SIMATIC S7-1200

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Brochures

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

www.siemens.com/simatic/printmaterial

S7-1200

Overview

- 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.

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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	-40 ... +70 °C
- With 95% humidity	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	Requirements of the EMC directive
• Noise immunity acc. to EN 50082-2	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.
Ambient conditions	
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

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)

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
General information			
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
Supply voltage			
24 V DC		Yes	Yes
120 V AC	Yes		
230 V AC	Yes		
Encoder supply			
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
Power losses			
Power loss, typ.	10 W	8 W	8 W
Memory			
Work memory			
• integrated	30 kbyte	30 kbyte	30 kbyte
Load memory			
• integrated	1 Mbyte	1 Mbyte	1 Mbyte
Backup			
• without battery	Yes	Yes	Yes
CPU processing times			
for bit operations, typ.	0.085 µs; / instruction	0.085 µs; / instruction	0.085 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.5 µs; / instruction	2.5 µs; / instruction	2.5 µs; / instruction
Data areas and their retentivity			
Flag			
• Number, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
Address area			
Process image			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
Time of day			
Clock			
• Hardware clock (real-time 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
Digital inputs			
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)
Digital outputs			
Number/binary outputs	4; Relay	4	4; Relay
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
Analog inputs			
Integrated channels (AI)	2; 0 to 10 V	2; 0 to 10 V	2; 0 to 10 V
Input ranges			
• Voltage	Yes	Yes	Yes
1st interface			
Type of interface	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Functionality			
• PROFINET IO Controller	Yes	Yes	Yes
Communication functions			
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
Integrated Functions			
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	
Ambient conditions			
Operating temperature			
• Min.	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C
Configuration			
programming			
• Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
Dimensions			
Width	90 mm	90 mm	90 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weight			
Weight, approx.	420 g	370 g	380 g

CPU 1211C

Ordering data	Order No.
CPU 1211C	
Compact CPU, AC/DC/relay; 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	**6ES7 211-1BE31-0XB0**
Compact CPU, DC/DC/DC; 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	**6ES7 211-1AE31-0XB0**
Compact CPU, DC/DC/relay; 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	**6ES7 211-1HE31-0XB0**
SB 1221 signal board	
4 inputs, 5 V DC, 200 kHz	**6ES7 221-3AD30-0XB0**
4 inputs, 24 V DC, 200 kHz	**6ES7 221-3BD30-0XB0**
SB 1222 signal board	
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**
SB 1223 signal board	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	**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**

	Order No.
SB 1231 signal board	**6ES7 231-4HA30-0XB0**
1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	
SB 1231 thermocouple signal board	**6ES7 231-5QA30-0XB0**
1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K	
SB 1231 RTD signal board	**6ES7 231-5PA30-0XB0**
1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	
SB 1232 signal board	**6ES7 232-4HA30-0XB0**
1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits	
CB 1241 RS485 communication board	**6ES7 241-1CH30-1XB0**
for point-to-point connection, with 1 RS485 interface	
Simulator (optional)	
8 input switches, for CPU 1211C / CPU 1212C	**6ES7 274-1XF30-0XA0**
SIMATIC Memory Card (optional)	
4 MB	**6ES7 954 -8LC01-0AA0**
12 MB	**6ES7 954 -8LE01-0AA0**
24 MB	**6ES7 954 -8LF01-0AA0**
Terminal block (spare part)	
for CPU 1211C/1212C	
For DI, with 14 screws, tin-plated; 4 units	**6ES7 292-1AH30-0XA0**
For DO, with 8 screws, tin-plated; 4 units	**6ES7 292-1AP30-0XA0**
For AI, with 3 screws, tin-plated; 4 units	**6ES7 292-1BC30-0XA0**
RJ45 cable grip	
4 items per pack	
Single port	**6ES7 290-3AA30-0XA0**
Front flap set (spare part)	
for CPU 1211C/1212C	**6ES7 291-1AA30-0XA0**
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**

Ordering data

	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**

	Order No.
STEP 7 Professional / Basic V12 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	
STEP 7 Professional V12, Floating License	**6ES7 822-1AA02-0YA5**
STEP 7 Basic V12, Floating License	**6ES7 822-0AA02-0YA5**

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
General information			
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
Supply voltage			
24 V DC		Yes	Yes
120 V AC	Yes		
230 V AC	Yes		
Encoder supply			
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
Power losses			
Power loss, typ.	11 W	9 W	9 W
Memory			
Work memory			
• integrated	50 kbyte	50 kbyte	50 kbyte
Load memory			
• integrated	1 Mbyte	1 Mbyte	1 Mbyte
Backup			
• without battery	Yes	Yes	Yes
CPU processing times			
for bit operations, typ.	0.085 µs; / instruction	0.085 µs; / instruction	0.085 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.5 µs; / instruction	2.5 µs; / instruction	2.5 µs; / instruction
Data areas and their retentivity			
Flag			
• Number, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
Address area			
Process image			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
Time of day			
Clock			
• Hardware clock (real-time 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
Digital inputs			
Number/binary inputs	8; integrated	8; integrated	8; integrated
• of which, inputs usable for technological functions	4; HSC (High Speed Counting)	4; HSC (High Speed Counting)	4; HSC (High Speed Counting)
Digital outputs			
Number/binary outputs	6; Relay	6	6; Relay
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
Analog inputs			
Integrated channels (AI)	2; 0 to 10 V	2; 0 to 10 V	2; 0 to 10 V
Input ranges			
• Voltage	Yes	Yes	Yes
1st interface			
Type of interface	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Functionality			
• PROFINET IO Controller	Yes	Yes	Yes
Communication functions			
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
Integrated Functions			
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	
Ambient conditions			
Operating temperature			
• Min.	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C
Configuration			
programming			
• Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
Dimensions			
Width	90 mm	90 mm	90 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weight			
Weight, approx.	425 g	370 g	385 g

CPU 1212C

Ordering data	Order No.
CPU 1212C	
Compact CPU, AC/DC/relay; 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	**6ES7 212-1BE31-0XB0**
Compact CPU, DC/DC/DC; 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	**6ES7 212-1AE31-0XB0**
Compact CPU, DC/DC/relay; 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	**6ES7 212-1HE31-0XB0**
SB 1221 signal board	
4 inputs, 5 V DC, 200 kHz	**6ES7 221-3AD30-0XB0**
4 inputs, 24 V DC, 200 kHz	**6ES7 221-3BD30-0XB0**
SB 1222 signal board	
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**

	Order No.
SB 1223 signal board	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	**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**
SB 1231 signal board 1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6ES7 231-4HA30-0XB0**
SB 1231 thermocouple signal board 1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K	**6ES7 231-5QA30-0XB0**
SB 1231 RTD signal board 1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	**6ES7 231-5PA30-0XB0**
SB 1232 signal board 1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits	**6ES7 232-4HA30-0XB0**
CB 1241 RS485 communication board for point-to-point connection, with 1 RS485 interface	**6ES7 241-1CH30-1XB0**
Simulator (optional) 8 input switches, for CPU 1211C / CPU 1212C	**6ES7 274-1XF30-0XA0**
SIMATIC Memory Card (optional)	
4 MB	**6ES7 954 -8LC01-0AA0**
12 MB	**6ES7 954 -8LE01-0AA0**
24 MB	**6ES7 954 -8LF01-0AA0**
Extension cable for two-tier configuration for connecting digital/analog signal modules; length 2 m	**6ES7 290-6AA30-0XA0**
Starter box CPU 1212C AC/DC/relay Complete offer SIMATIC S7-1200, starter box, comprising: CPU 1212C AC/DC/relay, simulator, STEP 7 BASIC CD, manual CD, info material, in Systainer	**6ES7 212-1BD33-4YB0**

Ordering data

	Order No.
Terminal block (spare part)	
for CPU 1211C/1212C	
for DI, with 14 screws, tin-plated; 4 units	**6ES7 292-1AH30-0XA0**
for DO, with 8 screws, tin-plated; 4 units	**6ES7 292-1AP30-0XA0**
for AI, with 3 screws, tin-plated; 4 units	**6ES7 292-1BC30-0XA0**
RJ45 cable grip	
4 items per pack	
Single port	**6ES7 290-3AA30-0XA0**
Front flap set (spare part)	
for CPU 1211C/1212C	**6ES7 291-1AA30-0XA0**
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**

	Order No.
STEP 7 Professional / Basic V12	
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	
STEP 7 Professional V12, Floating License	**6ES7 822-1AA02-0YA5**
STEP 7 Basic V12, Floating License	**6ES7 822-0AA02-0YA5**

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
General information			
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
Supply voltage			
24 V DC		Yes	Yes
120 V AC	Yes		
230 V AC	Yes		
Encoder supply			
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
Power losses			
Power loss, typ.	14 W	12 W	12 W
Memory			
Work memory			
• integrated	75 kbyte	75 kbyte	75 kbyte
Load memory			
• integrated	4 Mbyte	4 Mbyte	4 Mbyte
Backup			
• without battery	Yes	Yes	Yes
CPU processing times			
for bit operations, typ.	0.085 µs; / instruction	0.085 µs; / instruction	0.085 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.5 µs; / instruction	2.5 µs; / instruction	2.5 µs; / instruction
Data areas and their retentivity			
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
Address area			
Process image			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
Time of day			
Clock			
• Hardware clock (real-time 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
Digital inputs			
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)
Digital outputs			
Number/binary outputs	10; Relay	10	10; Relay
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
Analog inputs			
Integrated channels (AI)	2; 0 to 10 V	2; 0 to 10 V	2; 0 to 10 V
Input ranges			
• Voltage	Yes	Yes	Yes
1st interface			
Type of interface	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Functionality			
• PROFINET IO Controller	Yes	Yes	Yes
Communication functions			
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
Integrated Functions			
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	
Ambient conditions			
Operating temperature			
• Min.	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C
Configuration			
programming			
• Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
Dimensions			
Width	110 mm	110 mm	110 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weight			
Weight, approx.	455 g	415 g	435 g

CPU 1214C

Ordering data	Order No.
CPU 1214C	
Compact CPU, AC/DC/relay; 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	**6ES7 214-1BG31-0XB0**
Compact CPU, DC/DC/DC; 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	**6ES7 214-1AG31-0XB0**
Compact CPU, DC/DC/relay; 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	**6ES7 214-1HG31-0XB0**
SB 1221 signal board	
4 inputs, 5 V DC, 200 kHz	**6ES7 221-3AD30-0XB0**
4 inputs, 24 V DC, 200 kHz	**6ES7 221-3BD30-0XB0**
SB 1222 signal board	
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**

