

## SIMATIC S7-1200



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3/97	SIPLUS SM 1232 analog output modules		
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**Brochures**

For brochures serving as selection guides for SIMATIC products refer to:

[www.siemens.com/simatic/printmaterial](http://www.siemens.com/simatic/printmaterial)

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# SIMATIC S7-1200

## Introduction

### S7-1200

#### Overview

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- The new modular miniature controller from the SIMATIC S7 family
- Comprising:
  - Controller with integrated PROFINET IO controller interface for communication between SIMATIC controllers, HMI, programming device or other automation components
  - Communication module with PROFIBUS DP master interface
  - Communication module PROFIBUS DP slave interface
  - GPRS module for connection to GSM/G mobile phone networks
  - Integrated web server with standard and user-specific web pages
  - Data logging functionality for archiving of data at runtime from the user program
  - Powerful, integrated technology functions such as counting, measuring, closed-loop control, and motion control
  - Integrated digital and analog inputs/outputs
  - Signal boards for direct use in a controller
  - Signal modules for expansion of controllers by input/output channels
  - Communication modules for expansion of controllers with additional communications interfaces
  - Accessories, e.g. power supply, switch module or SIMATIC Memory Card
- The miniature controller that offers maximum automation at minimum cost.
- Extremely simple installation, programming and operation.
- Large-scale integration, space-saving, powerful.
- Suitable for small to medium-size automation engineering applications.
- Can be used both for simple controls and for complex automation tasks.
- All CPUs can be used in stand-alone mode, in networks and within distributed structures.
- Suitable for applications where programmable controllers would not have been economically viable in the past.
- With exceptional real-time performance and powerful communication options.

For brochures serving as selection guides for SIMATIC products refer to:

<http://www.siemens.com/simatic/printmaterial>

### Technical specifications

#### General technical specifications SIMATIC S7-1200

Degree of protection	IP20 acc. to IEC 529
Ambient temperature	
• Operation (95% humidity)	
- Horizontal installation	-20 ... +60 °C
- Vertical installation	-20 ... +50 °C
• Transportation and storage	
- With 95% humidity	-40 ... +70 °C 25 ... 55 °C
Insulation	
• 5/24 V DC circuits	500 V AC test voltage
• 115/230 V AC circuits to ground	1500 V AC test voltage
• 115/230 V AC circuits to 115/230 V AC circuits	1500 V AC test voltage
• 230 V AC circuits to 5/24 V DC circuits	1500 V AC test voltage
• 115 V AC circuits to 5/24 V DC circuits	1500 V AC test voltage
Electromagnetic compatibility	
• Noise immunity acc. to EN 50082-2	Requirements of the EMC directive Test acc. to: IEC 801-2, IEC 801-3, IEC 801-4, EN 50141, EN 50204, IEC 801-5, VDE 0160
• Emitted interference acc. to EN 50081-1 and EN 50081-2	Test according to EN 55011, Class A, Group 1
Mechanical strength	
• Vibrations, test acc. to / tested with	IEC 68, Part 2-6: 10 ... 57 Hz; constant amplitude 0.3 mm; 58 ... 150 Hz; constant acceleration 1 g (mounted on DIN rail) or 2 g (mounted in switchboard); mode of vibration: frequency sweeps with a sweep rate of 1 octave/minute; duration of vibration: 10 frequency sweeps per axis in each direction of the three mutually perpendicular axes
• Shocks, test acc. to / tested with	IEC 68, Part 2-27/half-sine: magnitude of shock 15 g (peak value), duration 11 ms, 6 shocks in each of the three mutually perpendicular axes

#### General technical specifications SIPLUS S7-1200

Ambient temperature range	-40/-25/-20 ... +55/+60/+70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical specifications	The technical specifications of the standard product apply except for the ambient conditions.
<b>Ambient conditions</b>	
Relative humidity	5 ... 100%, condensation allowed
Biologically active substances	Conformity with EN 60721-3-3, Class 3B2 mold and fungal spores (except fauna)
Chemically active substances	Compliance with EN 60721-3-3, class 3C4, incl. salt mist
Mechanically active substances	Conformity with EN 60721-3-3, Class 3S4 including sand, dust
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

# SIMATIC S7-1200

## Central processing units

### CPU 1211C

#### Overview



- The clever compact solution
- With 10 integral input/outputs
- Expandable by:
  - 1 signal board (SB) or communication board (CB)
  - Max. 3 communication modules (CM)

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#### Technical specifications

	6ES7 211-1BE31-0XB0 CPU 1211C AC/DC/Relay	6ES7 211-1AE31-0XB0 CPU 1211C DC/DC/DC	6ES7 211-1HE31-0XB0 CPU 1211C DC/DC/Relay
<b>General information</b>			
Engineering with			
• Programming package	As of STEP 7 V11.0 SP2	As of STEP 7 V11.0 SP2	As of STEP 7 V11.0 SP2
<b>Supply voltage</b>			
24 V DC		Yes	Yes
120 V AC	Yes		
230 V AC	Yes		
<b>Encoder supply</b>			
24 V encoder supply			
• 24 V	Permissible range: 20.4 to 28.8 V	Permissible range: 20.4 to 28.8 V	Permissible range: 20.4 to 28.8 V
<b>Power losses</b>			
Power loss, typ.	10 W	8 W	8 W
<b>Memory</b>			
Work memory			
• integrated	30 kbyte	30 kbyte	30 kbyte
Load memory			
• integrated	1 Mbyte	1 Mbyte	1 Mbyte
Backup			
• without battery	Yes	Yes	Yes
<b>CPU processing times</b>			
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.	2.5 µs; / instruction	2.5 µs; / instruction	2.5 µs; / instruction
<b>Data areas and their retentivity</b>			
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
<b>Address area</b>			
Process image			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
<b>Time of day</b>			
Clock			
• Hardware clock (real-time clock)	Yes	Yes	Yes

### Technical specifications (continued)

	6ES7 211-1BE31-0XB0 CPU 1211C AC/DC/Relay	6ES7 211-1AE31-0XB0 CPU 1211C DC/DC/DC	6ES7 211-1HE31-0XB0 CPU 1211C DC/DC/Relay
<b>Digital inputs</b>			
Number/binary inputs	6; integrated	6; integrated	6; integrated
• of which, inputs usable for technological functions	3; HSC (High Speed Counting)	3; HSC (High Speed Counting)	3; HSC (High Speed Counting)
<b>Digital outputs</b>			
Number/binary outputs	4; Relay	4	4; Relay
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
<b>Analog inputs</b>			
Integrated channels (AI)	2; 0 to 10 V	2; 0 to 10 V	2; 0 to 10 V
Input ranges			
• Voltage	Yes	Yes	Yes
<b>1st interface</b>			
Type of interface	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Functionality			
• PROFINET IO Controller	Yes	Yes	Yes
<b>Communication functions</b>			
S7 communication			
• supported	Yes	Yes	Yes
Open IE communication			
• TCP/IP	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes
• UDP	Yes	Yes	Yes
Web server			
• supported	Yes	Yes	Yes
<b>Integrated Functions</b>			
Number of counters	3	3	3
Counter frequency (counter) max.	100 kHz	100 kHz	100 kHz
Frequency meter	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs		4	
Limit frequency (pulse)		100 kHz	
<b>Ambient conditions</b>			
Operating temperature			
• Min.	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C
<b>Configuration</b>			
programming			
• Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
<b>Dimensions</b>			
Width	90 mm	90 mm	90 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
<b>Weight</b>			
Weight, approx.	420 g	370 g	380 g

# SIMATIC S7-1200

## Central processing units

### CPU 1211C

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Ordering data	Order No.	Order No.
<b>CPU 1211C</b> <b>Compact CPU, AC/DC/relay;</b> integral program/data memory 25 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	<b>6ES7 211-1BE31-0XB0</b>	<b>SB 1231 signal board</b> 1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits
<b>Compact CPU, DC/DC/DC;</b> integrated program/data memory 25 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	<b>6ES7 211-1AE31-0XB0</b>	<b>SB 1231 thermocouple signal board</b> 1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K
<b>Compact CPU, DC/DC/relay;</b> integrated program/data memory 25 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	<b>6ES7 211-1HE31-0XB0</b>	<b>SB 1231 RTD signal board</b> 1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign
<b>SB 1221 signal board</b> 4 inputs, 5 V DC, 200 kHz 4 inputs, 24 V DC, 200 kHz	<b>6ES7 221-3AD30-0XB0</b> <b>6ES7 221-3BD30-0XB0</b>	<b>SB 1232 signal board</b> 1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits
<b>SB 1222 signal board</b> 4 outputs, 5 V DC, 0.1 A, 200 kHz 4 outputs, 24 V DC, 0.1 A, 200 kHz	<b>6ES7 222-1AD30-0XB0</b> <b>6ES7 222-1BD30-0XB0</b>	<b>CB 1241 RS485 communication board</b> for point-to-point connection, with 1 RS485 interface
<b>SB 1223 signal board</b> 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	<b>6ES7 223-0BD30-0XB0</b>  <b>6ES7 223-3AD30-0XB0</b> <b>6ES7 223-3BD30-0XB0</b>	<b>Simulator (optional)</b> 8 input switches, for CPU 1211C / CPU 1212C
		<b>SIMATIC Memory Card (optional)</b> 4 MB <b>6ES7 954 -8LC01-0AA0</b> 12 MB <b>6ES7 954 -8LE01-0AA0</b> 24 MB <b>6ES7 954 -8LF01-0AA0</b>
		<b>Terminal block (spare part)</b> for CPU 1211C/1212C For DI, with 14 screws, tin-plated; 4 units <b>6ES7 292-1AH30-0XA0</b> For DO, with 8 screws, tin-plated; 4 units <b>6ES7 292-1AP30-0XA0</b> For AI, with 3 screws, tin-plated; 4 units <b>6ES7 292-1BC30-0XA0</b>
		<b>RJ45 cable grip</b> 4 items per pack Single port <b>6ES7 290-3AA30-0XA0</b>
		<b>Front flap set (spare part)</b> for CPU 1211C/1212C <b>6ES7 291-1AA30-0XA0</b>
		<b>S7-1200 automation system, System Manual</b> For SIMATIC S7-1200 and STEP 7 Basic  German <b>6ES7 298-8FA30-8AH0</b> English <b>6ES7 298-8FA30-8BH0</b> French <b>6ES7 298-8FA30-8CH0</b> Spanish <b>6ES7 298-8FA30-8DH0</b> Italian <b>6ES7 298-8FA30-8EH0</b> Chinese <b>6ES7 298-8FA30-8KH0</b>

# SIMATIC S7-1200

## Central processing units

CPU 1211C

Ordering data	Order No.	Order No.
<b>S7-1200 automation system, Easy Book</b> Brief instructions German English French Spanish Italian Chinese	<b>6ES7 298-8FA30-8AQ0</b>  <b>6ES7 298-8FA30-8BQ0</b>  <b>6ES7 298-8FA30-8CQ0</b>  <b>6ES7 298-8FA30-8DQ0</b>  <b>6ES7 298-8FA30-8EQ0</b>  <b>6ES7 298-8FA30-8KQ0</b>	<b>STEP 7 Professional / Basic V12</b> Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows XP Home SP3 (only STEP 7 Basic), Windows XP Professional SP3 (32 bit), Windows 7 Home Premium SP1 (only STEP 7 Basic), Windows 7 Professional SP1 (32/64 bit), Windows 7 Enterprise SP1 (32/64 bit), Windows 7 Ultimate SP1 (32/64 bit), Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2 (32/64 bit) Delivery package: German, English, Chinese, Italian, French, Spanish  <b>STEP 7 Professional V12, Floating License</b>  <b>STEP 7 Basic V12, Floating License</b>
		<b>6ES7 822-1AA02-0YA5</b>  <b>6ES7 822-0AA02-0YA5</b>

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# SIMATIC S7-1200

## Central processing units

### CPU 1212C

#### Overview



- The superior compact solution
- With 14 integral input/outputs
- Expandable by:
  - 1 signal board (SB) or communication board (CB)
  - 2 signal modules (SM)
  - Max. 3 communication modules (CM)

#### Technical specifications

	6ES7 212-1BE31-0XB0 CPU 1212C AC/DC/Relay	6ES7 212-1AE31-0XB0 CPU 1212C DC/DC/DC	6ES7 212-1HE31-0XB0 CPU 1212C AC/DC/Relay
<b>General information</b>			
Engineering with			
• Programming package	As of STEP 7 V11.0 SP2	As of STEP 7 V11.0 SP2	As of STEP 7 V11.0 SP2
<b>Supply voltage</b>			
24 V DC		Yes	Yes
120 V AC	Yes		
230 V AC	Yes		
<b>Encoder supply</b>			
24 V encoder supply			
• 24 V	Permissible range: 20.4 to 28.8 V	Permissible range: 20.4 to 28.8 V	Permissible range: 20.4 to 28.8 V
<b>Power losses</b>			
Power loss, typ.	11 W	9 W	9 W
<b>Memory</b>			
Work memory			
• integrated	50 kbyte	50 kbyte	50 kbyte
Load memory			
• integrated	1 Mbyte	1 Mbyte	1 Mbyte
Backup			
• without battery	Yes	Yes	Yes
<b>CPU processing times</b>			
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.	2.5 µs; / instruction	2.5 µs; / instruction	2.5 µs; / instruction
<b>Data areas and their retentivity</b>			
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
<b>Address area</b>			
Process image			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
<b>Time of day</b>			
Clock			
• Hardware clock (real-time clock)	Yes	Yes	Yes



### Technical specifications (continued)

	6ES7 212-1BE31-0XB0 CPU 1212C AC/DC/Relay	6ES7 212-1AE31-0XB0 CPU 1212C DC/DC/DC	6ES7 212-1HE31-0XB0 CPU 1212C AC/DC/Relay
<b>Digital inputs</b>			
Number/binary inputs • of which, inputs usable for technological functions	8; integrated 4; HSC (High Speed Counting)	8; integrated 4; HSC (High Speed Counting)	8; integrated 4; HSC (High Speed Counting)
<b>Digital outputs</b>			
Number/binary outputs • of which high-speed outputs	6; Relay	6 4; 100 kHz Pulse Train Output	6; Relay
<b>Analog inputs</b>			
Integrated channels (AI)	2; 0 to 10 V	2; 0 to 10 V	2; 0 to 10 V
Input ranges • Voltage	Yes	Yes	Yes
<b>1st interface</b>			
Type of interface	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Functionality • PROFINET IO Controller	Yes	Yes	Yes
<b>Communication functions</b>			
S7 communication • supported	Yes	Yes	Yes
Open IE communication • TCP/IP • ISO-on-TCP (RFC1006) • UDP	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes
Web server • supported	Yes	Yes	Yes
<b>Integrated Functions</b>			
Number of counters	4	4	4
Counter frequency (counter) max.	100 kHz	100 kHz	100 kHz
Frequency meter	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs		2	
Limit frequency (pulse)		100 kHz	
<b>Ambient conditions</b>			
Operating temperature • Min. • max.	-20 °C 60 °C	-20 °C 60 °C	-20 °C 60 °C
<b>Configuration</b>			
programming • Programming language - LAD - FBD - SCL	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes
<b>Dimensions</b>			
Width	90 mm	90 mm	90 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
<b>Weight</b>			
Weight, approx.	425 g	370 g	385 g

# SIMATIC S7-1200

## Central processing units

### CPU 1212C

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Ordering data	Order No.	Order No.
<b>CPU 1212C</b> <b>Compact CPU, AC/DC/relay;</b> integral program/data memory 25 KB, load memory 1 MB; wide-range power supply 85 ... 264 V AC; Boolean execution times 0.1 μs per operation; 8 digital inputs, 6 digital outputs (relays), 2 analog inputs; expandable by up to 3 communication modules, 2 signal modules and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz	<b>6ES7 212-1BE31-0XB0</b>	<b>SB 1223 signal board</b> 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
<b>Compact CPU, DC/DC/DC;</b> integrated program/data memory 25 KB, load memory 1 MB; power supply 24 V DC; Boolean execution times 0.1 μs per operation; 8 digital inputs, 6 digital outputs, 2 analog inputs; expandable by up to 3 communication modules, 2 signal 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	<b>6ES7 212-1AE31-0XB0</b>	<b>SB 1231 signal board</b> 1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits  <b>SB 1231 thermocouple            signal board</b> 1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K
<b>Compact CPU, DC/DC/relay;</b> integrated program/data memory 25 KB, load memory 2 MB; power supply 24 V DC; Boolean execution times 0.1 μs per operation; 8 digital inputs, 6 digital outputs (relays), 2 analog inputs; expandable by up to 3 communication modules, 2 signal 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	<b>6ES7 212-1HE31-0XB0</b>	<b>SB 1231 RTD signal board</b> 1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign  <b>SB 1232 signal board</b> 1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits
<b>SB 1221 signal board</b> 4 inputs, 5 V DC, 200 kHz  4 inputs, 24 V DC, 200 kHz	<b>6ES7 221-3AD30-0XB0</b>  <b>6ES7 221-3BD30-0XB0</b>	<b>CB 1241 RS485            communication board</b> for point-to-point connection, with 1 RS485 interface  <b>Simulator (optional)</b> 8 input switches, for CPU 1211C / CPU 1212C  <b>SIMATIC Memory Card (optional)</b> 4 MB 12 MB 24 MB
<b>SB 1222 signal board</b> 4 outputs, 5 V DC, 0.1 A, 200 kHz  4 outputs, 24 V DC, 0.1 A, 200 kHz	<b>6ES7 222-1AD30-0XB0</b>  <b>6ES7 222-1BD30-0XB0</b>	<b>6ES7 241-1CH30-1XB0</b>  <b>6ES7 232-4HA30-0XB0</b>  <b>6ES7 274-1XF30-0XA0</b>  <b>6ES7 954 -8LC01-0AA0</b> <b>6ES7 954 -8LE01-0AA0</b> <b>6ES7 954 -8LF01-0AA0</b>  <b>6ES7 290-6AA30-0XA0</b>  <b>6ES7 212-1BD33-4YB0</b>
		<b>Extension cable            for two-tier configuration</b> for connecting digital/analog signal modules; length 2 m  <b>Starter box            CPU 1212C AC/DC/relay</b> Complete offer SIMATIC S7-1200, starter box, comprising: CPU 1212C AC/DC/relay, simulator, STEP 7 BASIC CD, manual CD, info material, in Systainer

Ordering data	Order No.	Order No.
<b>Terminal block (spare part)</b> for CPU 1211C/1212C for DI, with 14 screws, tin-plated; 4 units <b>6ES7 292-1AH30-0XA0</b> for DO, with 8 screws, tin-plated; 4 units <b>6ES7 292-1AP30-0XA0</b> for AI, with 3 screws, tin-plated; 4 units <b>6ES7 292-1BC30-0XA0</b>		
<b>RJ45 cable grip</b> 4 items per pack Single port <b>6ES7 290-3AA30-0XA0</b>		
<b>Front flap set (spare part)</b> for CPU 1211C/1212C <b>6ES7 291-1AA30-0XA0</b>		
<b>S7-1200 automation system, System Manual</b> for SIMATIC S7-1200 and STEP 7 Basic German <b>6ES7 298-8FA30-8AH0</b> English <b>6ES7 298-8FA30-8BH0</b> French <b>6ES7 298-8FA30-8CH0</b> Spanish <b>6ES7 298-8FA30-8DH0</b> Italian <b>6ES7 298-8FA30-8EH0</b> Chinese <b>6ES7 298-8FA30-8KH0</b>		<b>STEP 7 Professional / Basic V12</b> Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows XP Home SP3 (only STEP 7 Basic), Windows XP Professional SP3 (32 bit), Windows 7 Home Premium SP1 (only STEP 7 Basic), Windows 7 Professional SP1 (32/64 bit), Windows 7 Enterprise SP1 (32/64 bit), Windows 7 Ultimate SP1 (32/64 bit), Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2 (32/64 bit) Delivery package: German, English, Chinese, Italian, French, Spanish
		<b>6ES7 822-1AA02-0YA5</b>
		<b>6ES7 822-0AA02-0YA5</b>
<b>S7-1200 automation system, Easy Book</b> Brief instructions German <b>6ES7 298-8FA30-8AQ0</b> English <b>6ES7 298-8FA30-8BQ0</b> French <b>6ES7 298-8FA30-8CQ0</b> Spanish <b>6ES7 298-8FA30-8DQ0</b> Italian <b>6ES7 298-8FA30-8EQ0</b> Chinese <b>6ES7 298-8FA30-8KQ0</b>		

# SIMATIC S7-1200

## Central processing units

### CPU 1214C

#### Overview



- The compact high-performance CPU
- With 24 integral input/outputs
- Expandable by:
  - 1 signal board (SB) or communication board (CB)
  - 8 signal modules (SM)
  - Max. 3 communication modules (CM)

#### Technical specifications

	6ES7 214-1BG31-0XB0 CPU 1214C AC/DC/Relay	6ES7 214-1AG31-0XB0 CPU 1214C DC/DC/DC	6ES7 214-1HG31-0XB0 CPU 1214C DC/DC/Relay
<b>General information</b>			
Engineering with			
• Programming package	As of STEP 7 V11.0 SP2	As of STEP 7 V11.0 SP2	As of STEP 7 V11.0 SP2
<b>Supply voltage</b>			
24 V DC		Yes	Yes
120 V AC	Yes		
230 V AC	Yes		
<b>Encoder supply</b>			
24 V encoder supply			
• 24 V	Permissible range: 20.4 to 28.8 V	Permissible range: 20.4 to 28.8 V	Permissible range: 20.4 to 28.8 V
<b>Power losses</b>			
Power loss, typ.	14 W	12 W	12 W
<b>Memory</b>			
Work memory			
• integrated	75 kbyte	75 kbyte	75 kbyte
Load memory			
• integrated	4 Mbyte	4 Mbyte	4 Mbyte
Backup			
• without battery	Yes	Yes	Yes
<b>CPU processing times</b>			
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.	2.5 µs; / instruction	2.5 µs; / instruction	2.5 µs; / instruction
<b>Data areas and their retentivity</b>			
Flag			
• Number, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
<b>Address area</b>			
Process image			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
<b>Time of day</b>			
Clock			
• Hardware clock (real-time clock)	Yes	Yes	Yes

### Technical specifications (continued)

	6ES7 214-1BG31-0XB0 CPU 1214C AC/DC/Relay	6ES7 214-1AG31-0XB0 CPU 1214C DC/DC/DC	6ES7 214-1HG31-0XB0 CPU 1214C DC/DC/Relay
<b>Digital inputs</b>			
Number/binary inputs • of which, inputs usable for technological functions	14; integrated 6; HSC (High Speed Counting)	14; integrated 6; HSC (High Speed Counting)	14; integrated 6; HSC (High Speed Counting)
<b>Digital outputs</b>			
Number/binary outputs • of which high-speed outputs	10; Relay	10 4; 100 kHz Pulse Train Output	10; Relay
<b>Analog inputs</b>			
Integrated channels (AI)	2; 0 to 10 V	2; 0 to 10 V	2; 0 to 10 V
Input ranges • Voltage	Yes	Yes	Yes
<b>1st interface</b>			
Type of interface	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Functionality • PROFINET IO Controller	Yes	Yes	Yes
<b>Communication functions</b>			
S7 communication • supported	Yes	Yes	Yes
Open IE communication • TCP/IP • ISO-on-TCP (RFC1006) • UDP	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes
Web server • supported	Yes	Yes	Yes
<b>Integrated Functions</b>			
Number of counters	6	6	6
Counter frequency (counter) max.	100 kHz	100 kHz	100 kHz
Frequency meter	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs		2	
Limit frequency (pulse)		100 kHz	
<b>Ambient conditions</b>			
Operating temperature • Min. • max.	-20 °C 60 °C	-20 °C 60 °C	-20 °C 60 °C
<b>Configuration</b>			
programming • Programming language - LAD - FBD - SCL	Yes Yes Yes	Yes Yes Yes	Yes Yes Yes
<b>Dimensions</b>			
Width	110 mm	110 mm	110 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
<b>Weight</b>			
Weight, approx.	455 g	415 g	435 g

# SIMATIC S7-1200

## Central processing units

### CPU 1214C

3

Ordering data	Order No.	Order No.
<b>CPU 1214C</b> <b>Compact CPU, AC/DC/relay;</b> integral program/data memory 50 KB, load memory 2 MB; wide-range power supply 85 ... 264 V AC; Boolean execution times 0.1 μs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs; expandable by up to 3 communication modules, 8 signal modules and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz	<b>6ES7 214-1BG31-0XB0</b>	<b>SB 1223 signal board</b> 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
<b>Compact CPU, DC/DC/DC;</b> integrated program/data memory 50 KB, load memory 2 MB; power supply 24 V DC; Boolean execution times 0.1 μs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs; expandable by up to 3 communication modules, 8 signal 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	<b>6ES7 214-1AG31-0XB0</b>	<b>SB 1231 signal board</b> 1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits  <b>SB 1231 thermocouple            signal board</b> 1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K
<b>Compact CPU, DC/DC/relay;</b> integrated program/data memory 50 KB, load memory 2 MB; power supply 24 V DC; Boolean execution times 0.1 μs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs; expandable by up to 3 communication modules, 8 signal 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	<b>6ES7 214-1HG31-0XB0</b>	<b>SB 1231 RTD signal board</b> 1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign  <b>SB 1232 signal board</b> 1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits
<b>SB 1221 signal board</b> 4 inputs, 5 V DC, 200 kHz 4 inputs, 24 V DC, 200 kHz	<b>6ES7 221-3AD30-0XB0</b> <b>6ES7 221-3BD30-0XB0</b>	<b>CB 1241 RS485            communication board</b> for point-to-point connection, with 1 RS485 interface  <b>Simulator (optional)</b> 14 input switches, for CPU 1214C
<b>SB 1222 signal board</b> 4 outputs, 5 V DC, 0.1 A, 200 kHz 4 outputs, 24 V DC, 0.1 A, 200 kHz	<b>6ES7 222-1AD30-0XB0</b> <b>6ES7 222-1BD30-0XB0</b>	<b>6ES7 274-1XH30-0XA0</b>  <b>SIMATIC Memory Card (optional)</b> 4 MB 12 MB 24 MB  <b>Extension cable            for two-tier configuration</b> for connecting digital/analog signal modules; length 2 m  <b>Terminal block (spare part)</b> for CPU 1214C for DI, with 20 screws, tin-plated; 4 units for DO, with 12 screws, tin-plated; 4 units for AI, with 3 screws, tin-plated; 4 units
		<b>6ES7 223-0BD30-0XB0</b>  <b>6ES7 223-3AD30-0XB0</b>  <b>6ES7 223-3BD30-0XB0</b>  <b>6ES7 231-4HA30-0XB0</b>  <b>6ES7 231-5QA30-0XB0</b>  <b>6ES7 231-5PA30-0XB0</b>  <b>6ES7 232-4HA30-0XB0</b>  <b>6ES7 241-1CH30-1XB0</b>  <b>6ES7 290-6AA30-0XA0</b>  <b>6ES7 954 -8LC01-0AA0</b> <b>6ES7 954 -8LE01-0AA0</b> <b>6ES7 954 -8LF01-0AA0</b>  <b>6ES7 292-1AV30-0XA0</b> <b>6ES7 292-1AM30-0XA0</b> <b>6ES7 292-1BC30-0XA0</b>

Ordering data	Order No.	Order No.
<b>RJ45 cable grip</b> 4 items per pack Single port	<b>6ES7 290-3AA30-0XA0</b>	
<b>Front flap set (spare part)</b> for CPU 1214C	<b>6ES7 291-1AB30-0XA0</b>	
<b>S7-1200 automation system, System Manual</b> for SIMATIC S7-1200 and STEP 7 Basic German English French Spanish Italian Chinese	<b>6ES7 298-8FA30-8AH0</b> <b>6ES7 298-8FA30-8BH0</b> <b>6ES7 298-8FA30-8CH0</b> <b>6ES7 298-8FA30-8DH0</b> <b>6ES7 298-8FA30-8EH0</b> <b>6ES7 298-8FA30-8KH0</b>	<b>STEP 7 Professional / Basic V12</b> Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows XP Home SP3 (only STEP 7 Basic), Windows XP Professional SP3 (32 bit), Windows 7 Home Premium SP1 (only STEP 7 Basic), Windows 7 Professional SP1 (32/64 bit), Windows 7 Enterprise SP1 (32/64 bit), Windows 7 Ultimate SP1 (32/64 bit), Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2 (32/64 bit) Delivery package: German, English, Chinese, Italian, French, Spanish
<b>S7-1200 automation system, Easy Book</b> Brief instructions German English French Spanish Italian Chinese	<b>6ES7 298-8FA30-8AQ0</b> <b>6ES7 298-8FA30-8BQ0</b> <b>6ES7 298-8FA30-8CQ0</b> <b>6ES7 298-8FA30-8DQ0</b> <b>6ES7 298-8FA30-8EQ0</b> <b>6ES7 298-8FA30-8KQ0</b>	<b>6ES7 822-1AA02-0YA5</b> <b>6ES7 822-0AA02-0YA5</b>

# SIMATIC S7-1200

## Central processing units

### CPU 1215C

#### Overview



- The compact high-performance CPU
- With 24 integral input/outputs
- Expandable by:
  - 1 signal board (SB) or communication board (CB)
  - 8 signal modules (SM)
  - Max. 3 communication modules (CM)

#### Technical specifications

	6ES7 215-1BG31-0XB0 CPU 1215C AC/DC/Relay	6ES7 215-1AG31-0XB0 CPU 1215C DC/DC/DC	6ES7 215-1HG31-0XB0 CPU 1215C DC/DC/Relay
<b>General information</b>			
Engineering with			
• Programming package	As of STEP 7 V11.0 SP2	As of STEP 7 V11.0 SP2	As of STEP 7 V11.0 SP2
<b>Supply voltage</b>			
24 V DC		Yes	Yes
120 V AC	Yes		
230 V AC	Yes		
<b>Power losses</b>			
Power loss, typ.	12 W	12 W	12 W
<b>Memory</b>			
Work memory			
• integrated	100 kbyte	100 kbyte	100 kbyte
Load memory			
• integrated	4 Mbyte	4 Mbyte	4 Mbyte
Backup			
• without battery	Yes	Yes	Yes
<b>CPU processing times</b>			
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.	2.5 µs; / instruction	2.5 µs; / instruction	2.5 µs; / instruction
<b>Data areas and their retentivity</b>			
Flag			
• Number, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
<b>Address area</b>			
Process image			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
<b>Time of day</b>			
Clock			
• Hardware clock (real-time clock)	Yes	Yes	Yes



### Technical specifications (continued)

	6ES7 215-1BG31-0XB0 CPU 1215C AC/DC/Relay	6ES7 215-1AG31-0XB0 CPU 1215C DC/DC/DC	6ES7 215-1HG31-0XB0 CPU 1215C DC/DC/Relay
<b>Digital inputs</b>			
Number/binary inputs	14; integrated	14; integrated	14; integrated
• of which, inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
<b>Digital outputs</b>			
Number/binary outputs	10; Relay	10	10; Relay
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
<b>Analog inputs</b>			
Integrated channels (AI)	2; 0 to 10 V	2; 0 to 10 V	2; 0 to 10 V
Input ranges			
• Voltage	Yes	Yes	Yes
<b>Analog outputs</b>			
Integrated channels (AO)	2; 0 to 20mA	2; 0 to 20mA	2; 0 to 20mA
<b>1st interface</b>			
Type of interface	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Functionality			
• PROFINET IO Controller	Yes	Yes	Yes
<b>Communication functions</b>			
S7 communication			
• supported	Yes	Yes	Yes
Open IE communication			
• TCP/IP	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes
• UDP	Yes	Yes	Yes
Web server			
• supported	Yes	Yes	Yes
<b>Integrated Functions</b>			
Number of counters	6	6	6
Counter frequency (counter) max.	100 kHz	100 kHz	100 kHz
Frequency meter	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs	4	4	4
<b>Ambient conditions</b>			
Operating temperature			
• Min.	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C
<b>Configuration</b>			
programming			
• Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
<b>Dimensions</b>			
Width	130 mm	130 mm	130 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
<b>Weight</b>			
Weight, approx.	550 g	520 g	585 g

# SIMATIC S7-1200

## Central processing units

### CPU 1215C

3

Ordering data	Order No.	Order No.
<b>CPU 1215C</b> <b>Compact CPU, AC/DC/relay;</b> integral program/data memory 100 KB, load memory 4 MB; wide-range power supply 85 ... 264 V AC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs, 2 analog outputs; expandable by up to 3 communication modules, 8 signal modules and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz	<b>6ES7 215-1BG31-0XB0</b>	<b>SB 1223 signal board</b> 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
<b>Compact CPU, DC/DC/DC;</b> integrated program/data memory 100 KB, load memory 4 MB; power supply 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs, 2 analog outputs; expandable by up to 3 communication modules, 8 signal 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	<b>6ES7 215-1AG31-0XB0</b>	<b>SB 1231 signal board</b> 1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits  <b>SB 1231 thermocouple            signal board</b> 1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K  <b>SB 1231 RTD signal board</b> 1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign
<b>Compact CPU, DC/DC/relay;</b> integrated program/data memory 100 KB, load memory 4 MB; power supply 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs, 2 analog outputs; expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz	<b>6ES7 215-1HG31-0XB0</b>	<b>SB 1232 signal board</b> 1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits  <b>CB 1241 RS485            communication board</b> for point-to-point connection, with 1 RS485 interface  <b>BB 1297 battery board</b> for long-term backup of real-time clock; can be plugged into the sig- nal board slot of an S7-1200 CPU in FW version 3.0 or higher; battery (CR 1025) is not included
<b>SB 1221 signal board</b> 4 inputs, 5 V DC, 200 kHz 4 inputs, 24 V DC, 200 kHz	<b>6ES7 221-3AD30-0XB0</b> <b>6ES7 221-3BD30-0XB0</b>	<b>Simulator (optional)</b> 14 input switches <b>6ES7 274-1XH30-0XA0</b>
<b>SB 1222 signal board</b> 4 outputs, 5 V DC, 0.1 A, 200 kHz 4 outputs, 24 V DC, 0.1 A, 200 kHz	<b>6ES7 222-1AD30-0XB0</b> <b>6ES7 222-1BD30-0XB0</b>	<b>SIMATIC Memory Card (optional)</b> 4 MB <b>6ES7 954 -8LC01-0AA0</b> 12 MB <b>6ES7 954 -8LE01-0AA0</b> 24 MB <b>6ES7 954 -8LF01-0AA0</b>  <b>Extension cable            for two-tier configuration</b> for connecting digital/analog signal modules; length 2 m <b>6ES7 290-6AA30-0XA0</b>

