

SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

SM 521 digital input modules

Overview



- 16 and 32-channel digital input modules
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs
- 35 mm wide modules with parameters and diagnostic functions
- 25 mm wide modules for use in tight spaces: particularly economical, without parameters or diagnostic functions

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Technical specifications

| Article number | 6ES7521-1BH00-0AB0 | 6ES7521-1BL00-0AB0 | 6ES7521-1BH50-0AA0 | 6ES7521-1FH00-0AA0 | 6ES7521-7EH00-0AB0 |
|---|-------------------------|-------------------------|-----------------------------|--------------------------|----------------------------------|
| | S7-1500, DI 16X24VDC HF | S7-1500, DI 32X24VDC HF | S7-1500, DI 16X24VDC SRC BA | S7-1500, DI 16X230VAC BA | S7-1500, DI 16 X 24...125V UC HF |
| General information | | | | | |
| Product type designation | DI 16x24VDC HF | DI 32x24VDC HF | DI 16x24VDC SRC BA | DI 16x230VAC BA | DI 16x24 ... 125VUC HF |
| Product function | | | | | |
| • I&M data | Yes; I&M0 to I&M3 | Yes; I&M0 to I&M3 | Yes; I&M0 to I&M3 | Yes; I&M0 to I&M3 | Yes; I&M0 to I&M3 |
| Engineering with | | | | | |
| • STEP 7 TIA Portal configurable/integrated as of version | V13 SP1 / - | V13 SP1 / - | V12 / V12 | V12 / V12 | V13 SP1 / - |
| • STEP 7 configurable/integrated as of version | V5.5 SP3 / - | V5.5 SP3 / - | V5.5 SP3 / - | V5.5 SP3 / - | V5.5 SP3 / - |
| • PROFIBUS as of GSD version/GSD revision | V1.0 / V5.1 | V1.0 / V5.1 | V1.0 / V5.1 | V1.0 / V5.1 | V1.0 / V5.1 |
| • PROFINET as of GSD version/GSD revision | V2.3 / - | V2.3 / - | V2.3 / - | V2.3 / - | V2.3 / - |
| Operating mode | | | | | |
| • DI | Yes | Yes | Yes | Yes | Yes |
| • Counter | Yes | Yes | No | No | No |
| • Oversampling | No | No | No | No | No |
| • MSI | Yes | Yes | Yes | Yes | Yes |
| Supply voltage | | | | | |
| Type of supply voltage | DC | DC | DC | | |
| Rated value (DC) | 24 V | 24 V | | | |
| Reverse polarity protection | Yes | Yes | | | |
| Digital inputs | | | | | |
| Number of digital inputs | 16 | 32 | 16 | 16 | 16 |
| Digital inputs, parameterizable | Yes | Yes | No | No | Yes |
| Source/sink input | P-reading | P-reading | m-reading | P-reading | Yes |
| Input characteristic curve in accordance with IEC 61131, type 1 | | | | Yes | |
| Input characteristic curve in accordance with IEC 61131, type 3 | Yes | Yes | Yes | | Yes; at 24 V DC |
| Digital input functions, parameterizable | | | | | |
| • Gate start/stop | Yes | Yes | | | |
| • Freely usable digital input | Yes | Yes | | | |
| • Counter | | | | | |
| - Number, max. | 2 | 2 | | | |
| - Counting frequency, max. | 1 kHz | 1 kHz | | | |
| - Counting width | 32 bit | 32 bit | | | |
| - Counting direction up/down | Up | Up | | | |

