

SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

SM 521 digital input modules

Overview

4



- 16, 32 and 64-channel digital input modules
- Sinking and sourcing input versions available
- Module for recording NAMUR signals
- For flexible adaptation of the PLC 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

Ordering data

Article No.

Article No.

SM 521 digital input modules

Module width 35 mm

16 inputs, 24 V DC
High Feature, isolated,
parameterizable diagnostics and
hardware interrupts

6ES7521-1BH00-0AB0

32 inputs, 24 V DC
High Feature, isolated,
parameterizable diagnostics and
hardware interrupts

6ES7521-1BL00-0AB0

16 inputs, 24 V DC
High Speed, isolated,
parameterizable diagnostics and
hardware interrupts

6ES7521-7BH00-0AB0

64 inputs, 24 V DC Basic,
source-sinking input,
input delay 3.2 ms; cables and
terminal blocks can be ordered
separately (SIMATIC TOP connect)

6ES7521-1BP00-0AA0

16 inputs, 24 V DC basic,
isolated,
input delay 3.2 ms

6ES7521-1BH50-0AA0

16 inputs, 230 V AC basic,
isolated,
input delay 20 ms

6ES7521-1FH00-0AA0

16 inputs, 24 ... 125 V UC
High Feature, input delay
0.05 ... 20 ms, parameterizable
diagnostics and hardware
interrupts

6ES7521-7EH00-0AB0

16 inputs to record
NAMUR signals (8.2 V DC),
2 potential groups,
input delay
0.05 ... 20 ms, parameterizable
diagnostics and hardware
interrupts

6ES7521-7TH00-0AB0

Module width 25 mm; front
connector (push-in) included in
scope of delivery

16 inputs, 24 V DC basic, isolated

6ES7521-1BH10-0AA0

32 inputs, 24 V DC basic, isolated

6ES7521-1BL10-0AA0

Accessories

Front connectors

For 35 mm modules (not 64-channel);
including four potential bridges,
cable ties and individual labeling
strips, 40-pin

- Screw terminals
- Push-in

6ES7592-1AM00-0XB0
6ES7592-1BM00-0XB0

Front connectors

For 25 mm modules;
including cable ties and
individual labeling strips;
push-in terminal 40-pin;
spare part

6ES7592-1BM00-0XA0

Potential bridges for front connectors

For 35 mm modules;
20 pieces; spare part

6ES7592-3AA00-0AA0

DIN A4 labeling sheets

For 35 mm modules;
10 sheets with 10
labeling strips each
for I/O modules;
perforated, Al gray

6ES7592-2AX00-0AA0

For 25 mm modules;
10 sheets with 20
labeling strips each
for I/O modules;
perforated, Al gray

6ES7592-1AX00-0AA0

U connector

5 units; spare part

6ES7590-0AA00-0AA0

Universal front door for I/O modules

For 35 mm modules;
5 front doors;
with 5 labeling strips on the front
and 5 cabling diagrams per front
door; spare part

6ES7528-0AA00-7AA0

For 25 mm modules;
5 front doors;
with 5 labeling strips on the front
and 5 cabling diagrams per front
door; spare part

6ES7528-0AA00-0AA0

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

6ES7998-8XC01-8YE0

SIMATIC Manual Collection update service for 1 year

Current Manual Collection DVD and
the three subsequent updates

6ES7998-8XC01-8YE2

Technical specifications

Article number	6ES7521-1BH00-0AB0 S7-1500, DI 16x24VDC HF	6ES7521-1BL00-0AB0 S7-1500, DI 32x24VDC HF	6ES7521-7BH00-0AB0 S7-1500, DI 16x24VDC HS	6ES7521-1BH50-0AA0 S7-1500, DI 16x24VDC SRC BA	6ES7521-1FH00-0AA0 S7-1500, DI 16x230VAC BA	6ES7521-1BP00-0AA0 S7-1500, DI 64x24VDC SNK/SRC BA
General information						
Product type designation	DI 16x24VDC HF	DI 32x24VDC HF	DI 16x24 V DC HS	DI 16x24VDC SRC BA	DI 16x230VAC BA	DI 64x24VDC BA
Product function						
• Isochronous mode	Yes	Yes	Yes	No	No	No
• Prioritized startup	Yes	Yes	Yes	Yes	Yes	No
Engineering with						
• STEP 7 TIA Portal configurable/ integrated from version	V13 SP1 / -	V13 SP1 / -	STEP 7 V17 or higher	V12 / V12	V12 / V12	V16 with HSP 0319 / V17
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -	V2.35 / -
Operating mode						
• DI	Yes	Yes	Yes	Yes	Yes	Yes
• Counter	Yes	Yes	Yes	No	No	No
• Oversampling	No	No	Yes			No
• MSI	Yes	Yes	Yes	Yes	Yes	Yes
Supply voltage						
Rated value (DC)	24 V	24 V	24 V			
Reverse polarity protection	Yes	Yes	Yes			
Encoder supply						
Number of outputs			16; 2x 24 V DC			
Short-circuit protection			Yes			
24 V encoder supply						
• 24 V			Yes			
• Short-circuit protection			Yes; Per group, electronic			
• Output current, max.			150 mA; per group			
Digital inputs						
Number of digital inputs	16	32	16	16	16	64
Digital inputs, parameterizable	Yes	Yes	Yes	No	No	No
Source/sink input	P-reading	P-reading	P-reading	Sourcing	P-reading	Yes
Input characteristic curve in accordance with IEC 61131, type 1			Yes		Yes	
Input characteristic curve in accordance with IEC 61131, type 2						
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes		Yes		Yes
Pulse extension			Yes; 0.05 s, 0.1 s, 0.2 s, 0.5 s, 1 s, 2 s			
Edge evaluation			Yes; Positive edge, negative edge			
Signal change flutter			Yes; 2 to 32 signal changes			
Flutter observation window			Yes; 0.5 s, 1 s to 100 s in 1-s steps			
Number of simultaneously controllable inputs						
• Number of simultaneously controllable inputs						64; see additional description in the manual
Digital input functions, parameterizable						
• Gate start/stop	Yes	Yes	Yes; software/ hardware gate			
• Freely usable digital input	Yes	Yes	Yes			
• Digital input with oversampling			Yes			

SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

SM 521 digital input modules

Technical specifications

Article number	6ES7521-1BH00-0AB0 S7-1500, DI 16x24VDC HF	6ES7521-1BL00-0AB0 S7-1500, DI 32x24VDC HF	6ES7521-7BH00-0AB0 S7-1500, DI 16x24VDC HS	6ES7521-1BH50-0AA0 S7-1500, DI 16x24VDC SRC BA	6ES7521-1FH00-0AA0 S7-1500, DI 16x230VAC BA	6ES7521-1BP00-0AA0 S7-1500, DI 64x24VDC SNK/SRC BA
Input voltage						
• Rated value (DC)	24 V	24 V	24 V	24 V		24 V
• Rated value (AC)					230 V; 120/230 V AC, 50/60 Hz	
• for signal "0"	-30 to +5 V	-30 to +5 V	-30 to +5 V	-5 to +30V	0V AC to 40V AC	-5 ... +5 V (reference potential is COM)
• for signal "1"	+11 to +30V	+11 to +30V	+11 to +30V	-11 to -30V	79V AC to 264V AC	-11 ... -30 V; +11 ... +30 V (reference potential is COM)
Input current						
• for signal "1", typ.	2.5 mA	2.5 mA	9 mA	4.5 mA	11 mA; At 230 V AC and 5.5 mA at 120 V AC	2.7 mA
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	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms	No	No	No
for interrupt inputs						
- parameterizable	Yes	Yes	Yes	No	No	No
for technological functions						
- parameterizable	Yes	Yes	Yes	No	No	No
Encoder						
Connectable encoders						
• 2-wire sensor	Yes	Yes	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	2 mA	1.5 mA	2 mA	1.5 mA
Isochronous mode						
Filtering and processing time (TCI), min.	80 µs; At 50 µs filter time	80 µs; At 50 µs filter time	60 µs; At 50 µs filter time			
Bus cycle time (TDP), min.	250 µs	250 µs	250 µs			
Interrupts/diagnostics/ status information						
Diagnostics function	Yes	Yes	Yes	No	No	No
Alarms						
• Diagnostic alarm	Yes	Yes	Yes	No	No	No
• Hardware interrupt	Yes	Yes	Yes	No	No	No
Diagnoses						
• Monitoring the supply voltage	Yes	Yes	Yes	No	No	No
• Monitoring of encoder power supply			Yes; short-circuit			
• Wire-break	Yes; to I < 350 µA	Yes; to I < 350 µA	Yes; to I < 350 µA	No	No	No
• Short-circuit	No	No	No	No	No	No
• Group error						No
Diagnostics indication LED						
• RUN LED	Yes; green 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	Yes; red LED
• MAINT LED						No
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED	Yes; green LED	No	No	Yes; via SIMATIC TOP connect connection module
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED	Yes; via SIMATIC TOP connect connection module
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	No	No	No
• for module diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	No	Yes; red LED	No

Technical specifications

Article number	6ES7521-1BH00-0AB0 S7-1500, DI 16x24VDC HF	6ES7521-1BL00-0AB0 S7-1500, DI 32x24VDC HF	6ES7521-7BH00-0AB0 S7-1500, DI 16x24VDC HS	6ES7521-1BH50-0AA0 S7-1500, DI 16x24VDC SRC BA	6ES7521-1FH00-0AA0 S7-1500, DI 16x230VAC BA	6ES7521-1BP00-0AA0 S7-1500, DI 64x24VDC SNK/SRC BA
Potential separation						
Potential separation channels						
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates						
Suitable for safety functions	No	No	No	No	No	No
Ambient conditions						
Ambient temperature during operation						
• horizontal installation, min.	-30 °C; From FS05	-30 °C; From FS05	-30 °C	0 °C	0 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; From FS05	-30 °C; From FS05	-30 °C	0 °C	0 °C	-30 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Altitude during operation relating to sea level						
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual		5 000 m
Dimensions						
Width	35 mm	35 mm	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm	129 mm	129 mm
Weights						
Weight, approx.	240 g	260 g	240 g	230 g	300 g	250 g
Other						
Note:						Please order cable and connection modules separately

Article number	6ES7521-7EH00-0AB0 S7-1500, DI 16 x 24...125V UC HF	6ES7521-7TH00-0AB0 S7-1500, DI 16xNAMUR HF
General information		
Product type designation	DI 16x24 ... 125 V UC HF	DI 16xNAMUR HF
Product function		
• Isochronous mode	No	Yes
• Prioritized startup	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V13 SP1 / -	STEP 7 V17 or higher
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -	V2.3 / -
Operating mode		
• DI	Yes	Yes
• Counter	No	Yes
• Oversampling	No	No
• MSI	Yes	Yes
Supply voltage		
Rated value (DC)		24 V
Reverse polarity protection		Yes
Encoder supply		
Number of outputs		16; 2x 8.2 V DC
Short-circuit protection		Yes

SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

SM 521 digital input modules

Technical specifications

Article number	6ES7521-7EH00-0AB0 S7-1500, DI 16 x 24...125V UC HF	6ES7521-7TH00-0AB0 S7-1500, DI 16xNAMUR HF
NAMUR encoder supply		
<ul style="list-style-type: none"> • 8.2 V • Short-circuit protection • Output current, max. • Output current per module, max. 		Yes Yes; Per group, electronic 100 mA; per group 200 mA
Digital inputs		
Number of digital inputs	16	16; NAMUR
Digital inputs, parameterizable	Yes	Yes
Source/sink input	Yes	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes; At 24 V DC	
Pulse extension		Yes
Digital input functions, parameterizable		
<ul style="list-style-type: none"> • Gate start/stop • Freely usable digital input 		Yes; software/hardware gate Yes
Input voltage		
<ul style="list-style-type: none"> • Rated value (DC) • Rated value (AC) • for signal "0" • for signal "1" 	24 V; 48 V, 125 V 24 V; 48 V, 125 V (50 - 60 Hz) -5 ... +5 V +11 ... +146 V	8.2 V
Input current		
<ul style="list-style-type: none"> • for signal "1", typ. 	3 mA; At 24 V DC	10 mA
for NAMUR encoders		
- for signal "0", min.		0.35 mA
- for signal "0", max.		1.2 mA
- for signal "1", min.		2.1 mA
- for signal "1", max.		10 mA
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 parameterizable with DC, 20 ms fixed with AC	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms
for interrupt inputs		
- parameterizable	Yes	Yes
for technological functions		
- parameterizable	No	Yes
Encoder		
Connectable encoders		
<ul style="list-style-type: none"> • 2-wire sensor - permissible quiescent current (2-wire sensor), max. 	Yes 1.5 mA	Yes 1.2 mA
isochronous mode		
Filtering and processing time (TCI), min.		60 µs; At 50 µs filter time
Bus cycle time (TDP), min.		250 µs
Interrupts/diagnostics/status information		
Diagnostics function	Yes	Yes
Alarms		
<ul style="list-style-type: none"> • Diagnostic alarm • Hardware interrupt 	Yes Yes	Yes Yes
Diagnoses		
<ul style="list-style-type: none"> • Monitoring the supply voltage • Wire-break • Short-circuit 	No Yes; To I < 550 µA No	Yes Yes; to I < 350 µA No

Technical specifications

Article number	6ES7521-7EH00-0AB0	6ES7521-7TH00-0AB0
	S7-1500, DI 16 x 24...125V UC HF	S7-1500, DI 16xNAMUR HF
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	Yes; green LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED
• for module diagnostics	Yes; red LED	Yes; red LED
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety functions	No	No
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	0 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	0 °C	-30 °C
• vertical installation, max.	40 °C	40 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.		5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions		
Width	35 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	240 g	240 g
Article number	6ES7521-1BH10-0AA0	6ES7521-1BL10-0AA0
	S7-1500, DI 16x24VDC BA	S7-1500, DI 32x24VDC BA
General information		
Product type designation	DI 16 x 24 V DC BA	DI 32x24VDC BA
Product function		
• Isochronous mode	No	No
• Prioritized startup	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V13 / V13	V13 / V13
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -	V2.3 / -
Operating mode		
• DI	Yes	Yes
• Counter	No	No
• MSI	Yes	Yes
Supply voltage		
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		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5 V	-30 to +5 V

SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

SM 521 digital input modules

Technical specifications

Article number	6ES7521-1BH10-0AA0	6ES7521-1BL10-0AA0
	S7-1500, DI 16x24VDC BA	S7-1500, DI 32x24VDC BA
• 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 technological functions		
- parameterizable	No	No
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
Interrupts/diagnostics/status information		
Diagnostics function	No	No
Alarms		
• Diagnostic alarm	No	No
• Hardware interrupt	No	No
Diagnoses		
• 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
Standards, approvals, certificates		
Suitable for safety functions	No	No
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C; from FS04	-30 °C; from FS04
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C; from FS04	-30 °C; from FS04
• vertical installation, max.	40 °C	40 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
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

Overview



- 8, 32, 16 and 64-channel digital output modules
- Sinking and sourcing output versions available
- For flexible adaptation of the PLC to the corresponding task
- For subsequent expansion of the system with additional outputs
- High Feature modules with parameters and diagnostic functions
- 25 mm wide modules for use in tight spaces: particularly economical, without parameters or diagnostic functions

4

Ordering data

SM 522 digital output modules

Module width 35 mm

8 outputs, 24 V DC,
2 A High Feature, isolated

6ES7522-1BF00-0AB0

16 outputs, 24 V DC,
0.5 A High Feature, isolated

6ES7522-1BH01-0AB0

32 outputs, 24 V DC,
0.5 A High Feature, isolated

6ES7522-1BL01-0AB0

64 outputs, 24 V DC;
0.3A Basic; sinking output;
cables and terminal blocks
can be ordered separately
(SIMATIC TOP connect)

6ES7522-1BP00-0AA0

64 outputs, 24 V DC;
0.3A Basic; sourcing;
cables and terminal blocks
can be ordered separately
(SIMATIC TOP connect)

6ES7522-1BP50-0AA0

8 relay outputs, 230 V AC,
5 A Standard

6ES7522-5HF00-0AB0

16 relay outputs, 230 V AC,
2 A Standard

6ES7522-5HH00-0AB0

8 outputs (triac), 230 V AC,
2 A Standard

6ES7522-5FF00-0AB0

16 outputs (triac), 230 V AC,
1 A Standard

6ES7522-5FH00-0AB0

16 outputs, 24 ... 48 V UC,
125 V DC, 0.5 A Standard, isolated

6ES7522-5EH00-0AB0

Module width 25 mm;
front connector (push-in)
included in scope of delivery

16 outputs, 24 V DC,
0.5 A Basic, isolated

6ES7 522-1BH10-0AA0

32 outputs, 24 V DC,
0.5 A Basic, isolated

6ES7 522-1BL10-0AA0

Accessories

Front connector

For 35 mm modules
(not 64-channel);
including four potential bridges,
cable ties and individual
labeling strips, 40-pin

