

SIEMENS

SIMATIC

S7-1200

S7-1200 1221, 1222, and 1223 Signal Boards

Product Information

Product Information

New S7-1200 digital signal boards available

The following S7-1200 digital signal boards have been added to the S7-1200 family. The order numbers for these signal boards are shown below.

| Signal Board | Order Number |
|---|---------------------|
| SB 1221 Digital Input 4 x 24 VDC, 200 kHz | 6ES7 221-3BD30-0XB0 |
| SB 1222 Digital Output 4 x 24 VDC, 200 kHz | 6ES7 222-1BD30-0XB0 |
| SB 1223 Digital Input 2 x 24 VDC / Digital Output 2 x 24 VDC, 200 kHz | 6ES7 223-3BD30-0XB0 |
| SB 1221 Digital Input 4 x 5 VDC, 200 kHz | 6ES7 221-3AD30-0XB0 |
| SB 1222 Digital Output 4 x 5 VDC, 200 kHz | 6ES7 222-1AD30-0XB0 |
| SB 1223 Digital Input 2 x 5 VDC / Digital Output 2 x 5 VDC, 200 kHz | 6ES7 223-3AD30-0XB0 |

This product information includes details about the characteristics and technical specifications of these digital signal boards. Refer to the SIMATIC S7-1200 Programmable Controller System Manual for more information about the S7-1200 product family.

| NOTICE |
|---|
| <p>When switching frequencies above 20 kHz, it is important that the digital inputs receive a square wave. Consider the following options to improve the signal quality to the inputs:</p> <ul style="list-style-type: none">• Minimize the cable length• Change a driver from a sink only driver to a sinking and sourcing driver• Change to a higher quality cable• Reduce the circuit/components from 24 V to 5 V• Add an external load at the input |

Additional assistance

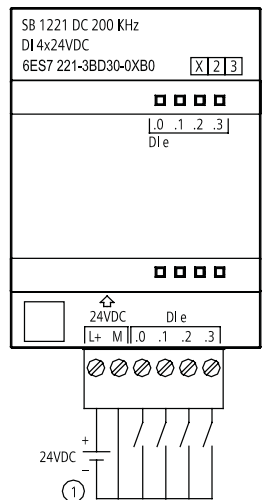
For assistance in answering technical questions, for training on these products, or for ordering, contact your Siemens distributor or sales office.

S7-1200 SB 1221 Digital Input Specifications

| Model | SB 1221 DI 4 x 24 VDC, 200 kHz | SB 1221 DI 4 x 5 VDC, 200 kHz |
|------------------------------------|--|-------------------------------|
| Order number (MLFB) | 6ES7 221-3BD30-0XB0 | 6ES7 221-3AD30-0XB0 |
| General | | |
| Dimensions W x H x D (mm) | 38 x 62 x 21 | |
| Weight | 35 grams | 35 grams |
| Power dissipation | 1.5 W | 1.0 W |
| Current consumption (SM Bus) | 40 mA | 40 mA |
| Current consumption (24 VDC) | 7 mA / input + 20 mA | 15 mA / input + 15 mA |
| Digital inputs | | |
| Number of inputs | 4 | |
| Type | Source | |
| Rated voltage | 24 VDC at 7 mA, nominal | 5 VDC at 15 mA, nominal |
| Continuous permissible voltage | 28.8 VDC | 6 VDC |
| Surge voltage | 35 VDC for 0.5 sec. | 6 V |
| Logic 1 signal (min.) | L+ minus 10 VDC at 2.9 mA | L+ minus 2.0 VDC at 5.1 mA |
| Logic 0 signal (max.) | L+ minus 5 VDC at 1.4 mA | L+ minus 1.0 VDC at 2.2 mA |
| HSC clock input rates (max.) | Single phase: 200 kHz Quadrature phase: 160 kHz | |
| Isolation (field side to logic) | 500 VAC for 1 minute | |
| Isolation groups | 1 | |
| Filter times | 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms; Selectable in groups of 4 | |
| Number of inputs on simultaneously | 4 | |
| Cable length (meters) | 50 shielded twisted pair | |