Ordering data	Order No.	Order No.
<b>Terminal block (spare part)</b> for CPU 1215C for DI, with 20 screws, tin-plated; 4 units for DO, with 12 screws, tin-plated; 4 units for analog units, with 6 screws, gold-plated; 4 units	<b>6ES7 292-1AV30-0XA0</b>  <b>6ES7 292-1AM30-0XA0</b>  <b>6ES7 292-1BF30-0XB0</b>	<b>STEP 7 Professional / Basic V12</b>  <b>Target system:</b> SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC <b>Requirement:</b> Windows XP Home SP3 (only STEP 7 Basic), Windows XP Professional SP3 (32 bit), Windows 7 Home Premium SP1 (only STEP 7 Basic), Windows 7 Professional SP1 (32/64 bit), Windows 7 Enterprise SP1 (32/64 bit), Windows 7 Ultimate SP1 (32/64 bit), Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2 (32/64 bit) <b>Delivery package:</b> German, English, Chinese, Italian, French, Spanish
<b>Front flap set (spare part)</b> for CPU 1215C	<b>6ES7 291-1AC30-0XA0</b>	
<b>RJ45 cable grip</b> 4 items per pack Dual port	<b>6ES7 290-3AB30-0XA0</b>	
<b>S7-1200 automation system,            System Manual</b> for SIMATIC S7-1200 and STEP 7 Basic		
German	<b>6ES7 298-8FA30-8AH0</b>	
English	<b>6ES7 298-8FA30-8BH0</b>	
French	<b>6ES7 298-8FA30-8CH0</b>	
Spanish	<b>6ES7 298-8FA30-8DH0</b>	
Italian	<b>6ES7 298-8FA30-8EH0</b>	
Chinese	<b>6ES7 298-8FA30-8KH0</b>	
<b>S7-1200 automation system,            Easy Book</b> Brief instructions		
German	<b>6ES7 298-8FA30-8AQ0</b>	
English	<b>6ES7 298-8FA30-8BQ0</b>	
French	<b>6ES7 298-8FA30-8CQ0</b>	
Spanish	<b>6ES7 298-8FA30-8DQ0</b>	
Italian	<b>6ES7 298-8FA30-8EQ0</b>	
Chinese	<b>6ES7 298-8FA30-8KQ0</b>	
		<b>STEP 7 Professional V12,            Floating License</b>
		<b>6ES7 822-1AA02-0YA5</b>
		<b>STEP 7 Basic V12,            Floating License</b>
		<b>6ES7 822-0AA02-0YA5</b>

# SIMATIC S7-1200

## Central processing units

### CPU 1217C

#### Overview

- The compact high-performance CPU
- With 24 integrated I/Os
- Expandable by:
  - 1 Signal Board (SB) or Communication Board (CB)
  - 8 signal modules (SM)
  - Max. 3 communication modules (CM)

#### Technical specifications

	6ES7 217-1AG40-0XB0 CPU 1217C DC/DC/DC
<b>Supply voltage</b> 24 V DC	Yes
<b>Encoder supply</b> 24 V encoder supply • 24 V	Permissible range: 20.4 to 28.8 V
<b>Power losses</b> Power loss, typ.	12 W
<b>Memory</b> Work memory • integrated	125 kbyte
Load memory • integrated • Plug-in (SIMATIC Memory Card), max.	4 Mbyte 2 Gbyte; with SIMATIC memory card
Backup • without battery	Yes
<b>CPU processing times</b> for bit operations, typ.	0.085 µs; / Operation
for word operations, typ.	1.5 µs; / Operation
for floating point arithmetic, typ.	2.5 µs; / Operation
<b>Data areas and their retentivity</b> Flag • Number, max.	8 kbyte; Size of bit memory address area
<b>Address area</b> I/O address area • Inputs • Outputs	1 024 byte 1 024 byte
Process image • Inputs, adjustable • Outputs, adjustable	1 kbyte 1 kbyte
<b>Time of day</b> Clock • Hardware clock (real-time clock)	Yes
<b>Digital inputs</b> Number/binary inputs • of which, inputs usable for technological functions	14; integrated 6; HSC (High Speed Counting)
<b>Digital outputs</b> Number/binary outputs • of which high-speed outputs	10 4
<b>Analog inputs</b> Integrated channels (AI)	2
Input ranges • Voltage	Yes
<b>Analog outputs</b> Integrated channels (AO)	2
Output ranges, current • 0 to 20 mA	Yes

	6ES7 217-1AG40-0XB0 CPU 1217C DC/DC/DC
<b>1st interface</b> Type of interface	PROFINET
Physics	Ethernet
Functionality • PROFINET IO Device • PROFINET IO Controller	Yes Yes
<b>Communication functions</b> S7 communication • supported	Yes
Open IE communication • TCP/IP • ISO-on-TCP (RFC1006) • UDP	Yes Yes Yes
Web server • supported	Yes
Number of connections • overall	16; dynamically
<b>Integrated Functions</b> Number of counters	6
Counter frequency (counter) max.	1 MHz
Frequency meter	Yes
controlled positioning	Yes
PID controller	Yes
Number of alarm inputs	4
Number of pulse outputs	4
<b>Ambient conditions</b> Operating temperature • Min. • max.	-20 °C 60 °C
<b>Configuration</b> programming • Programming language - LAD - FBD - SCL	Yes Yes Yes
<b>Dimensions</b> Width	150 mm
Height	100 mm
Depth	75 mm
<b>Weight</b> Weight, approx.	500 g

3

Ordering data	Order No.	Order No.
<b>CPU 1217C</b> <b>Compact CPU, DC/DC/DC;</b> integrated program/data memory 125 KB, load memory 4 MB; power supply 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs (10 digital 24 V DC inputs, 4 digital 1.5 V DC differential inputs), 10 digital outputs (6 digital 24 V DC outputs, 4 digital 1.5 V DC differential outputs), 2 analog inputs, 2 analog outputs; expandable by up to 3 communication modules, 8 signal modules, and 1 Signal Board/Communication Board; digital inputs can be used as HSC at 1 MHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	<b>6ES7 217-1AG40-0XB0</b>	
<b>SB 1221 signal board</b> 4 inputs, 5 V DC, 200 kHz 4 inputs, 24 V DC, 200 kHz	<b>6ES7 221-3AD30-0XB0</b> <b>6ES7 221-3BD30-0XB0</b>	
<b>SB 1222 signal board</b> 4 outputs, 5 V DC, 0.1 A, 200 kHz 4 outputs, 24 V DC, 0.1 A, 200 kHz	<b>6ES7 222-1AD30-0XB0</b> <b>6ES7 222-1BD30-0XB0</b>	
<b>SB 1223 signal board</b> 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	<b>6ES7 223-0BD30-0XB0</b> <b>6ES7 223-3AD30-0XB0</b> <b>6ES7 223-3BD30-0XB0</b>	
<b>SB 1231 signal board</b> 1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	<b>6ES7 231-4HA30-0XB0</b>	
<b>SB 1231 thermocouple signal board</b> 1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K	<b>6ES7 231-5QA30-0XB0</b>	
		<b>SB 1231 RTD signal board</b> 1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign
		<b>SB 1232 signal board</b> 1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits
		<b>CB 1241 RS485 communication board</b> for point-to-point connection, with 1 RS485 interface
		<b>BB 1297 battery board</b> for long-term backup of real-time clock; can be plugged into the sig- nal board slot of an S7-1200 CPU in FW version 3.0 or higher; battery (CR 1025) is not included
		<b>Simulator (optional)</b> 14 input switches
		<b>SIMATIC Memory Card (optional)</b> 4 MB 12 MB 24 MB 2 GB
		<b>Extension cable for two-tier configuration</b> for connecting digital/analog signal modules; length 2 m
		<b>Terminal block (spare part)</b> for CPU 1217C for DI, with 10 screws, tin-plated; 4 units for DI, with 16 screws, tin-plated; 4 units for DO, with 18 screws, tin-plated; 4 units for analog units, with 6 screws, gold- plated; 4 units
		<b>RJ45 cable grip</b> 4 items per pack Dual port
		<b>6ES7 231-5PA30-0XB0</b> <b>6ES7 232-4HA30-0XB0</b> <b>6ES7 241-1CH30-1XB0</b> <b>6ES7 297-0AX30-0XA0</b> <b>6ES7 274-1XK30-0XA0</b> <b>6ES7 954 -8LC01-0AA0</b> <b>6ES7 954 -8LE01-0AA0</b> <b>6ES7 954 -8LF01-0AA0</b> <b>6ES7 954 -8LP01-0AA0</b> <b>6ES7 290-6AA30-0XA0</b> <b>6ES7 292-1AK30-0XA0</b> <b>6ES7 292-1AR30-0XA0</b> <b>6ES7 292-1AT30-0XA0</b> <b>6ES7 292-1BF30-0XB0</b> <b>6ES7 290-3AB30-0XA0</b>

# SIMATIC S7-1200

## Central processing units

### CPU 1217C

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Ordering data	Order No.		Order No.
<b>S7-1200 automation system, System Manual</b> for SIMATIC S7-1200 and STEP 7 Basic German English French Spanish Italian Chinese	<b>6ES7 298-8FA30-8AH0</b> <b>6ES7 298-8FA30-8BH0</b> <b>6ES7 298-8FA30-8CH0</b> <b>6ES7 298-8FA30-8DH0</b> <b>6ES7 298-8FA30-8EH0</b> <b>6ES7 298-8FA30-8KH0</b>	<b>STEP 7 Professional / Basic V12</b> Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows XP Home SP3 (only STEP 7 Basic), Windows XP Professional SP3 (32 bit), Windows 7 Home Premium SP1 (only STEP 7 Basic), Windows 7 Professional SP1 (32/64 bit), Windows 7 Enterprise SP1 (32/64 bit), Windows 7 Ultimate SP1 (32/64 bit), Microsoft Server 2003 R2 Std. SP2 (32 bit), Microsoft Server 2008 Std. SP2 (32/64 bit) Delivery package: German, English, Chinese, Italian, French, Spanish	
<b>S7-1200 automation system, Easy Book</b> Brief instructions German English French Spanish Italian Chinese	<b>6ES7 298-8FA30-8AQ0</b> <b>6ES7 298-8FA30-8BQ0</b> <b>6ES7 298-8FA30-8CQ0</b> <b>6ES7 298-8FA30-8DQ0</b> <b>6ES7 298-8FA30-8EQ0</b> <b>6ES7 298-8FA30-8KQ0</b>	<b>STEP 7 Professional V12, Floating License</b>	<b>6ES7 822-1AA02-0YA5</b>
		<b>STEP 7 Basic V12, Floating License</b>	<b>6ES7 822-0AA02-0YA5</b>

### Overview



- The clever compact solution
- With 10 integrated I/Os
- Expandable with:
  - 1 signal board (SB) or communication board (CB)
  - Max. 3 communication modules (CM)

#### Note:

SIPLUS extreme products are based on Siemens Industry 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

The technical data correspond to those of the based-on modules apart from the values listed in the table.

	<b>6AG1 211-1AE31-4XB0 CPU 1211C DC/DC/DC</b>	<b>6AG1 211-1AE31-2XB0 CPU 1211C DC/DC/DC</b>
<b>Based on</b>	<b>6ES7 211-1AE31-0XB0</b>	<b>6ES7 211-1AE31-0XB0</b>
<b>Ambient conditions</b>		
Operating temperature		
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• horizontal installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• horizontal installation, max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• vertical installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax
Storage/transport temperature		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Vibrations		
• Vibrations	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail
• Operation, checked according to IEC 60068-2-6	Yes	Yes
Shock test		
• checked according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
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) 0 °C	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) -25 °C
• at cold restart		
• Relative humidity		
- with condensation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
• Resistance		
- to biologically active substances	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!
- to chemically active substances	Yes	Yes
- to mechanically active substances	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!

# SIMATIC S7-1200

## SIPLUS central processing units

### SIPLUS CPU 1211C

#### Technical specifications (continued)

Based on	6AG1 211-1BE31-4XB0 CPU 1211C AC/DC/Relay 6ES7 211-1BE31-0XB0	6AG1 211-1BE31-2XB0 CPU 1211C AC/DC/Relay 6ES7 211-1BE31-0XB0
<b>Ambient conditions</b>		
Operating temperature		
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• horizontal installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• horizontal installation, max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• vertical installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax
Storage/transport temperature		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Vibrations		
• Vibrations	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail
• Operation, checked according to IEC 60068-2-6	Yes	Yes
Shock test		
• checked according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
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) 0 °C	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) -25 °C
• at cold restart		
• Relative humidity	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
• Resistance		
- to biologically active substances	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!
- to chemically active substances	Yes	Yes
- to mechanically active substances	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!



### Technical specifications (continued)

Based on	6AG1 211-1HE31-4XB0 CPU 1211C DC/DC/Relay 6ES7 211-1HE31-0XB0	6AG1 211-1HE31-2XB0 CPU 1211C DC/DC/Relay 6ES7 211-1HE31-0XB0
<b>Ambient conditions</b>		
Operating temperature		
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• horizontal installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• horizontal installation, max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• vertical installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax
Storage/transport temperature		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Vibrations		
• Vibrations	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail
• Operation, checked according to IEC 60068-2-6	Yes	Yes
Shock test		
• checked according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
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)
• at cold restart	0 °C	-25 °C
• Relative humidity - with condensation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
• Resistance - to biologically active substances	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!
- to chemically active substances	Yes	Yes
- to mechanically active substances	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!

# SIMATIC S7-1200

## SIPLUS central processing units

### SIPLUS CPU 1211C

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#### Ordering data

#### Order No.

#### Order No.

##### SIPLUS CPU 1211C compact CPU, AC/DC/relay

(extended temperature range and medial exposure)

Integrated program and data memory of 25 KB, load memory of 1 MB; wide-range alternating voltage supply 85 ... 264 V AC; Boolean execution times of 0.1 ms per operation; 6 digital inputs, 4 digital outputs (relay), 2 analog inputs; expandable with up to 3 communication modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz

- for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C;
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C;

**6AG1 211-1BE31-4XB0**

**6AG1 211-1BE31-2XB0**

##### SIPLUS CPU 1211C compact CPU, DC/DC/DC

(extended temperature range and medial exposure)

Integrated program and data memory of 25 KB, load memory of 1 MB; power supply 24 V DC; Boolean execution times of 0.1 ms per operation; 6 digital inputs, 4 digital outputs, 2 analog inputs; expandable with up to 3 communication modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz, 24 V DC digital outputs usable as pulse outputs (PTO) or pulse-width-modulated outputs (PWM) with 100 kHz

- for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C;
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C;

**6AG1 211-1AE31-4XB0**

**6AG1 211-1AE31-2XB0**

##### SIPLUS CPU 1211C compact CPU, DC/DC/relay

(extended temperature range and medial exposure)

Integrated program and data memory of 25 KB, load memory of 1 MB; power supply 24 V DC; Boolean execution times of 0.1 ms per operation; 6 digital inputs, 4 digital outputs (relay), 2 analog inputs; expandable with up to 3 communication modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz

- for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C;
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C;

**6AG1 211-1HE31-4XB0**

**6AG1 211-1HE31-2XB0**

#### Accessories

##### SIPLUS SB 1223 digital input/output signal board

(extended temperature range and medial exposure)

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

- Suitable for areas with extraordinary medial exposure (conformal coating)
- Ambient temperature -25 ... +55 °C

**6AG1 223-0BD30-4XB0**

**6AG1 223-0BD30-5XB0**

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

- For areas with extreme medial exposure (conformal coating), ambient temperature -25 ... +55 °C

**6AG1 223-3AD30-5XB0**

##### SIPLUS SB 1232 analog output signal board

(extended temperature range and medial exposure)

Ambient temperature range  
-25 ... +55 °C

1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits

Ambient temperature range  
0 ... +55 °C

1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits

**6AG1 232-4HA30-5XB0**

**6AG1 232-4HA30-4XB0**

#### Additional accessories

See SIMATIC S7-1200 CPU 1211C, page 3/6

### Overview



- The superior compact solution
- With 14 integral input/outputs
- Expandable with:
  - 1 signal board (SB) or communication board (CB)
  - 2 signal modules (SM)
  - Max. 3 communication modules (CM)

#### Note:

SIPLUS extreme products are based on Siemens Industry 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

The technical data correspond to those of the based-on modules apart from the values listed in the table.

	<b>6AG1 212-1AE31-4XB0 CPU 1212C DC/DC/DC</b>	<b>6AG1 212-1AE31-2XB0 CPU 1212C DC/DC/DC</b>
<b>Based on</b>	<b>6ES7 212-1AE31-0XB0</b>	<b>6ES7 212-1AE31-0XB0</b>
<b>Ambient conditions</b>		
Operating temperature		
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• horizontal installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• horizontal installation, max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• vertical installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax
Storage/transport temperature		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Vibrations		
• Vibrations	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail
• Operation, checked according to IEC 60068-2-6	Yes	Yes
Shock test		
• checked according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
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) 0 °C	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) -25 °C
• at cold restart		
• Relative humidity		
- with condensation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
• Resistance		
- to biologically active substances	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!
- to chemically active substances	Yes	Yes
- to mechanically active substances	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!

# SIMATIC S7-1200

## SIPLUS central processing units

### SIPLUS CPU 1212C

#### Technical specifications (continued)

Based on	6AG1 212-1BE31-4XB0 CPU 1212C AC/DC/Relay 6ES7 212-1BE31-0XB0	6AG1 212-1BE31-2XB0 CPU 1212C AC/DC/Relay 6ES7 212-1BE31-0XB0
<b>Ambient conditions</b>		
Operating temperature		
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• horizontal installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• horizontal installation, max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• vertical installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax
Storage/transport temperature		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Vibrations		
• Vibrations	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail
• Operation, checked according to IEC 60068-2-6	Yes	Yes
Shock test		
• checked according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
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) 0 °C	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) -25 °C
• at cold restart		
• Relative humidity	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
• Resistance		
- to biologically active substances	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!
- to chemically active substances	Yes	Yes
- to mechanically active substances	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!

### Technical specifications (continued)

Based on	6AG1 212-1HE31-4XB0 CPU 1212C AC/DC/Relay 6ES7 212-1HE31-0XB0	6AG1 212-1HE31-2XB0 CPU 1212C AC/DC/Relay 6ES7 212-1HE31-0XB0
<b>Ambient conditions</b>		
Operating temperature		
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• horizontal installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• horizontal installation, max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• vertical installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax
Storage/transport temperature		
• Min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Vibrations		
• Vibrations	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail
• Operation, checked according to IEC 60068-2-6	Yes	Yes
Shock test		
• checked according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
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)
• at cold restart	0 °C	-25 °C
• Relative humidity - with condensation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
• Resistance - to biologically active substances	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!
- to chemically active substances	Yes	Yes
- to mechanically active substances	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!

# SIMATIC S7-1200

## SIPLUS central processing units

### SIPLUS CPU 1212C

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#### Ordering data

#### Order No.

#### Order No.

##### SIPLUS CPU 1212C compact CPU, AC/DC/relay

(extended temperature range and medial exposure)

Integrated program and data memory of 25 KB, load memory of 1 MB; wide-range alternating voltage supply 85 ... 264 V AC; Boolean execution times of 0.1 ms per operation; 8 digital inputs, 6 digital outputs (relay), 2 analog inputs; expandable with up to 3 communication modules, 2 signal modules, and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz

- for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C

**6AG1 212-1BE31-4XB0**

**6AG1 212-1BE31-2XB0**

##### SIPLUS CPU 1212C compact CPU, DC/DC/DC

(extended temperature range and medial exposure)

Integrated program and data memory of 25 KB, load memory of 1 MB; power supply 24 V DC; Boolean execution times of 0.1 ms per operation; 8 digital inputs, 6 digital outputs, 2 analog inputs; expandable with up to 3 communication modules, 2 signal modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz, 24 V DC digital outputs usable as pulse outputs (PTO) or pulse-width-modulated outputs (PWM) with 100 kHz

- for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C

**6AG1 212-1AE31-4XB0**

**6AG1 212-1AE31-2XB0**

##### SIPLUS CPU 1212C compact CPU, DC/DC/relay

(extended temperature range and medial exposure)

Integrated program and data memory of 25 KB, load memory of 1 MB; power supply 24 V DC; Boolean execution times of 0.1 ms per operation; 8 digital inputs, 6 digital outputs (relay), 2 analog inputs; expandable with up to 3 communication modules, 2 signal modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz

- for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C
- for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C

**6AG1 212-1HE31-4XB0**

**6AG1 212-1HE31-2XB0**

#### Accessories

##### SIPLUS SB 1223 digital input/output signal board

(extended temperature range and medial exposure)

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

- Suitable for areas with extraordinary medial exposure (conformal coating)
- Ambient temperature -25 ... +55 °C

**6AG1 223-0BD30-4XB0**

**6AG1 223-0BD30-5XB0**

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

- for areas with extreme medial exposure (conformal coating), ambient temperature -25 ... +55 °C

**6AG1 223-3AD30-5XB0**

##### SIPLUS SB 1232 analog output signal board

(extended temperature range and medial exposure)

Ambient temperature range  
-25 ... +55 °C

1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits

**6AG1 232-4HA30-5XB0**

Ambient temperature range  
0 ... +55 °C

1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits

**6AG1 232-4HA30-4XB0**

#### Additional accessories

See SIMATIC S7-1200 CPU 1212C, page 3/10

# SIMATIC S7-1200

## SIPLUS central processing units

SIPLUS CPU 1214C

### Overview



- The compact high-performance CPU
- With 24 integrated I/Os
- Expandable with:
  - 1 signal board (SB) or communication board (CB)
  - 8 signal modules (SM)
  - Max. 3 communication modules (CM)

#### Note:

SIPLUS extreme products are based on Siemens Industry 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

The technical data correspond to those of the based-on modules apart from the values listed in the table.

	6AG1 214-1AG31-4XB0 CPU 1214C DC/DC/DC	6AG1 214-1AG31-5XB0 CPU 1214C DC/DC/DC	6AG1 214-1AG31-2XB0 CPU 1214C DC/DC/DC
Based on	6ES7 214-1AG31-0XB0	6ES7 214-1AG31-0XB0	6ES7 214-1AG31-0XB0
<b>Ambient conditions</b>			
Operating temperature			
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• horizontal installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• horizontal installation, max.	60 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• vertical installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Storage/transport temperature			
• Min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
Vibrations			
• Vibrations	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail
• Operation, checked according to IEC 60068-2-6	Yes	Yes	Yes
Shock test			
• checked according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms

# SIMATIC S7-1200

## SIPLUS central processing units

### SIPLUS CPU 1214C

#### Technical specifications (continued)

	<b>6AG1 214-1AG31-4XB0 CPU 1214C DC/DC/DC</b>	<b>6AG1 214-1AG31-5XB0 CPU 1214C DC/DC/DC</b>	<b>6AG1 214-1AG31-2XB0 CPU 1214C DC/DC/DC</b>
<b>Based on</b>	<b>6ES7 214-1AG31-0XB0</b>	<b>6ES7 214-1AG31-0XB0</b>	<b>6ES7 214-1AG31-0XB0</b>
Extended ambient conditions			
<ul style="list-style-type: none"> <li>Relative to ambient temperature-atmospheric pressure-installation altitude</li> </ul>	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) 0 °C	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) -25 °C	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) -25 °C
<ul style="list-style-type: none"> <li>at cold restart</li> <li>Relative humidity           <ul style="list-style-type: none"> <li>with condensation</li> </ul> </li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<ul style="list-style-type: none"> <li>Resistance           <ul style="list-style-type: none"> <li>to biologically active substances</li> <li>to chemically active substances</li> <li>to mechanically active substances</li> </ul> </li> </ul>	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 Yes; Class 3S4 incl. sand, dust. 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 Yes; Class 3S4 incl. sand, dust. 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 Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!



### Technical specifications (continued)

	<b>6AG1 214-1BG31-4XB0 CPU 1214C AC/DC/Relay</b>	<b>6AG1 214-1BG31-5XB0 CPU 1214C AC/DC/Relay</b>	<b>6AG1 214-1BG31-2XB0 CPU 1214C AC/DC/Relay</b>
<b>Based on</b>	<b>6ES7 214-1BG31-0XB0</b>	<b>6ES7 214-1BG31-0XB0</b>	<b>6ES7 214-1BG31-0XB0</b>
<b>Ambient conditions</b>			
Operating temperature			
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	60 °C	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• horizontal installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• horizontal installation, max.	60 °C; = Tmax	60 °C	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• vertical installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
<b>Storage/transport temperature</b>			
• Min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
<b>Vibrations</b>			
• Vibrations	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail
• Operation, checked according to IEC 60068-2-6	Yes	Yes	Yes
<b>Shock test</b>			
• checked according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
<b>Extended ambient conditions</b>			
• 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) 0 °C	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) -25 °C	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) -25 °C
• at cold restart			
• Relative humidity	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
- with condensation			
• Resistance	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!
- to biologically active substances	Yes	Yes	Yes
- to chemically active substances	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!
- to mechanically active substances			

# SIMATIC S7-1200

## SIPLUS central processing units

### SIPLUS CPU 1214C

#### Technical specifications (continued)

	<b>6AG1 214-1HG31-4XB0 CPU 1214C DC/DC/Relay</b>	<b>6AG1 214-1HG31-5XB0 CPU 1214C DC/DC/Relay</b>	<b>6AG1 214-1HG31-2XB0 CPU 1214C DC/DC/Relay</b>
<b>Based on</b>	<b>6ES7 214-1HG31-0XB0</b>	<b>6ES7 214-1HG31-0XB0</b>	<b>6ES7 214-1HG31-0XB0</b>
<b>Ambient conditions</b>			
Operating temperature			
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• horizontal installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• horizontal installation, max.	60 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• vertical installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
<b>Storage/transport temperature</b>			
• Min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
<b>Vibrations</b>			
• Vibrations	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail
• Operation, checked according to IEC 60068-2-6	Yes	Yes	Yes
<b>Shock test</b>			
• checked according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
<b>Extended ambient conditions</b>			
• 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) 0 °C	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) -25 °C	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) -25 °C
• at cold restart			
• Relative humidity			
- with condensation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
• Resistance			
- to biologically active substances	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!
- to chemically active substances	Yes	Yes	Yes
- to mechanically active substances	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!

Ordering data	Order No.	Ordering data	Order No.
<b>SIPLUS CPU 1214C</b> <b>compact CPU, AC/DC/relay</b> (extended temperature range and medial exposure) Integrated program and data memory of 50 KB, load memory of 2 MB; wide-range alternating voltage supply 85 ... 264 V AC; Boolean execution times of 0.1 ms per operation; 14 digital inputs, 10 digital outputs (relay), 2 analog inputs; expandable with up to 3 communication modules, 8 signal modules, and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz <ul style="list-style-type: none"> <li>For areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C</li> <li>For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +60 °C</li> <li>For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C</li> </ul>	<b>6AG1 214-1BG31-4XB0</b>  <b>6AG1 214-1BG31-5XB0</b>  <b>6AG1 214-1BG31-2XB0</b>	<b>SIPLUS CPU 1214C</b> <b>compact CPU, DC/DC/relay</b> (extended temperature range and medial exposure) Integrated program and data memory of 50 KB, load memory of 2 MB; power supply 24 V DC; Boolean execution times of 0.1 ms per operation; 14 digital inputs, 10 digital outputs (relay), 2 analog inputs; expandable with up to 3 communication modules, 8 signal modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz <ul style="list-style-type: none"> <li>For areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C</li> <li>For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +60 °C</li> <li>For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C</li> </ul>	<b>6AG1 214-1HG31-4XB0</b>  <b>6AG1 214-1HG31-5XB0</b>  <b>6AG1 214-1HG31-2XB0</b>
<b>SIPLUS CPU 1214C</b> <b>compact CPU, DC/DC/DC</b> (extended temperature range and medial exposure) Integrated program and data memory of 50 KB, load memory of 2 MB; power supply 24 V DC; Boolean execution times of 0.1 ms per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs; expandable with up to 3 communication modules, 8 signal modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz, 24 V DC digital outputs usable as pulse outputs (PTO) or pulse-width-modulated outputs (PWM) with 100 kHz <ul style="list-style-type: none"> <li>for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C</li> <li>For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +60 °C</li> <li>For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C</li> </ul>	<b>6AG1 214-1AG31-4XB0</b>  <b>6AG1 214-1AG31-5XB0</b>  <b>6AG1 214-1AG31-2XB0</b>	<b>Accessories</b> <b>SIPLUS SB 1223</b> <b>digital input/outputsignal board</b> (extended temperature range and medial exposure) 2 inputs, 24 V DC, IEC type 1 current sinking; 2 transistor outputs 24 V DC, 0.5 A, 5 W; can be used as HSC at up to 30 kHz <ul style="list-style-type: none"> <li>Suitable for areas with extraordinary medial exposure (conformal coating)</li> <li>Ambient temperature -25 ... +55 °C</li> </ul> 2 inputs, 5 V DC, 200 kHz; 2 outputs 5 V DC, 0.1 A, 200 kHz <ul style="list-style-type: none"> <li>For areas with extreme medial exposure (conformal coating), ambient temperature -25 ... +55 °C</li> </ul>	<b>6AG1 223-0BD30-4XB0</b>  <b>6AG1 223-0BD30-5XB0</b>  <b>6AG1 223-3AD30-5XB0</b>
		<b>SIPLUS SB 1232</b> <b>analog output signal board</b> (extended temperature range and medial exposure) <u>Ambient temperature range</u> <u>-25 ... +55 °C</u> 1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits <u>Ambient temperature range</u> <u>0 ... +55 °C</u> 1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	<b>6AG1 232-4HA30-5XB0</b>  <b>6AG1 232-4HA30-4XB0</b>
		<b>Additional accessories</b>	See SIMATIC S7-1200 CPU 1214C, page 3/14

# SIMATIC S7-1200

## SIPLUS central processing units

### SIPLUS CPU 1215C

#### Overview



- The compact high-performance CPU
- With 24 integrated I/Os
- Expandable by:
  - 1 signal board (SB) or communication board (CB)
  - 8 signal modules (SM)
  - Max. 3 communication modules (CM)

#### Note:

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

#### Technical specifications

The technical data correspond to those of the based-on modules apart from the values listed in the table.

Based on	6AG1 215-1AG31-4XB0 CPU 1215C DC/DC/DC	6AG1 215-1AG31-5XB0 CPU 1215C DC/DC/DC	6AG1 215-1AG31-2XB0 CPU 1215C DC/DC/DC
	6ES7 215-1AG31-0XB0	6ES7 215-1AG31-0XB0	6ES7 215-1AG31-0XB0
<b>Ambient conditions</b>			
Operating temperature			
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• horizontal installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• horizontal installation, max.	60 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• vertical installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Storage/transport temperature			
• Min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
Vibrations			
• Vibrations	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail
• Operation, checked according to IEC 60068-2-6	Yes	Yes	Yes
Shock test			
• checked according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
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)		
• at cold restart	0 °C	-25 °C	-25 °C
• Relative humidity			
- with condensation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
• Resistance			
- to biologically active substances	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!
- to chemically active substances	Yes	Yes	Yes
- to mechanically active substances	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!