- Screw terminals
- Push-in

6ES7592-1AM00-0XB0

6ES7592-1BM00-0XB0

For 25 mm modules;
including cable ties and
individual labeling strips;
push-in terminal 40-pin;
spare part

6ES7592-1BM00-0XA0

Potential bridges for front connectors

For 35 mm modules;
20 pieces; spare part

6ES7592-3AA00-0AA0

DIN A4 labeling sheets

For 35 mm modules;
10 sheets with
10 labeling strips each for
I/O modules;
perforated, Al gray

6ES7592-2AX00-0AA0

For 25 mm modules;
10 sheets with
20 labeling strips each for
I/O modules;
perforated, Al gray

6ES7592-1AX00-0AA0

U connector

5 units; spare part

6ES7590-0AA00-0AA0

Universal front door for I/O modules

For 35 mm modules;
5 front doors;
with 5 labeling strips on the front
and 5 cabling diagrams per front
door; spare part

6ES7528-0AA00-7AA0

For 25 mm modules;
5 front doors;
with 5 labeling strips on the front
and 5 cabling diagrams per front
door; spare part

6ES7528-0AA00-0AA0

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

6ES7998-8XC01-8YE0

SIMATIC Manual Collection update service for 1 year

Current Manual Collection DVD and
the three subsequent updates

6ES7998-8XC01-8YE2

SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

SM 522 digital output modules

Technical specifications

Article number	6ES7522-1BH01-0AB0 S7-1500, DQ 16x24V DC/0.5A HF	6ES7522-1BL01-0AB0 S7-1500, DQ 32x24VDC/0.5A HF	6ES7522-1BF00-0AB0 S7-1500, DQ 8x24VDC/2A HF	6ES7522-5EH00-0AB0 S7-1500, DQ 16x24...48VUC/ 125VDC/0.5A ST
General information				
Product type designation	DQ 16x24VDC/0.5A HF	DQ 32x24VDC/0.5A HF	DQ 8x24VDC/2A HF	DQ 16x24 ... 48 V UC/ 125 V DC/0.5 A ST
Product function				
• Isochronous mode	Yes	Yes	No	No
• Prioritized startup	Yes	Yes	Yes	Yes
Engineering with				
• STEP 7 TIA Portal configurable/ integrated from version	V13 SP1 / -	V13 SP1 / -	V13 SP1 / -	V13 SP1 / -
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
Operating mode				
• DQ	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	Yes; with an application	No
• PWM	No	No	Yes; FS02 and FW V2.1.0 or higher; two outputs can be operated with max. 500 Hz PWM	No
• Cam control (switching at comparison values)	No	No	No	No
• Oversampling	No	No	No	No
• MSO	Yes	Yes	Yes	Yes
• Integrated operating cycle counter	Yes	Yes	Yes	No
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	
Reverse polarity protection	Yes; through internal protection with 7 A per group	Yes; through internal protection with 7 A per group	Yes; through internal protection with 10 A per group	
Digital outputs				
Type of digital output	Transistor	Transistor	Transistor	Transistor
Number of digital outputs	16	32	8	16
Current-sinking				Yes
Current-sourcing	Yes	Yes	Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes
Short-circuit protection	Yes; Clocked electronically	Yes; Clocked electronically	Yes	
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)	-17 V	200 V (suppressor diode)
Controlling a digital input	Yes	Yes	Yes	Yes
Digital output functions, parameterizable				
• Freely usable digital output			Yes	
• PWM output			Yes; FS02 and FW V2.1.0 or higher	
- Number, max.			2	
Switching capacity of the outputs				
• with resistive load, max.	0.5 A	0.5 A		0.5 A
• on lamp load, max.	5 W	5 W	10 W	40 W; At 125 V DC, 10 W at 48 V UC, 5 W at 24 V UC
Load resistance range				
• lower limit	48 Ω	48 Ω	12 Ω	
• upper limit	12 kΩ	12 kΩ	4 kΩ	
Output voltage				
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-1.0 V)
Output current				
• for signal "1" rated value	0.5 A	0.5 A	2 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA	

Technical specifications

Article number	6ES7522-1BH01-0AB0 S7-1500, DQ 16x24V DC/0.5A HF	6ES7522-1BL01-0AB0 S7-1500, DQ 32x24VDC/0.5A HF	6ES7522-1BF00-0AB0 S7-1500, DQ 8x24VDC/2A HF	6ES7522-5EH00-0AB0 S7-1500, DQ 16x24...48VUC/ 125VDC/0.5A ST
Output delay with resistive load				
• "0" to "1", typ.			80 µs	
• "0" to "1", max.	100 µs	100 µs	100 µs	5 ms
• "1" to "0", typ.			300 µs	
• "1" to "0", max.	500 µs	500 µs	500 µs	5 ms
Parallel switching of two outputs				
• for logic links	Yes	Yes	Yes	Yes
• for uprating	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes
Switching frequency				
• with resistive load, max.	100 Hz	100 Hz	100 Hz; With PWM operation: 500 Hz	25 Hz
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13; max. 500 Hz with PWM operation only with external circuit; see additional description in the manual	0.5 Hz
• on lamp load, max.	10 Hz	10 Hz	10 Hz	10 Hz
Total current of the outputs				
• Current per channel, max.	0.5 A; see additional description in the manual	0.5 A; see additional description in the manual	2 A; see additional description in the manual	0.5 A
• Current per group, max.	4 A; see additional description in the manual	4 A; see additional description in the manual	8 A; see additional description in the manual	0.5 A
• Current per module, max.	8 A; see additional description in the manual	16 A; see additional description in the manual	16 A; see additional description in the manual	8 A
Isochronous mode				
Execution and activation time (TCO), min.	70 µs	70 µs		
Bus cycle time (TDP), min.	250 µs	250 µs		
Interrupts/diagnostics/ status information				
Diagnostics function	Yes	Yes	Yes	No
Substitute values connectable	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	No
• Maintenance interrupt	Yes	Yes	Yes	No
Diagnoses				
• Monitoring the supply voltage	Yes	Yes	Yes	No
• Wire-break	Yes	Yes	No	No
• Short-circuit	Yes	Yes	Yes	No
• Group error	Yes	Yes	Yes	
Diagnostics indication LED				
• RUN 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
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED	Yes; Yellow LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED	Yes; green LED	No
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	No
• for module diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes

SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

SM 522 digital output modules

Technical specifications

Article number	6ES7522-1BH01-0AB0 S7-1500, DQ 16x24V DC/0.5A HF	6ES7522-1BL01-0AB0 S7-1500, DQ 32x24VDC/0.5A HF	6ES7522-1BF00-0AB0 S7-1500, DQ 8x24VDC/2A HF	6ES7522-5EH00-0AB0 S7-1500, DQ 16x24...48VUC/ 125VDC/0.5A ST
Standards, approvals, certificates				
Suitable for safety functions	No	No	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; From FS02	Yes; From FS03	Yes; From FS02
Highest safety class achievable for safety-related tripping of standard modules				
• Performance level according to ISO 13849-1	PL d	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2	SIL 2	SIL 2
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C; From FS03	-30 °C; From FS03		0 °C
• horizontal installation, max.	60 °C	60 °C		60 °C
• vertical installation, min.	-30 °C; From FS03	-30 °C; From FS03		0 °C
• vertical installation, max.	40 °C	40 °C		40 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	
Dimensions				
Width	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	230 g	280 g	240 g	230 g
Article number	6ES7522-5HF00-0AB0 S7-1500, DQ 8x230VAC/5A ST (Relay)	6ES7522-5HH00-0AB0 S7-1500, DQ 16x230VAC/2A ST (Relay)	6ES7522-5FF00-0AB0 S7-1500, DQ 8x230VAC/2A ST (Triac)	6ES7522-5FH00-0AB0 S7-1500, DQ 16x230VAC/1A ST (Triac)
General information				
Product type designation	DQ 8x230 V AC/5 A ST (relay)	DQ 16x 230 V AC/2 A ST (relay)	DQ 8x230 V AC/2A ST (triac)	DQ 16x230VAC/1A ST (Triac)
Product function				
• Isochronous mode	No	No	No	No
• Prioritized startup	Yes	Yes	Yes	Yes
Engineering with				
• STEP 7 TIA Portal configurable/integrated from version	V12 / V12	V13 SP1 / -	V12 / V12	V13 SP1 / -
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
Operating mode				
• DQ	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No	No
• PWM	No	No	No	No
• Oversampling	No	No	No	No
• MSO	Yes	Yes	Yes	Yes
• Integrated operating cycle counter	Yes; FW V2.1.0 or higher	Yes; FW V1.1.0 or higher	Yes; FW V2.2.0 or higher	Yes; FW V1.2.0 or higher
Supply voltage				
Rated value (DC)	24 V	24 V		
Reverse polarity protection	Yes	Yes		

Technical specifications

Article number	6ES7522-5HF00-0AB0	6ES7522-5HH00-0AB0	6ES7522-5FF00-0AB0	6ES7522-5FH00-0AB0
	S7-1500, DQ 8x230VAC/5A ST (Relay)	S7-1500, DQ 16x230VAC/2A ST (Relay)	S7-1500, DQ 8x230VAC/2A ST (Triac)	S7-1500, DQ 16x230VAC/1A ST (Triac)
Digital outputs				
Type of digital output	Relays	Relays	Triac	Triac
Number of digital outputs	8	16	8	16
Current-sinking	Yes	Yes		Yes
Current-sourcing	Yes	Yes	Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes
Short-circuit protection	No	No	No	No
Controlling a digital input	Yes; possible	Yes		
Size of motor starters according to NEMA, max.	5	5	5	4
Switching capacity of the outputs				
• with resistive load, max.			2 A	1 A
• on lamp load, max.	1 500 W; 10 000 operating cycles	50 W (230 V AC), 5 W (24 V DC)	50 W	50 W
• Low energy/fluorescent lamps with electronic control gear	10x 58 W (25 000 operating cycles)			
• Fluorescent tubes, conventionally compensated	1x 58 W (25 000 operating cycles)			
• Fluorescent tubes, uncompensated	10x 58 W (25 000 operating cycles)			
Output voltage				
• for signal "1", min.			L1 (-1.5 V) at maximum output current; L1 (-8.5 V) at minimum output current	L1 (-1.5 V) at maximum output current; L1 (-8.5 V) at minimum output current
Output current				
• for signal "1" rated value	5 A	2 A	2 A	1 A
• for signal "0" residual current, max.	0 A	0 A	2 mA	2 mA
Output delay with resistive load				
• "0" to "1", max.			1 AC cycle	1 AC cycle
• "1" to "0", max.			1 AC cycle	1 AC cycle
Parallel switching of two outputs				
• for logic links	Yes	Yes	No	No
• for uprating	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes
Switching frequency				
• with resistive load, max.	2 Hz	1 Hz	10 Hz	10 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	2 Hz	1 Hz	1 Hz	1 Hz
Total current of the outputs				
• Current per channel, max.	8 A; see additional description in the manual	2 A; see additional description in the manual	2 A; see additional description in the manual	1 A; see additional description in the manual
• Current per group, max.	8 A; see additional description in the manual	4 A; see additional description in the manual	2 A; see additional description in the manual	2 A; see additional description in the manual
• Current per module, max.	64 A; see additional description in the manual	32 A; see additional description in the manual	10 A; see additional description in the manual	10 A; see additional description in the manual

SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

SM 522 digital output modules

Technical specifications

Article number	6ES7522-5HF00-0AB0	6ES7522-5HH00-0AB0	6ES7522-5FF00-0AB0	6ES7522-5FH00-0AB0
	S7-1500, DQ 8x230VAC/5A ST (Relay)	S7-1500, DQ 16x230VAC/2A ST (Relay)	S7-1500, DQ 8x230VAC/2A ST (Triac)	S7-1500, DQ 16x230VAC/1A ST (Triac)
Relay outputs				
• Number of relay outputs	8	16		
• Rated supply voltage of relay coil L+ (DC)	24 V	24 V		
• Current consumption of relays (coil current of all relays), typ.	80 mA	150 mA		
• external protection for relay outputs	With miniature circuit breaker with characteristic B for: cos φ 1.0: 600 A cos φ 0.5 ... 0.7: 900 A with 8 A Diazed fuse: 1 000 A	Miniature circuit breaker B10 / B16		
• Contact connection (internal)	No	No		
• Number of operating cycles, max.	4 000 000; see additional description in the manual	see additional description in the manual		
• Relay approved acc. to UL 508	Yes; 250 V AC/5 A g.p.; 120 V AC TV-4 tungsten; A300, R300	No		
Switching capacity of contacts				
- with inductive load, max.	see additional description in the manual	2 A; see additional description in the manual		
- with resistive load, max.	see additional description in the manual	2 A; see additional description in the manual		
Interrupts/diagnostics/status information				
Diagnostics function	Yes		No	No
Substitute values connectable	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	No	No
• Maintenance interrupt		Yes	Yes; maintenance alarm for switching cycle counter	Yes; maintenance alarm for switching cycle counter
Diagnoses				
• Monitoring the supply voltage	Yes	Yes	No	No
• Wire-break	No	No	No	No
• Short-circuit	No	No	No	No
Diagnostics indication LED				
• RUN 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
• MAINT LED	Yes; Yellow LED	Yes; Yellow LED		
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; green LED	No	No
• Channel status display	Yes; green LED	Yes; green LED	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No	No	No
• for module diagnostics	Yes; red LED	Yes; red LED	Yes; red LED	Yes; red LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
Suitable for safety functions	No	No	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS03	Yes; From FS02		
Highest safety class achievable for safety-related tripping of standard modules				
• Performance level according to ISO 13849-1	PL c	PL c		
• Category according to ISO 13849-1	Cat. 2	Cat. 2		

Technical specifications

Article number	6ES7522-5HF00-0AB0	6ES7522-5HH00-0AB0	6ES7522-5FF00-0AB0	6ES7522-5FH00-0AB0
	S7-1500, DQ 8x230VAC/5A ST (Relay)	S7-1500, DQ 16x230VAC/2A ST (Relay)	S7-1500, DQ 8x230VAC/2A ST (Triac)	S7-1500, DQ 16x230VAC/1A ST (Triac)
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C; From FS03	-25 °C; From FS02	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; From FS03	-25 °C; From FS02	0 °C	0 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C
Dimensions				
Width	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	350 g	350 g	290 g	310 g
Article number				
	6ES7522-1BP00-0AA0		6ES7522-1BP50-0AA0	
	S7-1500, DQ 64x24VDC/0.3A BA		S7-1500, DQ 64x24VDC/0.3A SNK BA	
General information				
Product type designation	DQ 64x24VDC/0.3A BA		DQ 64x24VDC/0.3A SNK BA	
Product function				
• Isochronous mode	No		No	
• Prioritized startup	No		No	
Engineering with				
• STEP 7 TIA Portal configurable/ integrated from version	V16 with HSP 0319 / V17		V16 with HSP 0319 / V17	
• STEP 7 configurable/integrated from version	V5.5 SP3 / -		V5.5 SP3 / -	
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1		V1.0 / V5.1	
• PROFINET from GSD version/ GSD revision	V2.35 / -		V2.35 / -	
Operating mode				
• DQ	Yes		Yes	
• DQ with energy-saving function	No		No	
• PWM	No		No	
• Cam control (switching at comparison values)	No		No	
• Oversampling	No		No	
• MSO	Yes		Yes	
• Integrated operating cycle counter	No		No	
Supply voltage				
Rated value (DC)	24 V		24 V	
Reverse polarity protection	Yes; through internal protection with 7 A per group		Yes; Through internal protection with 4 A per group	
Digital outputs				
Type of digital output	Transistor		Transistor	
Number of digital outputs	64		64	
Current-sinking	No		Yes	
Current-sourcing	Yes		No	
Digital outputs, parameterizable	No		No	
Short-circuit protection	Yes		No; external fusing necessary, max. 4 A per group, tripping characteristic type B or C	
Limitation of inductive shutdown voltage to	L+ (-53 V)		L+ (-53 V)	
Controlling a digital input	Yes		Yes	
Switching capacity of the outputs				
• with resistive load, max.	0.3 A		0.3 A	
• on lamp load, max.	5 W		5 W	
Load resistance range				
• lower limit	80 Ω		80 Ω	
• upper limit	10 kΩ		10 kΩ	

SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

SM 522 digital output modules

Technical specifications

Article number	6ES7522-1BP00-0AA0 S7-1500, DQ 64x24VDC/0.3A BA	6ES7522-1BP50-0AA0 S7-1500, DQ 64x24VDC/0.3A SNK BA
Output voltage • for signal "1", min.	L+ (-0.8 V)	M+ (0.5 V)
Output current • for signal "1" rated value • for signal "0" residual current, max.	0.3 A 0.5 mA	0.3 A 0.5 mA
Output delay with resistive load • "0" to "1", max. • "1" to "0", max.	100 µs 500 µs	100 µs 500 µs
Parallel switching of two outputs • for logic links • for uprating • for redundant control of a load	Yes No Yes	Yes No Yes
Switching frequency • with resistive load, max. • with inductive load, max. • on lamp load, max.	100 Hz 0.5 Hz; According to IEC 60947-5-1, DC-13 10 Hz	100 Hz 0.5 Hz; According to IEC 60947-5-1, DC-13 10 Hz
Total current of the outputs • Current per channel, max. • Current per group, max. • Current per module, max.	0.3 A 2 A 8 A	0.3 A 2 A 8 A
Total current of the outputs (per module) horizontal installation - up to 60 °C, max.	8 A	8 A
vertical installation - up to 40 °C, max.	8 A	8 A
Interrupts/diagnostics/status information Diagnostics function Substitute values connectable	No No	No No
Alarms • Diagnostic alarm • Maintenance interrupt	No No	No No
Diagnoses • Monitoring the supply voltage • Wire-break • Short-circuit • Group error	No No No No	No No No No
Diagnostics indication LED • RUN LED • ERROR LED • MAINT LED • Monitoring of the supply voltage (PWR-LED) • Channel status display • for channel diagnostics • for module diagnostics	Yes; green LED Yes; red LED No Yes; via SIMATIC TOP connect connection module Yes; via SIMATIC TOP connect connection module No No	Yes; green LED Yes; red LED No Yes; via SIMATIC TOP connect connection module Yes; via SIMATIC TOP connect connection module No No
Potential separation Potential separation channels • between the channels and backplane bus	Yes	Yes

Technical specifications

Article number	6ES7522-1BP00-0AA0 S7-1500, DQ 64x24VDC/0.3A BA	6ES7522-1BP50-0AA0 S7-1500, DQ 64x24VDC/0.3A SNK BA
Standards, approvals, certificates		
Suitable for safety functions	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS01	No
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	
• Category according to ISO 13849-1	Cat. 3	
• SIL acc. to IEC 62061	SIL 2	
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C
• vertical installation, max.	40 °C	40 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
Dimensions		
Width	35 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	270 g	270 g
Other		
Note:	Please order cable and connection modules separately	Please order cable and connection modules separately
Article number	6ES7522-1BH10-0AA0 S7-1500, DQ 16x24VDC/0.5A BA	6ES7522-1BL10-0AA0 S7-1500, DQ 32x24VDC/0.5A BA
General information		
Product type designation	DQ 16x24VDC/0.5A BA	DQ 32x24VDC/0.5A BA
Product function		
• Isochronous mode	No	No
• Prioritized startup	Yes	Yes
Engineering with		
• STEP 7 TIA Portal configurable/integrated from version	V13 / V13	V13 / V13
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/GSD revision	V2.3 / -	V2.3 / -
Operating mode		
• DQ	Yes	Yes
• DQ with energy-saving function	No	No
• PWM	No	No
• Oversampling	No	No
• MSO	Yes	Yes
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; through internal protection with 7 A per group	Yes; through internal protection with 7 A per group

SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

SM 522 digital output modules

Technical specifications

Article number	6ES7522-1BH10-0AA0 S7-1500, DQ 16x24VDC/0.5A BA	6ES7522-1BL10-0AA0 S7-1500, DQ 32x24VDC/0.5A BA
Digital outputs		
Type of digital output	Transistor	Transistor
Number of digital outputs	16	32
Current-sourcing	Yes	Yes
Digital outputs, parameterizable	No	No
Short-circuit protection	Yes	Yes
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• with resistive load, max.	0.5 A	0.5 A
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	48 Ω	48 Ω
• upper limit	12 kΩ	12 kΩ
Output voltage		
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)
Output current		
• for signal "1" rated value	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
Output delay with resistive load		
• "0" to "1", max.	100 μs	100 μs
• "1" to "0", max.	500 μs	500 μs
Parallel switching of two outputs		
• for logic links	Yes	Yes
• for uprating	No	No
• for redundant control of a load	Yes	Yes
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13
• on lamp load, max.	10 Hz	10 Hz
Total current of the outputs		
• Current per channel, max.	0.5 A; see additional description in the manual	0.5 A; see additional description in the manual
• Current per group, max.	4 A; see additional description in the manual	4 A; see additional description in the manual
• Current per module, max.	8 A; see additional description in the manual	16 A; see additional description in the manual
Interrupts/diagnostics/status information		
Diagnostics function	No	No
Substitute values connectable	No	No
Alarms		
• Diagnostic alarm	No	No
• Maintenance interrupt	No	No
Diagnoses		
• Monitoring the supply voltage	No	No
• Wire-break	No	No
• Short-circuit	No	No
• Group error	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)	Yes; green LED	Yes; green LED
• Channel status display	Yes; green LED	Yes; green LED
• for channel diagnostics	No	No
• for module diagnostics	No	No

Technical specifications

Article number	6ES7522-1BH10-0AA0	6ES7522-1BL10-0AA0
	S7-1500, DQ 16x24VDC/0.5A BA	S7-1500, DQ 32x24VDC/0.5A BA
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety functions	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; From FS02
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3
• SIL acc. to IEC 62061	SIL 2	SIL 2
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C; from FS04	-30 °C; from FS04
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C; from FS04	-30 °C; from FS04
• vertical installation, max.	40 °C	40 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Dimensions		
Width	25 mm	25 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	230 g	280 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 523 digital input/output modules

Overview

4



- 16 digital inputs and 16 digital outputs (25 mm wide)
- 32 digital inputs, sinking/sourcing / 32 digital outputs, sourcing (35 mm wide)
- For flexible adaptation of the PLC to the corresponding task
- For subsequent expansion of the system with additional inputs and outputs
- For use in the tightest spaces: particularly economical, without parameters or diagnostic functions

Ordering data

Article No.

Article No.