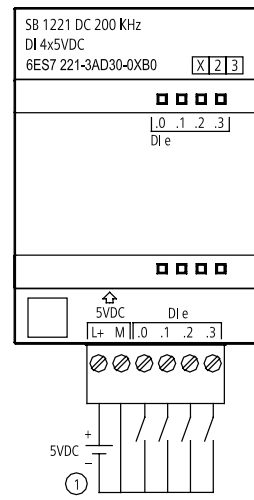
SB 1221 Wiring Diagrams

SB 1221 DI 4 x 24 VDC, 200 kHz



6ES7 221-3BD30-0XB0

SB 1221 DI 4 x 5 VDC, 200 kHz



6ES7 221-3AD30-0XB0

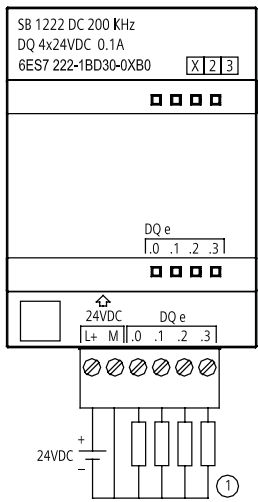
① Supports sourcing inputs only

S7-1200 SB 1222 Digital Output Specifications

| Model | SB 1222 DQ 4 x 24 VDC, 200 kHz | SB 1222 DQ 4 x 5 VDC, 200 kHz |
|-------------------------------------|--|--|
| Order number (MLFB) | 6ES7 222-1BD30-0XB0 | 6ES7 222-1AD30-0XB0 |
| General | | |
| Dimensions W x H x D (mm) | 38 x 62 x 21 | |
| Weight | 35 grams | 35 grams |
| Power dissipation | 0.5 W | 0.5 W |
| Current consumption (SM Bus) | 35 mA | 35 mA |
| Current consumption (24 VDC) | 15 mA | 15 mA |
| Digital Outputs | | |
| Number of outputs | 4 | |
| Output type | Solid state - MOSFET sink and source | |
| Voltage range | 20.4 to 28.8 VDC | 4.25 to 6.0 VDC |
| Logic 1 signal at max. current | L+ minus 1.5 V | L+ minus 0.7 V |
| Logic 0 signal at max. current | 1.0 VDC, max. | 0.2 VDC, max. |
| Current (max.) | 0.1 A | |
| Lamp load | -- | |
| On state contact resistance | 11 Ω max. | 7 Ω max. |
| Off state resistance | 6 Ω max. | 0.2 Ω max. |
| Leakage current per point | -- | |
| Pulse Train Output rate | 200 kHz max., 2 Hz min. | |
| Surge current | 0.11 A | 0.11 A |
| Overload protection | no | |
| Isolation (field side to logic) | 500 VAC for 1 minute | |
| Isolation groups | 1 | |
| Currents per common | 0.4 A | 0.4 A |
| Inductive clamp voltage | None | |
| Switching delay | 1.5 μ s + 300 ns rise 1.5 μ s + 300 ns fall | 200 ns + 300 ns rise 200 ns + 300 ns fall |
| Behavior on RUN to STOP | Last value or substitute value (default value 0) | |
| Number of outputs on simultaneously | 4 | |
| Cable length (meters) | 50 shielded twisted pair | |

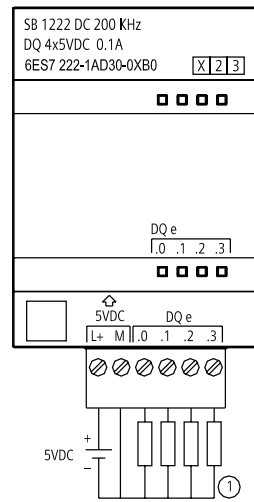
SB 1222 Wiring Diagrams

SB 1222 DQ 4 x 24 VDC, 200 kHz



6ES7 222-1BD30-0XB0

SB 1222 DQ 4 x 5 VDC, 200 kHz



6ES7 222-1AD30-0XB0

① For sourcing outputs, connect "Load" to "-" (shown). For sinking outputs, connect "Load" to "+".