	Order No.
SB 1223 signal board	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs 0.5 A, 5 W; can be used as HSC at up to 30 kHz	**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**
SB 1231 signal board	**6ES7 231-4HA30-0XB0**
1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	
SB 1231 thermocouple signal board	**6ES7 231-5QA30-0XB0**
1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K	
SB 1231 RTD signal board	**6ES7 231-5PA30-0XB0**
1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	
SB 1232 signal board	**6ES7 232-4HA30-0XB0**
1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits	
CB 1241 RS485 communication board	**6ES7 241-1CH30-1XB0**
for point-to-point connection, with 1 RS485 interface	
Simulator (optional)	
14 input switches, for CPU 1214C	**6ES7 274-1XH30-0XA0**
SIMATIC Memory Card (optional)	
4 MB	**6ES7 954 -8LC01-0AA0**
12 MB	**6ES7 954 -8LE01-0AA0**
24 MB	**6ES7 954 -8LF01-0AA0**
Extension cable for two-tier configuration	**6ES7 290-6AA30-0XA0**
for connecting digital/analog signal modules; length 2 m	
Terminal block (spare part)	
for CPU 1214C	
for DI, with 20 screws, tin-plated; 4 units	**6ES7 292-1AV30-0XA0**
for DO, with 12 screws, tin-plated; 4 units	**6ES7 292-1AM30-0XA0**
for AI, with 3 screws, tin-plated; 4 units	**6ES7 292-1BC30-0XA0**

Ordering data	Order No.
RJ45 cable grip	
4 items per pack	
Single port	**6ES7 290-3AA30-0XA0**
Front flap set (spare part)	
for CPU 1214C	**6ES7 291-1AB30-0XA0**
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**

	Order No.
STEP 7 Professional / Basic V12	
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	
STEP 7 Professional V12, Floating License	**6ES7 822-1AA02-0YA5**
STEP 7 Basic V12, Floating License	**6ES7 822-0AA02-0YA5**

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
General information			
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
Supply voltage			
24 V DC		Yes	Yes
120 V AC	Yes		
230 V AC	Yes		
Power losses			
Power loss, typ.	12 W	12 W	12 W
Memory			
Work memory			
• integrated	100 kbyte	100 kbyte	100 kbyte
Load memory			
• integrated	4 Mbyte	4 Mbyte	4 Mbyte
Backup			
• without battery	Yes	Yes	Yes
CPU processing times			
for bit operations, typ.	0.085 µs; / instruction	0.085 µs; / instruction	0.085 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.5 µs; / instruction	2.5 µs; / instruction	2.5 µs; / instruction
Data areas and their retentivity			
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
Address area			
Process image			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
Time of day			
Clock			
• Hardware clock (real-time 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
Digital inputs			
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)
Digital outputs			
Number/binary outputs	10; Relay	10	10; Relay
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
Analog inputs			
Integrated channels (AI)	2; 0 to 10 V	2; 0 to 10 V	2; 0 to 10 V
Input ranges			
• Voltage	Yes	Yes	Yes
Analog outputs			
Integrated channels (AO)	2; 0 to 20mA	2; 0 to 20mA	2; 0 to 20mA
1st interface			
Type of interface	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Functionality			
• PROFINET IO Controller	Yes	Yes	Yes
Communication functions			
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
Integrated Functions			
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
Ambient conditions			
Operating temperature			
• Min.	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C
Configuration			
programming			
• Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
Dimensions			
Width	130 mm	130 mm	130 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weight			
Weight, approx.	550 g	520 g	585 g

CPU 1215C

Ordering data	Order No.
CPU 1215C	
Compact CPU, AC/DC/relay; 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	**6ES7 215-1BG31-0XB0**
Compact CPU, DC/DC/DC; 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	**6ES7 215-1AG31-0XB0**
Compact CPU, DC/DC/relay; 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	**6ES7 215-1HG31-0XB0**
SB 1221 signal board	
4 inputs, 5 V DC, 200 kHz	**6ES7 221-3AD30-0XB0**
4 inputs, 24 V DC, 200 kHz	**6ES7 221-3BD30-0XB0**
SB 1222 signal board	
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**

	Order No.
SB 1223 signal board	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	**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**
SB 1231 signal board	**6ES7 231-4HA30-0XB0**
1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	
SB 1231 thermocouple signal board	**6ES7 231-5QA30-0XB0**
1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K	
SB 1231 RTD signal board	**6ES7 231-5PA30-0XB0**
1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	
SB 1232 signal board	**6ES7 232-4HA30-0XB0**
1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits	
CB 1241 RS485 communication board	**6ES7 241-1CH30-1XB0**
for point-to-point connection, with 1 RS485 interface	
BB 1297 battery board	**6ES7 297-0AX30-0XA0**
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	
Simulator (optional)	
14 input switches	**6ES7 274-1XH30-0XA0**
SIMATIC Memory Card (optional)	
4 MB	**6ES7 954 -8LC01-0AA0**
12 MB	**6ES7 954 -8LE01-0AA0**
24 MB	**6ES7 954 -8LF01-0AA0**
Extension cable for two-tier configuration	**6ES7 290-6AA30-0XA0**
for connecting digital/analog signal modules; length 2 m	

Ordering data

	Order No.
Terminal block (spare part)	
for CPU 1215C	
for DI, with 20 screws, tin-plated; 4 units	**6ES7 292-1AV30-0XA0**
for DO, with 12 screws, tin-plated; 4 units	**6ES7 292-1AM30-0XA0**
for analog units, with 6 screws, gold-plated; 4 units	**6ES7 292-1BF30-0XB0**
Front flap set (spare part)	
for CPU 1215C	**6ES7 291-1AC30-0XA0**
RJ45 cable grip	
4 items per pack	
Dual port	**6ES7 290-3AB30-0XA0**
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**

	Order No.
STEP 7 Professional / Basic V12	
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	
STEP 7 Professional V12, Floating License	**6ES7 822-1AA02-0YA5**
STEP 7 Basic V12, Floating License	**6ES7 822-0AA02-0YA5**

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

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

Ordering data	Order No.
CPU 1217C	
Compact CPU, DC/DC/DC; 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	**6ES7 217-1AG40-0XB0**
SB 1221 signal board	
4 inputs, 5 V DC, 200 kHz	**6ES7 221-3AD30-0XB0**
4 inputs, 24 V DC, 200 kHz	**6ES7 221-3BD30-0XB0**
SB 1222 signal board	
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**
SB 1223 signal board	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	**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**
SB 1231 signal board	**6ES7 231-4HA30-0XB0**
1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	
SB 1231 thermocouple signal board	**6ES7 231-5QA30-0XB0**
1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K	

	Order No.
SB 1231 RTD signal board	**6ES7 231-5PA30-0XB0**
1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	
SB 1232 signal board	**6ES7 232-4HA30-0XB0**
1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits	
CB 1241 RS485 communication board	**6ES7 241-1CH30-1XB0**
for point-to-point connection, with 1 RS485 interface	
BB 1297 battery board	**6ES7 297-0AX30-0XA0**
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	
Simulator (optional)	
14 input switches	**6ES7 274-1XK30-0XA0**
SIMATIC Memory Card (optional)	
4 MB	**6ES7 954 -8LC01-0AA0**
12 MB	**6ES7 954 -8LE01-0AA0**
24 MB	**6ES7 954 -8LF01-0AA0**
2 GB	**6ES7 954 -8LP01-0AA0**
Extension cable for two-tier configuration	**6ES7 290-6AA30-0XA0**
for connecting digital/analog signal modules; length 2 m	
Terminal block (spare part)	
for CPU 1217C	
for DI, with 10 screws, tin-plated; 4 units	**6ES7 292-1AK30-0XA0**
for DI, with 16 screws, tin-plated; 4 units	**6ES7 292-1AR30-0XA0**
for DO, with 18 screws, tin-plated; 4 units	**6ES7 292-1AT30-0XA0**
for analog units, with 6 screws, gold-plated; 4 units	**6ES7 292-1BF30-0XB0**
RJ45 cable grip	
4 items per pack	
Dual port	**6ES7 290-3AB30-0XA0**

CPU 1217C

Ordering data	Order No.
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**

	Order No.
STEP 7 Professional / Basic V12	
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	
STEP 7 Professional V12, Floating License	**6ES7 822-1AA02-0YA5**
STEP 7 Basic V12, Floating License	**6ES7 822-0AA02-0YA5**

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.

Technical specifications

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

	6AG1 211-1AE31-4XB0 **CPU 1211C DC/DC/DC**	**6AG1 211-1AE31-2XB0** **CPU 1211C DC/DC/DC**
Based on	**6ES7 211-1AE31-0XB0**	**6ES7 211-1AE31-0XB0**
Ambient conditions		
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!

Technical specifications (continued)

	6AG1 211-1BE31-4XB0 CPU 1211C AC/DC/Relay	6AG1 211-1BE31-2XB0 CPU 1211C AC/DC/Relay
Based on	**6ES7 211-1BE31-0XB0**	**6ES7 211-1BE31-0XB0**
Ambient conditions		
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!

Technical specifications (continued)

	6AG1 211-1HE31-4XB0 CPU 1211C DC/DC/Relay	6AG1 211-1HE31-2XB0 CPU 1211C DC/DC/Relay
Based on	**6ES7 211-1HE31-0XB0**	**6ES7 211-1HE31-0XB0**
Ambient conditions		
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!

SIPLUS CPU 1211C

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Ordering data	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;	**6AG1 211-1BE31-4XB0**
• for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C;	**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;	**6AG1 211-1AE31-4XB0**
• for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C;	**6AG1 211-1AE31-2XB0**

	Order No.
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;	**6AG1 211-1HE31-4XB0**
• for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C;	**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)	**6AG1 223-0BD30-4XB0**
• Ambient temperature -25 ... +55 °C	**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 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.

Technical specifications

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

	6AG1 212-1AE31-4XB0 **CPU 1212C DC/DC/DC**	**6AG1 212-1AE31-2XB0** **CPU 1212C DC/DC/DC**
Based on	**6ES7 212-1AE31-0XB0**	**6ES7 212-1AE31-0XB0**
Ambient conditions		
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!

Technical specifications (continued)

	6AG1 212-1BE31-4XB0 CPU 1212C AC/DC/Relay	6AG1 212-1BE31-2XB0 CPU 1212C AC/DC/Relay
Based on	**6ES7 212-1BE31-0XB0**	**6ES7 212-1BE31-0XB0**
Ambient conditions		
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!

Technical specifications (continued)

	6AG1 212-1HE31-4XB0 CPU 1212C AC/DC/Relay	6AG1 212-1HE31-2XB0 CPU 1212C AC/DC/Relay
Based on	**6ES7 212-1HE31-0XB0**	**6ES7 212-1HE31-0XB0**
Ambient conditions		
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!

SIPLUS CPU 1212C

Ordering data	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	**6AG1 212-1BE31-4XB0**
• for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C	**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	**6AG1 212-1AE31-4XB0**
• for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C	**6AG1 212-1AE31-2XB0**

	Order No.
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	**6AG1 212-1HE31-4XB0**
• for areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C	**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)	**6AG1 223-0BD30-4XB0**
• Ambient temperature -25 ... +55 °C	**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

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.

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**
Ambient conditions			
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

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Technical specifications (continued)

Based on	6AG1 214-1AG31-4XB0 CPU 1214C DC/DC/DC 6ES7 214-1AG31-0XB0	6AG1 214-1AG31-5XB0 CPU 1214C DC/DC/DC 6ES7 214-1AG31-0XB0	6AG1 214-1AG31-2XB0 CPU 1214C DC/DC/DC 6ES7 214-1AG31-0XB0
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)
• 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)

Based on	6AG1 214-1BG31-4XB0 CPU 1214C AC/DC/Relay 6ES7 214-1BG31-0XB0	6AG1 214-1BG31-5XB0 CPU 1214C AC/DC/Relay 6ES7 214-1BG31-0XB0	6AG1 214-1BG31-2XB0 CPU 1214C AC/DC/Relay 6ES7 214-1BG31-0XB0
Ambient conditions			
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
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)	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	-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!

