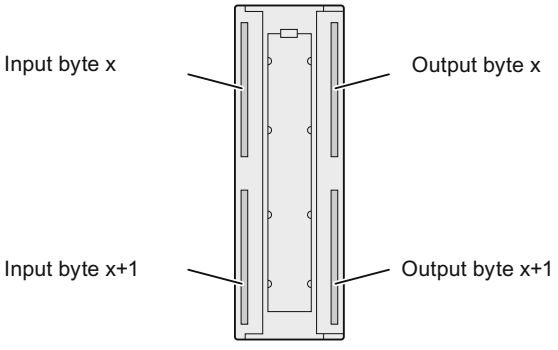
Wiring and block diagram of SM 323; DI 16/DO 16 x DC 24 V/0.5 A



① Channel number
② Status displays - green
③ Backplane bus interface

Terminal assignment

The diagram below shows the IO addressing of channels.



SM 323; DI 16/DO 16 x DC 24 V/0.5 A - Technical specifications

Technical specifications	
Dimensions and weight	
Dimensions W x H x D (mm)	40 x 125 x 117

Technical specifications	
Weight	ca. 260 g
Module-specific data	
Isochronous	no
Number of inputs	16
Number of outputs	16
Cable length • unshielded • shielded	 max. 600 m max. 1000 m
Voltages, currents, electrical potentials	
Rated load voltage L+	24 V DC
Number of simultaneously controlled inputs	
• horizontal mounting position to 40 °C to 60 °C	 16 8
• vertical mounting position to 40 °C	16
Total current of outputs (per group)	
• horizontal mounting position to 40 °C to 60 °C	 max. 4 A max. 3 A
• vertical mounting position to 40 °C	max. 2 A
Electrical isolation • between channels and the backplane bus	 yes
• between channels Inputs in groups of Outputs in groups of	yes 16 8
Isolation test voltage	500 V DC
Current consumption • from the backplane bus • from load voltage L+ (no-load)	max. 80 mA max. 80 mA
Power loss of the module	typ. 6.5 W
Status, interrupts, diagnostics	
Status display	green LED per channel
Interrupts	none
Diagnostic functions	none
Encoder selection data	
Input voltage • Rated value • "1" signal • "0" signal	 24 V DC 13 V to 30 V - 30 V to + 5 V
Input current • "1" signal	 typ. 7 mA

Technical specifications	
Input delay • "0" to "1" transition • "1" to "0" transition	 1.2 ms to 4.8 ms 1.2 ms to 4.8 ms
Input characteristics	to IEC 61131, type 1
Connection of 2-wire BEROs • Permissible quiescent current	supported max. 1.5 mA
Wiring of the signal transmitters	using a 40-pin front connector
Actuator selection data	
Output voltage • "1" signal	 min. L + (- 0.8 V)
Output current	
• "1" signal Rated value Permitted range	 0.5 A 5 mA to 0.6 A
• "0" signal (residual current)	max. 0.5 mA
Output delay (resistive load)	
• "0" to "1" transition • "1" to "0" transition	Max. 100 µs Max. 500 µs
Load resistance range	48 Ω to 4 kΩ
Lamp load	Max. 5 W
Wiring two outputs in parallel	
• for redundant load control	supported (only outputs of the same group)
• for performance increase	not supported
Control of a digital input	supported
Switching frequency • with resistive load • with inductive load to IEC 947-5-1, DC 13 • with lamp load	 max. 100 Hz max. 0.5 Hz max. 10 Hz
Internal limiting of the inductive shutdown voltage to	typ. L + (- 53 V)
Short circuit-proof output	yes, electronic
• Threshold	typ. 1 A
Wiring of the actuators	using a 40-pin front connector

3.38 Digital IO module SM 323; DI 8/DO 8 x DC 24 V/0.5 A; (6ES7323-1BH01-0AA0)

Order number: "Standard module"

6ES7323-1BH01-0AA0

Order number: "SIPLUS S7-300 module"

6AG1323-1BH01-2AA0

Properties

Properties of SM 323; DI 8/DO 8 x DC 24 V/0.5 A:

- 8 inputs, electrically isolated in groups of 8
- 8 outputs, electrically isolated in groups of 8
- Rated input voltage 24 V DC
- Rated load voltage 24 V DC
- Inputs suitable for switches and 2-/3-/4-wire proximity switches (BEROs)
- Outputs capable of driving solenoid valves, DC contactors and indicator lights

