

SIMATIC S7-1200 Basic Controllers

Central processing units
Standard CPUs

CPU 1211C

Overview



- Controller for intro to S7
- Expandable by:
 - 1 signal board (SB), battery board (BB) or communication board (CB)
 - Max. 3 communication modules (CM)

Technical specifications

Article number	6ES7211-1BE40-0XB0	6ES7211-1AE40-0XB0	6ES7211-1HE40-0XB0
	CPU 1211C, AC/DC/RELAY, 6DI/4DO/2AI	CPU 1211C, DC/DC/DC, 6DI/4DO/2AI	CPU 1211C, DC/DC/RELAY, 6DI/4DO/2AI
General information			
Product type designation	CPU 1211C AC/DC/Relay	CPU 1211C DC/DC/DC	CPU 1211C DC/DC/Relay
Engineering with			
• Programming package	STEP 7 V14 or higher	STEP 7 V14 or higher	STEP 7 V14 or higher
Supply voltage			
Rated value (DC)		Yes	Yes
• 24 V DC			
Rated value (AC)	Yes		
• 120 V AC	Yes		
• 230 V AC	Yes		
Encoder supply			
24 V encoder supply			
• 24 V	20.4 to 28.8V	L+ minus 4 V DC min.	L+ minus 4 V DC min.
Power loss			
Power loss, typ.	10 W	8 W	8 W
Memory			
Work memory			
• integrated	50 kbyte	50 kbyte	50 kbyte
Load memory			
• integrated	1 Mbyte	1 Mbyte	1 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
Backup			
• without battery	Yes	Yes	Yes
CPU processing times			
for bit operations, typ.	0.085 µs; / instruction	0.085 µs; / instruction	0.085 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity			
Flag			
• Number, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
Process image			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes

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CPU 1211C

Technical specifications (continued)

Article number	6ES7211-1BE40-0XB0	6ES7211-1AE40-0XB0	6ES7211-1HE40-0XB0
	CPU 1211C, AC/DC/RELAY, 6DI/4DO/2AI	CPU 1211C, DC/DC/DC, 6DI/4DO/2AI	CPU 1211C, DC/DC/RELAY, 6DI/4DO/2AI
Configuration			
Programming			
Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
Dimensions			
Width	90 mm	90 mm	90 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	420 g	370 g	380 g

Ordering data

Article No.	Article No.
CPU 1211C	
Compact CPU, AC/DC/relay; Integrated program/data memory 50 KB, load memory 1 MB; Wide-range power supply 85 ... 264 V AC; Boolean execution times 0.1 µs per operation; 6 digital inputs, 4 digital outputs (relays), 2 analog inputs; Expandable by up to 3 communication modules and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	6ES7211-1BE40-0XB0
Compact CPU, DC/DC/DC; Integrated program/data memory 50 KB, load memory 1 MB; Power supply 24 V DC; Boolean execution times 0.1 µs per operation; 6 digital inputs, 4 digital outputs, 2 analog inputs; Expandable by up to 3 communication modules and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	6ES7211-1AE40-0XB0
Compact CPU, DC/DC/relay; Integrated program/data memory 50 KB, load memory 1 MB; Power supply 24 V DC; Boolean execution times 0.1 µs per operation; 6 digital inputs, 4 digital outputs (relays), 2 analog inputs; Expandable by up to 3 communication modules and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	6ES7211-1HE40-0XB0
SB 1221 signal board 4 inputs, 5 V DC, 200 kHz 4 inputs, 24 V DC, 200 kHz	6ES7221-3AD30-0XB0 6ES7221-3BD30-0XB0
SB 1222 signal board 4 outputs, 5 V DC, 0.1 A, 200 kHz 4 outputs, 24 V DC, 0.1 A, 200 kHz	6ES7222-1AD30-0XB0 6ES7222-1BD30-0XB0
SB 1223 signal board 2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz 2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz 2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	6ES7223-0BD30-0XB0 6ES7223-3AD30-0XB0 6ES7223-3BD30-0XB0
SB 1231 signal board 1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	6ES7231-4HA30-0XB0
SB 1231 thermocouple signal board 1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K	6ES7231-5QA30-0XB0
RTD signal board SB 1231 1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	6ES7231-5PA30-0XB0
SB 1232 signal board 1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits	6ES7232-4HA30-0XB0
CB 1241 RS 485 communication board For point-to-point connection, with 1 RS 485 interface	6ES7241-1CH30-1XB0