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Technical specifications (continued)

Based on	6AG1 214-1HG31-4XB0 CPU 1214C DC/DC/Relay 6ES7 214-1HG31-0XB0	6AG1 214-1HG31-5XB0 CPU 1214C DC/DC/Relay 6ES7 214-1HG31-0XB0	6AG1 214-1HG31-2XB0 CPU 1214C DC/DC/Relay 6ES7 214-1HG31-0XB0
Ambient conditions			
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)	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	-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!

Ordering data

	Order No.
SIPLUS CPU 1214C compact CPU, AC/DC/relay	
(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	
• For areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C	**6AG1 214-1BG31-4XB0**
• For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +60 °C	**6AG1 214-1BG31-5XB0**
• For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C	**6AG1 214-1BG31-2XB0**
SIPLUS CPU 1214C compact CPU, DC/DC/DC	
(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	
• for areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C	**6AG1 214-1AG31-4XB0**
• For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +60 °C	**6AG1 214-1AG31-5XB0**
• For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C	**6AG1 214-1AG31-2XB0**

	Order No.
SIPLUS CPU 1214C compact CPU, DC/DC/relay	
(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	
• For areas with extreme medial exposure (conformal coating); ambient temperature -20 ... +60 °C	**6AG1 214-1HG31-4XB0**
• For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +60 °C	**6AG1 214-1HG31-5XB0**
• For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C	**6AG1 214-1HG31-2XB0**
Accessories	
SIPLUS SB 1223 digital input/outputsignal 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)	**6AG1 223-0BD30-4XB0**
• Ambient temperature -25 ... +55 °C	**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 1214C, page 3/14

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.

	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**
Based on	**6ES7 215-1AG31-0XB0**	**6ES7 215-1AG31-0XB0**	**6ES7 215-1AG31-0XB0**
Ambient conditions			
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)

	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
Based on	**6ES7 215-1AG31-0XB0**	**6ES7 215-1AG31-0XB0**	**6ES7 215-1AG31-0XB0**
Climatic and mechanical conditions for storage and transport			
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

	6AG1 215-1BG31-4XB0 CPU 1215C AC/DC/Relay	6AG1 215-1BG31-5XB0 CPU 1215C AC/DC/Relay	6AG1 215-1BG31-2XB0 CPU 1215C AC/DC/Relay
Based on	**6ES7 215-1BG31-0XB0**	**6ES7 215-1BG31-0XB0**	**6ES7 215-1BG31-0XB0**
Ambient conditions			
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!		
Climatic and mechanical conditions for storage and transport			
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

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Technical specifications (continued)

	6AG1 215-1HG31-4XB0 CPU 1215C DC/DC/Relay
Based on	**6ES7 215-1HG31-0XB0**
Ambient conditions	
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)
• at cold restart	0 °C

	6AG1 215-1HG31-4XB0 CPU 1215C DC/DC/Relay
Based on	**6ES7 215-1HG31-0XB0**
• Relative humidity	
- with condensation	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!
Climatic and mechanical conditions for storage and transport	
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

Ordering data

	Order No.
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	**6AG1 215-1BG31-4XB0**
• For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +60 °C	**6AG1 215-1BG31-5XB0**
• For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C	**6AG1 215-1BG31-2XB0**

	Order No.
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	**6AG1 215-1AG31-4XB0**
• For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +60 °C	**6AG1 215-1AG31-5XB0**
• For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C	**6AG1 215-1AG31-2XB0**

Ordering data

	Order No.
SIPLUS CPU 1215C compact CPU, DC/DC/relay	
(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 (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	**6AG1 215-1HG31-4XB0**
• For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +60 °C	**6AG1 215-1HG31-5XB0**
• For areas with extreme medial exposure (conformal coating); ambient temperature -40 ... +70 °C	**6AG1 215-1HG31-2XB0**

	Order No.
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)	**6AG1 223-0BD30-4XB0**
• Ambient temperature -25 ... +55 °C	**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 1215C, page 3/18

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

Technical specifications

	6ES7 221-1BF32-0XB0 SM 1221 DI 8x24 VDC	6ES7 221-1BH32-0XB0 SM 1221 DI 16x24 VDC
Supply voltage		
24 V DC	Yes	Yes
permissible range, upper limit (DC)	28.8 V	28.8 V
Input current		
from backplane bus 5 V DC, max.	105 mA	130 mA
Digital inputs		
• from load voltage L+ (without load), max.	4 mA; per channel	4 mA; per channel
Output voltage		
Power supply to the transmitters		
• present	Yes	Yes
Power losses		
Power loss, typ.	1.5 W	2.5 W
Digital inputs		
Number/binary inputs	8	16
• In groups of	2	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
Input voltage		
• Type of input voltage		DC
• Rated value, DC	24 V	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)	1 mA	1 mA
• for signal "1", min.	2.5 mA	2.5 mA
• for signal "1", typ.	4 mA; Typical	4 mA; Typical
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
• for interrupt inputs		
- Parameterizable	Yes	Yes
Cable length		
• Cable length, shielded, max.	500 m	500 m
• Cable length unshielded, max.	300 m	300 m
Interrupts/diagnostics/ status information		
Alarms		
• Alarms	Yes	Yes
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Diagnostic functions	Yes	Yes
• Monitoring the supply voltage	Yes	Yes
Diagnostics indication LED		
• for status of the inputs	Yes	Yes
• for maintenance	Yes	Yes
• Status indicator digital input (green)	Yes	Yes
Galvanic isolation		
Galvanic isolation digital inputs		
• between the channels, in groups of	2	4
Degree and class of protection		
IP20	Yes	Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval		Yes
C-TICK	Yes	Yes
FM approval	Yes	Yes
Marine approval		Yes
Climatic and mechanical conditions for storage and transport		
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

Technical specifications (continued)

	6ES7 221-1BF32-0XB0 SM 1221 DI 8x24 VDC	6ES7 221-1BH32-0XB0 SM 1221 DI 16x24 VDC
Mechanical and climatic conditions during operation		
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
Connection method		
required front connector	Yes	Yes
Mechanics/material		
Type of housing (front)		
• Plastic	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weight		
Weight, approx.	170 g	210 g

Ordering data

	Order No.
SM 1221 digital input signal module	
8 inputs, 24 V DC, isolated, current sourcing/sinking	**6ES7 221-1BF32-0XB0**
16 inputs, 24 V DC, isolated, current sourcing/sinking	**6ES7 221-1BH32-0XB0**
Extension cable for two-tier configuration	**6ES7 290-6AA30-0XA0**
for connecting digital/analog signal modules; length 2 m	
Terminal block (spare part)	
for 8/16-channel digital signal modules	
with 7 screws, tin-plated; 4 pcs.	**6ES7 292-1AG40-0XA0**
Front flap set (spare part)	
for 8/16-channel signal modules	**6ES7 291-1BA30-0XA0**

	Order No.
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 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
Input current		
from backplane bus 5 V DC, typ.	50 mA	50 mA
Output voltage		
Power supply to the transmitters		
• Supply current, max.	4 mA; per channel	4 mA; per channel
Power losses		
Power loss, typ.	1 W	1 W
Digital inputs		
Number/binary inputs	4; Current-sourcing	4; Current-sourcing
• In groups of	1	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	5 V	24 V
• for signal "0"	0 to 1 V	0 to 5 V
• for signal "1"	2 to 6 V	15 to 30 V
Input current		
• for signal "0", max. (permissible quiescent current)	3 mA	2 mA
• for signal "1", min.	6 mA	5.8 mA
• for signal "1", typ.		14 mA
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
- at "0" to "1", max.	2 µs	2.5 µs
• for interrupt inputs		
- Parameterizable	Yes	Yes
• for counter/technological functions		
- Parameterizable	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

Technical specifications (continued)

	6ES7 221-3AD30-0XB0 SB 1221 4xDI 5VDC 200kHz	6ES7 221-3BD30-0XB0 SB 1221 4xDI 24VDC 200kHz
Interrupts/diagnostics/ status information		
Alarms		
• Alarms	Yes	Yes
Diagnostic messages		
• Diagnostic functions	Yes	Yes
Diagnostics indication LED		
• for status of the inputs	Yes	Yes
Degree and class of protection		
IP20	Yes	Yes
Standards, approvals, certificates		
Marine approval according to Germanischer Lloyd	Yes	Yes
Climatic and mechanical conditions for storage and transport		
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
Mechanical and climatic conditions during operation		
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
Mechanics/material		
Type of housing (front)		
• Plastic	Yes	Yes
Dimensions		
Width	38 mm	38 mm
Height	62 mm	62 mm
Depth	21 mm	21 mm
Weight		
Weight, approx.	40 g	40 g

Ordering data

	Order No.
SB 1221 digital input signal boards	
4 inputs, 5 V DC, 200 kHz	**6ES7 221-3AD30-0XB0**
4 inputs, 24 V DC, 200 kHz	**6ES7 221-3BD30-0XB0**
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**

	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**

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
Supply voltage					
permissible range, lower limit (DC)					5 V
permissible range, upper limit (DC)					30 V
Input current					
from backplane bus 5 V DC, max.	120 mA	140 mA	120 mA	135 mA	140 mA
Digital inputs					
• from load voltage L+ (without load), max.			11 mA/relay coil	11 mA/relay coil	16.7 mA/relay coil
Power losses					
Power loss, typ.	1.5 W	2.5 W	4.5 W	8.5 W	5 W
Digital inputs					
Number/binary inputs					0
Digital outputs					
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			
Switching capacity of the outputs					
• with resistive load, max.	0.5 A	0.5 A	2 A	2 A	2 A
• on lamp load, max.	5 W	5 W			
Output voltage					
• Rated value (AC)					5 to 250 V AC
• Rated value (DC)	24 V	24 V			5 to 30 V DC
• for signal "0", max.	0.1 V; with 10 kOhm load	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			
• for signal "1" permissible range, max.			2 A	2 A	2 A
• 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
Interrupts/diagnostics/ status information					
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
Galvanic isolation					
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
Permissible potential difference between different circuits			750 V AC for 1 minute	750 V AC for 1 minute	750 V AC for 1 minute

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
Degree and class of protection					
IP20	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
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
Climatic and mechanical conditions for storage and transport					
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
Mechanical and climatic conditions during operation					
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
Connection method					
required front connector	Yes	Yes	Yes	Yes	Yes
Mechanics/material					
Type of housing (front)					
• Plastic	Yes	Yes	Yes	Yes	Yes
Dimensions					
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
Weight					
Weight, approx.	180 g	220 g	190 g	260 g	310 g