Technical specifications (continued)

| Article number | 6ES7521-1BH00-0AB0 S7-1500, DI 16X24VDC HF | 6ES7521-1BL00-0AB0 S7-1500, DI 32X24VDC HF | 6ES7521-1BH50-0AA0 S7-1500, DI 16X24VDC SRC BA | 6ES7521-1FH00-0AA0 S7-1500, DI 16X230VAC BA | 6ES7521-7EH00-0AB0 S7-1500, DI 16 X 24...125V UC HF |
|---|---|---|--|---|---|
| Input voltage | | | | | |
| • Type of input voltage | DC | DC | DC | AC | AC/DC |
| • Rated value (DC) | 24 V | 24 V | 24 V | | 24 V; 48 V, 125 V |
| • Rated value (AC) | | | | 230 V; 120/230V AC, 50/60 Hz | 24 V; 48 V, 125 V (50 - 60 Hz) |
| • for signal "0" | -30 to +5V | -30 to +5V | -5 to +30V | 0V AC to 40V AC | -5 ... +5 V |
| • for signal "1" | +11 to +30V | +11 to +30V | -11 to -30V | 79V AC to 264V AC | +11 V DC to +146 V DC |
| Input current | | | | | |
| • for signal "1", typ. | 2.5 mA | 2.5 mA | 4.5 mA | 11 mA; At 230 V AC and 5.5 mA at 120 V AC | 3 mA; at 24 V DC |
| Input delay (for rated value of input voltage) for standard inputs | | | | | |
| - parameterizable | Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms | Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms | No | No | Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms parameterizable with DC, 20 ms fixed with AC |
| for interrupt inputs | | | | | |
| - parameterizable | Yes | Yes | No | No | Yes |
| for counter/technological functions | | | | | |
| - parameterizable | Yes | Yes | No | No | No |
| 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 |
| Encoder | | | | | |
| Connectable encoders | | | | | |
| • 2-wire sensor | Yes | Yes | Yes | Yes | Yes |
| - permissible quiescent current (2-wire sensor), max. | 1.5 mA | 1.5 mA | 1.5 mA | 2 mA | 1.5 mA |
| Isochronous mode | | | | | |
| Isochronous operation (application synchronized up to terminal) | Yes | Yes | No | No | No |
| Filtering and processing time (TCI), min. | 80 µs; At 50 µs filter time | 80 µs; At 50 µs filter time | | | |
| Bus cycle time (TDP), min. | 250 µs | 250 µs | | | |
| Interrupts/diagnostics/ status information | | | | | |
| Diagnostics function | Yes | Yes | No | No | Yes |
| Alarms | | | | | |
| • Diagnostic alarm | Yes | Yes | No | No | Yes |
| • Hardware interrupt | Yes | Yes | No | No | Yes |
| Diagnostic messages | | | | | |
| • Monitoring the supply voltage | Yes | Yes | No | No | No |
| • Wire-break | Yes; to I < 350 µA | Yes; to I < 350 µA | No | No | Yes; To I < 550 µA |
| • Short-circuit | No | No | No | No | No |
| Diagnostics indication LED | | | | | |
| • RUN LED | Yes; Green LED | Yes; Green LED | Yes; Green LED | Yes; Green LED | Yes; Green LED |
| • ERROR LED | Yes; Red LED | Yes; Red LED | Yes; Red LED | Yes; Red LED | Yes; Red LED |
| • Monitoring of the supply voltage (PWR-LED) | Yes; Green LED | Yes; Green LED | No | No | No |
| • Channel status display | Yes; Green LED | Yes; Green LED | Yes; Green LED | Yes; Green LED | Yes; Green LED |
| • for channel diagnostics | Yes; Red LED | Yes; Red LED | No | No | Yes; Red LED |
| • for module diagnostics | Yes; Red LED | Yes; Red LED | No | Yes; Red LED | Yes; Red LED |
| Potential separation | | | | | |
| Potential separation channels | | | | | |
| • between the channels and backplane bus | Yes | Yes | Yes | Yes | Yes |
| Isolation | | | | | |
| Isolation tested with | 707 V DC (type test) | 707 V DC (type test) | 707 V DC (type test) | 3 100 V DC | 2 000 V DC |

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SM 521 digital input modules