### Technical specifications (continued)

	<b>6AG1 215-1AG31-4XB0 CPU 1215C DC/DC/DC</b>	<b>6AG1 215-1AG31-5XB0 CPU 1215C DC/DC/DC</b>	<b>6AG1 215-1AG31-2XB0 CPU 1215C DC/DC/DC</b>
<b>Based on</b>	<b>6ES7 215-1AG31-0XB0</b>	<b>6ES7 215-1AG31-0XB0</b>	<b>6ES7 215-1AG31-0XB0</b>
<b>Climatic and mechanical conditions for storage and transport</b>			
Climatic conditions for storage and transport			
• Free fall	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature			
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
	<b>6AG1 215-1BG31-4XB0 CPU 1215C AC/DC/Relay</b>	<b>6AG1 215-1BG31-5XB0 CPU 1215C AC/DC/Relay</b>	<b>6AG1 215-1BG31-2XB0 CPU 1215C AC/DC/Relay</b>
<b>Based on</b>	<b>6ES7 215-1BG31-0XB0</b>	<b>6ES7 215-1BG31-0XB0</b>	<b>6ES7 215-1BG31-0XB0</b>
<b>Ambient conditions</b>			
Operating temperature			
• Min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• horizontal installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• horizontal installation, max.	60 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• vertical installation, min.	-20 °C; = Tmin; startup @ 0 °C	-40 °C; = Tmin; startup @ -25 °C	-40 °C; = Tmin; startup @ -25 °C
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Storage/transport temperature			
• Min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
Vibrations			
• Vibrations	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail	2G wall mounting, 1G DIN rail
• Operation, checked according to IEC 60068-2-6	Yes	Yes	Yes
Shock test			
• checked according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
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)		
• at cold restart	0 °C	-25 °C	-25 °C
• Relative humidity			
- with condensation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
• Resistance			
- to biologically active substances	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!		
- to chemically active substances	Yes		
- to mechanically active substances	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!		
<b>Climatic and mechanical conditions for storage and transport</b>			
Climatic conditions for storage and transport			
• Free fall	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature			
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C

# SIMATIC S7-1200

## SIPLUS central processing units

### SIPLUS CPU 1215C

#### Technical specifications (continued)

Based on	6AG1 215-1HG31-4XB0 CPU 1215C DC/DC/Relay	6AG1 215-1HG31-4XB0 CPU 1215C DC/DC/Relay
<b>Ambient conditions</b>		
Operating temperature		
• Min.	-20 °C; = Tmin; startup @ 0 °C	
• max.	60 °C; = Tmax	
• horizontal installation, min.	-20 °C; = Tmin; startup @ 0 °C	
• horizontal installation, max.	60 °C; = Tmax	
• vertical installation, min.	-20 °C; = Tmin; startup @ 0 °C	
• vertical installation, max.	50 °C; = Tmax	
Storage/transport temperature		
• Min.	-40 °C	
• max.	70 °C	
Vibrations		
• Vibrations	2G wall mounting, 1G DIN rail	
• Operation, checked according to IEC 60068-2-6	Yes	
Shock test		
• checked according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	
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) 0 °C	
• at cold restart		
		<b>6AG1 215-1HG31-4XB0</b> <b>6ES7 215-1HG31-0XB0</b>
		<b>Based on</b> <b>6ES7 215-1HG31-0XB0</b>
		<ul style="list-style-type: none"> <li>Relative humidity           <ul style="list-style-type: none"> <li>- with condensation</li> </ul> </li> <li>Resistance           <ul style="list-style-type: none"> <li>- to biologically active substances</li> <li>- to chemically active substances</li> <li>- to mechanically active substances</li> </ul> </li> </ul>
		100 %; RH incl. condensation/frost (no commissioning under condensation conditions)  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 Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
		<b>Climatic and mechanical conditions for storage and transport</b> Climatic conditions for storage and transport
		<ul style="list-style-type: none"> <li>Free fall           <ul style="list-style-type: none"> <li>- Drop height, max. (in packaging)</li> </ul> </li> <li>Temperature           <ul style="list-style-type: none"> <li>- Permissible temperature range</li> </ul> </li> </ul>
		0.3 m; five times, in dispatch package  -40 °C to +70 °C

#### Ordering data

##### SIPLUS CPU 1215C compact CPU, AC/DC/relay

(extended temperature range and medial exposure)

Integrated program and data memory 100 KB, load memory 4 MB; wide-range power supply 85 ... 264 V AC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs (relay), 2 analog inputs, 2 analog outputs; expandable by up to 3 communication modules, 8 signal modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz

- For areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C
- For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +60 °C
- For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C

#### Order No.

**6AG1 215-1BG31-4XB0**

**6AG1 215-1BG31-5XB0**

**6AG1 215-1BG31-2XB0**

##### SIPLUS CPU 1215C compact CPU, DC/DC/DC

(extended temperature range and medial exposure)

Integrated program and data memory 100 KB, load memory 4 MB; power supply 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs, 2 analog outputs; expandable by up to 3 communication modules, 8 signal modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz; 24 V DC digital outputs usable as pulse outputs (PTO) or pulse-width-modulated outputs (PWM) with 100 kHz

- For areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C
- For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +60 °C
- For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C

#### Order No.

**6AG1 215-1AG31-4XB0**

**6AG1 215-1AG31-5XB0**

**6AG1 215-1AG31-2XB0**

Ordering data	Order No.	Order No.	Order No.
<p><b>SIPLUS CPU 1215C</b> <b>compact CPU, DC/DC/relay</b></p> <p>(extended temperature range and medial exposure)</p> <p>Integrated program and data memory 100 KB, load memory 4 MB; power supply 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs (relay), 2 analog inputs, 2 analog outputs; expandable by up to 3 communication modules, 8 signal modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz</p> <ul style="list-style-type: none"> <li>• For areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C</li> <li>• For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +60 °C</li> <li>• For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C</li> </ul>	<p><b>6AG1 215-1HG31-4XB0</b></p> <p><b>6AG1 215-1HG31-5XB0</b></p> <p><b>6AG1 215-1HG31-2XB0</b></p>	<p><b>Accessories</b></p> <p><b>SIPLUS SB 1223</b> <b>digital input/output signal board</b></p> <p>(extended temperature range and medial exposure)</p> <p>2 inputs, 24 V DC, IEC type 1 current sinking; 2 transistor outputs 24 V DC, 0.5 A, 5 W; can be used as HSC at up to 30 kHz</p> <ul style="list-style-type: none"> <li>• Suitable for areas with extraordinary medial exposure (conformal coating)</li> <li>• Ambient temperature -25 ... +55 °C</li> </ul> <p>2 inputs, 5 V DC, 200 kHz; 2 outputs 5 V DC, 0.1 A, 200 kHz</p> <ul style="list-style-type: none"> <li>• For areas with extreme medial exposure (conformal coating), ambient temperature -25 ... +55 °C</li> </ul> <p><b>SIPLUS SB 1232</b> <b>analog output signal board</b></p> <p>(extended temperature range and medial exposure)</p> <p><u>Ambient temperature range</u> -25 ... +55 °C</p> <p>1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits</p> <p><u>Ambient temperature range</u> 0 ... +55 °C</p> <p>1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits</p> <p><b>Additional accessories</b></p>	<p><b>6AG1 223-0BD30-4XB0</b></p> <p><b>6AG1 223-0BD30-5XB0</b></p> <p><b>6AG1 223-3AD30-5XB0</b></p> <p><b>6AG1 232-4HA30-5XB0</b></p> <p><b>6AG1 232-4HA30-4XB0</b></p> <p>See SIMATIC S7-1200 CPU 1215C, page 3/18</p>

# SIMATIC S7-1200

## Digital modules

### SM 1221 digital input modules

#### Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the relevant task
- For subsequent expansion of the system with additional inputs

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#### Technical specifications

	6ES7 221-1BF32-0XB0 SM 1221 DI 8x24 VDC	6ES7 221-1BH32-0XB0 SM 1221 DI 16x24 VDC
<b>Supply voltage</b> 24 V DC	Yes	Yes
permissible range, upper limit (DC)	28.8 V	28.8 V
<b>Input current</b> from backplane bus 5 V DC, max.	105 mA	130 mA
<b>Digital inputs</b> • from load voltage L+ (without load), max.	4 mA; per channel	4 mA; per channel
<b>Output voltage</b> Power supply to the transmitters • present	Yes	Yes
<b>Power losses</b> Power loss, typ.	1.5 W	2.5 W
<b>Digital inputs</b> Number/binary inputs • In groups of	8 2	16 4
Input characteristic curve acc. to IEC 61131, Type 1	Yes	Yes
Number of simultaneously controllable inputs • all mounting positions - up to 40 °C, max.	8	16
• horizontal installation - up to 40 °C, max.	8	16
- up to 50 °C, max.	8	16
• vertical installation - up to 40 °C, max.	8	16
<b>Input voltage</b> • Type of input voltage • Rated value, DC	24 V	DC 24 V



#### Technical specifications (continued)

	6ES7 221-1BF32-0XB0 SM 1221 DI 8x24 VDC	6ES7 221-1BH32-0XB0 SM 1221 DI 16x24 VDC
Input current • for signal "0", max. (permissible quiescent current) • for signal "1", min. • for signal "1", typ.	1 mA  2.5 mA 4 mA; Typical	1 mA  2.5 mA 4 mA; Typical
Input delay (for rated value of input voltage) • for standard inputs - Parameterizable  • for interrupt inputs - Parameterizable	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four  Yes	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four  Yes
Cable length • Cable length, shielded, max. • Cable length unshielded, max.	500 m 300 m	500 m 300 m
<b>Interrupts/diagnostics/ status information</b>		
Alarms • Alarms • Diagnostic alarm	Yes Yes	Yes Yes
Diagnostic messages • Diagnostic functions • Monitoring the supply voltage	Yes Yes	Yes Yes
Diagnostics indication LED • for status of the inputs • for maintenance • Status indicator digital input (green)	Yes Yes Yes	Yes Yes Yes
<b>Galvanic isolation</b> Galvanic isolation digital inputs • between the channels, in groups of	2	4
<b>Degree and class of protection</b> IP20	Yes	Yes
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
CSA approval		Yes
C-TICK	Yes	Yes
FM approval	Yes	Yes
Marine approval		Yes
<b>Climatic and mechanical conditions for storage and transport</b> Climatic conditions for storage and transport • Free fall - Drop height, max. (in packaging) • Temperature - Permissible temperature range • Air pressure acc. to IEC 60068-2-13 - Permissible air pressure	0.3 m; five times, in dispatch package  -40 °C to +70 °C  1080 to 660 hPa	0.3 m; five times, in dispatch package  -40 °C to +70 °C  1080 to 660 hPa

# SIMATIC S7-1200

## Digital modules

### SM 1221 digital input modules

#### Technical specifications (continued)

	6ES7 221-1BF32-0XB0 SM 1221 DI 8x24 VDC	6ES7 221-1BH32-0XB0 SM 1221 DI 16x24 VDC
<b>Mechanical and climatic conditions during operation</b>		
Climatic conditions in operation		
• Temperature		
- Min.		-20 °C
- max.		60 °C
- Permissible temperature change	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute
<b>Connection method</b>		
required front connector	Yes	Yes
<b>Mechanics/material</b>		
Type of housing (front)		
• Plastic	Yes	Yes
<b>Dimensions</b>		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
<b>Weight</b>		
Weight, approx.	170 g	210 g

#### Ordering data

	Order No.		Order No.
<b>SM 1221 digital input signal module</b>		<b>S7-1200 automation system, System Manual</b>	
8 inputs, 24 V DC, isolated, current sourcing/sinking	6ES7 221-1BF32-0XB0	For SIMATIC S7-1200 and STEP 7 Basic	
16 inputs, 24 V DC, isolated, current sourcing/sinking	6ES7 221-1BH32-0XB0	German	6ES7 298-8FA30-8AH0
<b>Extension cable for two-tier configuration</b>	6ES7 290-6AA30-0XA0	English	6ES7 298-8FA30-8BH0
for connecting digital/analog signal modules; length 2 m		French	6ES7 298-8FA30-8CH0
<b>Terminal block (spare part)</b>		Spanish	6ES7 298-8FA30-8DH0
for 8/16-channel digital signal modules		Italian	6ES7 298-8FA30-8EH0
with 7 screws, tin-plated; 4 pcs.	6ES7 292-1AG40-0XA0	Chinese	6ES7 298-8FA30-8KH0
<b>Front flap set (spare part)</b>		<b>S7-1200 automation system, Easy Book</b>	
for 8/16-channel signal modules	6ES7 291-1BA30-0XA0	Brief instructions	
		German	6ES7 298-8FA30-8AQ0
		English	6ES7 298-8FA30-8BQ0
		French	6ES7 298-8FA30-8CQ0
		Spanish	6ES7 298-8FA30-8DQ0
		Italian	6ES7 298-8FA30-8EQ0
		Chinese	6ES7 298-8FA30-8KQ0

#### Overview



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

#### Technical specifications

	6ES7 221-3AD30-0XB0 SB 1221 4xDI 5VDC 200kHz	6ES7 221-3BD30-0XB0 SB 1221 4xDI 24VDC 200kHz
<b>Input current</b> from backplane bus 5 V DC, typ.	50 mA	50 mA
<b>Output voltage</b> Power supply to the transmitters • Supply current, max.	4 mA; per channel	4 mA; per channel
<b>Power losses</b> Power loss, typ.	1 W	1 W
<b>Digital inputs</b> Number/binary inputs • In groups of	4; Current-sourcing 1	4; Current-sourcing 1
Input characteristic curve acc. to IEC 61131, Type 1	Yes	
Input characteristic curve acc. to IEC 61131, Type 2		Yes
Number of simultaneously controllable inputs • all mounting positions - up to 40 °C, max.	4	4
Input voltage • Rated value, DC • for signal "0" • for signal "1"	5 V 0 to 1 V 2 to 6 V	24 V 0 to 5 V 15 to 30 V
Input current • for signal "0", max. (permissible quiescent current) • for signal "1", min. • for signal "1", typ.	3 mA 6 mA	2 mA 5.8 mA 14 mA
Input delay (for rated value of input voltage) • for standard inputs - Parameterizable - at "0" to "1", max. • for interrupt inputs - Parameterizable • for counter/technological functions - Parameterizable	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four 2 µs Yes Yes	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four 2.5 µs Yes Yes
Cable length • Cable length, shielded, max.	50 m; Shielded, twisted wire pair	50 m; Standard input: 500 m, high-speed counters: 50 m

# SIMATIC S7-1200

## Digital modules

### SB 1221 digital input modules

#### Technical specifications (continued)

	6ES7 221-3AD30-0XB0 SB 1221 4xDI 5VDC 200kHz	6ES7 221-3BD30-0XB0 SB 1221 4xDI 24VDC 200kHz
<b>Interrupts/diagnostics/ status information</b>		
Alarms		
• Alarms	Yes	Yes
Diagnostic messages		
• Diagnostic functions	Yes	Yes
Diagnostics indication LED		
• for status of the inputs	Yes	Yes
<b>Degree and class of protection</b>		
IP20	Yes	Yes
<b>Standards, approvals, certificates</b>		
Marine approval according to Germanischer Lloyd	Yes	Yes
<b>Climatic and mechanical conditions for storage and transport</b>		
Climatic conditions for storage and transport		
• Free fall		
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature		
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C
• Air pressure acc. to IEC 60068-2-13		
- Permissible air pressure	1080 to 660 hPa	1080 to 660 hPa
<b>Mechanical and climatic conditions during operation</b>		
Climatic conditions in operation		
• Temperature		
- Permissible temperature range	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation
<b>Mechanics/material</b>		
Type of housing (front)		
• Plastic	Yes	Yes
<b>Dimensions</b>		
Width	38 mm	38 mm
Height	62 mm	62 mm
Depth	21 mm	21 mm
<b>Weight</b>		
Weight, approx.	40 g	40 g

Ordering data	Order No.		Order No.
<b>SB 1221 digital input signal boards</b>		<b>S7-1200 automation system, Easy Book</b>	
4 inputs, 5 V DC, 200 kHz	<b>6ES7 221-3AD30-0XB0</b>	Brief instructions	
4 inputs, 24 V DC, 200 kHz	<b>6ES7 221-3BD30-0XB0</b>	German	<b>6ES7 298-8FA30-8AQ0</b>
<b>Terminal block (spare part)</b>		English	<b>6ES7 298-8FA30-8BQ0</b>
for signal board		French	<b>6ES7 298-8FA30-8CQ0</b>
with 6 screws, gold-plated; 4 pcs.	<b>6ES7 292-1BF30-0XA0</b>	Spanish	<b>6ES7 298-8FA30-8DQ0</b>
<b>S7-1200 automation system, System Manual</b>		Italian	<b>6ES7 298-8FA30-8EQ0</b>
for SIMATIC S7-1200 and STEP 7 Basic		Chinese	<b>6ES7 298-8FA30-8KQ0</b>
German	<b>6ES7 298-8FA30-8AH0</b>		
English	<b>6ES7 298-8FA30-8BH0</b>		
French	<b>6ES7 298-8FA30-8CH0</b>		
Spanish	<b>6ES7 298-8FA30-8DH0</b>		
Italian	<b>6ES7 298-8FA30-8EH0</b>		
Chinese	<b>6ES7 298-8FA30-8KH0</b>		

# SIMATIC S7-1200

## Digital modules

### SM 1222 digital output modules

#### Overview



- Digital outputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the relevant task
- For subsequent expansion of the system with additional outputs

#### Technical specifications

	6ES7 222-1BF32-0XB0 SM 1222 DQ 8x24 VDC	6ES7 222-1BH32-0XB0 SM 1222 DQ 16x24 VDC	6ES7 222-1HF32-0XB0 SM 1222 DQ 8xRelay	6ES7 222-1HH32-0XB0 SM 1222 DQ 16xRelay	6ES7 222-1XF32-0XB0 SM 1222 DQ 8x relay changeover contact
<b>Supply voltage</b>					
permissible range, lower limit (DC)					5 V
permissible range, upper limit (DC)					30 V
<b>Input current</b>					
from backplane bus 5 V DC, max.	120 mA	140 mA	120 mA	135 mA	140 mA
<b>Digital inputs</b>					
• from load voltage L+ (without load), max.			11 mA/relay coil	11 mA/relay coil	16.7 mA/relay coil
<b>Power losses</b>					
Power loss, typ.	1.5 W	2.5 W	4.5 W	8.5 W	5 W
<b>Digital inputs</b>					
Number/binary inputs					0
<b>Digital outputs</b>					
Number/binary outputs	8	16	8	16	8
• In groups of	1	1	2	1	1
Functionality/short-circuit strength	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	typ. (L+) -48 V	typ. (L+) -48 V			
<b>Switching capacity of the outputs</b>					
• with resistive load, max.	0.5 A	0.5 A	2 A	2 A	2 A
• on lamp load, max.	5 W	5 W			
<b>Output voltage</b>					
• Rated value (AC)					5 to 250 V AC
• Rated value (DC)					5 to 30 V DC
• for signal "0", max.	24 V 0.1 V; with 10 kOhm load	24 V 0.1 V; with 10 kOhm load			
• for signal "1", min.	20 V DC	20 V DC			

#### Technical specifications (continued)

	6ES7 222-1BF32-0XB0 SM 1222 DQ 8x24 VDC	6ES7 222-1BH32-0XB0 SM 1222 DQ 16x24 VDC	6ES7 222-1HF32-0XB0 SM 1222 DQ 8xRelay	6ES7 222-1HH32-0XB0 SM 1222 DQ 16xRelay	6ES7 222-1XF32-0XB0 SM 1222 DQ 8x relay changeover contact
Output current					
• for signal "1" rated value	0.5 A	0.5 A	2 A	2 A	2 A
• for signal "1" permissible range, max.					
• for signal "0" residual current, max.	10 µA	10 µA			
Output delay with resistive load					
• "0" to "1", max.	50 µs	50 µs	10 ms	10 ms	10 ms
• "1" to "0", max.	200 µs	200 µs	10 ms	10 ms	10 ms
Aggregate current of outputs (per group)					
• horizontal installation					
- up to 50 °C, max.	4 A; Current per mass	8 A	10 A	10 A	2 A; Current per mass
Relay outputs					
• Number of relay outputs			8	16	8
• Rated input voltage of relay coil L+ (DC)			24 V	24 V	24 V
• Number of operating cycles, max.			mechanically 10 million, at rated load voltage 100,000	mechanically 10 million, at rated load voltage 100,000	mechanically 10 million, at rated load voltage 100,000
• Switching capacity of contacts					
- with inductive load, max.	0.5 A	0.5 A	2 A	2 A	2 A
- on lamp load, max.	5 W	5 W			
- Switching frequency/contacts/at ohmic load/maximum	0.5 A	0.5 A	2 A	2 A	2 A
Cable length					
• Cable length, shielded, max.	500 m	500 m	500 m	500 m	500 m
• Cable length unshielded, max.	150 m	150 m	150 m	150 m	150 m
<b>Interrupts/diagnostics/ status information</b>					
Alarms					
• Alarms	Yes	Yes	Yes	Yes	Yes
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnostic messages					
• Diagnostic functions	Yes	Yes	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	
Diagnostics indication LED					
• For status of the outputs	Yes	Yes	Yes	Yes	Yes
• for maintenance	Yes	Yes	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes	Yes	Yes
<b>Galvanic isolation</b>					
Galvanic isolation digital outputs					
• between the channels			Relay	Relay	Relay
• between the channels, in groups of	1	1	2	4	1
• between the channels and the backplane bus	500 V AC	500 V AC	1500 V AC for 1 minute	1500 V AC for 1 minute	1500 V A C for 1 minute
<b>Permissible potential difference</b> between different circuits			750 V AC for 1 minute	750 V AC for 1 minute	750 V AC for 1 minute

# SIMATIC S7-1200

## Digital modules

### SM 1222 digital output modules

#### Technical specifications (continued)

	6ES7 222-1BF32-0XB0 SM 1222 DQ 8x24 VDC	6ES7 222-1BH32-0XB0 SM 1222 DQ 16x24 VDC	6ES7 222-1HF32-0XB0 SM 1222 DQ 8xRelay	6ES7 222-1HH32-0XB0 SM 1222 DQ 16xRelay	6ES7 222-1XF32-0XB0 SM 1222 DQ 8x relay changeover contact
<b>Degree and class of protection</b>					
IP20	Yes	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>					
CE mark	Yes	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes	Yes
C-TICK	Yes	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes	Yes	Yes
<b>Climatic and mechanical conditions for storage and transport</b>					
Climatic conditions for storage and transport					
• Free fall					
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature					
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
• Air pressure acc. to IEC 60068-2-13					
- Permissible air pressure	1080 to 660 hPa	1080 to 660 hPa	1080 to 660 hPa	1080 to 660 hPa	1080 to 660 hPa
<b>Mechanical and climatic conditions during operation</b>					
Climatic conditions in operation					
• Temperature					
- Min.	-20 °C	-20 °C	-20 °C	-20 °C	-20 °C
- max.	60 °C	60 °C	60 °C	60 °C	60 °C
- Permissible temperature change	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute
<b>Connection method</b>					
required front connector	Yes	Yes	Yes	Yes	Yes
<b>Mechanics/material</b>					
Type of housing (front)					
• Plastic	Yes	Yes	Yes	Yes	Yes
<b>Dimensions</b>					
Width	45 mm	45 mm	45 mm	45 mm	45 mm
Height	100 mm	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm	75 mm
<b>Weight</b>					
Weight, approx.	180 g	220 g	190 g	260 g	310 g



Ordering data	Order No.		Order No.
<b>SM 1222 digital output signal module</b> 8 outputs, 24 V DC; 0.5 A, 5 W, isolated 16 outputs, 24 V DC; 0.5 A, 5 W, isolated 8 relay outputs, 5 ... 30 V DC / 5 ... 250 V AC, 2 A, 30 W DC / 200 W AC 8 relay outputs, change-over contact, 5 ... 30 V DC / 5 ... 250 V AC, 2 A, 30 W DC / 200 W AC 16 relay outputs, 5 ... 30 V DC / 5 ... 250 V AC, 2 A, 30 W DC / 200 W AC	<b>6ES7 222-1BF32-0XB0</b>  <b>6ES7 222-1BH32-0XB0</b>  <b>6ES7 222-1HF32-0XB0</b>  <b>6ES7 222-1XF32-0XB0</b>  <b>6ES7 222-1HH32-0XB0</b>	<b>Terminal block (spare part)</b> for 8/16-channel digital signal modules with 7 screws, tin-plated; 4 pcs. <b>Front flap set (spare part)</b> for 8/16-channel signal modules <b>S7-1200 automation system, System Manual</b> for SIMATIC S7-1200 and STEP 7 Basic German English French Spanish Italian Chinese	<b>6ES7 292-1AG30-0XA0</b>  <b>6ES7 291-1BA30-0XA0</b>  <b>6ES7 298-8FA30-8AH0</b> <b>6ES7 298-8FA30-8BH0</b> <b>6ES7 298-8FA30-8CH0</b> <b>6ES7 298-8FA30-8DH0</b> <b>6ES7 298-8FA30-8EH0</b> <b>6ES7 298-8FA30-8KH0</b>
<b>Extension cable for two-tier configuration</b> for connecting digital/analog signal modules; length 2 m	<b>6ES7 290-6AA30-0XA0</b>	<b>S7-1200 automation system, Easy Book</b> Brief instructions German English French Spanish Italian Chinese	<b>6ES7 298-8FA30-8AQ0</b> <b>6ES7 298-8FA30-8BQ0</b> <b>6ES7 298-8FA30-8CQ0</b> <b>6ES7 298-8FA30-8DQ0</b> <b>6ES7 298-8FA30-8EQ0</b> <b>6ES7 298-8FA30-8KQ0</b>

# SIMATIC S7-1200

## Digital modules

### SB 1222 digital output modules

#### Overview



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

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#### Technical specifications

	6ES7 222-1AD30-0XB0 SB 1222 4xDQ 5VDC 200kHz	6ES7 222-1BD30-0XB0 SB 1222 4xDQ 24VDC 200kHz
<b>Input current</b> from backplane bus 5 V DC, typ.	50 mA	50 mA
<b>Output voltage</b> Power supply to the transmitters • Supply current, max.	4 mA; per channel	4 mA; per channel
<b>Power losses</b> Power loss, typ.	1 W	1 W
<b>Digital outputs</b> Number/binary outputs • In groups of	4; MOSFET, solid-state (current-sinking/current-sourcing) 1	4; MOSFET, solid-state (current-sinking/current-sourcing) 1
Functionality/short-circuit strength	No	No
Switching capacity of the outputs • with resistive load, max.	0.1 A	0.1 A
Load resistance range • upper limit	5 Ω	10 Ω
Output voltage • Rated value (DC) • for signal "0", max. • for signal "1", min. • for signal "1", max.	5 V 0.4 V L+ (-0.5 V) 6 V	24 V 0.1 V; with 10 kOhm load 20 V
Output current • for signal "1" rated value • for signal "1" permissible range, max. • for signal "0" residual current, max.	0.1 A 0.11 A	0.1 A 10 μA
Cable length • Cable length, shielded, max.	50 m	50 m

### Technical specifications (continued)

	6ES7 222-1AD30-0XB0 SB 1222 4xDQ 5VDC 200kHz	6ES7 222-1BD30-0XB0 SB 1222 4xDQ 24VDC 200kHz
<b>Interrupts/diagnostics /status information</b>		
Alarms		
• Alarms	Yes	Yes
Diagnostic messages		
• Diagnostic functions	Yes	Yes
Diagnostics indication LED		
• For status of the outputs	Yes	Yes
<b>Degree and class of protection</b>		
IP20	Yes	Yes
<b>Standards, approvals, certificates</b>		
Marine approval according to Germanischer Lloyd	Yes	Yes
<b>Climatic and mechanical conditions for storage and transport</b>		
Climatic conditions for storage and transport		
• Free fall		
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature		
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C
• Air pressure acc. to IEC 60068-2-13		
- Permissible air pressure	1080 to 660 hPa	1080 to 660 hPa
<b>Mechanical and climatic conditions during operation</b>		
Climatic conditions in operation		
• Temperature		
- Permissible temperature range	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation
<b>Mechanics/material</b>		
Type of housing (front)		
• Plastic	Yes	Yes
<b>Dimensions</b>		
Width	38 mm	38 mm
Height	62 mm	62 mm
Depth	21 mm	21 mm
<b>Weight</b>		
Weight, approx.	40 g	40 g

# SIMATIC S7-1200

## Digital modules

### SB 1222 digital output modules

#### Ordering data

#### Order No.

##### SB 1222 digital output signal boards

4 outputs, 5 V DC, 0.1 A, 200 kHz

**6ES7 222-1AD30-0XB0**

4 outputs, 24 V DC, 0.1 A, 200 kHz

**6ES7 222-1BD30-0XB0**

##### Terminal block (spare part)

for signal board

with 6 screws, gold-plated; 4 pcs.

**6ES7 292-1BF30-0XA0**

##### S7-1200 automation system, System Manual

for SIMATIC S7-1200 and  
STEP 7 Basic

German

**6ES7 298-8FA30-8AH0**

English

**6ES7 298-8FA30-8BH0**

French

**6ES7 298-8FA30-8CH0**

Spanish

**6ES7 298-8FA30-8DH0**

Italian

**6ES7 298-8FA30-8EH0**

Chinese

**6ES7 298-8FA30-8KH0**

#### Order No.

##### S7-1200 automation system, Easy Book

Brief instructions

German

**6ES7 298-8FA30-8AQ0**

English

**6ES7 298-8FA30-8BQ0**

French

**6ES7 298-8FA30-8CQ0**

Spanish

**6ES7 298-8FA30-8DQ0**

Italian

**6ES7 298-8FA30-8EQ0**

Chinese

**6ES7 298-8FA30-8KQ0**

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#### Overview



- Digital inputs and outputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the relevant task
- For subsequent expansion of the system with additional inputs and outputs

#### Technical specifications

	6ES7 223-1BH32-0XB0 SM 1223 DI 8x24 VDC, DQ 8x24 VDC	6ES7 223-1BL32-0XB0 SM 1223 DI 16x24 VDC, DQ 16x24 VDC	6ES7 223-1PH32-0XB0 SM 1223 DI 8x24 VDC, DQ 8xRelay	6ES7 223-1PL32-0XB0 SM 1223 DI 16x24 VDC, DQ 16xRelay	6ES7 223-1QH32-0XB0 SM 223 120/230 V AC DIx8/DQx8 RLY
<b>Supply voltage</b> 24 V DC	Yes	Yes	Yes	Yes	Yes
permissible range, lower limit (DC)		20.4 V			20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	28.8 V	28.8 V
<b>Input current</b> from backplane bus 5 V DC, max.	145 mA	185 mA	145 mA	180 mA	120 mA
Digital inputs • from load voltage L+ (without load), max.	4 mA; per channel	4 mA; per channel	4 mA/input 11 mA/relay	4 mA/input 11 mA/relay	
<b>Output voltage</b> Power supply to the transmitters • present	Yes	Yes	Yes	Yes	Yes
<b>Power losses</b> Power loss, typ.	2.5 W	4.5 W	5.5 W	10 W	7.5 W
<b>Digital inputs</b> Number/binary inputs • In groups of	8 2	16 2	8 2	16 2	8 4
Input characteristic curve acc. to IEC 61131, Type 1	Yes	Yes	Yes	Yes	Yes
Number of simultaneously controllable inputs • all mounting positions - up to 40 °C, max.	8	16	8	16	8
• horizontal installation - up to 40 °C, max.	8	16	8	16	8
- up to 50 °C, max.	8	16	8	16	8
• vertical installation - up to 40 °C, max.	8	16	8	16	8

# SIMATIC S7-1200

## Digital modules

### SM 1223 digital input/output modules

#### Technical specifications (continued)

	<b>6ES7 223-1BH32-0XB0</b> <b>SM 1223 DI 8x24 VDC, DQ 8x24 VDC</b>	<b>6ES7 223-1BL32-0XB0</b> <b>SM 1223 DI 16x24 VDC, DQ 16x24 VDC</b>	<b>6ES7 223-1PH32-0XB0</b> <b>SM 1223 DI 8x24 VDC, DQ 8xRelay</b>	<b>6ES7 223-1PL32-0XB0</b> <b>SM 1223 DI 16x24 VDC, DQ 16xRelay</b>	<b>6ES7 223-1QH32-0XB0</b> <b>SM 223 120/230 V AC DIx8/DQx8 RLY</b>
Input voltage • Type of input voltage • Rated value, DC • for signal "0" • for signal "1"	24 V	DC 24 V 5 V DC at 1 mA 15 V DC at 2.5 mA	24 V	24 V	AC
Input current • for signal "0", max. (permissible quiescent current) • for signal "1", min. • for signal "1", typ.	1 mA 2.5 mA 4 mA; Typical	1 mA 2.5 mA 4 mA; Typical	1 mA 2.5 mA 4 mA; Typical	1 mA 2.5 mA 4 mA; Typical	1 mA 2.5 mA 9 mA; Typical
Input delay (for rated value of input voltage) • for standard inputs - Parameterizable  • for interrupt inputs - Parameterizable	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four  Yes	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four  Yes	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four  Yes	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four  Yes	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four  Yes
Cable length • Cable length, shielded, max. • Cable length unshielded, max.	500 m 300 m	500 m 300 m	500 m 300 m	500 m 300 m	500 m 300 m
<b>Digital outputs</b> Number/binary outputs • In groups of	8 1	16 1	8 2	16 4	8 4
Functionality/short-circuit strength	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	L+ (-48 V)	L+ (-48 V)			
Switching capacity of the outputs • with resistive load, max. • on lamp load, max.	0.5 A 5 W	0.5 A 5 W	2 A	2 A	2 A
Output voltage • Rated value (DC) • for signal "0", max.  • for signal "1", min.	24 V 0.1 V; with 10 kOhm load 20 V DC	24 V 0.1 V; with 10 kOhm load 20 V DC			
Output current • for signal "1" permissible range, max. • for signal "0" residual current, max.	0.5 A 10 µA	0.5 A 10 µA	2 A	2 A	2 A
Output delay with resistive load • "0" to "1", max. • "1" to "0", max.	50 µs 200 µs	50 µs 200 µs	10 ms 10 ms	10 ms 10 ms	10 ms 10 ms
Aggregate current of outputs (per group) • horizontal installation - up to 50 °C, max.	4 A; Current per mass	8 A; Current per mass	10 A; Current per mass	8 A; Current per mass	8 A; Current per mass

#### Technical specifications (continued)

	6ES7 223-1BH32-0XB0 SM 1223 DI 8x24 VDC, DQ 8x24 VDC	6ES7 223-1BL32-0XB0 SM 1223 DI 16x24 VDC, DQ 16x24 VDC	6ES7 223-1PH32-0XB0 SM 1223 DI 8x24 VDC, DQ 8xRelay	6ES7 223-1PL32-0XB0 SM 1223 DI 16x24 VDC, DQ 16xRelay	6ES7 223-1QH32-0XB0 SM 223 120/230 V AC DIx8/DQx8 RLY
Relay outputs					
• Number of relay outputs			8	16	8
• Rated input voltage of relay coil L+ (DC)			24 V	24 V	24 V
• Number of operating cycles, max.			mechanically 10 million, at rated load voltage 100,000	mechanically 10 million, at rated load voltage 100,000	mechanically 10 million, at rated load voltage 100,000
• Switching capacity of contacts					
- with inductive load, max.	0.5 A	0.5 A	2 A	2 A	2 A
- on lamp load, max.	5 W	5 W			
- Switching frequency/contacts/ at ohmic load/maximum	0.5 A	0.5 A	2 A	2 A	2 A
Cable length					
• Cable length, shielded, max.	500 m	500 m	500 m	500 m	500 m
• Cable length unshielded, max.	150 m	150 m	150 m	150 m	150 m
<b>Interrupts/diagnostics/ status information</b>					
Alarms					
• Alarms	Yes	Yes	Yes	Yes	Yes
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnostic messages					
• Diagnostic functions	Yes	Yes	Yes	Yes	Yes
• Monitoring the supply voltage	Yes		Yes	Yes	
Diagnostics indication LED					
• for status of the inputs	Yes	Yes	Yes	Yes	Yes
• For status of the outputs	Yes	Yes	Yes	Yes	Yes
• for maintenance	Yes	Yes	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes	Yes	Yes
• Status indicator digital input (green)	Yes	Yes	Yes	Yes	Yes
<b>Galvanic isolation</b>					
Galvanic isolation digital inputs					
• between the channels, in groups of	2	2	2	2	2
Galvanic isolation digital outputs					
• between the channels			Relay	Relay	Relay
• between the channels, in groups of	1	1	2	4	2
• between the channels and the backplane bus	500 V AC	500 V AC	1500 V AC for 1 minute	1500 V AC for 1 minute	1500 V AC for 1 minute
<b>Permissible potential difference</b>					
between different circuits			750 V AC for 1 minute	750 V AC for 1 minute	750 V AC for 1 minute
<b>Degree and class of protection</b>					
IP20	Yes	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>					
CE mark	Yes	Yes	Yes	Yes	Yes
CSA approval	Yes		Yes	Yes	Yes
C-TICK	Yes	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes	Yes
Marine approval	Yes		Yes	Yes	Yes