SIMATIC S7-1200 Basic Controllers

I/O modules

Digital modules

SB 1223 digital input/output modules

Overview



- Digital inputs and outputs as supplement to the integral I/O of the SIMATIC S7-1200 CPUs
- Can be plugged direct into the CPU

Technical specifications

Article number	6ES7223-0BD30-0XB0	6ES7223-3AD30-0XB0	6ES7223-3BD30-0XB0
	SIGNAL BOARD SB1223, 2 DI/2 DO	SIGNAL BOARD SB 1223, 2DI/2DQ 5V 200KHZ	SIGNAL BOARD SB 1223, 2DI/2DQ 24V 200KHZ
General information			
Product type designation	SB 1223 DI/2x24 VDC, DQ 2x24 VDC	SB 1223 2xDI / 2xDQ 5VDC 200kHz	SB 1223 2xDI / 2xDQ 24VDC 200kHz
Input current			
from backplane bus 5 V DC, typ.	50 mA	35 mA	35 mA
Output voltage			
Power supply to the transmitters			
• Supply current, max.	4 mA; per channel		
Power loss			
Power loss, typ.	1 W	0.5 W	0.5 W
Digital inputs			
Number of digital inputs	2; Current-sinking	2; Current-sourcing	2; Current-sourcing
• in groups of	1	2	2
Input characteristic curve in accordance with IEC 61131, type 1	Yes		
Number of simultaneously controllable inputs all mounting positions			
- up to 40 °C, max.	2		2
Input voltage			
• Type of input voltage	DC	DC	DC
• Rated value (DC)	24 V	5 V	24 V
• for signal "0"	0 to 5 V	(L+ minus 1.0 V DC) ... L+	(L+ minus 5.0 V DC) ... L+
• for signal "1"	+15 to +30V	0 V ... (L+ minus 2.0 V DC)	0 V ... (L+ minus 10 V DC)
Input current			
• for signal "0", max. (permissible quiescent current)	1 mA	2.2 mA	1.4 mA
• for signal "1", min.		5.1 mA	2.9 mA
• for signal "1", typ.	0.5 A		7 mA

Technical specifications (continued)

Article number	6ES7223-0BD30-0XB0 SIGNAL BOARD SB1223, 2 DI/2 DO	6ES7223-3AD30-0XB0 SIGNAL BOARD SB 1223, 2DI/2DQ 5V 200KHZ	6ES7223-3BD30-0XB0 SIGNAL BOARD SB 1223, 2DI/2DQ 24V 200KHZ
Input delay (for rated value of input voltage)			
for standard inputs			
- parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μ s; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 μ s; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms
- at "0" to "1", max.	2 μ s		
- at "1" to "0", max.	10 μ s		
for interrupt inputs			
- parameterizable	Yes	Yes	Yes
for counter/technological functions			
- parameterizable	Yes	Yes	Yes
Cable length			
• shielded, max.	500 m	50 m; shielded, twisted pair	50 m; shielded, twisted pair
• unshielded, max.	300 m		
Digital outputs			
Number of digital outputs	2; MOSFET, solid-state (current-sinking/current-sourcing)	2; MOSFET, solid-state (current-sinking/current-sourcing)	2; MOSFET, solid-state (current-sinking/current-sourcing)
• in groups of	1	2	2
Short-circuit protection	No	No	No
Switching capacity of the outputs			
• with resistive load, max.	0.5 A	0.1 A	0.1 A
• on lamp load, max.	5 W		
Load resistance range			
• upper limit	0.6 Ω	7 Ω	
Output voltage			
• Rated value (DC)	24 V	5 V	24 V
• for signal "0", max.	0.1 V; with 10 kOhm load	0.2 V	1 V
• for signal "1", min.	20 V	L+ minus 0.7 V DC	L+ (-1.5 V)
• for signal "1", max.		6 V	
Output current			
• for signal "1" rated value	0.5 A	0.1 A	0.1 A
• for signal "1" permissible range, max.		0.1 A	
• for signal "0" residual current, max.	10 μ A		
Cable length			
• shielded, max.	500 m	50 m	50 m
• unshielded, max.	150 m		
Interrupts/diagnostics/ status information			
Alarms	Yes		
Diagnostic functions	Yes		
Diagnostics indication LED			
• for status of the inputs	Yes	Yes	Yes
• for status of the outputs	Yes	Yes	Yes
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP20	Yes	Yes	Yes