Ordering data

	Order No.
SM 1222 digital output signal module	
8 outputs, 24 V DC; 0.5 A, 5 W, isolated	**6ES7 222-1BF32-0XB0**
16 outputs, 24 V DC; 0.5 A, 5 W, isolated	**6ES7 222-1BH32-0XB0**
8 relay outputs, 5 ... 30 V DC / 5 ... 250 V AC, 2 A, 30 W DC / 200 W AC	**6ES7 222-1HF32-0XB0**
8 relay outputs, change-over contact, 5 ... 30 V DC / 5 ... 250 V AC, 2 A, 30 W DC / 200 W AC	**6ES7 222-1XF32-0XB0**
16 relay outputs, 5 ... 30 V DC / 5 ... 250 V AC, 2 A, 30 W DC / 200 W AC	**6ES7 222-1HH32-0XB0**
Extension cable for two-tier configuration	**6ES7 290-6AA30-0XA0**
for connecting digital/analog signal modules; length 2 m	

	Order No.
Terminal block (spare part)	
for 8/16-channel digital signal modules	
with 7 screws, tin-plated; 4 pcs.	**6ES7 292-1AG30-0XA0**
Front flap set (spare part)	
for 8/16-channel signal modules	**6ES7 291-1BA30-0XA0**
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**

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

Technical specifications

	6ES7 222-1AD30-0XB0 SB 1222 4xDQ 5VDC 200kHz	6ES7 222-1BD30-0XB0 SB 1222 4xDQ 24VDC 200kHz
Input current		
from backplane bus 5 V DC, typ.	50 mA	50 mA
Output voltage		
Power supply to the transmitters		
• Supply current, max.	4 mA; per channel	4 mA; per channel
Power losses		
Power loss, typ.	1 W	1 W
Digital outputs		
Number/binary outputs	4; MOSFET, solid-state (current-sinking/current-sourcing)	4; MOSFET, solid-state (current-sinking/current-sourcing)
• In groups of	1	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)	5 V	24 V
• for signal "0", max.	0.4 V	0.1 V; with 10 kOhm load
• for signal "1", min.	L+ (-0.5 V)	20 V
• for signal "1", max.	6 V	
Output current		
• for signal "1" rated value	0.1 A	0.1 A
• for signal "1" permissible range, max.	0.11 A	
• for signal "0" residual current, max.		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
Interrupts/diagnostics /status information		
Alarms		
• Alarms	Yes	Yes
Diagnostic messages		
• Diagnostic functions	Yes	Yes
Diagnostics indication LED		
• For status of the outputs	Yes	Yes
Degree and class of protection		
IP20	Yes	Yes
Standards, approvals, certificates		
Marine approval according to Germanischer Lloyd	Yes	Yes
Climatic and mechanical conditions for storage and transport		
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
Mechanical and climatic conditions during operation		
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
Mechanics/material		
Type of housing (front)		
• Plastic	Yes	Yes
Dimensions		
Width	38 mm	38 mm
Height	62 mm	62 mm
Depth	21 mm	21 mm
Weight		
Weight, approx.	40 g	40 g

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**

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
Supply voltage					
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
Input current					
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	
Output voltage					
Power supply to the transmitters					
• present	Yes	Yes	Yes	Yes	Yes
Power losses					
Power loss, typ.	2.5 W	4.5 W	5.5 W	10 W	7.5 W
Digital inputs					
Number/binary inputs	8	16	8	16	8
• In groups of	2	2	2	2	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

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
Input voltage					
• Type of input voltage		DC			AC
• Rated value, DC	24 V	24 V	24 V	24 V	
• for signal "0"		5 V DC at 1 mA			
• for signal "1"		15 V DC at 2.5 mA			
Input current					
• for signal "0", max. (permissible quiescent current)	1 mA	1 mA	1 mA	1 mA	1 mA
• for signal "1", min.	2.5 mA	2.5 mA	2.5 mA	2.5 mA	2.5 mA
• for signal "1", typ.	4 mA; Typical	4 mA; Typical	4 mA; Typical	4 mA; Typical	9 mA; Typical
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	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
• for interrupt inputs					
- Parameterizable	Yes	Yes	Yes	Yes	Yes
Cable length					
• Cable length, shielded, max.	500 m	500 m	500 m	500 m	500 m
• Cable length unshielded, max.	300 m	300 m	300 m	300 m	300 m
Digital outputs					
Number/binary outputs	8	16	8	16	8
• In groups of	1	1	2	4	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.	0.5 A	0.5 A	2 A	2 A	2 A
• on lamp load, max.	5 W	5 W			
Output voltage					
• Rated value (DC)	24 V	24 V			
• for signal "0", max.	0.1 V; with 10 kOhm load	0.1 V; with 10 kOhm load			
• for signal "1", min.	20 V DC	20 V DC			
Output current					
• for signal "1" permissible range, max.	0.5 A	0.5 A	2 A	2 A	2 A
• 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; 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
Interrupts/diagnostics/ status information					
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
Galvanic isolation					
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
Permissible potential difference between different circuits			750 V AC for 1 minute	750 V AC for 1 minute	750 V AC for 1 minute
Degree and class of protection					
IP20	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
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

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
Climatic and mechanical conditions for storage and transport					
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
Mechanical and climatic conditions during operation					
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
Connection method					
required front connector	Yes	Yes	Yes	Yes	Yes
Mechanics/material					
Type of housing (front)					
• Plastic	Yes	Yes	Yes	Yes	Yes
Dimensions					
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
Weight					
Weight, approx.	210 g	310 g	230 g	350 g	230 g

Ordering data

	Order No.
SM 1223 digital input/output signal module	
8 inputs, 24 V DC, IEC type 1 current sinking; 8 24 V DC transistor outputs, 0.5 A, 5 W	**6ES7 223-1BH32-0XB0**
16 inputs, 24 V DC, IEC type 1 current sinking; 16 24 V DC transistor outputs, 0.5 A, 5 W	**6ES7 223-1BL32-0XB0**
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	**6ES7 223-1PH32-0XB0**
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	**6ES7 223-1PL32-0XB0**
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	**6ES7 223-1QH32-0XB0**
Extension cable for two-tier configuration	**6ES7 290-6AA30-0XA0**
for connecting digital/analog signal modules; length 2 m	
Terminal block (spare part)	
for 8/16-channel digital signal modules	
with 7 screws, tin-plated; 4 pcs.	**6ES7 292-1AG40-0XA0**

	Order No.
Front flap set (spare part)	
for 8/16-channel signal modules	**6ES7 291-1BA30-0XA0**
for 32-channel signal modules	**6ES7 291-1BB30-0XA0**
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**

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
Supply voltage			
permissible range, lower limit (DC)	20.4 V		
permissible range, upper limit (DC)	30 V		
Input current			
from backplane bus 5 V DC, typ.	50 mA	50 mA	50 mA
Output voltage			
Power supply to the transmitters			
• Supply current, max.	4 mA; per channel	4 mA; per channel	4 mA; per channel
Power losses			
Power loss, typ.	1 W	1 W	1 W
Digital inputs			
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
Input voltage			
• 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
Input current			
• 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		
Digital outputs			
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		
Interrupts/diagnostics/ status information			
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
Degree and class of protection			
IP20	Yes	Yes	Yes
Standards, approvals, certificates			
Marine approval according to Germanischer Lloyd	Yes	Yes	Yes

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
Climatic and mechanical conditions for storage and transport			
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
Mechanical and climatic conditions during operation			
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
Mechanics/material			
Type of housing (front)			
• Plastic	Yes	Yes	Yes
Dimensions			
Width	38 mm	38 mm	38 mm
Height	62 mm	62 mm	62 mm
Depth	21 mm	21 mm	21 mm
Weight			
Weight, approx.	40 g	40 g	40 g

Ordering data

	Order No.
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**

	Order No.
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.

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**
Ambient conditions				
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)

	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**
Climatic and mechanical conditions for storage and transport				
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
Mechanical and climatic conditions during operation				
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

	Order No.
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)	**6AG1 221-1BF30-4XB0**
• -25 ... +70 °C, from +60 … +70 °C number of simultaneously controllable inputs and outputs max. 50 %	**6AG1 221-1BF30-2XB0**
16 inputs, 24 V DC, isolated, current sourcing/sinking	
• Suitable for areas with extraordinary medial exposure (conformal coating)	**6AG1 221-1BH30-4XB0**
• -25 ... +70 °C, from +60 … +70 °C number of simultaneously controllable inputs and outputs max. 50 %	**6AG1 221-1BH30-2XB0**

	Order No.
Accessories	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.

Technical specifications

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

	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
Based on	**6ES7 222-1BF30-0XB0**	**6ES7 222-1BF30-0XB0**	**6ES7 222-1BH30-0XB0**	**6ES7 222-1BH30-0XB0**
Ambient conditions				
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!

SIPLUS SM 1222 digital output modules

Technical specifications (continued)

Based on	6AG1 222-1BF30-2XB0 SM 1222 DQ 8x24 VDC 6ES7 222-1BF30-0XB0	6AG1 222-1BF30-4XB0 SM 1222 DQ 8x24 VDC 6ES7 222-1BF30-0XB0	6AG1 222-1BH30-2XB0 SM 1222 DQ 16x24 VDC 6ES7 222-1BH30-0XB0	6AG1 222-1BH30-4XB0 SM 1222 DQ 16x24 VDC 6ES7 222-1BH30-0XB0
Climatic and mechanical conditions for storage and transport				
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
Mechanical and climatic conditions during operation				
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

Based on	6AG1 222-1HF30-2XB0 SM 1222 DQ 8xRelay 6ES7 222-1HF30-0XB0	6AG1 222-1HF30-4XB0 SM 1222 DQ 8xRelay 6ES7 222-1HF30-0XB0	6AG1 222-1HH30-2XB0 SM 1222 DQ 16xRelay 6ES7 222-1HH30-0XB0	6AG1 222-1HH30-4XB0 SM 1222 DQ 16xRelay 6ES7 222-1HH30-0XB0
Ambient conditions				
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)

	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
Based on	**6ES7 222-1HF30-0XB0**	**6ES7 222-1HF30-0XB0**	**6ES7 222-1HH30-0XB0**	**6ES7 222-1HH30-0XB0**
Climatic and mechanical conditions for storage and transport				
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
Mechanical and climatic conditions during operation				
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

	Order No.
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)	**6AG1 222-1BF30-4XB0**
• -25 ... +70 °C, from +60 … +70°C number of simultaneously controllable inputs and outputs max. 50 %	**6AG1 222-1BF30-2XB0**
16 outputs, 24 V DC; 0.5 A, 5 W, isolated	
• Suitable for areas with extraordinary medial exposure (conformal coating)	**6AG1 222-1BH30-4XB0**
• -25 ... +70 °C, from +60 … +70°C number of simultaneously controllable inputs and outputs max. 50 %	**6AG1 222-1BH30-2XB0**
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)	**6AG1 222-1HF30-4XB0**
• -25 ... +70 °C, from +60 … +70°C number of simultaneously controllable inputs and outputs max. 50 %	**6AG1 222-1HF30-2XB0**
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)	**6AG1 222-1HH30-4XB0**
• -25 ... +70 °C, from +60 … +70°C number of simultaneously controllable inputs and outputs max. 50 %	**6AG1 222-1HH30-2XB0**
Accessories	See SIMATIC S7-1200 SM 1222 digital output. page 3/49

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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.