# SIMATIC S7-1200

## Digital modules

### SM 1223 digital input/output modules

#### Technical specifications (continued)

	6ES7 223-1BH32-0XB0 SM 1223 DI 8x24 VDC, DQ 8x24 VDC	6ES7 223-1BL32-0XB0 SM 1223 DI 16x24 VDC, DQ 16x24 VDC	6ES7 223-1PH32-0XB0 SM 1223 DI 8x24 VDC, DQ 8xRelay	6ES7 223-1PL32-0XB0 SM 1223 DI 16x24 VDC, DQ 16xRelay	6ES7 223-1QH32-0XB0 SM 223 120/230 V AC DIx8/DQx8 RLY
<b>Climatic and mechanical conditions for storage and transport</b> Climatic conditions for storage and transport					
• Free fall - Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature - Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
• Air pressure acc. to IEC 60068-2-13 - Permissible air pressure	1080 to 660 hPa	1080 to 660 hPa	1080 to 660 hPa	1080 to 660 hPa	1080 to 660 hPa
<b>Mechanical and climatic conditions during operation</b> Climatic conditions in operation					
• Temperature - Min.	-20 °C	-20 °C	-20 °C	-20 °C	-20 °C
- Max.	60 °C	60 °C	60 °C	60 °C	60 °C
- Permissible temperature change	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute
<b>Connection method</b> required front connector	Yes	Yes	Yes	Yes	Yes
<b>Mechanics/material</b> Type of housing (front)					
• Plastic	Yes	Yes	Yes	Yes	Yes
<b>Dimensions</b>					
Width	45 mm	70 mm	45 mm	70 mm	45 mm
Height	100 mm	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm	75 mm
<b>Weight</b> Weight, approx.	210 g	310 g	230 g	350 g	230 g



Ordering data	Order No.	Order No.
<b>SM 1223 digital input/output signal module</b> 8 inputs, 24 V DC, IEC type 1 current sinking; 8 24 V DC transistor outputs, 0.5 A, 5 W 16 inputs, 24 V DC, IEC type 1 current sinking; 16 24 V DC transistor outputs, 0.5 A, 5 W 8 inputs, 24 V DC, IEC type 1 current sinking; 8 relay outputs, 5 ... 30 V DC/ 5 ... 250 V AC, 2 A, 30 W DC/ 200 W AC 16 inputs, 24 V DC, IEC type 1 current sinking; 16 relay outputs, 5 ... 30 V DC/ 5 ... 250 V AC, 2 A, 30 W DC/ 200 W AC 8 inputs, 120/230 V AC; 8 relay outputs, 5 ... 30 V DC/ 5 ... 250 V AC, 2 A, 30 W DC/ 200 W AC	<b>6ES7 223-1BH32-0XB0</b>  <b>6ES7 223-1BL32-0XB0</b>  <b>6ES7 223-1PH32-0XB0</b>  <b>6ES7 223-1PL32-0XB0</b>  <b>6ES7 223-1QH32-0XB0</b>	<b>Front flap set (spare part)</b> for 8/16-channel signal modules for 32-channel signal modules <b>S7-1200 automation system, System Manual</b> for SIMATIC S7-1200 and STEP 7 Basic German English French Spanish Italian Chinese <b>S7-1200 automation system, Easy Book</b> Brief instructions German English French Spanish Italian Chinese
<b>Extension cable for two-tier configuration</b> for connecting digital/analog signal modules; length 2 m	<b>6ES7 290-6AA30-0XA0</b>	<b>6ES7 291-1BA30-0XA0</b> <b>6ES7 291-1BB30-0XA0</b>  <b>6ES7 298-8FA30-8AH0</b> <b>6ES7 298-8FA30-8BH0</b> <b>6ES7 298-8FA30-8CH0</b> <b>6ES7 298-8FA30-8DH0</b> <b>6ES7 298-8FA30-8EH0</b> <b>6ES7 298-8FA30-8KH0</b>  <b>6ES7 298-8FA30-8AQ0</b> <b>6ES7 298-8FA30-8BQ0</b> <b>6ES7 298-8FA30-8CQ0</b> <b>6ES7 298-8FA30-8DQ0</b> <b>6ES7 298-8FA30-8EQ0</b> <b>6ES7 298-8FA30-8KQ0</b>
<b>Terminal block (spare part)</b> for 8/16-channel digital signal modules with 7 screws, tin-plated; 4 pcs.	<b>6ES7 292-1AG40-0XA0</b>	

# SIMATIC S7-1200

## 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

	6ES7 223-0BD30-0XB0 SB 1223 DI2x24 VDC, DQ 2x24 VDC	6ES7 223-3AD30-0XB0 SB 1223 2xDI / 2xDQ 5VDC 200kHz	6ES7 223-3BD30-0XB0 SB 1223 2xDI / 2xDQ 24VDC 200kHz
<b>Supply voltage</b>			
permissible range, lower limit (DC)	20.4 V		
permissible range, upper limit (DC)	30 V		
<b>Input current</b>			
from backplane bus 5 V DC, typ.	50 mA	50 mA	50 mA
<b>Output voltage</b>			
Power supply to the transmitters			
• Supply current, max.	4 mA; per channel	4 mA; per channel	4 mA; per channel
<b>Power losses</b>			
Power loss, typ.	1 W	1 W	1 W
<b>Digital inputs</b>			
Number/binary inputs	2; Current-sinking	2; Current-sourcing	2; Current-sourcing
• In groups of	1	1	1
Input characteristic curve acc. to IEC 61131, Type 1	Yes	Yes	Yes
Number of simultaneously controllable inputs			
• all mounting positions			
- up to 40 °C, max.	2	2	2
<b>Input voltage</b>			
• Type of input voltage	DC		
• Rated value, DC	24 V	5 V	24 V
• for signal "0"	0 to 5 V	0 to 1 V	0 to 5 V
• for signal "1"	15 to 30 V	2 to 6 V	15 to 30 V
<b>Input current</b>			
• for signal "0", max. (permissible quiescent current)	1 mA	3 mA	2 mA
• for signal "1", min.		6 mA	5.8 mA
• for signal "1", typ.	0.5 A		14 mA

### Technical specifications (continued)

	6ES7 223-0BD30-0XB0 SB 1223 DI2x24 VDC, DQ 2x24 VDC	6ES7 223-3AD30-0XB0 SB 1223 2xDI / 2xDQ 5VDC 200kHz	6ES7 223-3BD30-0XB0 SB 1223 2xDI / 2xDQ 24VDC 200kHz
Input delay (for rated value of input voltage)			
• for standard inputs			
- Parameterizable	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four	Yes; 0.2, 0.4, 0.8, 1.6, 3.2, 6.4, and 12.8 ms, selectable in groups of four
- at "0" to "1", max.	2 µs	2 µs	2.5 µs
- at "1" to "0", max.	10 µs		
• for interrupt inputs			
- Parameterizable	Yes	Yes	Yes
• for counter/technological functions			
- Parameterizable	Yes	Yes	Yes
Cable length			
• Cable length, shielded, max.	500 m	50 m	Standard input: 500 m, high-speed counters: 50 m
• Cable length unshielded, max.	300 m		
<b>Digital outputs</b>			
Number/binary 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	1	1
Functionality/short-circuit strength	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	5 Ω	10 Ω
Output voltage			
• Rated value (DC)	24 V	5 V	24 V
• for signal "0", max.	0.1 V; with 10 kOhm load	0.4 V	0.1 V; with 10 kOhm load
• for signal "1", min.	20 V	L+ (-0.5 V)	20 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.		0.11 A	
• for signal "0" residual current, max.	10 µA		10 µA
Cable length			
• Cable length, shielded, max.	500 m	50 m	50 m
• Cable length unshielded, max.	150 m		
<b>Interrupts/diagnostics/ status information</b>			
Alarms			
• Alarms	Yes	Yes	Yes
Diagnostic messages			
• Diagnostic functions	Yes	Yes	Yes
Diagnostics indication LED			
• for status of the inputs	Yes	Yes	Yes
• For status of the outputs	Yes	Yes	Yes
<b>Degree and class of protection</b>			
IP20	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>			
Marine approval according to Germanischer Lloyd	Yes	Yes	Yes

## SIMATIC S7-1200

## Digital modules

## SB 1223 digital input/output modules

## Technical specifications (continued)

	6ES7 223-0BD30-0XB0 SB 1223 DI2x24 VDC, DQ 2x24 VDC	6ES7 223-3AD30-0XB0 SB 1223 2xDI / 2xDQ 5VDC 200kHz	6ES7 223-3BD30-0XB0 SB 1223 2xDI / 2xDQ 24VDC 200kHz
<b>Climatic and mechanical conditions for storage and transport</b>			
Climatic conditions for storage and transport			
• Free fall			
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature			
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
• Air pressure acc. to IEC 60068-2-13			
- Permissible air pressure	1080 to 660 hPa	1080 to 660 hPa	1080 to 660 hPa
<b>Mechanical and climatic conditions during operation</b>			
Climatic conditions in operation			
• Temperature			
- Permissible temperature range	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation
<b>Mechanics/material</b>			
Type of housing (front)			
• Plastic	Yes	Yes	Yes
<b>Dimensions</b>			
Width	38 mm	38 mm	38 mm
Height	62 mm	62 mm	62 mm
Depth	21 mm	21 mm	21 mm
<b>Weight</b>			
Weight, approx.	40 g	40 g	40 g

## Ordering data

## SB 1223 digital input/output signal boards

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

6ES7 223-0BD30-0XB0

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

6ES7 223-3AD30-0XB0

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

6ES7 223-3BD30-0XB0

## Terminal block (spare part)

for signal board  
with 6 screws, gold-plated; 4 pcs.

6ES7 292-1BF30-0XA0

## S7-1200 automation system, System Manual

for SIMATIC S7-1200 and STEP 7 Basic

German

6ES7 298-8FA30-8AH0

English

6ES7 298-8FA30-8BH0

French

6ES7 298-8FA30-8CH0

Spanish

6ES7 298-8FA30-8DH0

Italian

6ES7 298-8FA30-8EH0

Chinese

6ES7 298-8FA30-8KH0

## S7-1200 automation system, Easy Book

Brief instructions

German

6ES7 298-8FA30-8AQ0

English

6ES7 298-8FA30-8BQ0

French

6ES7 298-8FA30-8CQ0

Spanish

6ES7 298-8FA30-8DQ0

Italian

6ES7 298-8FA30-8EQ0

Chinese

6ES7 298-8FA30-8KQ0

#### Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

#### Note:

SIPLUS extreme products are based on Siemens Industry 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

The technical data correspond to those of the based-on modules apart from the values listed in the table.

	6AG1 221-1BF30-2XB0 SM 1221 DI 8x24 VDC	6AG1 221-1BF30-4XB0 SM 1221 DI 8x24 VDC	6AG1 221-1BH30-2XB0 SM 1221 DI 16x24 VDC	6AG1 221-1BH30-4XB0 SM 1221 DI 16x24 VDC
Based on	6ES7 221-1BF30-0XB0	6ES7 221-1BF30-0XB0	6ES7 221-1BH30-0XB0	6ES7 221-1BH30-0XB0
<b>Ambient conditions</b>				
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	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
• Resistance - to biologically active substances	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!
- to chemically active substances	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 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 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 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!
- to mechanically active substances	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!

# SIMATIC S7-1200

## SIPLUS digital modules

### SIPLUS SM 1221 digital input modules

#### Technical specifications (continued)

	<b>6AG1 221-1BF30-2XB0</b> <b>SM 1221 DI 8x24 VDC</b>	<b>6AG1 221-1BF30-4XB0</b> <b>SM 1221 DI 8x24 VDC</b>	<b>6AG1 221-1BH30-2XB0</b> <b>SM 1221 DI 16x24 VDC</b>	<b>6AG1 221-1BH30-4XB0</b> <b>SM 1221 DI 16x24 VDC</b>
<b>Based on</b>	<b>6ES7 221-1BF30-0XB0</b>	<b>6ES7 221-1BF30-0XB0</b>	<b>6ES7 221-1BH30-0XB0</b>	<b>6ES7 221-1BH30-0XB0</b>
<b>Climatic and mechanical conditions for storage and transport</b>				
Climatic conditions for storage and transport				
• Free fall				
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature				
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
<b>Mechanical and climatic conditions during operation</b>				
Climatic conditions in operation				
• Temperature				
- Min.	-25 °C; = Tmin	0 °C; = Tmin	-25 °C; = Tmin	0 °C; = Tmin
- max.	70 °C; = Tmax	55 °C; = Tmax	70 °C; = Tmax	55 °C; = Tmax
- Permissible temperature change		5°C to 55°C, 3°C / minute		5°C to 55°C, 3°C / minute

#### Ordering data

##### SIPLUS SM 1221 digital input signal module

(extended temperature range and medial exposure)

8 inputs, 24 V DC, isolated, current sourcing/sinking

- Suitable for areas with extraordinary medial exposure (conformal coating)
- -25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %

16 inputs, 24 V DC, isolated, current sourcing/sinking

- Suitable for areas with extraordinary medial exposure (conformal coating)
- -25 ... +70 °C, from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %

#### Order No.

**6AG1 221-1BF30-4XB0**

**6AG1 221-1BF30-2XB0**

**6AG1 221-1BH30-4XB0**

**6AG1 221-1BH30-2XB0**

#### Accessories

#### Order No.

See SIMATIC S7-1200 SM 1221 digital input, page 3/42

### Overview



- Digital outputs as a supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

#### Note:

SIPLUS extreme products are based on Siemens Industry 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

The technical data correspond to those of the based-on modules apart from the values listed in the table.

	<b>6AG1 222-1BF30-2XB0</b> <b>SM 1222 DQ 8x24 VDC</b>	<b>6AG1 222-1BF30-4XB0</b> <b>SM 1222 DQ 8x24 VDC</b>	<b>6AG1 222-1BH30-2XB0</b> <b>SM 1222 DQ 16x24 VDC</b>	<b>6AG1 222-1BH30-4XB0</b> <b>SM 1222 DQ 16x24 VDC</b>
<b>Based on</b>	<b>6ES7 222-1BF30-0XB0</b>	<b>6ES7 222-1BF30-0XB0</b>	<b>6ES7 222-1BH30-0XB0</b>	<b>6ES7 222-1BH30-0XB0</b>
<b>Ambient conditions</b>				
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	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
• Resistance - to biologically active substances	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!
- to chemically active substances	Yes	Yes	Yes	Yes
- to mechanically active substances	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!

# SIMATIC S7-1200

## SIPLUS digital modules

### SIPLUS SM 1222 digital output modules

#### Technical specifications (continued)

	6AG1 222-1BF30-2XB0 SM 1222 DQ 8x24 VDC	6AG1 222-1BF30-4XB0 SM 1222 DQ 8x24 VDC	6AG1 222-1BH30-2XB0 SM 1222 DQ 16x24 VDC	6AG1 222-1BH30-4XB0 SM 1222 DQ 16x24 VDC
<b>Based on</b>	6ES7 222-1BF30-0XB0	6ES7 222-1BF30-0XB0	6ES7 222-1BH30-0XB0	6ES7 222-1BH30-0XB0
<b>Climatic and mechanical conditions for storage and transport</b>				
Climatic conditions for storage and transport				
• Free fall				
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature				
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
<b>Mechanical and climatic conditions during operation</b>				
Climatic conditions in operation				
• Temperature				
- Min.	-25 °C; = Tmin	0 °C; = Tmin	-25 °C; = Tmin	0 °C; = Tmin
- max.	70 °C; = Tmax	55 °C; = Tmax	70 °C; = Tmax	55 °C; = Tmax
- Permissible temperature change		5°C to 55°C, 3°C / minute		5°C to 55°C, 3°C / minute
<b>Based on</b>	6AG1 222-1HF30-2XB0 SM 1222 DQ 8xRelay	6AG1 222-1HF30-4XB0 SM 1222 DQ 8xRelay	6AG1 222-1HH30-2XB0 SM 1222 DQ 16xRelay	6AG1 222-1HH30-4XB0 SM 1222 DQ 16xRelay
	6ES7 222-1HF30-0XB0	6ES7 222-1HF30-0XB0	6ES7 222-1HH30-0XB0	6ES7 222-1HH30-0XB0
<b>Ambient conditions</b>				
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	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
• Resistance				
- to biologically active substances	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!
- to chemically active substances	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; , Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 incl. salt spray. The supplied connector covers must remain on the unused interfaces during operation!
- to mechanically active substances	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!



#### Technical specifications (continued)

	<b>6AG1 222-1HF30-2XB0</b> <b>SM 1222 DQ 8xRelay</b>	<b>6AG1 222-1HF30-4XB0</b> <b>SM 1222 DQ 8xRelay</b>	<b>6AG1 222-1HH30-2XB0</b> <b>SM 1222 DQ 16xRelay</b>	<b>6AG1 222-1HH30-4XB0</b> <b>SM 1222 DQ 16xRelay</b>
<b>Based on</b>	<b>6ES7 222-1HF30-0XB0</b>	<b>6ES7 222-1HF30-0XB0</b>	<b>6ES7 222-1HH30-0XB0</b>	<b>6ES7 222-1HH30-0XB0</b>
<b>Climatic and mechanical conditions for storage and transport</b> Climatic conditions for storage and transport • Free fall - Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature - Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
<b>Mechanical and climatic conditions during operation</b> Climatic conditions in operation • Temperature - Min. - max. - Permissible temperature change	-25 °C; = Tmin 70 °C; = Tmax	0 °C; = Tmin 55 °C; = Tmax 5°C to 55°C, 3°C / minute	-25 °C; = Tmin 70 °C; = Tmax	0 °C; = Tmin 55 °C; = Tmax 5°C to 55°C, 3°C / minute

#### Ordering data

##### SIPLUS SM 1222 digital output signal module

(extended temperature range and medial exposure)

8 outputs, 24 V DC;  
0.5 A, 5 W, isolated

- Suitable for areas with extraordinary medial exposure (conformal coating)
- -25 ... +70 °C, from +60 ... +70°C number of simultaneously controllable inputs and outputs max. 50 %

16 outputs, 24 V DC;  
0.5 A, 5 W, isolated

- Suitable for areas with extraordinary medial exposure (conformal coating)
- -25 ... +70 °C, from +60 ... +70°C number of simultaneously controllable inputs and outputs max. 50 %

#### Order No.

**6AG1 222-1BF30-4XB0**

**6AG1 222-1BF30-2XB0**

**6AG1 222-1BH30-4XB0**

**6AG1 222-1BH30-2XB0**

#### Order No.

**6AG1 222-1HF30-4XB0**

**6AG1 222-1HF30-2XB0**

**6AG1 222-1HH30-4XB0**

**6AG1 222-1HH30-2XB0**

8 relay outputs, 5 ... 30 V DC/  
5 ... 250 V AC, 2 A, 30 W DC/  
200 W AC

- Suitable for areas with extraordinary medial exposure (conformal coating)
- -25 ... +70 °C, from +60 ... +70°C number of simultaneously controllable inputs and outputs max. 50 %

16 relay outputs, 5 ... 30 V DC/  
5 ... 250 V AC, 2 A, 30 W DC/  
200 W AC

- Suitable for areas with extraordinary medial exposure (conformal coating)
- -25 ... +70 °C, from +60 ... +70°C number of simultaneously controllable inputs and outputs max. 50 %

#### Accessories

See SIMATIC S7-1200  
SM 1222 digital output. page 3/49

# SIMATIC S7-1200

## SIPLUS digital modules

### SIPLUS SM 1223 digital input/output modules

#### Overview



- Digital inputs and outputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs and outputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

#### Note:

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

#### Technical specifications

The technical data correspond to those of the based-on modules apart from the values listed in the table.

	<b>6AG1 223-1BH30-2XB0</b> <b>SM 1223 DI 8x24 VDC,</b> <b>DQ 8x24 VDC</b>	<b>6AG1 223-1BH30-4XB0</b> <b>SM 1223 DI 8x24 VDC,</b> <b>DQ 8x24 VDC</b>	<b>6AG1 223-1PH30-2XB0</b> <b>SM 1223 DI 8x24 VDC,</b> <b>DQ 8xRelay</b>	<b>6AG1 223-1PH30-4XB0</b> <b>SM 1223 DI 8x24 VDC,</b> <b>DQ 8xRelay</b>
<b>Based on</b>	<b>6ES7 223-1BH30-0XB0</b>	<b>6ES7 223-1BH30-0XB0</b>	<b>6ES7 223-1PH30-0XB0</b>	<b>6ES7 223-1PH30-0XB0</b>
<b>Ambient conditions</b>				
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	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
• Resistance - to biologically active substances	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!
- to chemically active substances	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 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 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 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!
- to mechanically active substances	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!

#### Technical specifications (continued)

	<b>6AG1 223-1BH30-2XB0</b> <b>SM 1223 DI 8x24 VDC,</b> <b>DQ 8x24 VDC</b>	<b>6AG1 223-1BH30-4XB0</b> <b>SM 1223 DI 8x24 VDC,</b> <b>DQ 8x24 VDC</b>	<b>6AG1 223-1PH30-2XB0</b> <b>SM 1223 DI 8x24 VDC,</b> <b>DQ 8xRelay</b>	<b>6AG1 223-1PH30-4XB0</b> <b>SM 1223 DI 8x24 VDC,</b> <b>DQ 8xRelay</b>
<b>Based on</b>	<b>6ES7 223-1BH30-0XB0</b>	<b>6ES7 223-1BH30-0XB0</b>	<b>6ES7 223-1PH30-0XB0</b>	<b>6ES7 223-1PH30-0XB0</b>
<b>Climatic and mechanical conditions for storage and transport</b>				
Climatic conditions for storage and transport				
• Free fall				
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature				
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
<b>Mechanical and climatic conditions during operation</b>				
Climatic conditions in operation				
• Temperature				
- Min.	-25 °C; = Tmin	0 °C; = Tmin	-25 °C; = Tmin	0 °C; = Tmin
- max.	70 °C; = Tmax	55 °C; = Tmax	70 °C; = Tmax	55 °C; = Tmax
- Permissible temperature change		5°C to 55°C, 3°C / minute		5°C to 55°C, 3°C / minute
<b>Ambient conditions</b>				
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	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
• Resistance				
- to biologically active substances	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!
- to chemically active substances	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 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 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 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!
- to mechanically active substances	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!

# SIMATIC S7-1200

## SIPLUS digital modules

### SIPLUS SM 1223 digital input/output modules

#### Technical specifications (continued)

	<b>6AG1 223-1PL30-2XB0</b> SM 1223 DI 16x24 VDC, DQ 16xRelay	<b>6AG1 223-1PL30-4XB0</b> SM 1223 DI 16x24 VDC, DQ 16xRelay	<b>6AG1 223-1BL30-2XB0</b> SM 1223 DI 16x24 VDC, DQ 16x24 VDC	<b>6AG1 223-1BL30-4XB0</b> SM 1223 DI 16x24 VDC, DQ 16x24 VDC
<b>Based on</b>	<b>6ES7 223-1PL30-0XB0</b>	<b>6ES7 223-1PL30-0XB0</b>	<b>6ES7 223-1BL30-0XB0</b>	<b>6ES7 223-1BL30-0XB0</b>
<b>Climatic and mechanical conditions for storage and transport</b> Climatic conditions for storage and transport				
• Free fall				
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature				
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
<b>Mechanical and climatic conditions during operation</b> Climatic conditions in operation				
• Temperature				
- Min.	-25 °C; = Tmin	0 °C; = Tmin	-25 °C; = Tmin	0 °C; = Tmin
- max.	70 °C; = Tmax	55 °C; = Tmax	70 °C; = Tmax	55 °C; = Tmax
- Permissible temperature change		5°C to 55°C, 3°C / minute		5°C to 55°C, 3°C / minute

#### Ordering data

##### SIPLUS SM 1223 digital input/output signal module

(extended temperature range and medial exposure)

8 inputs, 24 V DC,  
IEC type 1 current sinking;  
8 transistor outputs, 24 V DC,  
0.5 A, 5 W

- Suitable for areas with extraordinary medial exposure (conformal coating)
- -25 ... +70 °C,  
from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %

**6AG1 223-1BH30-4XB0**

**6AG1 223-1BH30-2XB0**

16 inputs, 24 V DC,  
IEC type 1 current sinking;  
16 transistor outputs, 24 V DC,  
0.5 A, 5 W

- Suitable for areas with extraordinary medial exposure (conformal coating)
- -25 ... +70 °C,  
from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %

**6AG1 223-1BL30-4XB0**

**6AG1 223-1BL30-2XB0**

8 inputs, 24 V DC,  
IEC type 1 current sinking;  
8 relay outputs, 5 ... 30 V DC /  
5 ... 250 V AC, 2 A, 30 W DC /  
200 W AC

- Suitable for areas with extraordinary medial exposure (conformal coating)
- -25 ... +70 °C,  
from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %

**6AG1 223-1PH30-4XB0**

**6AG1 223-1PH30-2XB0**

16 inputs, 24 V DC,  
IEC type 1 current sinking;  
16 relay outputs, 5 ... 30 V DC /  
5 ... 250 V AC, 2 A, 30 W DC /  
200 W AC

- Suitable for areas with extraordinary medial exposure (conformal coating)
- -25 ... +70 °C,  
from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50 %

**6AG1 223-1PL30-4XB0**

**6AG1 223-1PL30-2XB0**

#### Accessories

See SIMATIC S7-1200  
SM 1223 digital input/output,  
page 3/57

#### Overview



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

#### Note:

SIPLUS extreme products are based on Siemens Industry 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

The technical data correspond to those of the based-on modules apart from the values listed in the table.

	6AG1 223-0BD30-4XB0 SB 1223 DI2x24 VDC, DQ 2x24 VDC 6ES7 223-0BD30-0XB0	6AG1 223-0BD30-5XB0 SB 1223 DI2x24 VDC, DQ 2x24 VDC 6ES7 223-0BD30-0XB0
<b>Based on</b>		
<b>Ambient conditions</b> Extended ambient conditions		
<ul style="list-style-type: none"> <li>• Relative to ambient temperature-atmospheric pressure-installation altitude</li> </ul>	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)
<ul style="list-style-type: none"> <li>• Relative humidity <ul style="list-style-type: none"> <li>- with condensation</li> </ul> </li> </ul>	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<ul style="list-style-type: none"> <li>• Resistance <ul style="list-style-type: none"> <li>- to biologically active substances</li> <li>- to chemically active substances</li> <li>- to mechanically active substances</li> </ul> </li> </ul>	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 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 3S4 incl. sand, dust. 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 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 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
<b>Climatic and mechanical conditions for storage and transport</b> Climatic conditions for storage and transport		
<ul style="list-style-type: none"> <li>• Free fall <ul style="list-style-type: none"> <li>- Drop height, max. (in packaging)</li> </ul> </li> <li>• Temperature <ul style="list-style-type: none"> <li>- Permissible temperature range</li> </ul> </li> </ul>	0.3 m; five times, in dispatch package -40 °C to +70 °C	0.3 m; five times, in dispatch package -40 °C to +70 °C
<b>Mechanical and climatic conditions during operation</b> Climatic conditions in operation		
<ul style="list-style-type: none"> <li>• Temperature <ul style="list-style-type: none"> <li>- Min.</li> <li>- max.</li> </ul> </li> </ul>	0 °C; = Tmin 55 °C; = Tmax	-25 °C; = Tmin 55 °C; = Tmax

# SIMATIC S7-1200

## SIPLUS digital modules

### SIPLUS SB 1223 digital input/output modules

#### Ordering data

#### Order No.

#### SIPLUS SM 1223 digital input/output signal board

(extended temperature range and  
medial exposure)

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

- Suitable for areas with  
extraordinary medial exposure  
(conformal coating)
- Ambient temperature -25 ... +55 °C

**6AG1 223-0BD30-4XB0**

**6AG1 223-0BD30-5XB0**

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#### Overview



- Analog inputs for SIMATIC S7-1200
- With extremely short conversion times
- For connecting analog sensors without additional amplifiers
- For solving even more complex automation tasks

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#### Technical specifications

	6ES7 231-4HD32-0XB0	6ES7 231-4HF32-0XB0	6ES7 231-5ND32-0XB0
<b>Supply voltage</b> 24 V DC	Yes		Yes
<b>Input current</b> Current consumption, typ.	45 mA		65 mA
from backplane bus 5 V DC, typ.	80 mA		80 mA
<b>Power losses</b> Power loss, typ.	1.5 W		1.8 W
<b>Analog inputs</b> Number of analog inputs	4; Current or voltage differential inputs	8; Current or voltage differential inputs	4; Current or voltage differential inputs
permissible input frequency for current input (destruction limit), max.	± 35 V	± 35 V	± 35 V
permissible input voltage for voltage input (destruction limit), max.	35 V	35 V	35 V
permissible input current for voltage input (destruction limit), max.	40 mA	40 mA	40 mA
permissible input current for current input (destruction limit), max.	40 mA	40 mA	40 mA
Cycle time (all channels) max.	625 µs	625 µs	625 µs
<b>Input ranges</b> • Voltage • Current	Yes; ±10 V, ±5 V, ±2.5 V Yes; 4 to 20 mA, 0 to 20 mA	Yes; ±10 V, ±5 V, ±2.5 V Yes; 4 to 20 mA, 0 to 20 mA	Yes; ±10 V, ±5 V, ±2.5 V o. ±1.25 V Yes; 4 to 20 mA, 0 to 20 mA
<b>Input ranges (rated values), voltages</b> • -1.25 V to +1.25 V • -10 V to +10 V • Input resistance (-10 V to +10 V) • -2.5 V to +2.5 V • Input resistance (-2.5 V to +2.5 V) • -5 V to +5 V • Input resistance (-5 V to +5 V)	Yes ≥9 MOhm Yes ≥9 MOhm Yes ≥9 MOhm	Yes ≥9 MOhm Yes ≥9 MOhm Yes ≥9 MOhm	Yes Yes ≥9 MOhm Yes ≥9 MOhm Yes ≥9 MOhm
<b>Input ranges (rated values), currents</b> • 0 to 20 mA • Input resistance (0 to 20 mA) • 4 to 20 mA	Yes 280 Ω Yes	Yes	Yes Yes

## SIMATIC S7-1200

## Analog modules

## SM 1231 analog input modules

## Technical specifications (continued)

	6ES7 231-4HD32-0XB0	6ES7 231-4HF32-0XB0	6ES7 231-5ND32-0XB0
<b>Analog value creation</b>			
Integrations and conversion time/ resolution per channel			
• Resolution with overrange (bit including sign), max.	12 bit; + sign	12 bit; + sign	15 bit; + sign
• Integration time, parameterizable	Yes	Yes	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz
Smoothing of measured values			
• Parameterizable	Yes	Yes	Yes
• Step: None	Yes	Yes	Yes
• Step: low	Yes	Yes	Yes
• Step: Medium	Yes	Yes	Yes
• Step: High	Yes	Yes	Yes
<b>Errors/accuracies</b>			
Temperature error (relative to input area)	25 °C ±0.1 % to 55 °C ±0.2 % total measurement range	25 °C ±0.1 % to 55 °C ±0.2 % total measurement range	25 °C ±0.1 % / ±0.3% total measurement range
Basic error limit (operational limit at 25 °C)			
• Voltage, relative to input area	+/- 0,1 %	+/- 0,1 %	+/- 0,1 %
• Current, relative to input area	+/- 0,1 %	+/- 0,1 %	+/- 0,1 %
Interference voltage suppression for f = n x (f1 +/- 1%), f1 = interference frequency			
• common mode voltage, max.	12 V	12 V	12 V
<b>Interrupts/diagnostics/ status information</b>			
Alarms			
• Alarms	Yes	Yes	Yes
• Diagnostic alarm	Yes	Yes	Yes
Diagnostic messages			
• Diagnostic functions	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire break	Yes	Yes	Yes
Diagnostics indication LED			
• for status of the inputs	Yes	Yes	Yes
• for maintenance	Yes	Yes	Yes
<b>Galvanic isolation</b>			
Galvanic isolation analog outputs			
• between the channels and the power supply of the electronics	No	No	No
<b>Degree and class of protection</b>			
IP20	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>			
CE mark	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes
C-TICK	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes



#### Technical specifications (continued)

	6ES7 231-4HD32-0XB0	6ES7 231-4HF32-0XB0	6ES7 231-5ND32-0XB0
<b>Climatic and mechanical conditions for storage and transport</b>			
Climatic conditions for storage and transport			
• Free fall			
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature			
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
• Air pressure acc. to IEC 60068-2-13			
- Permissible air pressure	1080 to 660 hPa	1080 to 660 hPa	1080 to 660 hPa
<b>Mechanical and climatic conditions during operation</b>			
Climatic conditions in operation			
• Temperature			
- Min.	-20 °C	-20 °C	-20 °C
- max.	60 °C	60 °C	60 °C
• Air pressure acc. to IEC 60068-2-13			
- Permissible air pressure	1080 to 795 hPa	1080 to 795 hPa	1080 to 795 hPa
• Pollutant concentrations			
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>			
required front connector	Yes	Yes	Yes
<b>Mechanics/material</b>			
Type of housing (front)			
• Plastic	Yes	Yes	Yes
<b>Dimensions</b>			
Width	45 mm	45 mm	45 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
<b>Weight</b>			
Weight, approx.	180 g	180 g	180 g

# SIMATIC S7-1200

## Analog modules

### SM 1231 analog input modules

Ordering data	Order No.		Order No.
<b>SM 1231 analog input signal module</b> 4 analog inputs, $\pm 10V$ , $\pm 5V$ , $\pm 2.5V$ , or 0 ... 20 mA, 16 bits 4 analog inputs, $\pm 10V$ , $\pm 5V$ , $\pm 2.5V$ , or 0 ... 20 mA, 12 bits + sign 8 analog inputs, $\pm 10V$ , $\pm 5V$ , $\pm 2.5V$ , or 0 ... 20 mA, 12 bits + sign	<b>6ES7 231-5ND32-0XB0</b>  <b>6ES7 231-4HD32-0XB0</b>  <b>6ES7 231-4HF32-0XB0</b>	<b>S7-1200 automation system, System Manual</b> for SIMATIC S7-1200 and STEP 7 Basic German English French Spanish Italian Chinese	<b>6ES7 298-8FA30-8AH0</b> <b>6ES7 298-8FA30-8BH0</b> <b>6ES7 298-8FA30-8CH0</b> <b>6ES7 298-8FA30-8DH0</b> <b>6ES7 298-8FA30-8EH0</b> <b>6ES7 298-8FA30-8KH0</b>
<b>Extension cable for two-tier configuration</b> for connecting digital/analog signal modules; length 2 m	<b>6ES7 290-6AA30-0XA0</b>		
<b>Terminal block (spare part)</b> for 8/16-channel analog signal modules with 7 screws, gold-plated; 4 pcs.	<b>6ES7 292-1BG30-0XA0</b>	<b>S7-1200 automation system, Easy Book</b> Brief instructions German English French Spanish Italian Chinese	<b>6ES7 298-8FA30-8AQ0</b> <b>6ES7 298-8FA30-8BQ0</b> <b>6ES7 298-8FA30-8CQ0</b> <b>6ES7 298-8FA30-8DQ0</b> <b>6ES7 298-8FA30-8EQ0</b> <b>6ES7 298-8FA30-8KQ0</b>
<b>Front flap set (spare part)</b> for 8/16-channel signal modules	<b>6ES7 291-1BA30-0XA0</b>		

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### Overview

- Analog input module for the SIMATIC S7-1200
- With extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- For the solution of more complex automation tasks as well
- Can be plugged directly into the CPU

### Technical specifications

6ES7 231-4HA30-0XB0 SB1231 AI 1x12 BIT		6ES7 231-4HA30-0XB0 SB1231 AI 1x12 BIT	
<b>Supply voltage</b> 24 V DC	Yes	<b>Analog value creation</b> Measurement principle	integrating
<b>Input current</b> from backplane bus 5 V DC, typ.	55 mA	Integrations and conversion time/ resolution per channel	
<b>Power losses</b> Power loss, typ.	0.4 W	• Resolution with overrange (bit including sign), max.	11 bit; + sign
<b>Analog inputs</b> Number of analog inputs	1; Current or voltage differential inputs	• Integration time, parameterizable	Yes
permissible input frequency for current input (destruction limit), max.	± 35 V	• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 Hz
permissible input voltage for voltage input (destruction limit), max.	35 V	Smoothing of measured values	
permissible input current for voltage input (destruction limit), max.	40 mA	• Parameterizable	Yes
permissible input current for current input (destruction limit), max.	40 mA	• Step: None	Yes
Cycle time (all channels) max.	156.25 µs; 400 Hz suppression	• Step: low	Yes
Input ranges		• Step: Medium	Yes
• Voltage	Yes; ±10 V, ±5 V, ±2.5 V	• Step: High	Yes
• Current	Yes; 0 to 20 mA	<b>Errors/accuracies</b>	
• Thermocouple	No	Temperature error (relative to input area)	25 °C ±0.3% to 55 °C ±0.6% total measurement range
• Resistance thermometer	No	<b>Interrupts/diagnostics/ status information</b>	
• Resistance	No	Alarms	
Input ranges (rated values), voltages		• Alarms	Yes
• -10 V to +10 V	Yes	• Diagnostic alarm	Yes
• Input resistance (-10 V to +10 V)	≥9 MOhm	Diagnostic messages	
• -2.5 V to +2.5 V	Yes	• Diagnostic functions	Yes
• Input resistance (-2.5 V to +2.5 V)	≥9 MOhm	• Wire break	No
• -5 V to +5 V	Yes	Diagnostic indication LED	
• Input resistance (-5 V to +5 V)	≥9 MOhm	• for status of the inputs	Yes
Input ranges (rated values), currents		• for maintenance	Yes
• 0 to 20 mA	Yes	<b>Degree and class of protection</b>	
• Input resistance (0 to 20 mA)	≥ 250 ohms	IP20	Yes
		<b>Standards, approvals, certificates</b>	
		CE mark	Yes
		C-TICK	Yes
		FM approval	Yes

# SIMATIC S7-1200

## Analog modules

### SB 1231 analog input modules

#### Technical specifications (continued)

6ES7 231-4HA30-0XB0 SB1231 AI 1x12 BIT		6ES7 231-4HA30-0XB0 SB1231 AI 1x12 BIT	
<b>Climatic and mechanical conditions for storage and transport</b> Climatic conditions for storage and transport <ul style="list-style-type: none"> <li>Free fall               <ul style="list-style-type: none"> <li>Drop height, max. (in packaging) 0.3 m; five times, in dispatch package</li> </ul> </li> <li>Temperature               <ul style="list-style-type: none"> <li>Permissible temperature range -40 °C to +70 °C</li> </ul> </li> <li>Air pressure acc. to IEC 60068-2-13               <ul style="list-style-type: none"> <li>Permissible air pressure 1080 to 660 hPa</li> </ul> </li> </ul>			
<b>Mechanical and climatic conditions during operation</b> Climatic conditions in operation <ul style="list-style-type: none"> <li>Temperature               <ul style="list-style-type: none"> <li>Permissible temperature range 0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation</li> </ul> </li> <li>Air pressure acc. to IEC 60068-2-13               <ul style="list-style-type: none"> <li>Permissible air pressure 1080 to 795 hPa</li> </ul> </li> <li>Pollutant concentrations               <ul style="list-style-type: none"> <li>SO<sub>2</sub> at RH &lt; 60% without condensation SO<sub>2</sub>: &lt; 0.5 ppm; H<sub>2</sub>S: &lt; 0.1 ppm; RH &lt; 60% condensation-free</li> </ul> </li> </ul>			
		<b>Connection method</b> required front connector Yes	
		<b>Mechanics/material</b> Type of housing (front) <ul style="list-style-type: none"> <li>Plastic Yes</li> </ul>	
		<b>Dimensions</b> Width 38 mm	
		Height 62 mm	
		Depth 21 mm	
		<b>Weight</b> Weight, approx. 35 g	

#### Ordering data

Order No.	Order No.
<b>SB 1231 analog input signal board</b> 1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	<b>6ES7 231-4HA30-0XB0</b>
<b>Terminal block (spare part)</b> for signal board with 6 screws, gold-plated; 4 pcs.	<b>6ES7 292-1BF30-0XA0</b>
<b>S7-1200 automation system, System Manual</b> for SIMATIC S7-1200 and STEP 7 Basic	
German	<b>6ES7 298-8FA30-8AH0</b>
English	<b>6ES7 298-8FA30-8BH0</b>
French	<b>6ES7 298-8FA30-8CH0</b>
Spanish	<b>6ES7 298-8FA30-8DH0</b>
Italian	<b>6ES7 298-8FA30-8EH0</b>
Chinese	<b>6ES7 298-8FA30-8KH0</b>
	<b>S7-1200 automation system, Easy Book</b> Brief instructions
	German <b>6ES7 298-8FA30-8AQ0</b>
	English <b>6ES7 298-8FA30-8BQ0</b>
	French <b>6ES7 298-8FA30-8CQ0</b>
	Spanish <b>6ES7 298-8FA30-8DQ0</b>
	Italian <b>6ES7 298-8FA30-8EQ0</b>
	Chinese <b>6ES7 298-8FA30-8KQ0</b>

#### Overview



- Analog outputs for SIMATIC S7-1200
- With extremely short conversion times
- For connecting analog actuators without additional amplifiers
- For solving even more complex automation tasks

#### Technical specifications

	6ES7 232-4HB32-0XB0 SM 1232 AQ 2x14 bit	6ES7 232-4HD32-0XB0 SM 1232 AQ 4 x 14bit
<b>Supply voltage</b> 24 V DC	Yes	Yes
<b>Input current</b> Current consumption, typ.	45 mA	45 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
<b>Power losses</b> Power loss, typ.	1.5 W	1.5 W
<b>Analog inputs</b> Number of analog inputs	0	
Thermocouple (TC) • Temperature compensation - Parameterizable	No	No
<b>Analog outputs</b> Number of analog outputs	2; Current or voltage	4; Current or voltage
Output ranges, voltage • -10 to +10 V	Yes	Yes
Output ranges, current • 0 to 20 mA	Yes	Yes
Load impedance (in rated range of output) • with voltage outputs, min. • with current outputs, max.	1 000 Ω 600 Ω	1 000 Ω 600 Ω
<b>Analog value creation</b> Measurement principle	Differential	Differential
Integrations and conversion time/ resolution per channel • Resolution (incl. overrange) • Integration time, parameterizable • Interference voltage suppression for interference frequency f1 in Hz	Voltage: 14 bits; Current : 13 bits Yes 40 dB, DC to 60 V for interference frequency 50 / 60 Hz	Voltage: 14 bits; Current : 13 bits Yes 40 dB, DC to 60 V for interference frequency 50 / 60 Hz

# SIMATIC S7-1200

## Analog modules

### SM 1232 analog output modules

#### Technical specifications (continued)

	6ES7 232-4HB32-0XB0 SM 1232 AQ 2x14 bit	6ES7 232-4HD32-0XB0 SM 1232 AQ 4 x 14bit
<b>Errors/accuracies</b>		
Temperature error (relative to output area)	25 °C ±0.3% to 55 °C ±0.6% total measurement range	25 °C ±0.3% to 55 °C ±0.6% total measurement range
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to output area	+/- 0,3 %	+/- 0,3 %
• Current, relative to output area	+/- 0,3 %	+/- 0,3 %
Interference voltage suppression for $f = n \times (f_1 \pm 1\%)$ , $f_1 =$ interference frequency		
• common mode voltage, max.	12 V	12 V
<b>Interrupts/diagnostics/ status information</b>		
Alarms		
• Alarms	Yes	Yes
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Diagnostic functions	Yes	Yes
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes	Yes
• Short circuit	Yes	Yes
Diagnostics indication LED		
• For status of the outputs	Yes	Yes
• for maintenance	Yes	Yes
<b>Degree and class of protection</b>		
IP20	Yes	Yes
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
C-TICK	Yes	Yes
FM approval	Yes	Yes
<b>Climatic and mechanical conditions for storage and transport</b>		
Climatic conditions for storage and transport		
• Free fall		
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature		
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C
• Air pressure acc. to IEC 60068-2-13		
- Permissible air pressure	1080 to 660 hPa	1080 to 660 hPa
<b>Mechanical and climatic conditions during operation</b>		
Climatic conditions in operation		
• Temperature		
- Min.	-20 °C	-20 °C
- max.	60 °C	60 °C
• Air pressure acc. to IEC 60068-2-13		
- Permissible air pressure	1080 to 795 hPa	1080 to 795 hPa
• Pollutant concentrations		
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free

#### Technical specifications (continued)

	6ES7 232-4HB32-0XB0 SM 1232 AQ 2x14 bit	6ES7 232-4HD32-0XB0 SM 1232 AQ 4 x 14bit
<b>Connection method</b> required front connector	Yes	Yes
<b>Mechanics/material</b> Type of housing (front) • Plastic	Yes	Yes
<b>Dimensions</b>		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
<b>Weight</b> Weight, approx.	180 g	180 g

#### Ordering data

	Order No.		Order No.
<b>SM 1232 analog output signal module</b> 2 analog outputs, $\pm 10$ V with 14 bits or 0 ... 20 mA with 13 bits 4 analog outputs, $\pm 10$ V with 14 bits or 0 ... 20 mA with 13 bits	<b>6ES7 232-4HB32-0XB0</b> <b>6ES7 232-4HD32-0XB0</b>	<b>S7-1200 automation system, System Manual</b> for SIMATIC S7-1200 and STEP 7 Basic German English French Spanish Italian Chinese	<b>6ES7 298-8FA30-8AH0</b> <b>6ES7 298-8FA30-8BH0</b> <b>6ES7 298-8FA30-8CH0</b> <b>6ES7 298-8FA30-8DH0</b> <b>6ES7 298-8FA30-8EH0</b> <b>6ES7 298-8FA30-8KH0</b>
<b>Terminal block (spare part)</b> for 8/16-channel analog signal modules with 7 screws, gold-plated; 4 pcs.	<b>6ES7 292-1BG30-0XA0</b>	<b>S7-1200 automation system, Easy Book</b> Brief instructions German English French Spanish Italian Chinese	<b>6ES7 298-8FA30-8AQ0</b> <b>6ES7 298-8FA30-8BQ0</b> <b>6ES7 298-8FA30-8CQ0</b> <b>6ES7 298-8FA30-8DQ0</b> <b>6ES7 298-8FA30-8EQ0</b> <b>6ES7 298-8FA30-8KQ0</b>
<b>Extension cable for two-tier configuration</b> for connecting digital/analog signal modules; length 2 m	<b>6ES7 290-6AA30-0XA0</b>		
<b>Front flap set (spare part)</b> for 8/16-channel signal modules	<b>6ES7 291-1BA30-0XA0</b>		

# SIMATIC S7-1200

## Analog modules

### SB 1232 analog output modules

#### Overview



- Analog output for the SIMATIC S7-1200
- Can be plugged direct into the CPU

#### Technical specifications

	6ES7 232-4HA30-0XB0 SB 1232 1x AO
<b>Input current</b> from backplane bus 5 V DC, typ.	15 mA
<b>Output voltage</b> Power supply to the transmitters • Supply current, max.	25 mA
<b>Power losses</b> Power loss, typ.	1.5 W
<b>Analog outputs</b> Number of analog outputs	1
Cycle time (all channels) max.	Voltage: 300 $\mu$ S (R), 750 $\mu$ S (1 $\mu$ F) Current: 600 ms (1 mH); 2 ms (10 mH)
Output ranges, voltage • -10 to +10 V	Yes
Output ranges, current • 0 to 20 mA	Yes
Load impedance (in rated range of output) • with voltage outputs, min. • with current outputs, max.	1 000 $\Omega$ 600 $\Omega$
Cable length • Cable length, shielded, max.	10 m; Shielded, twisted wire pair
<b>Analog value creation</b> Measurement principle	Differential
Integrations and conversion time/ resolution per channel • Resolution (incl. overrange)	V/12 bits, I/11 bits
Smoothing of measured values • Parameterizable	Yes
<b>Errors/accuracies</b> Temperature error (relative to output area)	25°C $\pm$ 0.5% bis 55°C $\pm$ 1%
<b>Interrupts/diagnostics/ status information</b> Alarms • Alarms	Yes
Diagnostic messages • Diagnostic functions	Yes
Diagnostics indication LED • For status of the outputs	Yes

	6ES7 232-4HA30-0XB0 SB 1232 1x AO
<b>Degree and class of protection</b> IP20	Yes
<b>Standards, approvals, certificates</b> CE mark	Yes
C-TICK	Yes
FM approval	Yes
<b>Climatic and mechanical conditions for storage and transport</b> Climatic conditions for storage and transport • Free fall - Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
• Temperature - Permissible temperature range	-40 °C to +70 °C
• Air pressure acc. to IEC 60068-2-13 - Permissible air pressure	1080 to 660 hPa
<b>Mechanical and climatic conditions during operation</b> Climatic conditions in operation • Temperature - Permissible temperature range	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation
• Pollutant concentrations - SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Mechanics/material</b> Type of housing (front) • Plastic	Yes
<b>Dimensions</b> Width	38 mm
Height	62 mm
Depth	21 mm
<b>Weight</b> Weight, approx.	40 g



Ordering data	Order No.		Order No.
<b>SB 1232 analog output signal board</b> 1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	<b>6ES7 232-4HA30-0XB0</b>	<b>S7-1200 automation system, Easy Book</b> Brief instructions	
<b>Terminal block (spare part)</b> for signal board with 6 screws, gold-plated; 4 pcs.	<b>6ES7 292-1BF30-0XA0</b>	German	<b>6ES7 298-8FA30-8AQ0</b>
<b>S7-1200 automation system, System Manual</b> for SIMATIC S7-1200 and STEP 7 Basic		English	<b>6ES7 298-8FA30-8BQ0</b>
German	<b>6ES7 298-8FA30-8AH0</b>	French	<b>6ES7 298-8FA30-8CQ0</b>
English	<b>6ES7 298-8FA30-8BH0</b>	Spanish	<b>6ES7 298-8FA30-8DQ0</b>
French	<b>6ES7 298-8FA30-8CH0</b>	Italian	<b>6ES7 298-8FA30-8EQ0</b>
Spanish	<b>6ES7 298-8FA30-8DH0</b>	Chinese	<b>6ES7 298-8FA30-8KQ0</b>
Italian	<b>6ES7 298-8FA30-8EH0</b>		
Chinese	<b>6ES7 298-8FA30-8KH0</b>		

# SIMATIC S7-1200

## Analog modules

### SM 1234 analog input/output modules

#### Overview



- Analog inputs and outputs for the SIMATIC S7-1200
- With extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- For solving even more complex automation tasks

#### Technical specifications

	<b>6ES7 234-4HE32-0XB0</b> <b>SM 1234 A I4x13 bit AO 2x14 bit</b>
<b>Supply voltage</b> 24 V DC	Yes
<b>Input current</b> Current consumption, typ.	60 mA
from backplane bus 5 V DC, typ.	80 mA
<b>Power losses</b> Power loss, typ.	2 W
<b>Analog inputs</b> Number of analog inputs	4; Current or voltage differential inputs
permissible input frequency for current input (destruction limit), max.	± 35 V
permissible input voltage for voltage input (destruction limit), max.	35 V
permissible input current for voltage input (destruction limit), max.	40 mA
permissible input current for current input (destruction limit), max.	40 mA
Cycle time (all channels) max.	625 µs
<b>Input ranges</b> • Voltage • Current • Thermocouple • Resistance thermometer • Resistance	Yes; ±10 V, ±5 V, ±2.5 V Yes; 0 to 20 mA No No No
<b>Input ranges (rated values), voltages</b> • -10 V to +10 V • Input resistance (-10 V to +10 V) • -2.5 V to +2.5 V • Input resistance (-2.5 V to +2.5 V) • -5 V to +5 V • Input resistance (-5 V to +5 V)	Yes ≥9 MOhm Yes ≥9 MOhm Yes ≥9 MOhm

	<b>6ES7 234-4HE32-0XB0</b> <b>SM 1234 A I4x13 bit AO 2x14 bit</b>
<b>Input ranges (rated values), currents</b> • 0 to 20 mA • Input resistance (0 to 20 mA)	Yes 280 Ω
<b>Thermocouple (TC)</b> • Temperature compensation - Parameterizable	No
<b>Analog outputs</b> Number of analog outputs	2; Current or voltage
<b>Output ranges, voltage</b> • -10 to +10 V	Yes
<b>Output ranges, current</b> • 0 to 20 mA	Yes
<b>Load impedance (in rated range of output)</b> • with voltage outputs, min. • with current outputs, max.	1 000 Ω 600 Ω
<b>Analog value creation</b> Measurement principle	Differential
<b>Integrations and conversion time/ resolution per channel</b> • Resolution (incl. overrange) • Integration time, parameterizable • Interference voltage suppression for interference frequency f1 in Hz	Voltage: 14 bits; Current : 13 bits Yes 40 dB, DC to 60 V for interference frequency 50 / 60 Hz
<b>Smoothing of measured values</b> • Parameterizable • Step: None • Step: low • Step: Medium • Step: High	Yes Yes Yes Yes Yes

#### Technical specifications (continued)

	<b>6ES7 234-4HE32-0XB0</b> <b>SM 1234 A I4x13 bit AQ 2x14 bit</b>
<b>Errors/accuracies</b>	
Temperature error (relative to input area)	25 °C ±0.1 % to 55 °C ±0.2 % total measurement range
Temperature error (relative to output area)	25 °C ±0.3% to 55 °C ±0.6% total measurement range
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input area	+/- 0,1 %
• Current, relative to input area	+/- 0,1 %
• Voltage, relative to output area	+/- 0,3 %
• Current, relative to output area	+/- 0,3 %
Interference voltage suppression for $f = n \times (f_1 \pm 1\%)$ , $f_1 =$ interference frequency	
• common mode voltage, max.	12 V
<b>Interrupts/diagnostics/status information</b>	
Alarms	
• Alarms	Yes
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic functions	Yes
• Monitoring the supply voltage	Yes
• Wire break	Yes
• Short circuit	Yes
Diagnostics indication LED	
• for status of the inputs	Yes
• For status of the outputs	Yes
• for maintenance	Yes
<b>Galvanic isolation</b>	
Galvanic isolation analog outputs	
• between the channels and the power supply of the electronics	No
<b>Degree and class of protection</b>	
IP20	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
C-TICK	Yes
FM approval	Yes

	<b>6ES7 234-4HE32-0XB0</b> <b>SM 1234 A I4x13 bit AQ 2x14 bit</b>
<b>Climatic and mechanical conditions for storage and transport</b>	
Climatic conditions for storage and transport	
• Free fall	
- Drop height, max. (in packaging)	0,3 m; five times, in dispatch package
• Temperature	
- Permissible temperature range	-40 °C to +70 °C
• Air pressure acc. to IEC 60068-2-13	
- Permissible air pressure	1080 to 660 hPa
<b>Mechanical and climatic conditions during operation</b>	
Climatic conditions in operation	
• Temperature	
- Permissible temperature range	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation
• Air pressure acc. to IEC 60068-2-13	
- Permissible air pressure	1080 to 795 hPa
• Pollutant concentrations	
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>	
required front connector	Yes
<b>Mechanics/material</b>	
Type of housing (front)	
• Plastic	Yes
<b>Dimensions</b>	
Width	45 mm
Height	100 mm
Depth	75 mm
<b>Weight</b>	
Weight, approx.	220 g

# SIMATIC S7-1200

## Analog modules

### SM 1234 analog input/output modules

Ordering data	Order No.		Order No.
<b>SM 1234 analog input/output signal module</b> 4 analog inputs, ±10 V, ±5 V, ±2.5 V, or 0 ... 20 mA, 12 bits + sign; 2 analog outputs, ±10 V with 14 bits or 0 ... 20 mA with 13 bits	<b>6ES7 234-4HE32-0XB0</b>	<b>S7-1200 automation system, System Manual</b> for SIMATIC S7-1200 and STEP 7 Basic German English French Spanish Italian Chinese	<b>6ES7 298-8FA30-8AH0</b> <b>6ES7 298-8FA30-8BH0</b> <b>6ES7 298-8FA30-8CH0</b> <b>6ES7 298-8FA30-8DH0</b> <b>6ES7 298-8FA30-8EH0</b> <b>6ES7 298-8FA30-8KH0</b>
<b>Terminal block (spare part)</b> for 8/16-channel analog signal modules with 7 screws, gold-plated; 4 pcs.	<b>6ES7 292-1BG30-0XA0</b>	<b>S7-1200 automation system, Easy Book</b> Brief instructions German English French Spanish Italian Chinese	<b>6ES7 298-8FA30-8AQ0</b> <b>6ES7 298-8FA30-8BQ0</b> <b>6ES7 298-8FA30-8CQ0</b> <b>6ES7 298-8FA30-8DQ0</b> <b>6ES7 298-8FA30-8EQ0</b> <b>6ES7 298-8FA30-8KQ0</b>
<b>Extension cable for two-tier configuration</b> for connecting digital/analog signal modules; length 2 m	<b>6ES7 290-6AA30-0XA0</b>		
<b>Front flap set (spare part)</b> for 8/16-channel signal modules	<b>6ES7 291-1BA30-0XA0</b>		

3

### Overview

- For the convenient recording of temperatures with great accuracy
- 7 common thermocouple types can be used
- Also for the measurement of analog signals with a low level ( $\pm 80$  mV)
- Can easily be retrofitted to existing plant

### Technical specifications

	6ES7 231-5QD30-0XB0 SM1231 TC 4x16 bit	6ES7 231-5QF30-0XB0 SM 1231 TC 8x16bit
<b>Supply voltage</b> 24 V DC	Yes	Yes
<b>Input current</b> Current consumption, typ.	40 mA	80 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
<b>Power losses</b> Power loss, typ.	1.5 W	1.5 W
<b>Analog inputs</b> Number of analog inputs	4; Thermocouples	8; Thermocouples
permissible input frequency for current input (destruction limit), max.	$\pm 35$ V	$\pm 35$ V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit
<b>Input ranges</b> • Thermocouple	Yes; J, K, T, E, R, S, N, C, TXK/XK(L); voltage range: +/-80 mV	Yes; J, K, T, E, R, S, N, C, TXK/XK(L); voltage range: +/-80 mV
<b>Input ranges (rated values), voltages</b> • -80 mV to +80 mV	Yes	Yes
<b>Input ranges (rated values), thermoelements</b> • Type C • Type E • Type J • Type K • Type N • Type R • Type S • Type T • Type TXK/TXK(L) to GOST	Yes Yes Yes Yes Yes Yes Yes Yes Yes	Yes Yes Yes Yes Yes Yes Yes Yes Yes
<b>Thermocouple (TC)</b> • permissible input voltage for voltage input (destruction limit), max. • Temperature compensation - Parameterizable	+ -35V  No	+ -35V  No
<b>Analog value creation</b> Measurement principle	integrating	integrating
<b>Integrations and conversion time/ resolution per channel</b> • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Interference voltage suppression for interference frequency f1 in Hz	15 bit; + sign  No 85 dB at 50 / 60 / 400 Hz	15 bit; + sign  No 85 dB at 50 / 60 / 400 Hz

# SIMATIC S7-1200

## Analog modules

### SM 1231 thermocouple modules

#### Technical specifications (continued)

	6ES7 231-5QD30-0XB0 SM1231 TC 4x16 bit	6ES7 231-5QF30-0XB0 SM 1231 TC 8x16bit
<b>Analog value generation (in isochronous mode)</b> Smoothing of measured values • Parameterizable	Yes	Yes
<b>Errors/accuracies</b> cold connection point		+/-1.5 °C
Temperature error (relative to input area)	25 °C ±0.1 % to 55 °C ±0.2 % total measurement range	25 °C ±0.1 % to 55 °C ±0.2 % total measurement range
Interference voltage suppression for $f = n \times (f_1 \pm 1\%)$ , $f_1 =$ interference frequency • Common mode interference, min.	120 dB	120 dB
<b>Interrupts/diagnostics/ status information</b> Alarms • Alarms • Diagnostic alarm	Yes Yes	Yes Yes
Diagnostic messages • Diagnostic functions • Monitoring the supply voltage • Wire break	Yes; Can be read out Yes Yes	Yes; Can be read out Yes Yes
Diagnostics indication LED • for status of the inputs • for maintenance	Yes Yes	Yes Yes
<b>Degree and class of protection</b> IP20	Yes	Yes
<b>Standards, approvals, certificates</b> CE mark	Yes	Yes
C-TICK	Yes	Yes
FM approval	Yes	Yes
<b>Climatic and mechanical conditions for storage and transport</b> Climatic conditions for storage and transport • Free fall - Drop height, max. (in packaging) • Temperature - Permissible temperature range • Air pressure acc. to IEC 60068-2-13 - Permissible air pressure	0.3 m; five times, in dispatch package -40 °C to +70 °C 1080 to 660 hPa	0.3 m; five times, in dispatch package -40 °C to +70 °C 1080 to 660 hPa

#### Technical specifications (continued)

	6ES7 231-5QD30-0XB0 SM1231 TC 4x16 bit	6ES7 231-5QF30-0XB0 SM 1231 TC 8x16bit
<b>Mechanical and climatic conditions during operation</b>		
Climatic conditions in operation		
• Temperature		
- Permissible temperature range	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation
• Air pressure acc. to IEC 60068-2-13		
- Permissible air pressure	1080 to 795 hPa	1080 to 795 hPa
• Pollutant concentrations		
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>		
required front connector	Yes	Yes
<b>Mechanics/material</b>		
Type of housing (front)		
• Plastic	Yes	Yes
<b>Dimensions</b>		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
<b>Weight</b>		
Weight, approx.	180 g	220 g

#### Ordering data

	Order No.		Order No.
<b>SM 1231 thermocouple module</b>		<b>S7-1200 automation system, System Manual</b>	
4 inputs +/- 80 mV, resolution 15 bits + sign, thermocouple types J, K, S, T, R, E, N	<b>6ES7 231-5QD30-0XB0</b>	for SIMATIC S7-1200 and STEP 7 Basic	
8 inputs +/- 80 mV, resolution 15 bits + sign, thermocouple types J, K, T, E, R, S, N, C, TXK/XK(L)	<b>6ES7 231-5QF30-0XB0</b>	German	<b>6ES7 298-8FA30-8AH0</b>
<b>Accessories</b>		English	<b>6ES7 298-8FA30-8BH0</b>
<b>Terminal block (spare part)</b>		French	<b>6ES7 298-8FA30-8CH0</b>
for 8/16-channel analog signal modules		Spanish	<b>6ES7 298-8FA30-8DH0</b>
with 7 screws, gold-plated; 4 pcs.	<b>6ES7 292-1BG30-0XA0</b>	Italian	<b>6ES7 298-8FA30-8EH0</b>
<b>Extension cable for two-tier configuration</b>		Chinese	<b>6ES7 298-8FA30-8KH0</b>
for connecting digital/analog signal modules; length 2 m	<b>6ES7 290-6AA30-0XA0</b>	<b>S7-1200 automation system, Easy Book</b>	
<b>Front flap set (spare part)</b>		Brief instructions	
for 8/16-channel signal modules	<b>6ES7 291-1BA30-0XA0</b>	German	<b>6ES7 298-8FA30-8AQ0</b>
		English	<b>6ES7 298-8FA30-8BQ0</b>
		French	<b>6ES7 298-8FA30-8CQ0</b>
		Spanish	<b>6ES7 298-8FA30-8DQ0</b>
		Italian	<b>6ES7 298-8FA30-8EQ0</b>
		Chinese	<b>6ES7 298-8FA30-8KQ0</b>

## SIMATIC S7-1200

## Analog modules

## SB 1231 thermocouple signal boards

## Overview

- For the convenient recording of temperatures with great accuracy
- 1 input with 16-bit resolution
- Common thermocouple types can be used
- Also for the measurement of analog signals with a low level ( $\pm 80$  mV)
- Can easily be retrofitted to existing plant
- Can be plugged directly into the CPU

## Technical specifications

6ES7 231-5QA30-0XB0 SB1231 AI 1xTC		6ES7 231-5QA30-0XB0 SB1231 AI 1xTC	
<b>Supply voltage</b> 24 V DC	Yes	<b>Analog value generation (in isochronous mode)</b> Smoothing of measured values • Parameterizable	Yes
<b>Input current</b> Current consumption, typ.	5 mA	<b>Errors/accuracies</b> Temperature error (relative to input area)	25 °C $\pm 0.1$ % to 55 °C $\pm 0.2$ % total measurement range
from backplane bus 5 V DC, typ.	20 mA	Interference voltage suppression for $f = n \times (f_1 \pm 1\%)$ , $f_1 =$ interference frequency • Common mode interference, min.	120 dB
<b>Power losses</b> Power loss, typ.	0.5 W	<b>Interrupts/diagnostics/ status information</b> Alarms • Alarms • Diagnostic alarm	Yes Yes
<b>Analog inputs</b> Number of analog inputs	1; Thermocouples	Diagnostic messages • Diagnostic functions • Wire break	Yes; Can be read out Yes
permissible input frequency for current input (destruction limit), max.	$\pm 35$ V	Diagnostics indication LED • for status of the inputs • for maintenance	Yes Yes
Technical unit for temperature measurement adjustable	Degrees Celsius/ degrees Fahrenheit	<b>Degree and class of protection</b> IP20	Yes
Input ranges • Thermocouple	Yes; J, K; voltage range $\pm 80$ MV	<b>Standards, approvals, certificates</b> CE mark	Yes
Input ranges (rated values), voltages • -80 mV to +80 mV	Yes	C-TICK	Yes
Input ranges (rated values), thermoelements • Type J • Input resistance (type J) • Type K • Input resistance (Type K)	Yes 1200°C Yes 1372°C	FM approval	Yes
Thermocouple (TC) • permissible input voltage for voltage input (destruction limit), max. • Temperature compensation - Parameterizable	+35V No	<b>Climatic and mechanical conditions for storage and transport</b> Climatic conditions for storage and transport • Free fall - Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
<b>Analog value creation</b> Measurement principle	integrating	• Temperature - Permissible temperature range • Air pressure acc. to IEC 60068-2-13 - Permissible air pressure	-40 °C to +70 °C 1080 to 660 hPa
Integrations and conversion time/ resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Interference voltage suppression for interference frequency $f_1$ in Hz	15 bit; + sign No 85 dB at 10 / 50 / 60 / 400 Hz		