SM 523 digital input/output module

Module width 35 mm

32 inputs, 24 V DC Basic, source-sinking input, input delay 3.2 ms, input type 3 (IEC 61131); 32 outputs, 24 V DC / 0.3 A Basic, sourcing

Module width 25 mm; front connector (push-in) included in scope of delivery

16 inputs, 24 V DC, isolated;
16 outputs, 24 V DC;
0.5 A, isolated

Accessories

Front connector

For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; spare part

DIN A4 labeling sheets

For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray

6ES7523-1BP50-0AA0

6ES7523-1BL00-0AA0

6ES7592-1BM00-0XA0

6ES7592-1AX00-0AA0

U connector

5 units; spare part

Universal front door for I/O modules

For 25 mm modules; 5 front doors; with 5 labeling strips on the 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

6ES7590-0AA00-0AA0

6ES7528-0AA00-0AA0

6ES7998-8XC01-8YE0

6ES7998-8XC01-8YE2

Technical specifications

Article number	6ES7523-1BL00-0AA0 S7-1500, DI 16x24VDC/DQ 16x24VDC/0.5A BA	6ES7523-1BP50-0AA0 S7-1500, DI 32x24VDC/DQ 32x24VDC/0.3A BA
General information		
Product type designation	DI 16x24VDC / DQ16x24VDC/0.5A BA	DI 32 x 24 V DC / DQ 32 x 24 V DC/0.3A SNK BA
Product function		
• Isochronous mode	No	No
• Prioritized startup	Yes	No
Engineering with		
• STEP 7 TIA Portal configurable/ integrated from version	V13 / V13	V16 with HSP 0319 / V17
• STEP 7 configurable/integrated from version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS from GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET from GSD version/ GSD revision	V2.3 / -	V2.35 / -
Operating mode		
• DI	Yes	Yes
• Counter	No	No
• DQ	Yes	Yes
• DQ with energy-saving function	No	No
• PWM	No	No
• Cam control (switching at comparison values)	No	No
• Oversampling	No	No
• MSI	Yes	Yes
• MSO	Yes	Yes
• Integrated operating cycle counter	No	No
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; through internal protection with 7 A per group	Yes; Through internal protection with 4 A per group
Digital inputs		
Number of digital inputs	16	32
Digital inputs, parameterizable	No	No
Source/sink input	P-reading	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Number of simultaneously controllable inputs		
• Number of simultaneously controllable inputs		32
horizontal installation - up to 60 °C, max.		32
vertical installation - up to 40 °C, max.		16
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5 V	-5 ... +5 V (reference potential is COM)
• for signal "1"	+11 to +30V	-11 ... -30 V; +11 ... +30 V (reference potential is COM)
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 technological functions - parameterizable	No	No

SIMATIC S7-1500 Advanced Controllers

I/O modules

Digital modules

SM 523 digital input/output modules

Technical specifications

Article number	6ES7523-1BL00-0AA0 S7-1500, DI 16x24VDC/DQ 16x24VDC/0.5A BA	6ES7523-1BP50-0AA0 S7-1500, DI 32x24VDC/DQ 32x24VDC/0.3A BA
Digital outputs		
Type of digital output	Transistor	Transistor
Number of digital outputs	16	32
Current-sinking	Yes	Yes
Current-sourcing	Yes	No
Digital outputs, parameterizable	No	No
Short-circuit protection	Yes	No; external fusing necessary, max. 4 A per group, tripping characteristic type B or C
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• with resistive load, max.	0.5 A	0.3 A
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	48 Ω	80 Ω
• upper limit	12 kΩ	10 kΩ
Output voltage		
• for signal "1", min.	L+ (-0.8 V)	M+ (0.5 V)
Output current		
• for signal "1" rated value	0.5 A	0.3 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
Output delay with resistive load		
• "0" to "1", max.	100 μs	100 μs
• "1" to "0", max.	500 μs	500 μs
Parallel switching of two outputs		
• for logic links	Yes	Yes
• for uprating	No	No
• for redundant control of a load	Yes	Yes
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz; According to IEC 60947-5-1, DC-13
• on lamp load, max.	10 Hz	10 Hz
Total current of the outputs		
• Current per channel, max.	0.5 A; see additional description in the manual	0.3 A
• Current per group, max.	4 A; see additional description in the manual	2 A
• Current per module, max.	8 A; see additional description in the manual	4 A
Total current of the outputs (per module)		
horizontal installation - up to 60 °C, max.		4 A
vertical installation - up to 40 °C, max.		4 A
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA

Technical specifications

Article number	6ES7523-1BL00-0AA0	6ES7523-1BP50-0AA0
	S7-1500, DI 16x24VDC/DQ 16x24VDC/0.5A BA	S7-1500, DI 32x24VDC/DQ 32x24VDC/0.3A BA
Interrupts/diagnostics/status information		
Diagnostics function	No	No
Substitute values connectable	No	No
Alarms		
• Diagnostic alarm	No	No
• Maintenance interrupt	No	No
• Hardware interrupt	No	No
Diagnoses		
• Monitoring the supply voltage	No	No
• Wire-break	No	No
• Short-circuit	No	No
• Group error	No	No
Diagnostics indication LED		
• RUN LED	Yes; green LED	Yes; green LED
• ERROR LED	Yes; red LED	Yes; red LED
• MAINT LED	No	No
• Monitoring of the supply voltage (PWR-LED)	Yes; green LED	Yes; via SIMATIC TOP connect connection module
• Channel status display	Yes; green LED	Yes; via SIMATIC TOP connect connection module
• for channel diagnostics	No	No
• for module diagnostics	No	No
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes; From FS03	
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	
• Category according to ISO 13849-1	Cat. 3	
• SIL acc. to IEC 62061	SIL 2	
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-30 °C; from FS04	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C; from FS04	-30 °C
• vertical installation, max.	40 °C	40 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m
Dimensions		
Width	25 mm	35 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	280 g	250 g
Other		
Note:	Supplied incl. 40-pole push-in front connectors	Please order cable and connection modules separately