	6AG1 223-1BH30-2XB0 **SM 1223 DI 8x24 VDC, DQ 8x24 VDC**	**6AG1 223-1BH30-4XB0** **SM 1223 DI 8x24 VDC, DQ 8x24 VDC**	**6AG1 223-1PH30-2XB0** **SM 1223 DI 8x24 VDC, DQ 8xRelay**	**6AG1 223-1PH30-4XB0** **SM 1223 DI 8x24 VDC, DQ 8xRelay**
Based on	**6ES7 223-1BH30-0XB0**	**6ES7 223-1BH30-0XB0**	**6ES7 223-1PH30-0XB0**	**6ES7 223-1PH30-0XB0**
Ambient conditions				
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)

Based on	6AG1 223-1BH30-2XB0 SM 1223 DI 8x24 VDC, DQ 8x24 VDC 6ES7 223-1BH30-0XB0	6AG1 223-1BH30-4XB0 SM 1223 DI 8x24 VDC, DQ 8x24 VDC 6ES7 223-1BH30-0XB0	6AG1 223-1PH30-2XB0 SM 1223 DI 8x24 VDC, DQ 8xRelay 6ES7 223-1PH30-0XB0	6AG1 223-1PH30-4XB0 SM 1223 DI 8x24 VDC, DQ 8xRelay 6ES7 223-1PH30-0XB0
Climatic and mechanical conditions for storage and transport				
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
Mechanical and climatic conditions during operation				
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

Based on	6AG1 223-1PL30-2XB0 SM 1223 DI 16x24 VDC, DQ 16xRelay 6ES7 223-1PL30-0XB0	6AG1 223-1PL30-4XB0 SM 1223 DI 16x24 VDC, DQ 16xRelay 6ES7 223-1PL30-0XB0	6AG1 223-1BL30-2XB0 SM 1223 DI 16x24 VDC, DQ 16x24 VDC 6ES7 223-1BL30-0XB0	6AG1 223-1BL30-4XB0 SM 1223 DI 16x24 VDC, DQ 16x24 VDC 6ES7 223-1BL30-0XB0
Ambient conditions				
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)

	6AG1 223-1PL30-2XB0 SM 1223 DI 16x24 VDC, DQ 16xRelay	6AG1 223-1PL30-4XB0 SM 1223 DI 16x24 VDC, DQ 16xRelay	6AG1 223-1BL30-2XB0 SM 1223 DI 16x24 VDC, DQ 16x24 VDC	6AG1 223-1BL30-4XB0 SM 1223 DI 16x24 VDC, DQ 16x24 VDC
Based on	**6ES7 223-1PL30-0XB0**	**6ES7 223-1PL30-0XB0**	**6ES7 223-1BL30-0XB0**	**6ES7 223-1BL30-0XB0**
Climatic and mechanical conditions for storage and transport				
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
Mechanical and climatic conditions during operation				
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

	Order No.
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)	**6AG1 223-1BH30-4XB0**
• -25 ... +70 °C, from +60 … +70 °C number of simultaneously controllable inputs and outputs max. 50 %	**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)	**6AG1 223-1BL30-4XB0**
• -25 ... +70 °C, from +60 … +70 °C number of simultaneously controllable inputs and outputs max. 50 %	**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)	**6AG1 223-1PH30-4XB0**
• -25 ... +70 °C, from +60 … +70 °C number of simultaneously controllable inputs and outputs max. 50 %	**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)	**6AG1 223-1PL30-4XB0**
• -25 ... +70 °C, from +60 … +70 °C number of simultaneously controllable inputs and outputs max. 50 %	**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-CPUs
- 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 223-0BD30-4XB0 **SB 1223 DI2x24 VDC, DQ 2x24 VDC**	**6AG1 223-0BD30-5XB0** **SB 1223 DI2x24 VDC, DQ 2x24 VDC**
Based on	**6ES7 223-0BD30-0XB0**	**6ES7 223-0BD30-0XB0**
Ambient conditions		
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!
Climatic and mechanical conditions for storage and transport		
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
Mechanical and climatic conditions during operation		
Climatic conditions in operation		
• Temperature		
- Min.	0 °C; = Tmin	-25 °C; = Tmin
- max.	55 °C; = Tmax	55 °C; = Tmax

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)	**6AG1 223-0BD30-4XB0**
• Ambient temperature -25 ... +55 °C	**6AG1 223-0BD30-5XB0**

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

Technical specifications

	6ES7 231-4HD32-0XB0	6ES7 231-4HF32-0XB0	6ES7 231-5ND32-0XB0
Supply voltage			
24 V DC	Yes		Yes
Input current			
Current consumption, typ.	45 mA		65 mA
from backplane bus 5 V DC, typ.	80 mA		80 mA
Power losses			
Power loss, typ.	1.5 W		1.8 W
Analog inputs			
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
Input ranges			
• Voltage	Yes; ±10 V, ±5 V, ±2.5 V	Yes; ±10 V, ±5 V, ±2.5 V	Yes; ±10 V, ±5 V, ±2.5 V o. ±1.25 V
• Current	Yes; 4 to 20 mA, 0 to 20 mA	Yes; 4 to 20 mA, 0 to 20 mA	Yes; 4 to 20 mA, 0 to 20 mA
Input ranges (rated values), voltages			
• -1.25 to +1.25 V			Yes
• -10 V to +10 V	Yes	Yes	Yes
• Input resistance (-10 V to +10 V)	≥9 MOhm	≥9 MOhm	≥9 MOhm
• -2.5 V to +2.5 V	Yes	Yes	Yes
• Input resistance (-2.5 V to +2.5 V)	≥9 MOhm	≥9 MOhm	≥9 MOhm
• -5 V to +5 V	Yes	Yes	Yes
• Input resistance (-5 V to +5 V)	≥9 MOhm	≥9 MOhm	≥9 MOhm
Input ranges (rated values), currents			
• 0 to 20 mA	Yes		Yes
• Input resistance (0 to 20 mA)	280 Ω		
• 4 to 20 mA	Yes	Yes	Yes

Technical specifications (continued)

	6ES7 231-4HD32-0XB0	6ES7 231-4HF32-0XB0	6ES7 231-5ND32-0XB0
Analog value creation			
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
Errors/accuracies			
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
Interrupts/diagnostics/ status information			
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
Galvanic isolation			
Galvanic isolation analog outputs			
• between the channels and the power supply of the electronics	No	No	No
Degree and class of protection			
IP20	Yes	Yes	Yes
Standards, approvals, certificates			
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
Climatic and mechanical conditions for storage and transport			
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
Mechanical and climatic conditions during operation			
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			
- SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Connection method			
required front connector	Yes	Yes	Yes
Mechanics/material			
Type of housing (front)			
• Plastic	Yes	Yes	Yes
Dimensions			
Width	45 mm	45 mm	45 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weight			
Weight, approx.	180 g	180 g	180 g

SM 1231 analog input modules

Ordering data	Order No.
SM 1231 analog input signal module	
4 analog inputs, ± 10V, ± 5V, ± 2.5V, or 0 ... 20 mA, 16 bits	**6ES7 231-5ND32-0XB0**
4 analog inputs, ± 10V, ± 5V, ± 2.5V, or 0 ... 20 mA,12 bits + sign	**6ES7 231-4HD32-0XB0**
8 analog inputs, ± 10V, ± 5V, ± 2.5V, or 0 ... 20 mA,12 bits + sign	**6ES7 231-4HF32-0XB0**
Extension cable for two-tier configuration	**6ES7 290-6AA30-0XA0**
for connecting digital/analog signal modules; length 2 m	
Terminal block (spare part)	
for 8/16-channel analog signal modules	
with 7 screws, gold-plated; 4 pcs.	**6ES7 292-1BG30-0XA0**
Front flap set (spare part)	
for 8/16-channel signal modules	**6ES7 291-1BA30-0XA0**

	Order No.
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

- 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
Supply voltage	
24 V DC	Yes
Input current	
from backplane bus 5 V DC, typ.	55 mA
Power losses	
Power loss, typ.	0.4 W
Analog inputs	
Number of analog inputs	1; 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.	156.25 µs; 400 Hz suppression
Input ranges	
• Voltage	Yes; ±10 V, ±5 V, ±2.5 V
• Current	Yes; 0 to 20 mA
• Thermocouple	No
• Resistance thermometer	No
• Resistance	No
Input ranges (rated values), voltages	
• -10 V to +10 V	Yes
• Input resistance (-10 V to +10 V)	≥9 MOhm
• -2.5 V to +2.5 V	Yes
• Input resistance (-2.5 V to +2.5 V)	≥9 MOhm
• -5 V to +5 V	Yes
• Input resistance (-5 V to +5 V)	≥9 MOhm
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• Input resistance (0 to 20 mA)	≥ 250 ohms

	6ES7 231-4HA30-0XB0 SB1231 AI 1x12 BIT
Analog value creation	
Measurement principle	integrating
Integrations and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	11 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 Hz
Smoothing of measured values	
• Parameterizable	Yes
• Step: None	Yes
• Step: low	Yes
• Step: Medium	Yes
• Step: High	Yes
Errors/accuracies	
Temperature error (relative to input area)	25 °C ±0.3% to 55 °C ±0.6% total measurement range
Interrupts/diagnostics/ status information	
Alarms	
• Alarms	Yes
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic functions	Yes
• Wire break	No
Diagnostics indication LED	
• for status of the inputs	Yes
• for maintenance	Yes
Degree and class of protection	
IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
C-TICK	Yes
FM approval	Yes

Technical specifications (continued)

	6ES7 231-4HA30-0XB0 SB1231 AI 1x12 BIT
Climatic and mechanical conditions for storage and transport	
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
Mechanical and climatic conditions during operation	
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	
- SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free

	6ES7 231-4HA30-0XB0 SB1231 AI 1x12 BIT
Connection method	
required front connector	Yes
Mechanics/material	
Type of housing (front)	
• Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weight	
Weight, approx.	35 g

Ordering data

	Order No.
SB 1231 analog input signal board	
1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6ES7 231-4HA30-0XB0**
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**

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
Supply voltage		
24 V DC	Yes	Yes
Input current		
Current consumption, typ.	45 mA	45 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
Power losses		
Power loss, typ.	1.5 W	1.5 W
Analog inputs		
Number of analog inputs	0	
Thermocouple (TC)		
• Temperature compensation		
- Parameterizable	No	No
Analog outputs		
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.	1 000 Ω	1 000 Ω
• with current outputs, max.	600 Ω	600 Ω
Analog value creation		
Measurement principle	Differential	Differential
Integrations and conversion time/ resolution per channel		
• Resolution (incl. overrange)	Voltage: 14 bits; Current : 13 bits	Voltage: 14 bits; Current : 13 bits
• Integration time, parameterizable	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

Technical specifications (continued)