### Technical specifications (continued)

	6ES7 231-5QA30-0XB0 SB1231 AI 1xTC	6ES7 231-5QA30-0XB0 SB1231 AI 1xTC
<b>Mechanical and climatic conditions during operation</b>		
Climatic conditions in operation		
• Temperature		
- Permissible temperature range	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation	
• Air pressure acc. to IEC 60068-2-13		
- Permissible air pressure	1080 to 795 hPa	
• Pollutant concentrations		
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	
<b>Connection method</b>		
required front connector		Yes
<b>Mechanics/material</b>		
Type of housing (front)		
• Plastic		Yes
<b>Dimensions</b>		
Width		38 mm
Height		62 mm
Depth		21 mm
<b>Weight</b>		
Weight, approx.		35 g

### Ordering data

Ordering data	Order No.	Ordering data	Order No.
<b>SB 1231 thermocouple signal board</b>	<b>6ES7 231-5QA30-0XB0</b>	<b>S7-1200 automation system, Easy Book</b>	
1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K		Brief instructions	
<b>Accessories</b>		German	<b>6ES7 298-8FA30-8AQ0</b>
<b>Terminal block (spare part)</b>		English	<b>6ES7 298-8FA30-8BQ0</b>
for signal board		French	<b>6ES7 298-8FA30-8CQ0</b>
with 6 screws, gold-plated; 4 pcs.	<b>6ES7 292-1BF30-0XA0</b>	Spanish	<b>6ES7 298-8FA30-8DQ0</b>
<b>S7-1200 automation system, System Manual</b>		Italian	<b>6ES7 298-8FA30-8EQ0</b>
for SIMATIC S7-1200 and STEP 7 Basic		Chinese	<b>6ES7 298-8FA30-8KQ0</b>
German	<b>6ES7 298-8FA30-8AH0</b>		
English	<b>6ES7 298-8FA30-8BH0</b>		
French	<b>6ES7 298-8FA30-8CH0</b>		
Spanish	<b>6ES7 298-8FA30-8DH0</b>		
Italian	<b>6ES7 298-8FA30-8EH0</b>		
Chinese	<b>6ES7 298-8FA30-8KH0</b>		

# SIMATIC S7-1200

## Analog modules

### SM 1231 RTD signal modules

#### Overview

- For the convenient recording of temperatures with great accuracy
- 4 inputs
- Most popular resistance temperature detectors can be used
- Can easily be retrofitted to existing installation

#### Technical specifications

	6ES7 231-5PD30-0XB0 SM1231 RTD 4x16bit	6ES7 231-5PF30-0XB0 SM 1231 RTD 8x16bit
<b>Supply voltage</b> 24 V DC	Yes	Yes
<b>Input current</b> Current consumption, typ.	40 mA	90 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
<b>Power losses</b> Power loss, typ.	1.5 W	1.5 W
<b>Analog inputs</b> Number of analog inputs	4; Resistance thermometer	8; Resistance thermometer
permissible input frequency for current input (destruction limit), max.	± 35 V	± 35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit
<b>Input ranges</b> • Resistance thermometer	Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000	Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000
• Resistance	Yes; 150 Ω, 300 Ω, 600 Ω	Yes; 150 Ω, 300 Ω, 600 Ω
<b>Input ranges (rated values), resistance thermometers</b> • Cu 10	Yes	Yes
• Input resistance (Cu 10)	10 Ω	10 Ω
• Ni 100	Yes	Yes
• Input resistance (Ni 100)	100 Ω	100 Ω
• Ni 1000	Yes	Yes
• Input resistance (Ni 1000)	1 000 Ω	1 000 Ω
• LG-Ni 1000	Yes	Yes
• Input resistance (LG-Ni 1000)	1 000 Ω	1 000 Ω
• Ni 120	Yes	Yes
• Input resistance (Ni 120)	120 Ω	120 Ω
• Ni 200	Yes	Yes
• Input resistance (Ni 200)	200 Ω	200 Ω
• Ni 500	Yes	Yes
• Input resistance (Ni 500)	500 Ω	500 Ω
• Pt 100	Yes	Yes
• Input resistance (Pt 100)	100 Ω	100 Ω
• Pt 1000	Yes	Yes
• Input resistance (Pt 1000)	1 000 Ω	1 000 Ω
• Pt 200	Yes	Yes
• Input resistance (Pt 200)	200 Ω	200 Ω
• Pt 500	Yes	Yes
• Input resistance (Pt 500)	500 Ω	500 Ω
<b>Input ranges (rated values), resistors</b> • 0 to 150 ohms	Yes	Yes
• 0 to 300 ohms	Yes	Yes
• 0 to 600 ohms	Yes	Yes
<b>Thermocouple (TC)</b> • Temperature compensation - Parameterizable	No	No

#### Technical specifications (continued)

	6ES7 231-5PD30-0XB0 SM1231 RTD 4x16bit	6ES7 231-5PF30-0XB0 SM 1231 RTD 8x16bit
<b>Analog value creation</b>		
Measurement principle	integrating	integrating
Integrations and conversion time/ resolution per channel		
• Resolution with overrange (bit including sign), max.	15 bit; + sign	15 bit; + sign
• Integration time, parameterizable	No	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 50 / 60 / 400 Hz	85 dB at 10 / 50 / 60 / 400 Hz
<b>Errors/accuracies</b>		
cold connection point		+/-1.5 °C
Temperature error (relative to input area)	25 °C ±0.1 % to 55 °C ±0.2 % total measurement range	25 °C ±0.1 % to 55 °C ±0.2 % total measurement range
Interference voltage suppression for f = n x (f1 +/- 1%), f1 = interference frequency		
• Common mode interference, min.	120 dB	120 dB
<b>Interrupts/diagnostics/ status information</b>		
Alarms		
• Alarms	Yes	Yes
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Diagnostic functions	Yes; Can be read out	Yes; Can be read out
• Monitoring the supply voltage	Yes	Yes
• Wire break	Yes	Yes
Diagnostics indication LED		
• for status of the inputs	Yes	Yes
• for maintenance	Yes	Yes
<b>Degree and class of protection</b>		
IP20	Yes	Yes
<b>Standards, approvals, certificates</b>		
CE mark	Yes	Yes
C-TICK	Yes	Yes
FM approval	Yes	Yes
<b>Climatic and mechanical conditions for storage and transport</b>		
Climatic conditions for storage and transport		
• Free fall		
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature		
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C
• Air pressure acc. to IEC 60068-2-13		
- Permissible air pressure	1080 to 660 hPa	1080 to 660 hPa

# SIMATIC S7-1200

## Analog modules

### SM 1231 RTD signal modules

#### Technical specifications (continued)

	6ES7 231-5PD30-0XB0 SM1231 RTD 4x16bit	6ES7 231-5PF30-0XB0 SM 1231 RTD 8x16bit
<b>Mechanical and climatic conditions during operation</b>		
Climatic conditions in operation		
• Temperature		
- Permissible temperature range	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation
• Air pressure acc. to IEC 60068-2-13		
- Permissible air pressure	1080 to 795 hPa	1080 to 795 hPa
• Pollutant concentrations		
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Connection method</b>		
required front connector	Yes	Yes
<b>Mechanics/material</b>		
Type of housing (front)		
• Plastic	Yes	Yes
<b>Dimensions</b>		
Width	45 mm	70 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
<b>Weight</b>		
Weight, approx.	220 g	220 g

#### Ordering data

Ordering data	Order No.	Ordering data	Order No.
<b>SM 1231 RTD signal module</b>		<b>S7-1200 automation system, System Manual</b>	
4 inputs for resistance temperature detectors Pt10/50/100/200/500/1000, Ni100/120/200/500/1000, Cu10/50/100, LG-Ni1000; resistance 150/300/600 Ohm, resolution 15 bits + sign	<b>6ES7 231-5PD30-0XB0</b>	for SIMATIC S7-1200 and STEP 7 Basic	
8 inputs for resistance temperature detectors Pt10/50/100/200/500/1000, Ni100/120/200/500/1000, Cu10/50/100, LG-Ni1000; resistance 150/300/600 Ohm, resolution 15 bits + sign	<b>6ES7 231-5PF30-0XB0</b>	German	<b>6ES7 298-8FA30-8AH0</b>
		English	<b>6ES7 298-8FA30-8BH0</b>
		French	<b>6ES7 298-8FA30-8CH0</b>
		Spanish	<b>6ES7 298-8FA30-8DH0</b>
		Italian	<b>6ES7 298-8FA30-8EH0</b>
		Chinese	<b>6ES7 298-8FA30-8KH0</b>
<b>Accessories</b>		<b>S7-1200 automation system, Easy Book</b>	
<b>Terminal block (spare part)</b>		Brief instructions	
for 8/16-channel analog signal modules		German	<b>6ES7 298-8FA30-8AQ0</b>
with 7 screws, gold-plated; 4 pcs.	<b>6ES7 292-1BG30-0XA0</b>	English	<b>6ES7 298-8FA30-8BQ0</b>
		French	<b>6ES7 298-8FA30-8CQ0</b>
		Spanish	<b>6ES7 298-8FA30-8DQ0</b>
		Italian	<b>6ES7 298-8FA30-8EQ0</b>
		Chinese	<b>6ES7 298-8FA30-8KQ0</b>
<b>Extension cable for two-tier configuration</b>			
for connecting digital/analog signal modules; length 2 m	<b>6ES7 290-6AA30-0XA0</b>		
<b>Front flap set (spare part)</b>			
for 8/16-channel signal modules	<b>6ES7 291-1BA30-0XA0</b>		

### Overview

- For the convenient recording of temperatures with great accuracy
- 1 input with 16-bit resolution
- Common resistance-type temperature detectors can be used
- Can easily be retrofitted to existing plant
- Can be plugged directly into the CPU

### Technical specifications

6ES7 231-5PA30-0XB0 SB1231 AI 1xRTD		6ES7 231-5PA30-0XB0 SB1231 AI 1xRTD	
<b>Supply voltage</b> 24 V DC	Yes	<b>Errors/accuracies</b> Temperature error (relative to input area)	25 °C ±0.1 % to 55 °C ±0.2 % total measurement range
<b>Input current</b> Current consumption, typ. from backplane bus 5 V DC, typ.	5 mA 20 mA	Interference voltage suppression for $f = n \times (f_1 \pm 1\%)$ , $f_1 =$ interference frequency • Common mode interference, min.	120 dB
<b>Power losses</b> Power loss, typ.	0.5 W	<b>Interrupts/diagnostics/ status information</b> Alarms • Alarms • Diagnostic alarm	Yes Yes
<b>Analog inputs</b> Number of analog inputs permissible input frequency for current input (destruction limit), max.	1; Resistance thermometer ± 35 V	Diagnostic messages • Diagnostic functions • Wire break	Yes; Can be read out Yes
Technical unit for temperature measurement adjustable	Degrees Celsius/ degrees Fahrenheit	Diagnosis indication LED • for status of the inputs • for maintenance	Yes Yes
Input ranges • Resistance thermometer • Resistance	Yes; Platinum (Pt) Yes; 150 Ω, 300 Ω, 600 Ω	<b>Degree and class of protection</b> IP20	Yes
Input ranges (rated values), voltages • Input resistance (-80 mV to +80 mV)	>= 10 MOhm	<b>Standards, approvals, certificates</b> CE mark C-TICK FM approval	Yes Yes Yes
Input ranges (rated values), resistance thermometers • Pt 100 • Input resistance (Pt 100) • Pt 1000 • Input resistance (Pt 1000) • Pt 200 • Input resistance (Pt 200) • Pt 500 • Input resistance (Pt 500)	Yes 100 Ω Yes 1 000 Ω Yes 200 Ω Yes 500 Ω	<b>Climatic and mechanical conditions for storage and transport</b> Climatic conditions for storage and transport • Free fall - Drop height, max. (in packaging)  • Temperature - Permissible temperature range • Air pressure acc. to IEC 60068-2-13 - Permissible air pressure	0.3 m; five times, in dispatch package  -40 °C to +70 °C 1080 to 660 hPa
Input ranges (rated values), resistors • 0 to 150 ohms • 0 to 300 ohms • 0 to 600 ohms	Yes Yes Yes		
Thermocouple (TC) • Temperature compensation - Parameterizable	No		
<b>Analog value creation</b> Measurement principle	integrating		
Integrations and conversion time/ resolution per channel • Resolution with overrange (bit including sign), max. • Integration time, parameterizable • Interference voltage suppression for interference frequency $f_1$ in Hz	15 bit; + sign  No 85 dB at 10 / 50 / 60 / 400 Hz		

# SIMATIC S7-1200

## Analog modules

### SB 1231 RTD signal boards

#### Technical specifications (continued)

	6ES7 231-5PA30-0XB0 SB1231 AI 1xRTD	6ES7 231-5PA30-0XB0 SB1231 AI 1xRTD
<b>Mechanical and climatic conditions during operation</b>		
Climatic conditions in operation		
• Temperature		
- Permissible temperature range	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation	
• Air pressure acc. to IEC 60068-2-13		
- Permissible air pressure	1080 to 795 hPa	
• Pollutant concentrations		
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free	
<b>Connection method</b>		
required front connector		Yes
<b>Mechanics/material</b>		
Type of housing (front)		Yes
• Plastic		
<b>Dimensions</b>		
Width		38 mm
Height		62 mm
Depth		21 mm
<b>Weight</b>		
Weight, approx.		35 g

#### Ordering data

Ordering data	Order No.	Ordering data	Order No.
<b>SB 1231 RTD signal board</b>	<b>6ES7 231-5PA30-0XB0</b>	<b>Accessories</b>	
1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign		<b>Terminal block (spare part)</b>	
		for signal board	
		with 6 screws, gold-plated; 4 pcs.	<b>6ES7 292-1BF30-0XA0</b>
		<b>S7-1200 automation system, System Manual</b>	
		for SIMATIC S7-1200 and STEP 7 Basic	
		German	<b>6ES7 298-8FA30-8AH0</b>
		English	<b>6ES7 298-8FA30-8BH0</b>
		French	<b>6ES7 298-8FA30-8CH0</b>
		Spanish	<b>6ES7 298-8FA30-8DH0</b>
		Italian	<b>6ES7 298-8FA30-8EH0</b>
		Chinese	<b>6ES7 298-8FA30-8KH0</b>
		<b>S7-1200 automation system, Easy Book</b>	
		Brief instructions	
		German	<b>6ES7 298-8FA30-8AQ0</b>
		English	<b>6ES7 298-8FA30-8BQ0</b>
		French	<b>6ES7 298-8FA30-8CQ0</b>
		Spanish	<b>6ES7 298-8FA30-8DQ0</b>
		Italian	<b>6ES7 298-8FA30-8EQ0</b>
		Chinese	<b>6ES7 298-8FA30-8KQ0</b>

#### Overview



- Analog inputs for SIPLUS S7-1200
- With extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- Even solves more complex automation tasks
- From +60°C to +70°C, max. 50% of the inputs can be controlled simultaneously

#### Note:

SIPLUS extreme products are based on Siemens Industry 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

The technical data correspond to those of the based-on modules apart from the values listed in the table.

	6AG1 231-4HD30-2XB0 SM 1231 AI 4x13 bit	6AG1 231-4HD30-4XB0 SM 1231 AI 4x13 bit
Based on	6ES7 231-4HD30-0XB0	6ES7 231-4HD30-0XB0
<b>Ambient conditions</b>		
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)
• Relative humidity - with condensation	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
• Resistance - to biologically active substances	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!
- to chemically active substances	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 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!
- to mechanically active substances	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!
<b>Climatic and mechanical conditions for storage and transport</b>		
Climatic conditions for storage and transport		
• Free fall - Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature - Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C
<b>Mechanical and climatic conditions during operation</b>		
Climatic conditions in operation		
• Temperature - Min.	-25 °C; = Tmin	0 °C; = Tmin
- max.	70 °C; = Tmax	55 °C; = Tmax

# SIMATIC S7-1200

## SIPLUS analog modules

### SIPLUS SM 1231 analog input modules

#### Ordering data

#### Order No.

##### SIPLUS SM 1231 analog input signal module

(extended temperature range and  
medial exposure)

Ambient temperature range

-25 ... +70 °C,

from +60 ... +70 °C number of  
simultaneously controllable inputs  
and outputs max. 50%

4 analog inputs  $\pm 10$  V,  $\pm 5$  V,  $\pm 2.5$  V,  
or 0 ... 20 mA; 12 bits + sign

**6AG1 231-4HD30-2XB0**

Ambient temperature range

0 ... +55 °C

4 analog inputs  $\pm 10$  V,  $\pm 5$  V,  $\pm 2.5$  V,  
or 0 ... 20 mA; 12 bits + sign

**6AG1 231-4HD30-4XB0**

#### Accessories

#### Order No.

See SIMATIC S7-1200  
SM 1231 analog input,  
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#### Overview



- Analog outputs for SIPLUS S7-1200
- With extremely short conversion times
- For connecting analog actuators without additional amplifiers
- Even solves more complex automation tasks
- From +60 °C to +70 °C, max. 50% of the outputs can be controlled simultaneously

#### Note:

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

3

#### Technical specifications

The technical data correspond to those of the based-on modules apart from the values listed in the table.

	6AG1 232-4HB30-2XB0 SM 1232 AQ 2x14 bit	6AG1 232-4HB30-4XB0 SM 1232 AQ 2x14 bit
Based on	6ES7 232-4HB30-0XB0	6ES7 232-4HB30-0XB0
<b>Ambient conditions</b>		
Extended ambient conditions		
<ul style="list-style-type: none"> <li>• Relative to ambient temperature-atmospheric pressure-installation altitude</li> </ul>	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)
<ul style="list-style-type: none"> <li>• Relative humidity <ul style="list-style-type: none"> <li>- with condensation</li> </ul> </li> </ul>	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<ul style="list-style-type: none"> <li>• Resistance <ul style="list-style-type: none"> <li>- to biologically active substances</li> <li>- to chemically active substances</li> <li>- to mechanically active substances</li> </ul> </li> </ul>	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 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 3S4 incl. sand, dust. 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 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 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
<b>Climatic and mechanical conditions for storage and transport</b>		
Climatic conditions for storage and transport		
<ul style="list-style-type: none"> <li>• Free fall <ul style="list-style-type: none"> <li>- Drop height, max. (in packaging)</li> </ul> </li> <li>• Temperature <ul style="list-style-type: none"> <li>- Permissible temperature range</li> </ul> </li> </ul>	0.3 m; five times, in dispatch package -40 °C to +70 °C	0.3 m; five times, in dispatch package -40 °C to +70 °C
<b>Mechanical and climatic conditions during operation</b>		
Climatic conditions in operation		
<ul style="list-style-type: none"> <li>• Temperature <ul style="list-style-type: none"> <li>- Min.</li> <li>- max.</li> </ul> </li> </ul>	-25 °C; = Tmin 70 °C; = Tmax	0 °C; = Tmin 55 °C; = Tmax

# SIMATIC S7-1200

## SIPLUS analog modules

### SIPLUS SM 1232 analog output modules

#### Ordering data

##### SIPLUS SM 1232 analog output signal modules

(extended temperature range and  
medial exposure)

##### Ambient temperature range

-25 ... +70 °C,

from +60 ... +70 °C number of  
simultaneously controllable inputs  
and outputs max. 50%

2 analog outputs, ± 10 V with 14 bits  
or 0 ... 20 mA with 13 bits

**6AG1 232-4HB30-2XB0**

##### Ambient temperature range

0 ... +55 °C

2 analog outputs, ± 10 V with 14 bits  
or 0 ... 20 mA with 13 bits

**6AG1 232-4HB30-4XB0**

#### Accessories

#### Order No.

See SIMATIC S7-1200  
SM 1232 analog output,  
page 3/79

3

#### Overview



- Analog output for SIPLUS S7-1200
- Can be plugged directly into the CPU (cannot be used for +70 °C version)

#### Note:

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

#### Technical specifications

The technical data correspond to those of the based-on modules apart from the values listed in the table.

	6AG1 232-4HA30-4XB0 SB 1232 1x AO 6ES7 232-4HA30-0XB0	6AG1 232-4HA30-5XB0 SB 1232 1x AO 6ES7 232-4HA30-0XB0
<b>Based on</b>		
<b>Ambient conditions</b>		
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)
• Relative humidity		
- with condensation		100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
- With condensation/maximum/ tested in accordance with IEC 60068-2-38	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	
• Resistance		
- to biologically active substances	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!
- to chemically active substances	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 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!
- to mechanically active substances	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!
<b>Climatic and mechanical conditions for storage and transport</b>		
Climatic conditions for storage and transport		
• Free fall		
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature		
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C
<b>Mechanical and climatic conditions during operation</b>		
Climatic conditions in operation		
• Temperature		
- Min.	0 °C; = Tmin	-25 °C; = Tmin
- max.	55 °C; = Tmax	55 °C; = Tmax

# SIMATIC S7-1200

## SIPLUS analog modules

### SIPLUS SB 1232 analog output modules

#### Ordering data

##### SIPLUS SB 1232 analog output signal board

(extended temperature range and  
medial exposure)

Ambient temperature range  
-25 ... +55 °C

1 analog output, ±10 V with 12 bits  
or 0 ... 20 mA with 11 bits

Ambient temperature range  
0 ... +55 °C

1 analog output, ±10 V with 12 bits  
or 0 ... 20 mA with 11 bits

#### Order No.

**6AG1 232-4HA30-5XB0**

**6AG1 232-4HA30-4XB0**

#### Accessories

#### Order No.

See SIMATIC S7-1200  
SB 1232 analog output,  
page 3/81

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#### Overview



- Analog inputs and outputs for SIPLUS S7-1200
- With extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- Even solves more complex automation tasks
- From +60 °C to +70 °C, max. 50% of the inputs and outputs can be controlled simultaneously

#### Note:

SIPLUS extreme products are based on Siemens Industry 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

The technical data correspond to those of the based-on modules apart from the values listed in the table.

	6AG1 234-4HE30-2XB0 SM 1234 A I4x13 bit AQ 2x14 bit	6AG1 234-4HE30-4XB0 SM 1234 A I4x13 bit AQ 2x14 bit
<b>Based on</b>	6ES7 234-4HE30-0XB0	6ES7 234-4HE30-0XB0
<b>Ambient conditions</b> Extended ambient conditions		
<ul style="list-style-type: none"> <li>• Relative to ambient temperature-atmospheric pressure-installation altitude</li> </ul>	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)
<ul style="list-style-type: none"> <li>• Relative humidity <ul style="list-style-type: none"> <li>- with condensation</li> </ul> </li> </ul>	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)
<ul style="list-style-type: none"> <li>• Resistance <ul style="list-style-type: none"> <li>- to biologically active substances</li> <li>- to chemically active substances</li> <li>- to mechanically active substances</li> </ul> </li> </ul>	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 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 3S4 incl. sand, dust. 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 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 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
<b>Climatic and mechanical conditions for storage and transport</b> Climatic conditions for storage and transport		
<ul style="list-style-type: none"> <li>• Free fall <ul style="list-style-type: none"> <li>- Drop height, max. (in packaging)</li> </ul> </li> <li>• Temperature <ul style="list-style-type: none"> <li>- Permissible temperature range</li> </ul> </li> </ul>	0.3 m; five times, in dispatch package -40 °C to +70 °C	0.3 m; five times, in dispatch package -40 °C to +70 °C
<b>Mechanical and climatic conditions during operation</b> Climatic conditions in operation		
<ul style="list-style-type: none"> <li>• Temperature <ul style="list-style-type: none"> <li>- Min.</li> <li>- max.</li> </ul> </li> </ul>	-25 °C; = Tmin 70 °C; = Tmax	0 °C; = Tmin 55 °C; = Tmax

# SIMATIC S7-1200

## SIPLUS analog modules

### SIPLUS SM 1234 analog input/output modules

#### Ordering data

#### Order No.

#### Order No.

##### SIPLUS SM 1234 analog input/output signal modules

(extended temperature range and medial exposure)

##### Ambient temperature range

-25 ... +70 °C,  
from +60 ... +70 °C number of simultaneously controllable inputs and outputs max. 50%

4 analog inputs, ±10 V, ±5 V, ±2.5 V, or 0 ... 20 mA, 12 bits + sign;  
2 analog outputs, ±10 V with 14 bits or 0 ... 20 mA with 13 bits

**6AG1 234-4HE30-2XB0**

##### Ambient temperature range

0 ... +55 °C

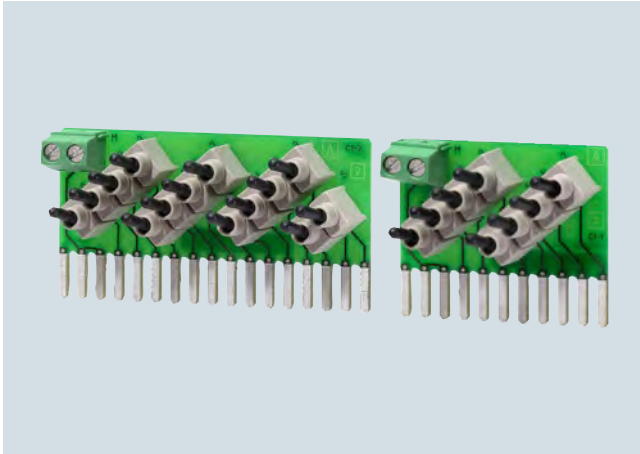
4 analog inputs, ±10 V, ±5 V, ±2.5 V, or 0 ... 20 mA, 12 bits + sign;  
2 analog outputs, ±10 V with 14 bits or 0 ... 20 mA with 13 bits

**6AG1 234-4HE30-4XB0**

#### Accessories

See SIMATIC S7-1200 SM 1234 analog input/output, page 3/84

### Overview



- Simulator module for program testing during commissioning and ongoing operation
- Simulation of 8 or 14 inputs

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### Ordering data

#### Digital input simulator SIM 1274 simulator module (optional)

with 8 input switches,  
for CPU 1211C, CPU 1212C

with 14 input switches,  
for CPU 1214C, 1215C

with 14 input switches,  
for CPU 1217C

### Order No.

**6ES7 274-1XF30-0XA0**

**6ES7 274-1XH30-0XA0**

**6ES7 274-1XK30-0XA0**

### Order No.

#### Accessories

#### S7-1200 automation system, System Manual

For SIMATIC S7-1200 and  
STEP 7 Basic

German

**6ES7 298-8FA30-8AH0**

English

**6ES7 298-8FA30-8BH0**

French

**6ES7 298-8FA30-8CH0**

Spanish

**6ES7 298-8FA30-8DH0**

Italian

**6ES7 298-8FA30-8EH0**

Chinese

**6ES7 298-8FA30-8KH0**

#### S7-1200 automation system, Easy Book

Brief instructions

German

**6ES7 298-8FA30-8AQ0**

English

**6ES7 298-8FA30-8BQ0**

French

**6ES7 298-8FA30-8CQ0**

Spanish

**6ES7 298-8FA30-8DQ0**

Italian

**6ES7 298-8FA30-8EQ0**

Chinese

**6ES7 298-8FA30-8KQ0**

# SIMATIC S7-1200

## Special modules

### BB 1297 Battery Board

#### Overview

- Battery board for extending the power reserve for the S7-1200 real-time clock

#### Technical specifications

	6ES7 297-0AX30-0XA0 BB 1297 battery board
<b>Interrupts/diagnostics/ status information</b>	
Alarms	
• Alarms	Yes
Diagnostic messages	
• Diagnostic functions	Yes
Diagnosics indication LED	
• for maintenance	Yes; The maintenance LED (MAINT) of the PLC signals that the battery needs to be replaced.
<b>Degree and class of protection</b>	
IP20	Yes
<b>Standards, approvals, certificates</b>	
CE mark	Yes
CSA approval	Yes
C-TICK	Yes
FM approval	Yes
Marine approval	Yes
Marine approval according to American Bureau of Shipping	Yes
Marine approval according to Bureau Veritas	Yes
Marine approval according to Det Norske Veritas	Yes
Marine approval according to Germanischer Lloyd	Yes
Marine approval according to Lloyds Register of Shipping	Yes

6ES7 297-0AX30-0XA0 BB 1297 battery board	
<b>Climatic and mechanical conditions for storage and transport</b>	
Climatic conditions for storage and transport	
• Free fall	0,3 m; five times, in dispatch package
- Drop height, max. (in packaging)	
• Temperature	
- Permissible temperature range	-40 °C to +70 °C
• Air pressure acc. to IEC 60068-2-13	
- Permissible air pressure	1080 to 660 hPa
<b>Mechanical and climatic conditions during operation</b>	
Climatic conditions in operation	
• Temperature	
- Min.	-20 °C
- max.	60 °C
• Air pressure acc. to IEC 60068-2-13	
- Permissible air pressure	1080 to 795 hPa
<b>Mechanics/material</b>	
Type of housing (front)	
• Plastic	Yes
<b>Dimensions</b>	
Width	38 mm
Height	62 mm
Depth	21 mm
<b>Weight</b>	
Weight, approx.	40 g

#### Ordering data

**BB 1297 battery board**  
for long-term backup of real-time clock; can be plugged into the signal board slot of an S7-1200 CPU in FW version 3.0 or higher; battery (CR 1025) is not included

#### Order No.

**6ES7 297-0AX30-0XA0**



#### Overview



- For quick, high-performance serial data exchange via point-to-point connection
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can also be loaded
- Simple parameterization with STEP 7 Basic

#### Technical specifications

	6ES7 241-1CH31-0XB0 CM 1241 RS422/485	6ES7 241-1AH30-0XB0 CM 1241 RS232
<b>Supply voltage</b>		
24 V DC	Yes	
permissible range, lower limit (DC)	20.4 V	
permissible range, upper limit (DC)	28.8 V	
<b>Input current</b>		
Current consumption, max.	240 mA; From L5+; logic	220 mA; From L5+; logic
<b>Power losses</b>		
Power loss, typ.	1.2 W	1.1 W
<b>Interfaces</b>		
Number of interfaces	1	1
Interface physics, RS 232C (V.24)		Yes
Interface physics, RS 422/RS 485 (X.27)	Yes	
Point-to-point		
• Cable length, max.	1 000 m	10 m
• Integrated protocol driver		
- ASCII	Yes; Available as library function	Yes
- USS	Yes; Available as library function	
<b>Climatic and mechanical conditions for storage and transport</b>		
Climatic conditions for storage and transport		
• Free fall		
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature		
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C
• Air pressure acc. to IEC 60068-2-13		
- Permissible air pressure	1080 to 660 hPa	1080 to 660 hPa

# SIMATIC S7-1200

## Communication

### CM 1241 communication modules

#### Technical specifications (continued)

	6ES7 241-1CH31-0XB0 CM 1241 RS422/485	6ES7 241-1AH30-0XB0 CM 1241 RS232
<b>Mechanical and climatic conditions during operation</b>		
Climatic conditions in operation		
• Temperature		
- Permissible temperature range	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation
- Permissible temperature change	5°C to 55°C, 3°C / minute	5°C to 55°C, 3°C / minute
• Air pressure acc. to IEC 60068-2-13		
- Permissible air pressure	1080 to 795 hPa	1080 to 795 hPa
<b>Software</b>		
Runtime software		
• Target system		
- S7-1200	Yes	Yes
<b>Dimensions</b>		
Width	30 mm	30 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
<b>Weight</b>		
Weight, approx.	155 g	150 g

#### Ordering data

##### CM 1241 communication module

Communication module for point-to-point connection, with one RS422/485 interface

Communication module for point-to-point connection, with one RS232 interface

##### Order No.

6ES7 241-1CH31-0XB0

6ES7 241-1AH30-0XB0

##### Order No.

##### Accessories

**Front flap set (spare part)**  
for communication modules

6ES7 291-1CC30-0XA0

**S7-1200 automation system, System Manual**

for SIMATIC S7-1200 and STEP 7 Basic

German

6ES7 298-8FA30-8AH0

English

6ES7 298-8FA30-8BH0

French

6ES7 298-8FA30-8CH0

Spanish

6ES7 298-8FA30-8DH0

Italian

6ES7 298-8FA30-8EH0

Chinese

6ES7 298-8FA30-8KH0

**S7-1200 automation system, Easy Book**

Brief instructions

German

6ES7 298-8FA30-8AQ0

English

6ES7 298-8FA30-8BQ0

French

6ES7 298-8FA30-8CQ0

Spanish

6ES7 298-8FA30-8DQ0

Italian

6ES7 298-8FA30-8EQ0

Chinese

6ES7 298-8FA30-8KQ0

#### Overview

- For fast, high-performance serial data exchange via point-to-point connection
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can be loaded later
- Simple parameterization with STEP 7 Basic
- Can be plugged directly into the CPU

#### Technical specifications

6ES7 241-1CH30-1XB0 CB 1241 RS485	
<b>Input current</b> from backplane bus 5 V DC, typ.	50 mA
<b>Power losses</b> Power loss, typ.	1.5 W
<b>Interrupts/diagnostics/ status information</b> Diagnostic messages	
• Diagnostic functions	Yes
Diagnostics indication LED	
• For status of the outputs	Yes
<b>Degree and class of protection</b> IP20	Yes
<b>Standards, approvals, certificates</b> CE mark	Yes
C-TICK	Yes
FM approval	Yes
<b>Climatic and mechanical conditions for storage and transport</b> Climatic conditions for storage and transport	
• Free fall	
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
• Temperature	
- Permissible temperature range	-40 °C to +70 °C
• Air pressure acc. to IEC 60068-2-13	
- Permissible air pressure	1080 to 660 hPa
<b>Mechanical and climatic conditions during operation</b> Climatic conditions in operation	
• Temperature	
- Permissible temperature range	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation
- Permissible temperature change	5°C to 55°C, 3°C / minute
• Air pressure acc. to IEC 60068-2-13	
- Permissible air pressure	1080 to 795 hPa
• Pollutant concentrations	
- SO <sub>2</sub> at RH < 60% without condensation	SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free
<b>Mechanics/material</b> Type of housing (front)	
• Plastic	Yes
<b>Dimensions</b> Width	38 mm
Height	62 mm
Depth	21 mm
<b>Weight</b> Weight, approx.	40 g

#### Ordering data

#### Order No.

<b>CB 1241 communication board RS485</b> for point-to-point connection, with 1 RS485 interface	<b>6ES7 241-1CH30-1XB0</b>
<b>Accessories</b>	
<b>Terminal block (spare part)</b> for signal board with 6 screws, gold-plated; 4 pcs.	<b>6ES7 292-1BF30-0XA0</b>
<b>S7-1200 automation system, System Manual</b> for SIMATIC S7-1200 and STEP 7 Basic	
German	<b>6ES7 298-8FA30-8AH0</b>
English	<b>6ES7 298-8FA30-8BH0</b>
French	<b>6ES7 298-8FA30-8CH0</b>
Spanish	<b>6ES7 298-8FA30-8DH0</b>
Italian	<b>6ES7 298-8FA30-8EH0</b>
Chinese	<b>6ES7 298-8FA30-8KH0</b>
<b>S7-1200 automation system, Easy Book</b> Brief instructions	
German	<b>6ES7 298-8FA30-8AQ0</b>
English	<b>6ES7 298-8FA30-8BQ0</b>
French	<b>6ES7 298-8FA30-8CQ0</b>
Spanish	<b>6ES7 298-8FA30-8DQ0</b>
Italian	<b>6ES7 298-8FA30-8EQ0</b>
Chinese	<b>6ES7 298-8FA30-8KQ0</b>

# SIMATIC S7-1200

## Communication

### CM 1242-5

#### Overview



DP-M	DP-S	FMS	PG/OP	S7
	●			

The CM 1242-5 communication module is used to connect a SIMATIC S7-1200 to PROFIBUS as a DP slave and has the following characteristics:

- PROFIBUS DPV1 slave in accordance with IEC 61158
- Module replacement without PG supported
- Power is supplied via the backplane bus so that no extra cabling is required
- Support of all standard baud rates from 9.6 Kbit/s to 12 Mbit/s
- Compact industry-standard enclosure in S7-1200 design for mounting on a standard mounting rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1242-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of the S7-1200 for optimal production.