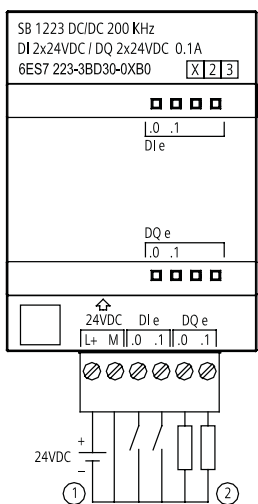
S7-1200 SB 1223 Digital Input/Output Specifications

| Model | SB 1223 DI 2 x 24 VDC / DQ 2 x 24 VDC, 200 kHz | SB 1223 DI 2 x 5 VDC / DQ 2 x 5 VDC, 200 kHz |
|------------------------------------|--|---|
| Order number (MLFB) | 6ES7 223-3BD30-0XB0 | 6ES7 223-3AD30-0XB0 |
| General | | |
| Dimensions W x H x D (mm) | 38 x 62 x 21 | |
| Weight | 35 grams | 35 grams |
| Power dissipation | 1.0 W | 0.5 W |
| Current consumption (SM Bus) | 35 mA | 35 mA |
| Current consumption (24 VDC) | 7 mA / Input + 30 mA | 15 mA / input + 15 mA |
| Digital inputs | | |
| Number of inputs | 2 | |
| Type | Source | |
| Rated voltage | 24 VDC at 7 mA, nominal | 5 VDC at 15 mA, nominal |
| Continuous permissible voltage | 28.8 VDC | 6 VDC |
| Surge voltage | 35 VDC for 0.5 sec. | 6 V |
| Logic 1 signal (min.) | L+ minus 10 VDC at 2.9 mA | L+ minus 2.0 VDC at 5.1 mA |
| Logic 0 signal (max.) | L+ minus 5 VDC at 1.4 mA | L+ minus 1.0 VDC at 2.2 mA |
| HSC clock input rates (max.) | Single phase: 200 kHz Quadrature phase: 160 kHz | |
| Isolation (field side to logic) | 500 VAC for 1 minute | |
| Isolation groups | 1 (no isolation to outputs) | |
| Filter times | 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms; Selectable in groups of 4 | |
| Number of inputs on simultaneously | 2 | |
| Cable length (meters) | 50 shielded twisted pair | |
| Digital Outputs | | |
| Number of outputs | 2 | |
| Output type | Solid state - MOSFET sink and source | |
| Voltage range | 20.4 to 28.8 VDC | 4.25 to 6.0 VDC |
| Rated value | 24 VDC | 5 VDC |
| Logic 1 signal at max. current | L+ minus 1.5 V | L+ minus 0.7 V |
| Logic 0 signal at max. current | 1.0 VDC, max. | 0.2 VDC, max. |
| Current (max.) | 0.1 A | |
| Lamp load | -- | |
| On state contact resistance | 11 Ω max. | 7 Ω max. |
| Off state resistance | 6 Ω max. | 0.2 Ω max. |
| Leakage current per point | -- | |
| Pulse Train Output rate | 200 kHz max., 2 Hz min. | |
| Surge current | 0.11 A | 0.11 A |
| Overload protection | no | |
| Isolation (field side to logic) | 500 VAC for 1 minute | |
| Isolation groups | 1 (no isolation to inputs) | |
| Currents per common | 0.2 A | 0.2 A |
| Inductive clamp voltage | None | |

| Model | SB 1223 DI 2 x 24 VDC / DQ 2 x 24 VDC, 200 kHz | SB 1223 DI 2 x 5 VDC / DQ 2 x 5 VDC, 200 kHz |
|-------------------------------------|--|---|
| Switching delay | 1.5 μ s + 300 ns rise 1.5 μ s + 300 ns fall | 200 ns + 300 ns rise 200 ns + 300 ns fall |
| Behavior on RUN to STOP | Last value or substitute (default value 0) | |
| Number of outputs on simultaneously | 2 | |
| Cable length (meters) | 50 shielded twisted pair | |

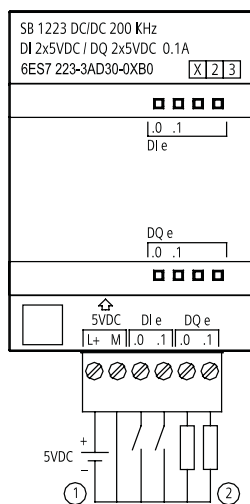
SB 1223 Wiring Diagrams

SB 1223 DI 2 x 24 VDC /
DQ 2 x 24 VDC, 200 kHz



6ES7 223-3BD30-0XB0

SB 1223 DI 2 x 5 VDC /
DQ 2 x 5 VDC, 200 kHz



6ES7 223-3AD30-0XB0

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