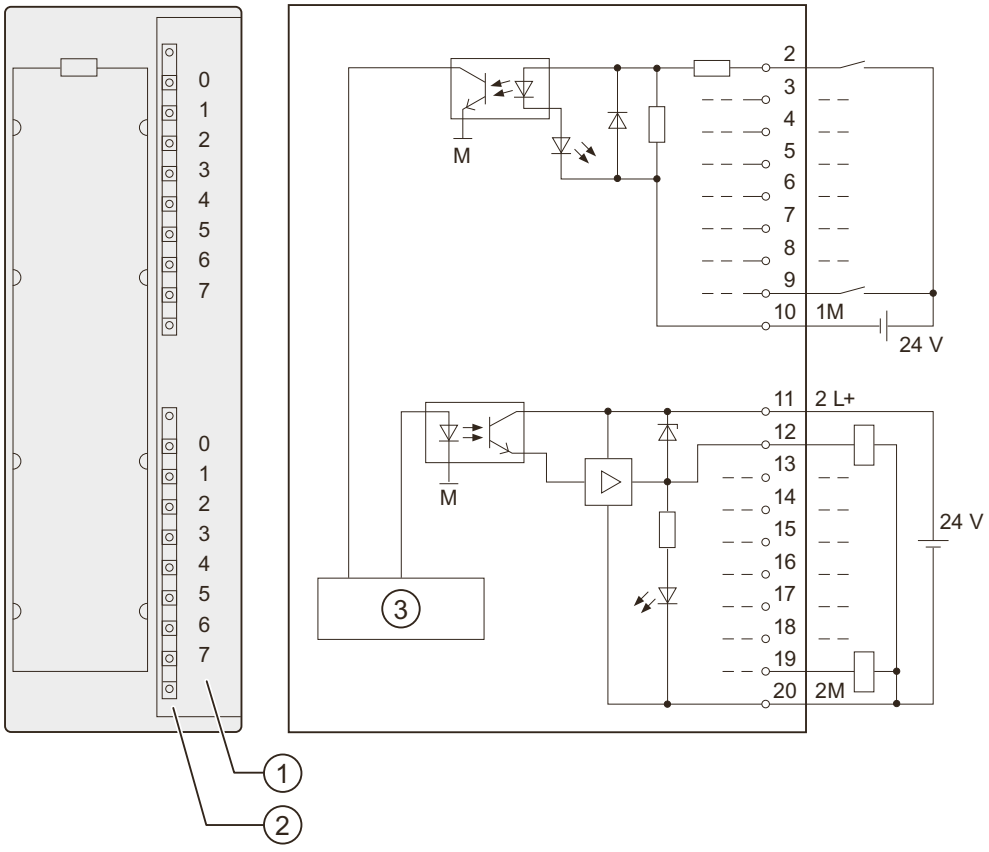
Use of the module with high-speed counters

Please note when using the module in combination with high-speed counters:

NOTE

When using a mechanical contact to switch on the 24-V power supply to SM 323; DI 8/DO 8 x DC 24 V/0.5 A, its outputs will carry "1" signal for the duration of ca. 50 µs, due to the circuit structure.

Wiring and block diagram of SM 323; DI 8/DO 8 x DC 24 V/0.5 A



① Channel number
② Status displays - green
③ Backplane bus interface

SM 323; DI 8/DO 8 x DC 24 V/0.5 A - Technical specifications

Technical specifications	
Dimensions and weight	
Dimensions W x H x D (mm)	40 x 125 x 117
Weight	ca. 200 g
Module-specific data	
Supports isochronous mode	no
Number of inputs	8
Number of outputs	8
Cable length • unshielded • shielded	 max. 600 m max. 1000 m
Voltages, currents, electrical potentials	
Rated load voltage L+	24 V DC
Number of simultaneously controlled inputs	
• horizontal mounting position to 60 °C • vertical mounting position to 40 °C	8 8
Total current of outputs (per group)	
• horizontal mounting position to 60 °C • vertical mounting position to 40 °C	max. 4 A max. 4 A
Electrical isolation	
• between channels and the backplane bus	yes
• between channels Inputs in groups of Outputs in groups of	yes 8 8
Isolation test voltage	500 V DC
Current consumption • from the backplane bus • from load voltage L+ (no-load)	 max. 40 mA max. 40 mA
Power loss of the module	typ. 3.5 W
Status, interrupts, diagnostics	
Status display	green LED per channel
Interrupts	none
Diagnostic functions	none
Encoder selection data	
Input voltage • Rated value • "1" signal • "0" signal	 24 V DC 13 V to 30 V - 30 V to + 5 V

Spare parts and accessories for S7-300 modules

D

Spare parts

The table below lists the S7-300 parts you can order separately or later.

Table D-1 Accessories and spare parts

S7-300 parts	Order number
Bus connector	6ES7390-0AA00-0AA0
Connection comb between power supply and CPU (older generation, before 2003)	6ES7390-7BA00-0AA0
Labeling strips for • Modules with 20-pin front connector: – (petrol) – (light beige) – (yellow) – (red)	 6ES7392-2AX00-0AA0 6ES7392-2BX00-0AA0 6ES7392-2CX00-0AA0 6ES7392-2DX00-0AA0
Labeling strips for • Modules with 40-pin front connector: – (petrol) – (light beige) – (yellow) – (red)	 6ES7392-2AX10-0AA0 6ES7392-2BX10-0AA0 6ES7392-2CX10-0AA0 6ES7392-2DX10-0AA0
• Instructions for printing labeling strips using print templates	On the Internet (http://www.siemens.com/automation/service&support) Entry ID: 11978022
Slot number plate	6ES7912-0AA00-0AA0
Front connector 20-pin • Screw terminal technology (1 unit) • Screw technology (100 units) • Spring clamp technology (1 unit) • Spring clamp technology (100 units)	 6ES7392-1AJ00-0AA0 6ES7392-1AJ00-1AB0 6ES7392-1BJ00-0AA0 6ES7392-1BJ00-1AB0
Front connector 40-pin • Screw technology (1 unit) • Screw technology (100 units) • Spring clamp technology (1 unit) • Spring clamp technology (100 units)	 6ES7392-1AM00-0AA0 6ES7392-1AM00-1AB0 6ES7392-1BM01-0AA0 6ES7392-1BM01-1AB0
Front connector for 2 ribbon cable connections • screw terminal technology • Spring clamp technology	 6ES7921-3AB00-0AA0 6ES7921-3AA00-0AA0
Front connector for 4 ribbon cable connections • Spring clamp technology	 6ES7921-3AA20-0AA0