#### Technical specifications

Order No.	6GK7 242-5DX30-0XE0
<b>Product-type designation</b>	<b>CM 1242-5</b>
<b>Transmission rate</b>	
Transmission rate at interface 1 in accordance with PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>Interfaces</b>	
Number of electrical connections	
• at interface 1 in accordance with PROFIBUS	1
• for power supply	0
Design of electrical connection	
• at interface 1 in accordance with PROFIBUS	9-pin Sub-D socket (RS485)
• for power supply	-
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of supply voltage	DC
Supply voltage	
• 1 from backplane bus	5 V
• external	-
Relative positive tolerance at 24 V with DC	-
Relative negative tolerance at 24 V with DC	-
Consumed current	
• from backplane bus at 5 V for DC Typical	0.15 A
• from external supply voltage at 24 V with DC	
- typical	-
- maximum	-
Resistive loss	0.75 W

Order No.	6GK7 242-5DX30-0XE0
<b>Product-type designation</b>	<b>CM 1242-5</b>
<b>Permitted ambient conditions</b>	
Ambient temperature	
• for vertical installation during operating phase	0 ... 45 °C
• for horizontal installation during operating phase	0 ... 55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
• Comment	-
Relative humidity at 25 °C without condensation during operating maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	
Width	30 mm
Height	100 mm
Depth	75 mm
Net weight	0.115 kg
<b>Product properties, functions, components general</b>	
Number of units per CPU maximum	3
Number of modules note	-

Technical specifications (continued)		Ordering data	Order No.
<b>Order No.</b>	<b>6GK7 242-5DX30-0XE0</b>	<b>CM 1242-5 communication module</b>	
<b>Product-type designation</b>	<b>CM 1242-5</b>	Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 slave	<b>6GK7 242-5DX30-0XE0</b>
<b>Performance data</b>		<b>Accessories</b>	
<u>Performance data open communication</u>		<b>PROFIBUS FastConnect connector RS485</b>	
Number of possible connections for open communication by means of SEND/RECEIVE blocks maximum	-	With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbit/s	
Data volume as user data per connection for open communication by means of SEND/RECEIVE blocks maximum	-	<ul style="list-style-type: none"> <li>Without PG interface</li> <li>With PG interface</li> </ul>	<b>6ES7 972-0BA52-0XA0</b> <b>6ES7 972-0BB52-0XA0</b>
<u>Performance data PROFIBUS DP</u>		<b>PROFIBUS FC standard cable</b>	
Service as DP master DPV1	-	2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order 20 m, sold by the meter	<b>6XV1 830-0EH10</b>
Number of DP slaves on DP master usable	-	<b>PROFIBUS FastConnect stripping tool</b>	
<u>Amount of data</u>		Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	<b>6GK1 905-6AA00</b>
• of the address area of the inputs as DP master overall	-	<b>PROFIBUS bus terminal 12M</b>	
• of the address area of the outputs as DP master overall	-	Bus terminal for connection of PROFIBUS nodes at up to 12 Mbit/s with connecting cable	<b>6GK1 500-0AA10</b>
• of the address area of the inputs per DP slave	-		
• of the address area of the outputs per DP slave	-		
• of the address area of the diagnostic data per DP slave	-		
Service as DP slave			
• DPV0	Yes		
• DPV1	Yes		
<u>Amount of data</u>			
• of the address area of the inputs as DP slave overall	240 byte		
• of the address area of the outputs as DP slave overall	240 byte		
<u>Performance data S7 communication</u>			
Number of possible connections for S7 communication			
• maximum	-		
• with PG connections maximum	-		
• with PG/OP connections maximum	-		
• note	-		
<u>Performance data multi-protocol mode</u>			
Number of active connections with multi-protocol mode			
• without DP maximum	-		
• with DP maximum	-		
<b>Product functions management, configuration</b>			
Configuration software required			

# SIMATIC S7-1200 Communication

## CM 1243-2

### Overview

3



The CM 1243-2 communication module is the AS-Interface master for the SIMATIC S7-1200 and has the following features:

- Connection of up to 62 AS-Interface slaves
- Integrated analog value transmission (Analog Profiles 7.3 and 7.4)
- Supports all AS-Interface master functions according to the AS-Interface Specification V3.0
- Indication of the operating state on the front of the device displayed via LED
- Display of operating mode, AS-Interface voltage faults, configuration faults and peripheral faults via LED behind the front flap
- Compact enclosure in the design of the SIMATIC S7-1200
- Suitable for AS-i power 24V: in combination with the optional DCM 1271 data decoupling module, a standard 24 V power supply unit can be used
- Configuration and diagnostics via the TIA portal

### Design

The CM 1243-2 communication module is positioned to the left of the S7-1200 CPU and linked to the S7-1200 via lateral contacts.

It has:

Terminals for two AS-i cables (internally jumpered) via two screw terminals each respectively

- One terminal for connection to the functional ground
- LEDs for indication of the operating state and fault statuses of the connected slaves
- The screw terminals (included in scope of supply) can be removed to facilitate installation.

### Function

The CM 1243-2 supports all specified functions of the AS-Interface Specification V3.0.

The values of the digital AS-i slaves can be activated via the process image of the S7-1200. During configuration of the slaves in the TIA Portal, the values of the analog AS-i slaves can also be reached via process image transfer.

It is also possible to exchange all data of the AS-i master and the connected AS-i slaves with the S7-1200 via the data record interface.

Changeover of the operating mode, automatic application of the slave configuration and the re-addressing of a connected AS-i slave can be implemented via the control panel of the CM 1243-2 in the TIA portal.

The optional DCM 1271 data decoupling module has an integrated recognition unit for detecting ground faults on the AS-Interface cable. The integrated overload protection also disconnects the AS-Interface cable if the drive power required exceeds 4 A.

### Notes on safety

The use of this product requires suitable protective measures (e. g. network segmentation for IT security among others) in order to ensure safe plant operation, see <http://www.siemens.com/industrialsecurity>.

### Configuration

To configure CM 1243-2, you require STEP 7 starting with V11 SP 2 or higher.

Below version STEP 7 V11 you also require the hardware support package for the CM 1243-2, which can be obtained via Siemens Internet Service & Support.

The software enables user-friendly configuration and diagnostics of the AS-i master and any connected slaves.

Alternatively, you can also apply the AS-Interface ACTUAL configuration at the "touch of a button" via the control panel integrated in the TIA portal/STEP7.

Ordering data	Order No.
<b>CM 1243-2 communication module</b> <ul style="list-style-type: none"> <li>• AS-Interface masters for SIMATIC S7-1200</li> <li>• Corresponds to AS-Interface Specification V3.0</li> <li>• Dimensions (W × H × D / mm): 30 × 100 × 75</li> </ul>	<b>3RK7 243-2AA30-0XB0</b>
<b>Accessories</b>	
<b>DCM 1271 data decoupling module</b> <ul style="list-style-type: none"> <li>• Optional, for AS-i Power24V when using a standard 24 V power supply</li> <li>• Dimensions (W × H × D / mm): 30 × 100 × 75</li> </ul>	<b>3RK7 271-1AA30-0AA0</b>
<b>5-pole screw terminal for AS-i CM 1243-2 master and AS-i DCM 1271 data decoupling module</b> <ul style="list-style-type: none"> <li>• Screw terminals</li> <li>• As spare part (included in scope of delivery for CM / DCM)</li> </ul>	<b>3RK1 901-3MA00</b>
<b>3-pole screw terminal for AS-i DCM 1271 data decoupling module for connection to power supply</b> <ul style="list-style-type: none"> <li>• Screw terminals</li> <li>• As spare part (included in scope of delivery for CM / DCM)</li> </ul>	<b>3RK1 901-3MB00</b>
<b>Manuals</b> <p>Manual AS-i master CM 1243-2 and AS-i data decoupling module DCM 1271 for SIMATIC S7-1200 Free download on the Internet at <a href="http://support.automation.siemens.com/WW/view/en/57358958/0/de">http://support.automation.siemens.com/WW/view/en/57358958/0/de</a></p> <p>German</p> <p>English</p>	<b>3ZX1012-0RK71-1AB1</b> <b>3ZX1012-0RK71-1AC1</b>

### Overview



DP-M	DP-S	FMS	PG/OP	S7
●			●	●

The CM 1243-5 communication module is used to connect a SIMATIC S7-1200 to PROFIBUS as a DP master and has the following characteristics:

- PROFIBUS DPV1 master in accordance with IEC 61158
- Support of up to 16 PROFIBUS DP slaves
- Communication with other S7 controllers based on S7 communication
- Allows the connection of programming devices and operator panels with a PROFIBUS interface to the S7-1200
- Module replacement without PG supported
- Support of all standard baud rates from 9.6 Kbit/s to 12 Mbit/s
- Compact industry-standard enclosure in S7-1200 design for mounting on a standard mounting rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1243-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of the S7-1200 for optimal production.

### Technical specifications

Order No.	6GK7 243-5DX30-0XE0
<b>Product-type designation</b>	<b>CM 1243-5</b>
<b>Transmission rate</b>	
Transmission rate at interface 1 in accordance with PROFIBUS	9.6 kbit/s ... 12 Mbit/s
<b>Interfaces</b>	
Number of electrical connections	
• at interface 1 in accordance with PROFIBUS	1
• for power supply	1
Design of electrical connection	
• at interface 1 in accordance with PROFIBUS	9-pin Sub-D socket (RS485)
• for power supply	
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of supply voltage	DC
Supply voltage	
• external	24 V
Relative positive tolerance at 24 V with DC	20 %
Relative negative tolerance at 24 V with DC	20 %
Consumed current	
• from external supply voltage at 24 V with DC	
- typical	0.1 A
Resistive loss	2.4 W

Order No.	6GK7 243-5DX30-0XE0
<b>Product-type designation</b>	<b>CM 1243-5</b>
<b>Permitted ambient conditions</b>	
Ambient temperature	
• for vertical installation during operating phase	0 ... 45 °C
• for horizontal installation during operating phase	0 ... 55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operating maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	
Width	30 mm
Height	100 mm
Depth	75 mm
Net weight	0.134 kg
<b>Product properties, functions, components general</b>	
Number of modules	
• per CPU maximum	1

# SIMATIC S7-1200

## Communication

### CM 1243-5

#### Technical specifications (continued)

<b>Order No.</b>	<b>6GK7 243-5DX30-0XE0</b>
<b>Product-type designation</b>	<b>CM 1243-5</b>
<b>Performance data</b>	
<u>Performance data PROFIBUS DP</u>	
Service as DP master DPV1	Yes
Number of DP slaves on DP master usable	16
Amount of data	
• of the address area of the inputs as DP master overall	512 byte
• of the address area of the outputs as DP master overall	512 byte
• of the address area of the inputs per DP slave	244 byte
• of the address area of the outputs per DP slave	244 byte
• of the address area of the diagnostic data per DP slave	240 byte
Service as DP slave	
• DPV0	No
• DPV1	No
<u>Performance data S7 communication</u>	
Number of possible connections for S7 communication	
• maximum	8
• with PG connections maximum	1
• with PG/OP connections maximum	3
• note	max. 4 connections to other S7 stations
<u>Performance data multi-protocol mode</u>	
Number of active connections with multi-protocol mode	
• without DP maximum	8
• with DP maximum	8
<b>Product functions management, configuration</b>	
Configuration software required	

#### Ordering data

#### Order No.

<b>CM 1243-5 communication module</b>	<b>6GK7 243-5DX30-0XE0</b>
Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 master	
<b>Accessories</b>	
<b>PROFIBUS FastConnect connector RS485</b>	
With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbit/s	
• Without PG interface	<b>6ES7 972-0BA52-0XA0</b>
• With PG interface	<b>6ES7 972-0BB52-0XA0</b>
<b>PROFIBUS FC standard cable</b>	
2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order 20 m, sold by the meter	<b>6XV1 830-0EH10</b>
<b>PROFIBUS FastConnect stripping tool</b>	
Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	<b>6GK1 905-6AA00</b>
<b>PROFIBUS bus terminal 12M</b>	
Bus terminal for connection of PROFIBUS nodes at up to 12 Mbit/s with connecting cable	<b>6GK1 500-0AA10</b>



### Overview



- Unmanaged switch for connecting a SIMATIC S7-1200 to an Industrial Ethernet network with a line, tree or star topology
- Multiplication of Ethernet interfaces on a SIMATIC S7-1200 for additional connection of up to three programming devices, operator controls, and further Ethernet nodes
- Simple, space-saving mounting on the SIMATIC S7-1200 mounting rail
- Low-cost solution for implementing small, local Ethernet networks
- Connection without any problems using RJ45 standard connectors
- Simple and fast status display via LEDs on the device
- Integral autocrossover function permits use of uncrossed connecting cables

### Technical specifications

Order No.	6GK7 277-1AA10-0AA0
Product-type designation	CSM 1277
<b>Transmission rate</b>	
Transfer rate 1	10 Mbit/s
Transfer rate 2	100 Mbit/s
<b>Interfaces</b>	
Number of electrical/optical connections for network components or terminal equipment maximum	4
Number of electrical connections	
• for network components and terminal equipment	4
• for power supply	1
Design of electrical connection	
• for network components and terminal equipment	RJ45 port
• for power supply	3-pole terminal block
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of supply voltage	DC
Supply voltage external	24 V
• minimum	19.2 V
• maximum	28.8 V
Product component fusing at power supply input	Yes
Type of fusing at input for supply voltage	0,5 A / 60 V
Consumed current maximum	0.07 A
Active power loss at 24 V for DC	1.6 W
<b>Permitted ambient conditions</b>	
Ambient temperature	
• during operating	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operating maximum	95 %
Protection class IP	IP20

Order No.	6GK7 277-1AA10-0AA0
Product-type designation	CSM 1277
<b>Design, dimensions and weight</b>	
Design	SIMATIC S7-1200 device design
Width	45 mm
Height	100 mm
Depth	75 mm
Net weight	0.15 kg
Type of mounting	
• 35 mm DIN rail mounting	Yes
• wall mounting	Yes
• S7-300 rail mounting	No
<b>Product functions management, configuration</b>	
Product function switch-managed	No
<b>Standards, specifications, approvals</b>	
Standard	
• for EMC from FM	FM3611: Class 1, Division 2, Group A, B, C, D / T., CL.1, Zone 2, GP. IIC, T. Ta
• for hazardous zone	EN 600079-15:2005, EN 600079-0:2006, II 3 G Ex nA II T4, KEMA 08 ATEX 0003 X
• for safety of CSA and UL	UL 508, CSA C22.2 No. 142
• for hazardous area of CSA and UL	-
• for emitted interference	EN 61000-6-4 (Class A)
• for interference immunity	EN 61000-6-2
Verification of suitability	EN 61000-6-2, EN 61000-6-4
• CE mark	Yes
• C-Tick	Yes
• KC approval	No

# SIMATIC S7-1200

## Communication

### CSM 1277 unmanaged

#### Ordering data

##### CSM 1277 compact switch module

Unmanaged switch for connecting a SIMATIC S7-1200 and up to three further nodes to Industrial Ethernet with 10/100 Mbit/s; 4 x RJ45 ports; external 24 V DC power supply, diagnostics on LEDs, S7-1200 module including electronic manual on CD-ROM

#### Order No.

**6GK7 277-1AA10-0AA0**

#### Order No.

##### Accessories

##### IE TP Cord RJ45/RJ45

TP cable 4 x 2  
with 2 RJ45 connectors

- 0.5 m
- 1 m
- 2 m
- 6 m
- 10 m

**6XV1 870-3QE50**  
**6XV1 870-3QH10**  
**6XV1 870-3QH20**  
**6XV1 870-3QH60**  
**6XV1 870-3QN10**

##### IE FC Outlet RJ45

For connecting Industrial Ethernet FC cables and TP cords; graduated prices for 10 and 50 units or more

**6GK1 901-1FC00 0AA0**

### Overview



The CP 1242-7 communications processor is used to connect a SIMATIC S7-1200 to the globally widespread GSM/GPRS mobile radio network and has the following characteristics:

- Worldwide wireless exchange of data between S7-1200 controllers and/or between S7-1200 controllers and control centers with an Internet connection
- Communication based on the GPRS (**G**eneral **P**acket **R**adio **S**ervice) mobile wireless service with data transmission speeds of up to 86 Kbit/s in the downlink and 43 Kbit/s in the uplink
- GPRS mode with fixed IP addresses and dynamic IP addresses with standard mobile phone contract
- Time synchronization on the basis of NTP (**N**etwork **T**ime **P**rotocol)
- On-demand connection buildup via voice call or text message
- Sending and receiving of text messages
- Clearly laid out LED signaling for fast and easy diagnostics
- Compact industrial enclosure in S7-1200 design for mounting on a standard mounting rail
- Fast commissioning thanks to easy configuration using STEP 7

In conjunction with the "Telecontrol Server Basic" software, the CP 1242-7 forms a telecontrol system with further properties:

- Connection of up to 5000 telecontrol stations to the control center via an OPC interface
- Data buffering in the substations in the event of connection failures
- Central status monitoring of the substations
- No special provider services required for fixed IP addresses
- Teleservice access with STEP 7 to the substations via the Internet

### Technical specifications

<b>Order No.</b>	<b>6GK7 242-7KX30-0XE0</b>
<b>Product-type designation</b>	<b>CP 1242-7</b>
<b>Transmission rate</b>	
Transfer rate with GPRS transmission	
• with uplink maximum	43 kbit/s
• with downlink maximum	86 kbit/s
<b>Wireless technology</b>	
Type of mobile wireless service	
• is supported	
- SMS	Yes
- GPRS	Yes
• note	GPRS (multislot Class 10)
Type of mobile wireless network is supported	
• GSM	Yes
• UMTS	No
Operating frequency	
• 850 MHz	Yes
• 900 MHz	Yes
• 1800 MHz	Yes
• 1900 MHz	Yes
Transmit power	
• at operating frequency 850 MHz	2 W
• at operating frequency 900 MHz	2 W
• at operating frequency 1800 MHz	1 W
• at operating frequency 1900 MHz	1 W
<b>Interfaces</b>	
Number of electrical connections	
• for external antenna(s)	1
• for power supply	1
Number of slots for SIM cards	1
Design of the electrical connection	
• for external antenna(s)	SMA socket (50 ohms)
• for power supply	
Design of slot for SIM card	Slot under front flap
<b>Supply voltage, current consumption, power loss</b>	
Type of voltage of supply voltage	DC
Supply voltage external	24 V
Relative positive tolerance at 24 V with DC	20 %
Relative negative tolerance at 24 V with DC	20 %
Consumed current from external supply voltage at 24 V with DC	
• typical	0.1 A
• maximum	0.22 A
Resistive loss	2.4 W

# SIMATIC S7-1200 Communication

## CP 1242-7 GPRS module

### Technical specifications (continued)

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<b>Order No.</b>	<b>6GK7 242-7KX30-0XE0</b>
<b>Product-type designation</b>	<b>CP 1242-7</b>
<b>Permitted ambient conditions</b>	
Ambient temperature	
• for vertical installation during operating phase	0 ... 45 °C
• for horizontal installation during operating phase	0 ... 55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operating maximum	95 %
Protection class IP	IP20
<b>Design, dimensions and weight</b>	
Module format	
Width	30 mm
Height	100 mm
Depth	75 mm
Net weight	0.133 kg
<b>Product properties, functions, components general</b>	
Number of modules	
• per CPU maximum	3
<b>Performance data</b>	
<u>Performance data open communication</u>	
Number of possible connections for open communication by means of TC blocks maximum	5
Data volume as user data per polling maximum	1 024 byte

<b>Order No.</b>	<b>6GK7 242-7KX30-0XE0</b>
<b>Product-type designation</b>	<b>CP 1242-7</b>
<b>Performance data telecontrol</b>	
Connection to the control center	Telecontrol Server Basic
• note	Connection to Scada system using OPC interface supported
• by means of a permanent connection	supported
• by means of a demand-oriented connection	supported
Protocol is supported	
• DNP3	No
• IEC 60870-5	No
Product function data buffering if connection is aborted	Yes
• note	up to 1000 message frames
Data volume as user data per station in telecontrol mode maximum	2 048 byte
<b>Performance data Teleservice</b>	
Diagnostic function online diagnostics with SIMATIC STEP 7	Yes
Product function program download with SIMATIC STEP 7	Yes
Product function remote firmware update	No
<b>Product functions management, configuration</b>	
Configuration software required	
<b>Product functions Security</b>	
Product function password protection for teleservice access	Yes
Product function encrypted data transmission	Yes
<b>Product functions Time</b>	
Protocol is supported NTP	Yes

### Ordering data

<b>Communications processor CP 1242-7<sup>1)</sup></b>	<b>6GK7 242-7KX30-0XE0</b>
Communications processor for connecting SIMATIC S7-1200 to GSM/GPRS mobile wireless network	
<b>Accessories</b>	
<b>Telecontrol Server Basic</b>	
Software for	
• License for up to 8 stations	<b>6NH9 910-0AA20-0AA0</b>
• License for up to 32 stations	<b>6NH9 910-0AA20-0AF0</b>
• License for up to 64 stations	<b>6NH9 910-0AA20-0AB0</b>
• License for up to 256 stations	<b>6NH9 910-0AA20-0AC0</b>
• License for up to 1000 stations	<b>6NH9 910-0AA20-0AD0</b>
• License for up to 5000 stations	<b>6NH9 910-0AA20-0AE0</b>

<b>ANT794-4MR antenna</b>	<b>6NH9 860-1AA00</b>
Omnidirectional antenna for GSM (2G) and UMTS (3G) networks; weather-resistant for indoor and outdoor use; 5 m cable with fixed connection to antenna; SMA connector; including mounting bracket, screws, wall plugs	
<b>ANT794-3M antenna</b>	<b>6NH9 870-1AA00</b>
Flat panel antenna for GSM (2G) networks, for triband with 900/1800/1900 MHz; weather-resistant for indoor/outdoor use, 1.2 m cable with fixed connection to antenna; SMA connector, incl. assembly adhesive tape	

<sup>1)</sup> Please note national approvals under <http://www.siemens.com/wireless-approvals>

## Overview



- For fast, high-performance serial data exchange via point-to-point coupling
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can also be loaded
- Simple parameterization with STEP 7 Basic

**Note:**

SIPLUS extreme products are based on Siemens Industry 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

The technical data correspond to those of the based-on modules apart from the values listed in the table.

	6AG1 241-1AH30-2XB0 CM 1241 RS232	6AG1 241-1AH30-4XB0 CM 1241 RS232	6AG1 241-1CH31-2XB0 CM 1241 RS422/485	6AG1 241-1CH31-4XB0 CM 1241 RS422/485
Based on	6ES7 241-1AH30-0XB0	6ES7 241-1AH30-0XB0	6ES7 241-1CH31-0XB0	6ES7 241-1CH31-0XB0
<b>Ambient conditions</b>				
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	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
• Resistance - to biologically active substances	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!
- to chemically active substances	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 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!
- to mechanically active substances	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!

# SIMATIC S7-1200

## SIPLUS communication

### SIPLUS CM 1241 communication modules

#### Technical specifications (continued)

	<b>6AG1 241-1AH30-2XB0 CM 1241 RS232</b>	<b>6AG1 241-1AH30-4XB0 CM 1241 RS232</b>	<b>6AG1 241-1CH31-2XB0 CM 1241 RS422/485</b>	<b>6AG1 241-1CH31-4XB0 CM 1241 RS422/485</b>
<b>Based on</b>	<b>6ES7 241-1AH30-0XB0</b>	<b>6ES7 241-1AH30-0XB0</b>	<b>6ES7 241-1CH31-0XB0</b>	<b>6ES7 241-1CH31-0XB0</b>
<b>Climatic and mechanical conditions for storage and transport</b> Climatic conditions for storage and transport				
• Free fall				
- Drop height, max. (in packaging)	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package	0.3 m; five times, in dispatch package
• Temperature				
- Permissible temperature range	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
• Relative humidity				
- Permissible range (without condensation) at 25 °C				95 %
<b>Mechanical and climatic conditions during operation</b> Climatic conditions in operation				
• Temperature				
- Permissible temperature range				0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation
- Min.	-25 °C; = Tmin	0 °C; = Tmin	-25 °C	
- max.	70 °C; = Tmax	55 °C; = Tmax	70 °C; Tmax > 55 °C derating: Max. one module may be configured; this module must be the last module on the CM bus; minimum clearance on the left side of at least 45 mm	
- Permissible temperature change		5°C to 55°C, 3°C / minute		5°C to 55°C, 3°C / minute

#### Ordering data

##### SIPLUS CM 1241 communication module

(extended temperature range and medial exposure)

Ambient temperature -25 ... +70 °C

Communication module for point-to-point connection, with one RS485 interface

Communication module for point-to-point connection, with one RS232 interface

#### Order No.

**6AG1 241-1CH30-2XB0**

**6AG1 241-1AH30-2XB0**

Suitable for areas with extraordinary medial exposure (conformal coating)

Communication module for point-to-point connection, with one RS485 interface

Communication module for point-to-point connection, with one RS232 interface

#### Accessories

#### Order No.

**6AG1 241-1CH31-4XB0**

**6AG1 241-1AH31-4XB0**

See SIMATIC S7-1200 CM 1241 communication module, page 3/106

# SIMATIC S7-1200 SIPLUS communication

## SIPLUS CM 1242-5 communication modules

### Overview



DP-M	DP-S	FMS	PG/OP	S7
	●			

The SIPLUS CM 1242-5 communication module is used to connect a SIMATIC S7-1200 to PROFIBUS as a DP slave and has the following characteristics:

- PROFIBUS DPV1 slave in accordance with IEC 61158
- Module replacement without PG supported
- Power is supplied via the backplane bus so that no extra cabling is required
- Support of all standard baud rates from 9.6 Kbit/s to 12 Mbit/s
- Compact industry-standard enclosure in S7-1200 design for mounting on a standard mounting rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1242-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of the S7-1200 for optimal production.

### Note:

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

SIPLUS S7-1200 CM 1242-5	
Order No.	<b>6AG1 242-5DX30-2XE0</b>
Order number based on	<b>6GK7 242-5DX30-0XE0</b>
Ambient temperature range	-25 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. sulfur chlorine atmosphere).
Technical data	The technical data of the standard product applies except for the ambient conditions.

### Ambient conditions

Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

Ordering data	Order No.
<b>SIPLUS CM 1242-5 communication module</b> (extended temperature range and medial exposure) Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 slave	<b>6AG1 242-5DX30-2XE0</b>
<b>Accessories</b>	See SIMATIC S7-1200 CM 1242-5 communication module, page 3/109

3

# SIMATIC S7-1200 SIPLUS communication

## SIPLUS CM 1243-5 communication modules

### Overview

3



DP-M	DP-S	FMS	PG/OP	S7
●			●	●

The CM 1243-5 communication module is used to connect a SIMATIC S7-1200 to PROFIBUS as a DP master and has the following characteristics:

- PROFIBUS DPV1 master in accordance with IEC 61158
- Support of up to 16 PROFIBUS DP slaves
- Communication with other S7 controllers based on S7 communication
- Allows the connection of programming devices and operator panels with a PROFIBUS interface to the S7-1200
- Module replacement without PG supported
- Support of all standard baud rates from 9.6 Kbit/s to 12 Mbit/s
- Compact industry-standard enclosure in S7-1200 design for mounting on a standard mounting rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1243-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of the S7-1200 for optimal production.

### Note:

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

SIPLUS S7-1200 CM 1243-5	
<b>Order No.</b>	<b>6AG1 243-5DX30-2XE0</b>
<b>Order number based on</b>	<b>6GK7 243-5DX30-0XE0</b>
Ambient temperature range	-25 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. sulfur chlorine atmosphere).
Technical data	The technical data of the standard product applies except for the ambient conditions.

### Ambient conditions

Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K

For technical documentation on SIPLUS, see: <http://www.siemens.com/siplus-extreme>

Ordering data	Order No.
<b>SIPLUS CM 1243-5 communication module</b> (extended temperature range and medial exposure) Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 master	<b>6AG1 243-5DX30-2XE0</b>
<b>Accessories</b>	see SIMATIC S7-1200 CM 1243-5 communication module, page 3/112



### Overview



The power supply PM1207 (Power Module) is optimized for the new SIMATIC S7-1200 controllers in terms of design and functionality and serves as an external supply for the inputs and outputs which, to prevent an imbalance, must not be drawn from the CPU encoder supply.