	6ES7 232-4HB32-0XB0 SM 1232 AQ 2x14 bit	6ES7 232-4HD32-0XB0 SM 1232 AQ 4 x 14bit
Errors/accuracies		
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 x (f1 +/- 1%), f1 = interference frequency		
• common mode voltage, max.	12 V	12 V
Interrupts/diagnostics/ status information		
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
Degree and class of protection		
IP20	Yes	Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
C-TICK	Yes	Yes
FM approval	Yes	Yes
Climatic and mechanical conditions for storage and transport		
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
Mechanical and climatic conditions during operation		
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		
- SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 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
Connection method		
required front connector	Yes	Yes
Mechanics/material		
Type of housing (front)		
• Plastic	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weight		
Weight, approx.	180 g	180 g

Ordering data

	Order No.
SM 1232 analog output signal module	
2 analog outputs, ±10 V with 14 bits or 0 ... 20 mA with 13 bits	**6ES7 232-4HB32-0XB0**
4 analog outputs, ±10 V with 14 bits or 0 ... 20 mA with 13 bits	**6ES7 232-4HD32-0XB0**
Terminal block (spare part)	
for 8/16-channel analog signal modules	
with 7 screws, gold-plated; 4 pcs.	**6ES7 292-1BG30-0XA0**
Extension cable for two-tier configuration	**6ES7 290-6AA30-0XA0**
for connecting digital/analog signal modules; length 2 m	
Front flap set (spare part)	**6ES7 291-1BA30-0XA0**
for 8/16-channel signal modules	

	Order No.
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**

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
Input current	
from backplane bus 5 V DC, typ.	15 mA
Output voltage	
Power supply to the transmitters	
• Supply current, max.	25 mA
Power losses	
Power loss, typ.	1.5 W
Analog outputs	
Number of analog outputs	1
Cycle time (all channels) max.	Voltage: 300 µS (R), 750 µS (1 uF) 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.	1 000 Ω
• with current outputs, max.	600 Ω
Cable length	
• Cable length, shielded, max.	10 m; Shielded, twisted wire pair
Analog value creation	
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
Errors/accuracies	
Temperature error (relative to output area)	25°C ±0.5% bis 55°C ±1%
Interrupts/diagnostics/ status information	
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
Degree and class of protection	
IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
C-TICK	Yes
FM approval	Yes
Climatic and mechanical conditions for storage and transport	
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
Mechanical and climatic conditions during operation	
Climatic conditions in operation	
• Temperature	
- Permissible temperature range	0 °C to 55 °C horizontal installation 0 °C to 45 °C vertical installation
• Pollutant concentrations	
- SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Mechanics/material	
Type of housing (front)	
• Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weight	
Weight, approx.	40 g

Ordering data

	Order No.
SB 1232 analog output signal board	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6ES7 232-4HA30-0XB0**
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**

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

	6ES7 234-4HE32-0XB0 SM 1234 A I4x13 bit AQ 2x14 bit
Supply voltage	
24 V DC	Yes
Input current	
Current consumption, typ.	60 mA
from backplane bus 5 V DC, typ.	80 mA
Power losses	
Power loss, typ.	2 W
Analog inputs	
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
Input ranges	
• Voltage	Yes; ±10 V, ±5 V, ±2.5 V
• Current	Yes; 0 to 20 mA
• Thermocouple	No
• Resistance thermometer	No
• Resistance	No
Input ranges (rated values), voltages	
• -10 V to +10 V	Yes
• Input resistance (-10 V to +10 V)	≥9 MOhm
• -2.5 V to +2.5 V	Yes
• Input resistance (-2.5 V to +2.5 V)	≥9 MOhm
• -5 V to +5 V	Yes
• Input resistance (-5 V to +5 V)	≥9 MOhm

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

Technical specifications (continued)

	6ES7 234-4HE32-0XB0 SM 1234 A I4x13 bit AQ 2x14 bit
Errors/accuracies	
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 x (f1 +/- 1%), f1 = interference frequency	
• common mode voltage, max.	12 V
Interrupts/diagnostics/ status information	
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
Galvanic isolation	
Galvanic isolation analog outputs	
• between the channels and the power supply of the electronics	No
Degree and class of protection	
IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
C-TICK	Yes
FM approval	Yes

	6ES7 234-4HE32-0XB0 SM 1234 A I4x13 bit AQ 2x14 bit
Climatic and mechanical conditions for storage and transport	
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
Mechanical and climatic conditions during operation	
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	
- SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Connection method	
required front connector	Yes
Mechanics/material	
Type of housing (front)	
• Plastic	Yes
Dimensions	
Width	45 mm
Height	100 mm
Depth	75 mm
Weight	
Weight, approx.	220 g

SM 1234 analog input/output modules

Ordering data	Order No.
SM 1234 analog input/output signal module	
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	**6ES7 234-4HE32-0XB0**
Terminal block (spare part)	
for 8/16-channel analog signal modules	
with 7 screws, gold-plated; 4 pcs.	**6ES7 292-1BG30-0XA0**
Extension cable for two-tier configuration	**6ES7 290-6AA30-0XA0**
for connecting digital/analog signal modules; length 2 m	
Front flap set (spare part)	
for 8/16-channel signal modules	**6ES7 291-1BA30-0XA0**

	Order No.
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 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 (±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
Supply voltage		
24 V DC	Yes	Yes
Input current		
Current consumption, typ.	40 mA	80 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
Power losses		
Power loss, typ.	1.5 W	1.5 W
Analog inputs		
Number of analog inputs	4; Thermocouples	8; Thermocouples
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
Input ranges		
• 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
Input ranges (rated values), voltages		
• -80 mV to +80 mV	Yes	Yes
Input ranges (rated values), thermoelements		
• Type C	Yes	Yes
• Type E	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type N	Yes	Yes
• Type R	Yes	Yes
• Type S	Yes	Yes
• Type T	Yes	Yes
• Type TXK/TXK(L) to GOST	Yes	Yes
Thermocouple (TC)		
• permissible input voltage for voltage input (destruction limit), max.	+-35V	+-35V
• Temperature compensation		
- Parameterizable	No	No
Analog value creation		
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 50 / 60 / 400 Hz

Technical specifications (continued)

	6ES7 231-5QD30-0XB0 SM1231 TC 4x16 bit	6ES7 231-5QF30-0XB0 SM 1231 TC 8x16bit
Analog value generation (in isochronous mode)		
Smoothing of measured values		
• Parameterizable	Yes	Yes
Errors/accuracies		
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
Interrupts/diagnostics/ status information		
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
Degree and class of protection		
IP20	Yes	Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
C-TICK	Yes	Yes
FM approval	Yes	Yes
Climatic and mechanical conditions for storage and transport		
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

Technical specifications (continued)

	6ES7 231-5QD30-0XB0 SM1231 TC 4x16 bit	6ES7 231-5QF30-0XB0 SM 1231 TC 8x16bit
Mechanical and climatic conditions during operation		
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		
- SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Connection method		
required front connector	Yes	Yes
Mechanics/material		
Type of housing (front)		
• Plastic	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weight		
Weight, approx.	180 g	220 g

Ordering data

	Order No.
SM 1231 thermocouple module	
4 inputs +/- 80 mV, resolution 15 bits + sign, thermocouple types J, K, S, T, R, E, N	**6ES7 231-5QD30-0XB0**
8 inputs +/- 80 mV, resolution 15 bits + sign, thermocouple types J, K, T, E, R, S, N, C, TXK/XK(L)	**6ES7 231-5QF30-0XB0**
Accessories	
Terminal block (spare part)	
for 8/16-channel analog signal modules	
with 7 screws, gold-plated; 4 pcs.	**6ES7 292-1BG30-0XA0**
Extension cable for two-tier configuration	
for connecting digital/analog signal modules; length 2 m	**6ES7 290-6AA30-0XA0**
Front flap set (spare part)	
for 8/16-channel signal modules	**6ES7 291-1BA30-0XA0**

	Order No.
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**

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 (±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
Supply voltage	
24 V DC	Yes
Input current	
Current consumption, typ.	5 mA
from backplane bus 5 V DC, typ.	20 mA
Power losses	
Power loss, typ.	0.5 W
Analog inputs	
Number of analog inputs	1; Thermocouples
permissible input frequency for current input (destruction limit), max.	± 35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/ degrees Fahrenheit
Input ranges	
• Thermocouple	Yes; J, K; voltage range ±80 MV
Input ranges (rated values), voltages	
• -80 mV to +80 mV	Yes
Input ranges (rated values), thermoelements	
• Type J	Yes
• Input resistance (type J)	1200°C
• Type K	Yes
• Input resistance (Type K)	1372°C
Thermocouple (TC)	
• permissible input voltage for voltage input (destruction limit), max.	+-35V
• Temperature compensation	
- Parameterizable	No
Analog value creation	
Measurement principle	integrating
Integrations and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	15 bit; + sign
• Integration time, parameterizable	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 10 / 50 / 60 / 400 Hz

	6ES7 231-5QA30-0XB0 SB1231 AI 1xTC
Analog value generation (in isochronous mode)	
Smoothing of measured values	
• Parameterizable	Yes
Errors/accuracies	
Temperature error (relative to input area)	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
Interrupts/diagnostics/ status information	
Alarms	
• Alarms	Yes
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic functions	Yes; Can be read out
• Wire break	Yes
Diagnostics indication LED	
• for status of the inputs	Yes
• for maintenance	Yes
Degree and class of protection	
IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
C-TICK	Yes
FM approval	Yes
Climatic and mechanical conditions for storage and transport	
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

Technical specifications (continued)

	6ES7 231-5QA30-0XB0 SB1231 AI 1xTC
Mechanical and climatic conditions during operation	
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	
- SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free

	6ES7 231-5QA30-0XB0 SB1231 AI 1xTC
Connection method	
required front connector	Yes
Mechanics/material	
Type of housing (front)	
• Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weight	
Weight, approx.	35 g

Ordering data

	Order No.
SB 1231 thermocouple signal board	**6ES7 231-5QA30-0XB0**
1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K	
Accessories	
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**

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
Supply voltage		
24 V DC	Yes	Yes
Input current		
Current consumption, typ.	40 mA	90 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
Power losses		
Power loss, typ.	1.5 W	1.5 W
Analog inputs		
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
Input ranges		
• 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
Input ranges (rated values), resistance thermometers		
• 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
Input ranges (rated values), resistors		
• 0 to 150 ohms	Yes	Yes
• 0 to 300 ohms	Yes	Yes
• 0 to 600 ohms	Yes	Yes
Thermocouple (TC)		
• Temperature compensation		
- Parameterizable	No	No

Technical specifications (continued)

	6ES7 231-5PD30-0XB0 SM1231 RTD 4x16bit	6ES7 231-5PF30-0XB0 SM 1231 RTD 8x16bit
Analog value creation		
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
Errors/accuracies		
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
Interrupts/diagnostics/ status information		
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
Degree and class of protection		
IP20	Yes	Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
C-TICK	Yes	Yes
FM approval	Yes	Yes
Climatic and mechanical conditions for storage and transport		
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

Technical specifications (continued)

	6ES7 231-5PD30-0XB0 SM1231 RTD 4x16bit	6ES7 231-5PF30-0XB0 SM 1231 RTD 8x16bit
Mechanical and climatic conditions during operation		
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		
- SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Connection method		
required front connector	Yes	Yes
Mechanics/material		
Type of housing (front)		
• Plastic	Yes	Yes
Dimensions		
Width	45 mm	70 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weight		
Weight, approx.	220 g	220 g