Technical specifications (continued)

| Article number | 6ES7521-1BH00-0AB0 S7-1500, DI 16X24VDC HF | 6ES7521-1BL00-0AB0 S7-1500, DI 32X24VDC HF | 6ES7521-1BH50-0AA0 S7-1500, DI 16X24VDC SRC BA | 6ES7521-1FH00-0AA0 S7-1500, DI 16X230VAC BA | 6ES7521-7EH00-0AB0 S7-1500, DI 16 X 24...125V UC HF |
|--|--|--|--|---|---|
| Standards, approvals, certificates | | | | | |
| Suitable for safety functions | No | No | No | No | No |
| Ambient conditions | | | | | |
| Ambient temperature during operation | | | | | |
| • horizontal installation, min. | 0 °C | 0 °C | 0 °C | 0 °C | 0 °C |
| • horizontal installation, max. | 60 °C | 60 °C | 60 °C | 60 °C | 60 °C |
| • vertical installation, min. | 0 °C | 0 °C | 0 °C | 0 °C | 0 °C |
| • vertical installation, max. | 40 °C | 40 °C | 40 °C | 40 °C | 40 °C |
| Decentralized operation | | | | | |
| Prioritized startup | Yes | Yes | Yes | Yes | Yes |
| Dimensions | | | | | |
| Width | 35 mm | 35 mm | 35 mm | 35 mm | 35 mm |
| Height | 147 mm | 147 mm | 147 mm | 147 mm | 147 mm |
| Depth | 129 mm | 129 mm | 129 mm | 129 mm | 129 mm |
| Weights | | | | | |
| Weight, approx. | 240 g | 260 g | 230 g | 300 g | 240 g |
| Article number | 6ES7521-1BH10-0AA0 S7-1500, DI 16X24VDC BA | | 6ES7521-1BL10-0AA0 S7-1500, DI 32X24VDC BA | | |
| General information | | | | | |
| Product type designation | DI 16 x 24 V DC BA | | DI 32x24VDC BA | | |
| Product function | | | | | |
| • I&M data | Yes; I&M0 to I&M3 | | Yes; I&M0 to I&M3 | | |
| Engineering with | | | | | |
| • STEP 7 TIA Portal configurable/ integrated as of version | V13 / V13 | | V13 / V13 | | |
| • STEP 7 configurable/integrated as of version | V5.5 SP3 / - | | V5.5 SP3 / - | | |
| • PROFIBUS as of GSD version/ GSD revision | V1.0 / V5.1 | | V1.0 / V5.1 | | |
| • PROFINET as of GSD version/ GSD revision | V2.3 / - | | V2.3 / - | | |
| Operating mode | | | | | |
| • DI | Yes | | Yes | | |
| • Counter | No | | No | | |
| • MSI | Yes | | Yes | | |
| Supply voltage | | | | | |
| Type of supply voltage | DC | | DC | | |
| Rated value (DC) | 24 V | | 24 V | | |
| Digital inputs | | | | | |
| Number of digital inputs | 16 | | 32 | | |
| Digital inputs, parameterizable | No | | No | | |
| Source/sink input | P-reading | | P-reading | | |
| Input characteristic curve in accordance with IEC 61131, type 3 | Yes | | Yes | | |
| Input voltage | | | | | |
| • Type of input voltage | DC | | DC | | |
| • Rated value (DC) | 24 V | | 24 V | | |
| • for signal "0" | -30 to +5V | | -30 to +5V | | |
| • for signal "1" | +11 to +30V | | +11 to +30V | | |
| Input current | | | | | |
| • for signal "1", typ. | 2.7 mA | | 2.7 mA | | |
| Input delay (for rated value of input voltage) | | | | | |
| for standard inputs | | | | | |
| - parameterizable | No | | No | | |
| for interrupt inputs | | | | | |
| - parameterizable | No | | No | | |
| for counter/technological functions | | | | | |
| - parameterizable | No | | No | | |