SIMATIC S7-1200 Basic Controllers

I/O modules

Digital modules

SB 1223 digital input/output modules**Technical specifications** (continued)

Article number	6ES7223-0BD30-0XB0 SIGNAL BOARD SB1223, 2 DI/2 DO	6ES7223-3AD30-0XB0 SIGNAL BOARD SB 1223, 2DI/2DQ 5V 200KHZ	6ES7223-3BD30-0XB0 SIGNAL BOARD SB 1223, 2DI/2DQ 24V 200KHZ
Ambient conditions			
Free fall			
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation			
• permissible temperature range	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting	-20 °C to +60 °C horizontal mounting, -20 °C to 50 °C vertical mounting
• min.	0 °C	-20 °C	-20 °C
• max.	55 °C	60 °C	60 °C
Mechanics/material			
Enclosure material (front)			
• Plastic	Yes	Yes	Yes
Dimensions			
Width	38 mm	38 mm	38 mm
Height	62 mm	62 mm	62 mm
Depth	21 mm	21 mm	21 mm
Weights			
Weight, approx.	40 g	35 g	35 g

Ordering data**SB 1223 digital input/output signal board**

2 inputs, 24 V DC,
IEC type 1 current sinking;
2 24 V DC transistor outputs,
0.5 A, 5 W; can be used as HSC at
up to 30 kHz

6ES7223-0BD30-0XB0

2 inputs, 5 V DC, 200 kHz
2 outputs 5 V DC, 0.1 A, 200 kHz

6ES7223-3AD30-0XB0

2 inputs, 24 V DC, 200 kHz
2 outputs 24 V DC, 0.1 A, 200 kHz

6ES7223-3BD30-0XB0**Article No.****Terminal block (spare part)**

For signal board
With 6 screws, gold-plated; 4 pcs.

6ES7292-1BF30-0XA0

Overview



- Digital inputs and outputs as supplement to the integral I/O of the SIPLUS S7-1200-CPU's
- Can be plugged directly into the CPU (cannot be used for +70 °C version)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme-specific information was added.

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Technical specifications

Article number	6AG1223-0BD30-4XB0	6AG1223-0BD30-5XB0	6AG1223-3AD30-5XB0	6AG1223-3BD30-5XB0
Based on	6ES7223-0BD30-0XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	6ES7223-0BD30-0XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	6ES7223-3AD30-0XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ 5VDC	6ES7223-3BD30-0XB0 SIPLUS S7-1200 SB 1223 2DI/2DQ, 24VDC
Ambient conditions				
Free fall				
• Fall height, max.	0.3 m; five times, in product package			
Ambient temperature during operation				
• min.	0 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	55 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
Extended ambient conditions				
• relative to ambient temperature-atmospheric pressure-installation altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
Relative humidity				
- With condensation, tested in accordance with IEC 60068-2-38, max.	100%; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100%; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100%; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100%; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
- against biologically active substances / conformity with EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna). The supplied connector covers must remain on the unused interfaces during operation!
- against chemically active substances / conformity with EN 60721-3-3	Yes; Class 3C4 incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- against mechanically active substances / conformity with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!