Ordering data

	Order No.
SM 1231 RTD signal module	
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	**6ES7 231-5PD30-0XB0**
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	**6ES7 231-5PF30-0XB0**
Accessories	
Terminal block (spare part)	
for 8/16-channel analog signal modules	
with 7 screws, gold-plated; 4 pcs.	**6ES7 292-1BG30-0XA0**
Extension cable for two-tier configuration	
for connecting digital/analog signal modules; length 2 m	**6ES7 290-6AA30-0XA0**
Front flap set (spare part)	
for 8/16-channel signal modules	**6ES7 291-1BA30-0XA0**

	Order No.
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 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
Supply voltage	
24 V DC	Yes
Input current	
Current consumption, typ.	5 mA
from backplane bus 5 V DC, typ.	20 mA
Power losses	
Power loss, typ.	0.5 W
Analog inputs	
Number of analog inputs	1; Resistance thermometer
permissible input frequency for current input (destruction limit), max.	± 35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/ degrees Fahrenheit
Input ranges	
• Resistance thermometer	Yes; Platinum (Pt)
• Resistance	Yes; 150 Ω, 300 Ω, 600 Ω
Input ranges (rated values), voltages	
• Input resistance (-80 mV to +80 mV)	>= 10 MOhm
Input ranges (rated values), resistance thermometers	
• Pt 100	Yes
• Input resistance (Pt 100)	100 Ω
• Pt 1000	Yes
• Input resistance (Pt 1000)	1 000 Ω
• Pt 200	Yes
• Input resistance (Pt 200)	200 Ω
• Pt 500	Yes
• Input resistance (Pt 500)	500 Ω
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
• 0 to 600 ohms	Yes
Thermocouple (TC)	
• Temperature compensation	
- Parameterizable	No
Analog value creation	
Measurement principle	integrating
Integrations and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	15 bit; + sign
• Integration time, parameterizable	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 10 / 50 / 60 / 400 Hz

	6ES7 231-5PA30-0XB0 SB1231 AI 1xRTD
Errors/accuracies	
Temperature error (relative to input area)	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
Interrupts/diagnostics/ status information	
Alarms	
• Alarms	Yes
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic functions	Yes; Can be read out
• Wire break	Yes
Diagnostics indication LED	
• for status of the inputs	Yes
• for maintenance	Yes
Degree and class of protection	
IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
C-TICK	Yes
FM approval	Yes
Climatic and mechanical conditions for storage and transport	
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

Technical specifications (continued)

	6ES7 231-5PA30-0XB0 SB1231 AI 1xRTD
Mechanical and climatic conditions during operation	
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	
- SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free

	6ES7 231-5PA30-0XB0 SB1231 AI 1xRTD
Connection method	
required front connector	Yes
Mechanics/material	
Type of housing (front)	
• Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weight	
Weight, approx.	35 g

Ordering data

	Order No.
SB 1231 RTD signal board	**6ES7 231-5PA30-0XB0**
1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	

	Order No.
Accessories	
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

- 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.

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**
Ambient conditions		
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!
Climatic and mechanical conditions for storage and transport		
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
Mechanical and climatic conditions during operation		
Climatic conditions in operation		
• Temperature		
- Min.	-25 °C; = Tmin	0 °C; = Tmin
- max.	70 °C; = Tmax	55 °C; = Tmax

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 ±10 V, ±5 V, ±2.5 V, or 0 ... 20 mA; 12 bits + sign	**6AG1 231-4HD30-2XB0**
Ambient temperature range 0 ... +55 °C	
4 analog inputs ±10 V, ±5 V, ±2.5 V, or 0 ... 20 mA; 12 bits + sign	**6AG1 231-4HD30-4XB0**

	Order No.
Accessories	See SIMATIC S7-1200 SM 1231 analog input, page 3/74

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.

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**
Ambient conditions		
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!
Climatic and mechanical conditions for storage and transport		
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
Mechanical and climatic conditions during operation		
Climatic conditions in operation		
• Temperature		
- Min.	-25 °C; = Tmin	0 °C; = Tmin
- max.	70 °C; = Tmax	55 °C; = Tmax

SIPLUS SM 1232 analog output modules

Ordering data	Order No.
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**

	Order No.
Accessories	See SIMATIC S7-1200 SM 1232 analog output, page 3/79

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**	**6AG1 232-4HA30-5XB0** **SB 1232 1x AO**
Based on	**6ES7 232-4HA30-0XB0**	**6ES7 232-4HA30-0XB0**
Ambient conditions		
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!
Climatic and mechanical conditions for storage and transport		
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
Mechanical and climatic conditions during operation		
Climatic conditions in operation		
• Temperature		
- Min.	0 °C; = Tmin	-25 °C; = Tmin
- max.	55 °C; = Tmax	55 °C; = Tmax

SIPLUS SB 1232 analog output modules

Ordering data	Order No.
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**

	Order No.
Accessories	See SIMATIC S7-1200 SB 1232 analog output, page 3/81

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.

Technical specifications

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

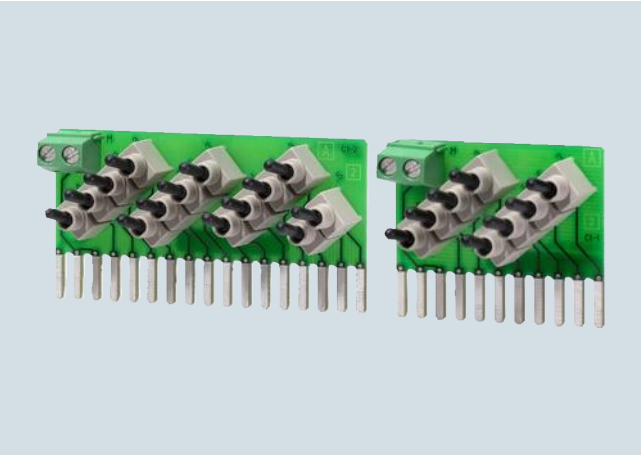
	6AG1 234-4HE30-2XB0 **SM 1234 A I4x13 bit AQ 2x14 bit**	**6AG1 234-4HE30-4XB0** **SM 1234 A I4x13 bit AQ 2x14 bit**
Based on	**6ES7 234-4HE30-0XB0**	**6ES7 234-4HE30-0XB0**
Ambient conditions		
Extended ambient conditions		
• Relative to ambient temperature-atmospheric pressure-installation altitude	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!
Climatic and mechanical conditions for storage and transport		
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
Mechanical and climatic conditions during operation		
Climatic conditions in operation		
• Temperature		
- Min.	-25 °C; = Tmin	0 °C; = Tmin
- max.	70 °C; = Tmax	55 °C; = Tmax

SIPLUS SM 1234 analog input/output modules

Ordering data	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**

	Order No.
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

Ordering data

	Order No.
Digital input simulator SIM 1274 simulator module (optional)	
with 8 input switches, for CPU 1211C, CPU 1212C	**6ES7 274-1XF30-0XA0**
with 14 input switches, for CPU 1214C, 1215C	**6ES7 274-1XH30-0XA0**
with 14 input switches, for CPU 1217C	**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**

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
Interrupts/diagnostics/ status information	
Alarms	
• Alarms	Yes
Diagnostic messages	
• Diagnostic functions	Yes
Diagnostics indication LED	
• for maintenance	Yes; The maintenance LED (MAINT) of the PLC signals that the battery needs to be replaced.
Degree and class of protection	
IP20	Yes
Standards, approvals, certificates	
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
Climatic and mechanical conditions for storage and transport	
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
Mechanical and climatic conditions during operation	
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
Mechanics/material	
Type of housing (front)	
• Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weight	
Weight, approx.	40 g

Ordering data

	Order No.
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	**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
Supply voltage		
24 V DC	Yes	
permissible range, lower limit (DC)	20.4 V	
permissible range, upper limit (DC)	28.8 V	
Input current		
Current consumption, max.	240 mA; From L5+; logic	220 mA; From L5+; logic
Power losses		
Power loss, typ.	1.2 W	1.1 W
Interfaces		
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	
Climatic and mechanical conditions for storage and transport		
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

Technical specifications (continued)

	6ES7 241-1CH31-0XB0 CM 1241 RS422/485	6ES7 241-1AH30-0XB0 CM 1241 RS232
Mechanical and climatic conditions during operation		
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
Software		
Runtime software		
• Target system		
- S7-1200	Yes	Yes
Dimensions		
Width	30 mm	30 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weight		
Weight, approx.	155 g	150 g

Ordering data

	Order No.
CM 1241 communication module	
Communication module for point-to-point connection, with one RS422/485 interface	**6ES7 241-1CH31-0XB0**
Communication module for point-to-point connection, with one RS232 interface	**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
Input current	
from backplane bus 5 V DC, typ.	50 mA
Power losses	
Power loss, typ.	1.5 W
Interrupts/diagnostics/ status information	
Diagnostic messages	
• Diagnostic functions	Yes
Diagnostics indication LED	
• For status of the outputs	Yes
Degree and class of protection	
IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
C-TICK	Yes
FM approval	Yes
Climatic and mechanical conditions for storage and transport	
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
Mechanical and climatic conditions during operation	
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	
- SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Mechanics/material	
Type of housing (front)	
• Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weight	
Weight, approx.	40 g

Ordering data

	Order No.
CB 1241 communication board RS485	**6ES7 241-1CH30-1XB0**
for point-to-point connection, with 1 RS485 interface	
Accessories	
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**

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
Product-type designation	**CM 1242-5**
Transmission rate	
Transmission rate at interface 1 in accordance with PROFIBUS	9.6 kbit/s … 12 Mbit/s
Interfaces	
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	-
Supply voltage, current consumption, power loss	
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
Product-type designation	**CM 1242-5**
Permitted ambient conditions	
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
Design, dimensions and weight	
Module format	
Width	30 mm
Height	100 mm
Depth	75 mm
Net weight	0.115 kg
Product properties, functions, components general	
Number of units per CPU maximum	3
Number of modules note	-

Technical specifications (continued)

Order No.	6GK7 242-5DX30-0XE0
Product-type designation	**CM 1242-5**
Performance data	
Performance data open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks maximum	-
Data volume as user data per connection for open communication by means of SEND/RECEIVE blocks maximum	-
Performance data PROFIBUS DP	
Service as DP master DPV1	-
Number of DP slaves on DP master usable	-
Amount of data	
• of the address area of the inputs as DP master overall	-
• of the address area of the outputs as DP master overall	-
• 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
Amount of data	
• 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
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	-
• with PG connections maximum	-
• with PG/OP connections maximum	-
• note	-
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	
• without DP maximum	-
• with DP maximum	-
Product functions management, configuration	
Configuration software required	

Ordering data

Ordering data	Order No.
CM 1242-5 communication module	
Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 slave	**6GK7 242-5DX30-0XE0**
Accessories	
PROFIBUS FastConnect connector RS485	
With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbit/s	
• Without PG interface	**6ES7 972-0BA52-0XA0**
• With PG interface	**6ES7 972-0BB52-0XA0**
PROFIBUS FC standard cable	
2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order 20 m, sold by the meter	**6XV1 830-0EH10**
PROFIBUS FastConnect stripping tool	
Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	**6GK1 905-6AA00**
PROFIBUS bus terminal 12M	
Bus terminal for connection of PROFIBUS nodes at up to 12 Mbit/s with connecting cable	**6GK1 500-0AA10**