Technical specifications (continued)

| Article number | 6ES7521-1BH10-0AA0 S7-1500, DI 16X24VDC BA | 6ES7521-1BL10-0AA0 S7-1500, DI 32X24VDC BA |
|---|---|---|
| Cable length | | |
| • shielded, max. | 1 000 m | 1 000 m |
| • unshielded, max. | 600 m | 600 m |
| Encoder | | |
| Connectable encoders | | |
| • 2-wire sensor | Yes | Yes |
| - permissible quiescent current (2-wire sensor), max. | 1.5 mA | 1.5 mA |
| Isochronous mode | | |
| Isochronous operation (application synchronized up to terminal) | No | No |
| Interrupts/diagnostics/status information | | |
| Diagnostics function | No | No |
| Alarms | | |
| • Diagnostic alarm | No | No |
| • Hardware interrupt | No | No |
| Diagnostic messages | | |
| • Monitoring the supply voltage | No | No |
| • Wire-break | No | No |
| • Short-circuit | No | No |
| Diagnostics indication LED | | |
| • RUN LED | Yes; Green LED | Yes; Green LED |
| • ERROR LED | Yes; Red LED | Yes; Red LED |
| • Monitoring of the supply voltage (PWR-LED) | No | No |
| • Channel status display | Yes; Green LED | Yes; Green LED |
| • for channel diagnostics | No | No |
| • for module diagnostics | No | No |
| Potential separation | | |
| Potential separation channels | | |
| • between the channels and backplane bus | Yes | Yes |
| Isolation | | |
| Isolation tested with | 707 V DC (type test) | 707 V DC (type test) |
| Standards, approvals, certificates | | |
| Suitable for safety functions | No | No |
| Ambient conditions | | |
| Ambient temperature during operation | | |
| • horizontal installation, min. | 0 °C | 0 °C |
| • horizontal installation, max. | 60 °C | 60 °C |
| • vertical installation, min. | 0 °C | 0 °C |
| • vertical installation, max. | 40 °C | 40 °C |
| Decentralized operation | | |
| Prioritized startup | Yes | Yes |
| Dimensions | | |
| Width | 25 mm | 25 mm |
| Height | 147 mm | 147 mm |
| Depth | 129 mm | 129 mm |
| Weights | | |
| Weight, approx. | 230 g | 260 g |
| Other | | |
| Note: | Supplied incl. 40-pole push-in front connectors | Supplied incl. 40-pole push-in front connectors |

SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

SM 521 digital input modules

| Ordering data | Article No. | Article No. |
|--|---|--|
| SM 521 digital input modules <u>Module width 35 mm</u> 16 inputs, 24 V DC, isolated, parameterizable diagnostics and hardware interrupts 32 inputs, 24 V DC, isolated, parameterizable diagnostics and hardware interrupts 16 inputs, 24 V DC, isolated, input delay 3.2 ms 16 inputs, 230 V AC, isolated, input delay 20 ms 16 inputs, 24 ... 125 V UC, input delay 0.05 ... 20 ms, parameterizable diagnostics and hardware interrupts <u>Module width 25 mm;</u> <u>front connector (push-in)</u> <u>included in delivery package</u> 16 inputs, 24 V DC, isolated 32 inputs, 24 V DC, isolated | 6ES7521-1BH00-0AB0 6ES7521-1BL00-0AB0 6ES7521-1BH50-0AA0 6ES7521-1FH00-0AA0 6ES7521-7EH00-0AB0 | DIN A4 labeling sheets For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, Al gray For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray U connector 5 units; spare part Universal front door for I/O modules For 35 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part SIMATIC Manual Collection Electronic manuals on DVD, multi-language: 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 Current "Manual Collection" DVD and the three subsequent updates |
| Accessories Front connectors For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin <ul style="list-style-type: none"> • Screw terminals • Push-in For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; spare part | 6ES7521-1BH10-0AA0 6ES7521-1BL10-0AA0 6ES7592-1AM00-0XB0 6ES7592-1BM00-0XB0 6ES7592-1BM00-0XA0 | 6ES7592-2AX00-0AA0 6ES7592-1AX00-0AA0 6ES7590-0AA00-0AA0 6ES7528-0AA00-7AA0 6ES7528-0AA00-0AA0 6ES7998-8XC01-8YE0 6ES7998-8XC01-8YE2 |
| Potential bridges for front connectors For 35 mm modules; 20 pieces; spare part | 6ES7592-3AA00-0AA0 | |

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