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### Technical specifications

Order No.	6EP1 332-1SH71
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
<b>Input</b>	
Input	1-phase AC
Supply voltage	120 V 230 V
<ul style="list-style-type: none"> <li>• 1 at AC nominal value</li> <li>• 2 at AC nominal value</li> <li>• Note</li> </ul>	Automatic range selection
Input voltage	85 ... 132 V 176 ... 264 V
<ul style="list-style-type: none"> <li>• 1 at AC</li> <li>• 2 at AC</li> </ul>	
Oversvoltage resistance	$2.3 \times V_{in}$ rated, 1.3 ms
Mains buffering at I <sub>out</sub> rated, min.	20 ms
Mains buffering	at $V_{in} = 93/187$ V
Rated line frequency	
<ul style="list-style-type: none"> <li>• 1</li> <li>• 2</li> </ul>	50 Hz 60 Hz
Rated line range	47 ... 63 Hz
Input current	
<ul style="list-style-type: none"> <li>• at nominal level of the input voltage 120 V nominal value</li> <li>• at nominal level of the input voltage 230 V nominal value</li> </ul>	1.2 A 0.67 A
Switch-on current limiting (+25 °C), max.	13 A
Duration of current limiting at 25 °C maximum	3 ms
I <sup>2</sup> t, max.	0.5 A <sup>2</sup> ·s
Built-in incoming fuse	T 3, 15 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 16 A, characteristic B, or 10 A, characteristic C

Order No.	6EP1 332-1SH71
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
<b>Output</b>	
Output	Controlled, isolated DC voltage
Rated voltage V <sub>out</sub> DC	24 V
Total tolerance, static ±	3 %
Static mains compensation, approx.	0.1 %
Static load balancing, approx.	0.2 %
Residual ripple peak-peak, max.	150 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	240 mV
Product feature output voltage adjustable	No
Output voltage setting	-
Status display	Green LED for 24 V OK
On/off behavior	No overshoot of V <sub>out</sub> (soft start)
Startup delay, max.	6 s
Note	2 s at 230 V, 6 s at 120 V
Voltage rise, typ.	10 ms
Rated current value I <sub>out</sub> rated	2.5 A
Current range	0 ... 2.5 A
delivered active power typ.	60 W
short-term overload current at short-circuit during run-up typical	6 A
Duration of overloading ability for excess current on short-circuiting during the start-up	100 ms
short-term overload current at short-circuit during operation typical	6 A
Duration of overloading ability for excess current on short-circuiting during the operational phase	100 ms
Parallel switching for enhanced performance	Yes
Numbers of parallel switchable units for enhanced performance	2

# SIMATIC S7-1200

## Power supplies

### SIMATIC S7-1200 PM 1207

#### Technical specifications (continued)

Order No.	6EP1 332-1SH71
<b>Product</b>	<b>S7-1200 PM1207</b>
<b>Power supply, type</b>	<b>24 V/2.5 A</b>
<b>Efficiency</b>	
Efficiency at $V_{out}$ rated, $I_{out}$ rated, approx.	83 %
Power loss at $V_{out}$ rated, $I_{out}$ rated, approx.	12 W
<b>Closed-loop control</b>	
Dynamic mains compensation ( $V_{in}$ rated $\pm 15\%$ ), max.	0.3 %
Dynamic load smoothing ( $I_{out}$ : 50/100/50 %), $U_{out} \pm$ typ.	3 %
Load step setting time 50 to 100%, typ.	5 ms
Load step setting time 100 to 50%, typ.	5 ms
Setting time maximum	5 ms
<b>Protection and monitoring</b>	
Output overvoltage protection	< 33 V
Current limitation, typ.	2.65 A
Characteristic feature of the output short-circuit protected	Yes
Short-circuit protection	Constant current characteristic
Enduring short circuit current Effective level typical	2.7 A
Overload/short-circuit indicator	-
<b>Safety</b>	
Primary/secondary isolation	Yes
Potential separation	Safety extra-low output voltage $U_{out}$ acc. to EN 60950-1 and EN 50178
Protection class	Class I
stray current maximum	3.5 mA
CE mark	Yes
UL/CSA approval	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950-1, CSA C22.2 No. 60950-1) File E151273
Explosion protection	ATEX (EX) II 3G Ex nA II T4; cULus (ISA 12.12.01, CSA C22.2 No.213) File E330455
FM approval	Yes
FM approval	Class I, Div. 2, Group ABCD, T4
CB approval	No
Marine approval	GL, ABS, BV, DNV, LRS, NK
Degree of protection (EN 60529)	IP20
<b>EMC</b>	
Emitted interference	EN 55022 Class B
Supply harmonics limitation	not applicable
Noise immunity	EN 61000-6-2

Order No.	6EP1 332-1SH71
<b>Product</b>	<b>S7-1200 PM1207</b>
<b>Power supply, type</b>	<b>24 V/2.5 A</b>
<b>Operating data</b>	
Ambient temperature	
• in operation	0 ... 60 °C
- Note	with natural convection
Ambient temperature	
• on transport	-40 ... +85 °C
Ambient temperature	
• in storage	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation
<b>Mechanics</b>	
Connection technology	screw-type terminals
Connections	
• Supply input	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm <sup>2</sup>
• Output	L+, M: 2 screw terminals each for 0.5 ... 2.5 mm <sup>2</sup>
• Auxiliary	-
Width of the housing	70 mm
Height of the housing	100 mm
Depth of the housing	75 mm
Installation width	70 mm
Installation height	140 mm
Weight, approx.	0.3 kg
Product feature of the housing housing for side-by-side mounting	Yes
Type of mounting wall mounting	Yes
Type of fixing cap rail mounting	Yes
Type of mounting S7-300 rail mounting	No
Installation	Snaps onto DIN rail EN 60715 35x7.5/15, wall mounting

#### Ordering data

##### SIMATIC S7-1200 PM 1207

Input 120/230 V AC,  
output 24 V DC/2.5 A

#### Order No.

**6EP1 332-1SH71**

# SIMATIC S7-1200 SIPLUS power supplies

## SIPLUS PM 1207 power supplies

### Overview



- Stabilized power supply for SIPLUS S7-1200
- In the S7-1200 design
- Input 120/230 V AC, output 24 V DC, 2.5 A (derating: 1.5 A from 60 °C)

**Note:**

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

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SIPLUS PM 1207 power supply		
Order number	6AG1 332-1SH71-4AA0	6AG1 332-1SH71-7AA0
Order number based on	6EP1 332-1SH71	6EP1 332-1SH71
Ambient temperature range	0 ... +60° C	-25 ... +70° C
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	
<b>Ambient conditions</b>		
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.	
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold spores, fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!	
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!	
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!	
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K	

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

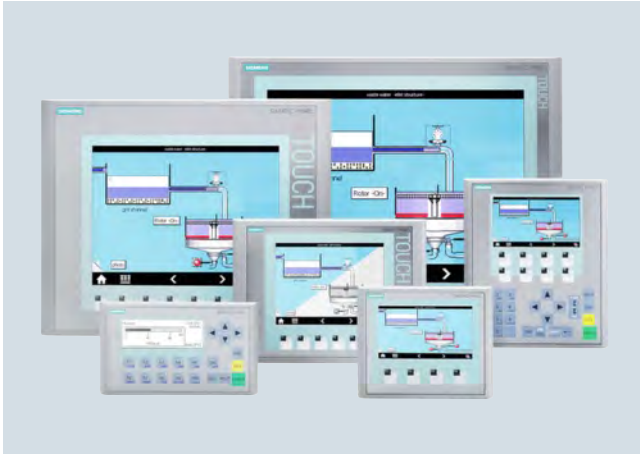
Ordering data	Order No.
<b>SIPLUS PM 1207 power supply</b> (extended temperature range and medial exposure) Input 120/230 V AC, output 24 V DC, 2.5 A; derating from + 55 °C to + 70 °C to 1.2 A output current Ambient temperature -25 ... +70 °C Ambient temperature 0 ... +60 °C	6AG1 332-1SH71- 7AA0 6AG1 332-1SH71- 4AA0

# SIMATIC S7-1200

## Operator control and monitoring

### Basic Panels – Standard

#### Overview



- Ideal entry-level series from 3" to 15" for operating and monitoring compact machines and systems
- Clear process representation thanks to use of pixel-graphics displays
- Intuitive operation using Touch and tactile function keys
- Equipped with all the necessary basic functions such as alarm logging, recipe management, plots, vector graphics, and language switching
- Simple connection to the controller via integral Ethernet interface or separate version with RS485/422

#### Technical specifications

	6AV6 647-0AH11-3AX0 SIMATIC HMI KP300 Basic mono PN	6AV6 647-0AJ11-3AX0 SIMATIC HMI KP400 Basic color PN	6AV6 647-0AA11-3AX0 SIMATIC HMI KTP400 Basic mono PN	6AV6 647-0AK11-3AX0 SIMATIC HMI KTP400 Basic color PN
<b>Display</b>				
Design of display	FSTN	TFT	STN	TFT
Screen diagonal	3.6 in	4.3 in	3.8 in	4.3 in
Number of colors	4; Backlit display only (white, red, green, yellow)	256	4; Grayscales	256
Resolution (pixels)				
• Horizontal image resolution	240	480	320	480
• Vertical image resolution	80	272	240	272
<b>Backlighting</b>				
• MTBF backlighting (at 25 °C)	50 000 h	50 000 h	30 000 h	50 000 h
• Dimmable backlight	No	No	No	No
<b>Control elements</b>				
<b>Keyboard fonts</b>				
• Number of function keys	10	8	4	4
<b>Touch operation</b>				
• Design as touch screen	No	No	Yes	Yes
<b>Installation type/mounting</b>				
Mounting in portrait format possible	No	No	Yes	Yes
<b>Supply voltage</b>				
Type of supply voltage	DC	DC	DC	DC
Rated voltage/DC	24 V	24 V	24 V	24 V
<b>Memory</b>				
Usable memory for user data	512 kbyte	512 kbyte	512 kbyte	512 kbyte
<b>Type of output</b>				
<b>Acoustics</b>				
• Buzzer	No	No	Yes	Yes

**Technical specifications** (continued)

	<b>6AV6 647-0AH11-3AX0</b> <b>SIMATIC HMI KP300</b> <b>Basic mono PN</b>	<b>6AV6 647-0AJ11-3AX0</b> <b>SIMATIC HMI KP400</b> <b>Basic color PN</b>	<b>6AV6 647-0AA11-3AX0</b> <b>SIMATIC HMI KTP400</b> <b>Basic mono PN</b>	<b>6AV6 647-0AK11-3AX0</b> <b>SIMATIC HMI KTP400</b> <b>Basic color PN</b>
<b>Time of day</b>				
Clock				
• Software clock	Yes	Yes	Yes	Yes
• Battery-backed	No	No	No	No
• Synchronizable	Yes	Yes	Yes	Yes
<b>Interfaces</b>				
Number of RS 485 interfaces	0	0	0	0
Number of USB interfaces	0	0	0	0
Number of SD card slots	0	0	0	0
Industrial Ethernet				
• Number of industrial Ethernet interfaces	1	1	1	1
<b>Protocols</b>				
PROFINET	Yes	Yes	Yes	Yes
PROFIBUS	No	No	No	No
MPI	No	No	No	No
<b>Degree and class of protection</b>				
Type of protection	IP20	IP20	IP20	IP20
IP (at the front)	IP65	IP65	IP65	IP65
Enclosure type 4x at the front	Yes	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>				
CE	Yes	Yes	Yes	Yes
cULus	Yes	Yes	Yes	Yes
GL	Yes	No	Yes	Yes
ABS	Yes	No	Yes	Yes
BV	Yes	No	Yes	Yes
DNV	Yes	No	Yes	Yes
LRS	Yes	No	Yes	Yes
Class NK	Yes	No	Yes	Yes
Use in hazardous areas				
• ATEX Zone 2	No	No	No	No
• ATEX Zone 22	No	No	No	No
• cULus Class I Zone 2, Division 2	Yes	No	No	No
• FM Class I Division 2	No	No	No	No
<b>Ambient conditions</b>				
Operating temperature				
• Operation (vertical installation)				
- in vertical mounting position/ minimum	0 °C	0 °C	0 °C	0 °C
- in vertical mounting position/ maximum	50 °C	50 °C	50 °C	50 °C
Relative humidity				
• max. relative humidity	90 %	90 %	90 %	90 %
<b>Configuration</b>				
Configuration software				
• STEP 7 Basic (TIA Portal)	Yes; via integrated WinCC Basic (TIA Portal)	Yes; via integrated WinCC Basic (TIA Portal)	Yes; via integrated WinCC Basic (TIA Portal)	Yes; via integrated WinCC Basic (TIA Portal)
• WinCC flexible Compact	No	No	Yes	No
• WinCC Basic (TIA Portal)	Yes	Yes	Yes	Yes

# SIMATIC S7-1200

## Operator control and monitoring

### Basic Panels – Standard

#### Technical specifications (continued)

	6AV6 647-0AH11-3AX0 SIMATIC HMI KP300 Basic mono PN	6AV6 647-0AJ11-3AX0 SIMATIC HMI KP400 Basic color PN	6AV6 647-0AA11-3AX0 SIMATIC HMI KTP400 Basic mono PN	6AV6 647-0AK11-3AX0 SIMATIC HMI KTP400 Basic color PN
<b>Languages</b>				
Online languages				
• Number of online/runtime languages	5	5	5	5
<b>Functionality under WinCC flexible</b>				
Task planner				
• time-controlled	No	No	No	No
• task-controlled	Yes	Yes	Yes	Yes
With alarm logging system (incl. buffer and acknowledgment)				
• Number of bit messages	200	200	200	200
• Number of analog messages	15	15	15	15
• Message buffer				
- Number of entries	256	256	256	256
- Circulating buffer	Yes	Yes	Yes	Yes
- retentive	Yes	Yes	Yes	Yes
Recipes				
• Number of recipes	5	5	5	5
• Size of internal recipe memory	40 kbyte	40 kbyte	40 kbyte	40 kbyte
• Recipe memory expandable	No	No	No	No
Variables				
• Number of variables per device	250	500	250	500
• Number of variables per screen	30	30	30	30
Images				
• Number of configurable images	50	50	50	50
Archiving				
• Number of archives per device	0	0	0	0
Security				
• Number of user groups	50	50	50	50
• Number of users	50	50	50	50
Transfer (upload/download)				
• MPI/PROFIBUS DP	No	No	No	No
• Ethernet	Yes	Yes	Yes	Yes
Process coupling				
• S7-1200	Yes	Yes	Yes	Yes
• S7-1500	Yes	Yes	Yes	Yes
• S7-200	Yes	Yes	Yes	Yes
• S7-300/400	Yes	Yes	Yes	Yes
• LOGO!	Yes	Yes	Yes	Yes
• Win AC	Yes	No	Yes	No
• SIMOTION	No	No	No	No
• Allen Bradley (EtherNet/IP)	Yes	Yes	Yes	Yes
• Allen Bradley (DF1)	No	No	No	No
• Mitsubishi (MC TCP/IP)	Yes	Yes	Yes	Yes
• Mitsubishi (FX)	No	No	No	No
• OMRON (FINS TCP)	No	No	No	No
• OMRON (LINK/Multiink)	No	No	No	No
• Modicon (Modbus TCP/IP)	Yes	Yes	Yes	Yes
• Modicon (Modbus)	No	No	No	No

**Technical specifications (continued)**

	<b>6AV6 647-0AH11-3AX0</b> <b>SIMATIC HMI KP300</b> <b>Basic mono PN</b>	<b>6AV6 647-0AJ11-3AX0</b> <b>SIMATIC HMI KP400</b> <b>Basic color PN</b>	<b>6AV6 647-0AA11-3AX0</b> <b>SIMATIC HMI KTP400</b> <b>Basic mono PN</b>	<b>6AV6 647-0AK11-3AX0</b> <b>SIMATIC HMI KTP400</b> <b>Basic color PN</b>
<b>I/O</b>				
I/O devices				
• Printer	No	No	No	No
• Multi Media Card	No	No	No	No
• SD card	No	No	No	No
• USB memory	No	No	No	No
<b>Mechanics/material</b>				
Type of housing (front)				
• Plastic	Yes	Yes	Yes	Yes
<b>Dimensions</b>				
Width of the housing front	165 mm	162 mm	140 mm	140 mm
Height of housing front	97 mm	189 mm	116 mm	116 mm
Mounting cutout, width	149 mm	135 mm	123 mm	123 mm
Mounting cutout, height	82 mm	171 mm	99 mm	99 mm
<b>Weight</b>				
Weight without packaging	0.25 kg	0.51 kg	0.32 kg	0.34 kg

	<b>6AV6 647-0AB11-3AX0</b> <b>SIMATIC HMI KTP600</b> <b>Basic mono PN</b>	<b>6AV6 647-0AC11-3AX0</b> <b>SIMATIC HMI KTP600</b> <b>Basic color DP</b>	<b>6AV6 647-0AD11-3AX0</b> <b>SIMATIC HMI KTP600</b> <b>Basic color PN</b>
<b>Display</b>			
Design of display	STN	TFT	TFT
Screen diagonal	5.7 in	5.7 in	5.7 in
Number of colors	4; Grayscale	256	256
Resolution (pixels)			
• Horizontal image resolution	320	320	320
• Vertical image resolution	240	240	240
Backlighting			
• MTBF backlighting (at 25 °C)	50 000 h	50 000 h	50 000 h
• Dimmable backlight	No	No	No
<b>Control elements</b>			
Keyboard fonts			
• Number of function keys	6	6	6
Touch operation			
• Design as touch screen	Yes	Yes	Yes
<b>Installation type/mounting</b>			
Mounting in portrait format possible	Yes	Yes	Yes
<b>Supply voltage</b>			
Type of supply voltage	DC	DC	DC
Rated voltage/DC	24 V	24 V	24 V
<b>Memory</b>			
Usable memory for user data	512 kbyte	512 kbyte	512 kbyte
<b>Type of output</b>			
Acoustics			
• Buzzer	Yes	Yes	Yes

# SIMATIC S7-1200

## Operator control and monitoring

### Basic Panels – Standard

#### Technical specifications (continued)

	6AV6 647-0AB11-3AX0 SIMATIC HMI KTP600 Basic mono PN	6AV6 647-0AC11-3AX0 SIMATIC HMI KTP600 Basic color DP	6AV6 647-0AD11-3AX0 SIMATIC HMI KTP600 Basic color PN
<b>Time of day</b>			
Clock			
• Software clock	Yes	Yes	Yes
• Battery-backed	No	No	No
• Synchronizable	Yes	Yes	Yes
<b>Interfaces</b>			
Number of RS 485 interfaces	0	1	0
Number of USB interfaces	0	0	0
Number of SD card slots	0	0	0
Industrial Ethernet			
• Number of industrial Ethernet interfaces	1	0	1
<b>Protocols</b>			
PROFINET	Yes	No	Yes
PROFIBUS	No	Yes	No
MPI	No	Yes	No
<b>Degree and class of protection</b>			
Type of protection	IP20	IP20	IP20
IP (at the front)	IP65	IP65	IP65
Enclosure type 4x at the front	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>			
CE	Yes	Yes	Yes
cULus	Yes	Yes	Yes
GL	Yes	Yes	Yes
ABS	Yes	Yes	Yes
BV	Yes	Yes	Yes
DNV	Yes	Yes	Yes
LRS	Yes	Yes	Yes
Class NK	Yes	Yes	Yes
Use in hazardous areas			
• ATEX Zone 2	No	No	No
• ATEX Zone 22	No	No	No
• cULus Class I Zone 2, Division 2	No	No	No
• FM Class I Division 2	No	No	No
<b>Ambient conditions</b>			
Operating temperature			
• Operation (vertical installation)			
- in vertical mounting position/ minimum	0 °C	0 °C	0 °C
- in vertical mounting position/ maximum	50 °C	50 °C	50 °C
Relative humidity			
• max. relative humidity	90 %	90 %	90 %
<b>Configuration</b>			
Configuration software			
• STEP 7 Basic (TIA Portal)	Yes; via integrated WinCC Basic (TIA Portal)	Yes; via integrated WinCC Basic (TIA Portal)	Yes; via integrated WinCC Basic (TIA Portal)
• WinCC flexible Compact	Yes	Yes	Yes
• WinCC Basic (TIA Portal)	Yes	Yes	Yes



**Technical specifications** (continued)

	<b>6AV6 647-0AB11-3AX0</b> <b>SIMATIC HMI KTP600</b> <b>Basic mono PN</b>	<b>6AV6 647-0AC11-3AX0</b> <b>SIMATIC HMI KTP600</b> <b>Basic color DP</b>	<b>6AV6 647-0AD11-3AX0</b> <b>SIMATIC HMI KTP600</b> <b>Basic color PN</b>
<b>Languages</b>			
Online languages			
• Number of online/runtime languages	5	5	5
<b>Functionality under WinCC flexible</b>			
Task planner			
• time-controlled	No	No	No
• task-controlled	Yes	Yes	Yes
With alarm logging system (incl. buffer and acknowledgment)			
• Number of bit messages	200	200	200
• Number of analog messages	15	15	15
• Message buffer			
- Number of entries	256	256	256
- Circulating buffer	Yes	Yes	Yes
- retentive	Yes	Yes	Yes
Recipes			
• Number of recipes	5	5	5
• Size of internal recipe memory	40 kbyte	40 kbyte	40 kbyte
• Recipe memory expandable	No	No	No
Variables			
• Number of variables per device	500	500	500
• Number of variables per screen	30	30	30
Images			
• Number of configurable images	50	50	50
Archiving			
• Number of archives per device	0	0	0
Security			
• Number of user groups	50	50	50
• Number of users	50	50	50
Transfer (upload/download)			
• MPI/PROFIBUS DP	No	Yes	No
• Ethernet	Yes	No	Yes
Process coupling			
• S7-1200	Yes	Yes	Yes
• S7-1500	Yes	Yes	Yes
• S7-200	Yes	Yes	Yes
• S7-300/400	Yes	Yes	Yes
• LOGO!	Yes	Yes	Yes
• Win AC	Yes	Yes	Yes
• SIMOTION	No	No	No
• Allen Bradley (EtherNet/IP)	Yes	No	Yes
• Allen Bradley (DF1)	No	Yes	No
• Mitsubishi (MC TCP/IP)	Yes	No	Yes
• Mitsubishi (FX)	No	Yes	No
• OMRON (FINS TCP)	No	No	No
• OMRON (LINK/Multilink)	No	Yes	No
• Modicon (Modbus TCP/IP)	Yes	No	Yes
• Modicon (Modbus)	No	Yes	No

# SIMATIC S7-1200

## Operator control and monitoring

### Basic Panels – Standard

#### Technical specifications (continued)

	<b>6AV6 647-0AB11-3AX0</b> <b>SIMATIC HMI KTP600</b> <b>Basic mono PN</b>	<b>6AV6 647-0AC11-3AX0</b> <b>SIMATIC HMI KTP600</b> <b>Basic color DP</b>	<b>6AV6 647-0AD11-3AX0</b> <b>SIMATIC HMI KTP600</b> <b>Basic color PN</b>
<b>I/O</b>			
I/O devices			
• Printer	No	No	No
• Multi Media Card	No	No	No
• SD card	No	No	No
• USB memory	No	No	No
<b>Mechanics/material</b>			
Type of housing (front)			
• Plastic	Yes	Yes	Yes
<b>Dimensions</b>			
Width of the housing front	214 mm	214 mm	214 mm
Height of housing front	158 mm	158 mm	158 mm
Mounting cutout, width	197 mm	197 mm	197 mm
Mounting cutout, height	141 mm	141 mm	141 mm
<b>Weight</b>			
Weight without packaging	1.07 kg	1.07 kg	1.07 kg

	<b>6AV6 647-0AE11-3AX0</b> <b>SIMATIC HMI KTP1000</b> <b>Basic color DP</b>	<b>6AV6 647-0AF11-3AX0</b> <b>SIMATIC HMI KTP1000</b> <b>Basic color PN</b>	<b>6AV6 647-0AG11-3AX0</b> <b>SIMATIC HMI TP1500</b> <b>Basic color PN</b>
<b>Display</b>			
Design of display	TFT	TFT	TFT
Screen diagonal	10.4 in	10.4 in	15 in
Number of colors	256	256	256
Resolution (pixels)			
• Horizontal image resolution	640	640	1 024
• Vertical image resolution	480	480	768
Backlighting			
• MTBF backlighting (at 25 °C)	50 000 h	50 000 h	50 000 h
• Dimmable backlight	No	No	No
<b>Control elements</b>			
Keyboard fonts			
• Number of function keys	8	8	0
Touch operation			
• Design as touch screen	Yes	Yes	Yes
<b>Installation type/mounting</b>			
Mounting in portrait format possible	No	No	No
<b>Supply voltage</b>			
Type of supply voltage	DC	DC	DC
Rated voltage/DC	24 V	24 V	24 V
<b>Memory</b>			
Usable memory for user data	1 024 kbyte	1 024 kbyte	1 024 kbyte
<b>Type of output</b>			
Acoustics			
• Buzzer	Yes	Yes	Yes

**Technical specifications** (continued)

	<b>6AV6 647-0AE11-3AX0</b> <b>SIMATIC HMI KTP1000</b> <b>Basic color DP</b>	<b>6AV6 647-0AF11-3AX0</b> <b>SIMATIC HMI KTP1000</b> <b>Basic color PN</b>	<b>6AV6 647-0AG11-3AX0</b> <b>SIMATIC HMI TP1500</b> <b>Basic color PN</b>
<b>Time of day</b>			
Clock			
• Software clock	Yes	Yes	Yes
• Battery-backed	No	No	No
• Synchronizable	Yes	Yes	Yes
<b>Interfaces</b>			
Number of RS 485 interfaces	1	0	0
Number of USB interfaces	0	0	0
Number of SD card slots	0	0	0
Industrial Ethernet			
• Number of industrial Ethernet interfaces	0	1	1
<b>Protocols</b>			
PROFINET	No	Yes	Yes
PROFIBUS	Yes	No	No
MPI	Yes	No	No
<b>Degree and class of protection</b>			
Type of protection	IP20	IP20	IP20
IP (at the front)	IP65	IP65	IP65
Enclosure type 4x at the front	Yes	Yes	Yes
<b>Standards, approvals, certificates</b>			
CE	Yes	Yes	Yes
cULus	Yes	Yes	Yes
GL	Yes	Yes	No
ABS	Yes	Yes	No
BV	Yes	Yes	No
DNV	Yes	Yes	No
LRS	Yes	Yes	No
Class NK	Yes	Yes	No
Use in hazardous areas			
• ATEX Zone 2	No	No	No
• ATEX Zone 22	No	No	No
• cULus Class I Zone 2, Division 2	No	No	No
• FM Class I Division 2	No	No	No
<b>Ambient conditions</b>			
Operating temperature			
• Operation (vertical installation)			
- in vertical mounting position/ minimum	0 °C	0 °C	0 °C
- in vertical mounting position/ maximum	50 °C	50 °C	50 °C
Relative humidity			
• max. relative humidity	90 %	90 %	90 %
<b>Configuration</b>			
Configuration software			
• STEP 7 Basic (TIA Portal)	Yes; via integrated WinCC Basic (TIA Portal)	Yes; via integrated WinCC Basic (TIA Portal)	Yes; via integrated WinCC Basic (TIA Portal)
• WinCC flexible Compact	Yes	Yes	Yes
• WinCC Basic (TIA Portal)	Yes	Yes	Yes

# SIMATIC S7-1200

## Operator control and monitoring

### Basic Panels – Standard

#### Technical specifications (continued)

	6AV6 647-0AE11-3AX0 SIMATIC HMI KTP1000 Basic color DP	6AV6 647-0AF11-3AX0 SIMATIC HMI KTP1000 Basic color PN	6AV6 647-0AG11-3AX0 SIMATIC HMI TP1500 Basic color PN
<b>Languages</b>			
Online languages			
• Number of online/runtime languages	5	5	5
<b>Functionality under WinCC flexible</b>			
Task planner			
• time-controlled	No	No	No
• task-controlled	Yes	Yes	Yes
With alarm logging system (incl. buffer and acknowledgment)			
• Number of bit messages	200	200	200
• Number of analog messages	15	15	15
• Message buffer			
- Number of entries	256	256	256
- Circulating buffer	Yes	Yes	Yes
- retentive	Yes	Yes	Yes
Recipes			
• Number of recipes	5	5	5
• Size of internal recipe memory	40 kbyte	40 kbyte	40 kbyte
• Recipe memory expandable	No	No	No
Variables			
• Number of variables per device	500	500	500
• Number of variables per screen	30	30	30
Images			
• Number of configurable images	50	50	50
Archiving			
• Number of archives per device	0	0	0
Security			
• Number of user groups	50	50	50
• Number of users	50	50	50
Transfer (upload/download)			
• MPI/PROFIBUS DP	Yes	No	No
• Ethernet	No	Yes	Yes
Process coupling			
• S7-1200	Yes	Yes	Yes
• S7-1500	Yes	Yes	Yes
• S7-200	Yes	Yes	Yes
• S7-300/400	Yes	Yes	Yes
• LOGO!	Yes	Yes	Yes
• Win AC	Yes	Yes	Yes
• SIMOTION	No	No	No
• Allen Bradley (EtherNet/IP)	No	Yes	Yes
• Allen Bradley (DF1)	Yes	No	No
• Mitsubishi (MC TCP/IP)	No	Yes	Yes
• Mitsubishi (FX)	Yes	No	No
• OMRON (FINS TCP)	No	No	No
• OMRON (LINK/Multilink)	Yes	No	No
• Modicon (Modbus TCP/IP)	No	Yes	Yes
• Modicon (Modbus)	Yes	Yes	Yes
<b>I/O</b>			
I/O devices			
• Printer	No	No	No
• Multi Media Card	No	No	No
• SD card	No	No	No
• USB memory	No	No	No
<b>Mechanics/material</b>			
Type of housing (front)			
• Plastic	Yes	Yes	Yes

# SIMATIC S7-1200

## Operator control and monitoring

### Basic Panels – Standard

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#### Technical specifications (continued)

	6AV6 647-0AE11-3AX0 SIMATIC HMI KTP1000 Basic color DP	6AV6 647-0AF11-3AX0 SIMATIC HMI KTP1000 Basic color PN	6AV6 647-0AG11-3AX0 SIMATIC HMI TP1500 Basic color PN
<b>Dimensions</b>			
Width of the housing front	335 mm	335 mm	400 mm
Height of housing front	275 mm	275 mm	310 mm
Mounting cutout, width	310 mm	310 mm	367 mm
Mounting cutout, height	248 mm	248 mm	289 mm
<b>Weight</b>			
Weight without packaging	2.65 kg	2.65 kg	4.2 kg

#### Ordering data

Ordering data	Order No.	Order No.	
<b>SIMATIC HMI Basic Panels, Key and Touch</b>		<b>Starter kits consist of:</b> <ul style="list-style-type: none"> <li>the respective SIMATIC HMI Basic Panel                             <ul style="list-style-type: none"> <li>- SIMATIC HMI KP300 Basic mono PN</li> <li>- SIMATIC HMI KTP400 Basic mono PN</li> <li>- SIMATIC HMI KTP600 Basic color PN</li> </ul> </li> <li>SIMATIC S7-1200 CPU 1212C AC/DC/Rly</li> <li>SIMATIC S7-1200 Simulator Module SIM 1274</li> <li>SIMATIC STEP 7 BASIC CD</li> <li>SIMATIC S7-1200 HMI Manual Collection CD</li> <li>Ethernet CAT5 cable, 2 m</li> </ul>	
SIMATIC HMI KTP400 Basic mono PN	6AV6 647-0AA11-3AX0		
SIMATIC HMI KTP400 Basic color PN	6AV6 647-0AK11-3AX0		
SIMATIC HMI KTP600 Basic mono PN	6AV6 647-0AB11-3AX0		
SIMATIC HMI KTP600 Basic color DP	6AV6 647-0AC11-3AX0		
SIMATIC HMI KTP600 Basic color PN	6AV6 647-0AD11-3AX0		
SIMATIC HMI KTP1000 Basic color DP	6AV6 647-0AE11-3AX0		
SIMATIC HMI KTP1000 Basic color PN	6AV6 647-0AF11-3AX0		
<b>SIMATIC HMI Basic Panels, Key</b>			See Catalog ST 80/ST PC, HMI software
SIMATIC HMI KP300 Basic mono PN	6AV6 647-0AH11-3AX0		
SIMATIC HMI KP400 Basic color PN	6AV6 647-0AJ11-3AX0	See Catalog ST 80/ST PC, HMI software	
<b>SIMATIC HMI Basic Panels, Touch</b>			
SIMATIC HMI TP1500 Basic color PN	6AV6 647-0AG11-3AX0		
Starter kit SIMATIC S7-1200 + KP300 Basic mono PN	6AV6 651-7HA01-3AA3	See Catalog ST 80/ST PC, HMI software	
Starter kit SIMATIC S7-1200 + KTP400 Basic color PN	6AV6 651-7KA01-3AA3		
Starter kit SIMATIC S7-1200 + KTP600 Basic color PN	6AV6 651-7DA01-3AA3		
<b>SIMATIC HMI Manual Collection</b>		<b>6AV6 691-1SA01-0AX0</b>	
<b>Electronic documentation, on DVD</b>			
5 languages (English, French, German, Italian and Spanish); contains: all currently available user manuals, manuals and communication manuals for SIMATIC HMI			
<b>Accessories</b>		See Catalog ST 80/ST PC, HMI accessories	

# SIMATIC S7-1200

## SIPLUS operator control and monitoring

### SIPLUS Basic Panels

#### Overview

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- Ideal entry-level series of 3.8 inches to 15 inches for operating and monitoring compact machines and systems
- Clear process representation through the use of full-graphic displays
- Intuitive operation via touch and tactile function keys
- Equipped with all the necessary basic functions such as reporting, recipe management, curve representation, vector graphics, and language selection
- Easy connection to the controller via integrated Ethernet interface or a separate version with RS485/422

**Note:**

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

	SIPLUS HMI KTP 300 BASIC MONO PN	SIPLUS HMI KTP 400 BASIC MONO PN	SIPLUS HMI KTP 600 BASIC COLOR PN	SIPLUS HMI KTP 1000 BASIC COLOR DP	SIPLUS HMI KTP 1000 BASIC COLOR PN	SIPLUS HMI TP 1500 BASIC COLOR PN
<b>Order number</b>	6AG1647-0AH11-2AX0	6AG1647-0AA11-2AX0	6AG1647-0AD11-2AX0	6AG1647-0AE11-4AX0	6AG1647-0AF11-4AX0	6AG1647-0AG11-4AX0
<b>Order No. based on</b>	6AV6647-0AH11-3AX0	6AV6647-0AA11-3AX0	6AV6647-0AD11-3AX0	6AV6647-0AE11-3AX0	6AV6647-0AF11-3AX0	6AV6647-0AG11-3AX0
Ambient temperature range	-25 ... +60 °C	-10 ... +60 °C	-25 ... +60 °C	0 ... +50 °C	0 ... +50 °C	0 ... +50 °C
Conformal coating	Coating of the printed circuit boards and the electronic components					
Technical data	The technical data of the standard product applies except for the ambient conditions.					
<b>Ambient conditions</b>						
Relative humidity	100 %, condensation/frost permissible. No commissioning if condensation present.					
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!					
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!					
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!					
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range		795 ... 658 hPa (+2000 ... +3500 m) derating 10 K	658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K		

For technical documentation on SIPLUS, see:  
<http://www.siemens.com/siplus-extreme>

# SIMATIC S7-1200

## SIPLUS operator control and monitoring

### SIPLUS Basic Panels

Ordering data	Order No.		Order No.
<b>SIPLUS HMI KTP300 Basic mono PN</b> For areas with extreme medial exposure (conformal coating); ambient temperature -25 ... +60 °C	<b>6AG1 647-0AH11-2AX0</b>	<b>SIPLUS HMI KTP 1000 Basic Color DP</b> For areas with extreme medial exposure (conformal coating); ambient temperature 0 ... +50 °C	<b>6AG1 647-0AE11-4AX0</b>
<b>SIPLUS HMI KTP400 Basic mono PN</b> For areas with extreme medial exposure (conformal coating); ambient temperature -10 ... +60 °C	<b>6AG1 647-0AA11-2AX0</b>	<b>SIPLUS HMI KTP 1000 Basic Color PN</b> For areas with extreme medial exposure (conformal coating); ambient temperature 0 ... +50 °C	<b>6AG1 647-0AF11-4AX0</b>
<b>SIPLUS HMI KTP 600 Basic color PN</b> For areas with extreme medial exposure (conformal coating); ambient temperature -25 ... +60 °C	<b>6AG1 647-0AD11-2AX0</b>	<b>SIPLUS HMI TP 1500 Basic Color PN</b> For areas with extreme medial exposure (conformal coating); ambient temperature 0 ... +50 °C	<b>6AG1 647-0AG11-4AX0</b>
		<b>Accessories</b>	See SIMATIC Basic Panels, page 3/133

#### Overview

- Software for the SIMATIC S7-1200
- Functions for all phases of the automation project:
  - configuring and parameterizing the hardware
  - specifying the communication
  - programming in LAD (Ladder Diagram) and FBD (Function Block Diagram)
  - configuration of the visualization
  - test, commissioning, and service

The following is available:

- STEP 7 Basic

For further information, see chapter 11.