CM 1243-2

Overview

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.
CM 1243-2 communication module • AS-Interface masters for SIMATIC S7-1200 • Corresponds to AS-Interface Specification V3.0 • Dimensions (W × H × D / mm): 30 × 100 × 75	**3RK7 243-2AA30-0XB0**
Accessories	
DCM 1271 data decoupling module • Optional, for AS-i Power24V when using a standard 24 V power supply • Dimensions (W × H × D / mm): 30 × 100 × 75	**3RK7 271-1AA30-0AA0**
5-pole screw terminal for AS-i CM 1243-2 master and AS-i DCM 1271 data decoupling module • Screw terminals • As spare part (included in scope of delivery for CM / DCM)	**3RK1 901-3MA00**
3-pole screw terminal for AS-i DCM 1271 data decoupling module for connection to power supply • Screw terminals • As spare part (included in scope of delivery for CM / DCM)	**3RK1 901-3MB00**
Manuals 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 http://support.automation.siemens.com/WW/view/en/57358958/0/de	
German	**3ZX1012-0RK71-1AB1**
English	**3ZX1012-0RK71-1AC1**

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
Product-type designation	**CM 1243-5**
Transmission rate	
Transmission rate at interface 1 in accordance with PROFIBUS	9.6 kbit/s … 12 Mbit/s
Interfaces	
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	
Supply voltage, current consumption, power loss	
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
Product-type designation	**CM 1243-5**
Permitted ambient conditions	
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
Design, dimensions and weight	
Module format	
Width	30 mm
Height	100 mm
Depth	75 mm
Net weight	0.134 kg
Product properties, functions, components general	
Number of modules	
• per CPU maximum	1

Technical specifications (continued)

Order No.	6GK7 243-5DX30-0XE0
Product-type designation	**CM 1243-5**
Performance data	
Performance data PROFIBUS DP	
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
Performance data S7 communication	
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
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	
• without DP maximum	8
• with DP maximum	8
Product functions management, configuration	
Configuration software required	

Ordering data

	Order No.
CM 1243-5 communication module	
Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 master	**6GK7 243-5DX30-0XE0**
Accessories	
PROFIBUS FastConnect connector RS485	
With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbit/s	
• Without PG interface	**6ES7 972-0BA52-0XA0**
• With PG interface	**6ES7 972-0BB52-0XA0**
PROFIBUS FC standard cable	
2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order 20 m, sold by the meter	**6XV1 830-0EH10**
PROFIBUS FastConnect stripping tool	
Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	**6GK1 905-6AA00**
PROFIBUS bus terminal 12M	
Bus terminal for connection of PROFIBUS nodes at up to 12 Mbit/s with connecting cable	**6GK1 500-0AA10**

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**
Transmission rate	
Transfer rate 1	10 Mbit/s
Transfer rate 2	100 Mbit/s
Interfaces	
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
Supply voltage, current consumption, power loss	
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
Permitted ambient conditions	
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**
Design, dimensions and weight	
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
Product functions management, configuration	
Product function switch-managed	No
Standards, specifications, approvals	
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

CSM 1277 unmanaged

Ordering data	Order No.
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	**6GK7 277-1AA10-0AA0**

	Order No.
Accessories	
IE TP Cord RJ45/RJ45 TP cable 4 x 2 with 2 RJ45 connectors	
• 0.5 m	**6XV1 870-3QE50**
• 1 m	**6XV1 870-3QH10**
• 2 m	**6XV1 870-3QH20**
• 6 m	**6XV1 870-3QH60**
• 10 m	**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

Order No.	6GK7 242-7KX30-0XE0
Product-type designation	**CP 1242-7**
Transmission rate	
Transfer rate with GPRS transmission	
• with uplink maximum	43 kbit/s
• with downlink maximum	86 kbit/s
Wireless technology	
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
Operatng 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
Interfaces	
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
Supply voltage, current consumption, power loss	
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

Technical specifications (continued)

Order No.	6GK7 242-7KX30-0XE0
Product-type designation	**CP 1242-7**
Permitted ambient conditions	
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
Design, dimensions and weight	
Module format	
Width	30 mm
Height	100 mm
Depth	75 mm
Net weight	0.133 kg
Product properties, functions, components general	
Number of modules	
• per CPU maximum	3
Performance data	
Performance data open communication	
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

Order No.	6GK7 242-7KX30-0XE0
Product-type designation	**CP 1242-7**
Performance data telecontrol	
Connection to the control center	Telecontrol Server Basic
• note	Connection to Scada system using OPC interface
• 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
Performance data Teleservice	
Diagnostic function online diagnostics with SIMATIC STEP 7	Yes
Product function program download with SIMATIC STEP 7	Yes
Product function remote firmware update	No
Product functions management, configuration	
Configuration software required	
Product functions Security	
Product function password protection for teleservice access	Yes
Product function encrypted data transmission	Yes
Product functions Time	
Protocol is supported NTP	Yes

Ordering data

	Order No.
Communications processor CP 1242-7[1]	
Communications processor for connecting SIMATIC S7-1200 to GSM/GPRS mobile wireless network	**6GK7 242-7KX30-0XE0**
Accessories	
Telecontrol Server Basic	
Software for	
• License for up to 8 stations	**6NH9 910-0AA20-0AA0**
• License for up to 32 stations	**6NH9 910-0AA20-0AF0**
• License for up to 64 stations	**6NH9 910-0AA20-0AB0**
• License for up to 256 stations	**6NH9 910-0AA20-0AC0**
• License for up to 1000 stations	**6NH9 910-0AA20-0AD0**
• License for up to 5000 stations	**6NH9 910-0AA20-0AE0**

	Order No.
ANT794-4MR antenna	**6NH9 860-1AA00**
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	
ANT794-3M antenna	**6NH9 870-1AA00**
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	

[1] 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.

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**
Ambient conditions				
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) a t 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!

Technical specifications (continued)

	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**
Climatic and mechanical conditions for storage and transport				
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				
- Permissable range (without condensation) at 25 °C				95 %
Mechanical and climatic conditions during operation				
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

	Order No.
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	**6AG1 241-1CH30-2XB0**
Communication module for point-to-point connection, with one RS232 interface	**6AG1 241-1AH30-2XB0**
Suitable for areas with extraordinary medial exposure (conformal coating)	
Communication module for point-to-point connection, with one RS485 interface	**6AG1 241-1CH31-4XB0**
Communication module for point-to-point connection, with one RS232 interface	**6AG1 241-1AH31-4XB0**
Accessories	See SIMATIC S7-1200 CM 1241 communication module, page 3/106

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.	**6AG1 242-5DX30-2XE0**
Order number based on	**6GK7 242-5DX30-0XE0**
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.
SIPLUS CM 1242-5 communication module	
(extended temperature range and medial exposure)	
Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 slave	**6AG1 242-5DX30-2XE0**
Accessories	See SIMATIC S7-1200 CM 1242-5 communication module, page 3/109

SIPLUS CM 1243-5 communication modules

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.

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	
Order No.	**6AG1 243-5DX30-2XE0**
Order number based on	**6GK7 243-5DX30-0XE0**
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.
SIPLUS CM 1243-5 communication module	
(extended temperature range and medial exposure)	
Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 master	**6AG1 243-5DX30-2XE0**
Accessories	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.

Technical specifications

Order No.	6EP1 332-1SH71
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
Input	
Input	1-phase AC
Supply voltage	
• 1 at AC nominal value	120 V
• 2 at AC nominal value	230 V
• Note	Automatic range selection
Input voltage	
• 1 at AC	85 … 132 V
• 2 at AC	176 … 264 V
Overvoltage resistance	2.3 × Vin rated, 1.3 ms
Mains buffering at Iout rated, min.	20 ms
Mains buffering	at Vin = 93/187 V
Rated line frequency	
• 1	50 Hz
• 2	60 Hz
Rated line range	47 … 63 Hz
Input current	
• at nominal level of the input voltage 120 V nominal value	1.2 A
• at nominal level of the input voltage 230 V nominal value	0.67 A
Switch-on current limiting (+25 °C), max.	13 A
Duration of current limiting at 25 °C maximum	3 ms
I^2t, max.	0.5 $A^2 \cdot s$
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
Output	
Output	Controlled, isolated DC voltage
Rated voltage Vout 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 Vout (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 Iout 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

Technical specifications (continued)

Order No.	6EP1 332-1SH71
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
Efficiency	
Efficiency at Vout rated, Iout rated, approx.	83 %
Power loss at Vout rated, Iout rated, approx.	12 W
Closed-loop control	
Dynamic mains compensation (Vin rated ±15 %), max.	0.3 %
Dynamic load smoothing (Iout: 50/100/50 %), Uout ± 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
Protection and monitoring	
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	-
Safety	
Primary/secondary isolation	Yes
Potential separation	Safety extra-low output voltage Uout 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
EMC	
Emitted interference	EN 55022 Class B
Supply harmonics limitation	not applicable
Noise immunity	EN 61000-6-2

Order No.	6EP1 332-1SH71
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
Operating data	
Ambient temperature • in operation - Note	 0 … 60 °C with natural convection
Ambient temparature • on transport	 -40 … +85 °C
Ambient temparature • in storage	 -40 … +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation
Mechanics	
Connection technology	screw-type terminals
Connections • Supply input • Output • Auxiliary	 L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm² L+, M: 2 screw terminals each for 0.5 ... 2.5 mm² -
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

	Order No.
SIMATIC S7-1200 PM 1207	**6EP1 332-1SH71**
Input 120/230 V AC, output 24 V DC/2.5 A	

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.

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.	
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 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	

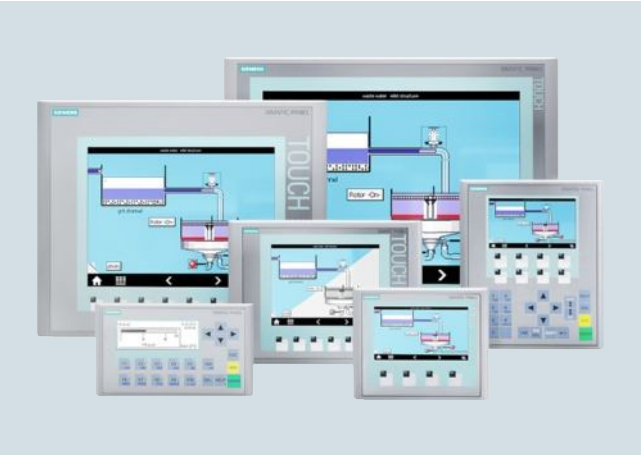
For technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-extreme

Ordering data

	Order No.
SIPLUS PM 1207 power supply	
(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	**6AG1 332-1SH71- 7AA0**
Ambient temperature 0 ... +60 °C	**6AG1 332-1SH71- 4AA0**

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
Display				
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
Backlighting				
• MTBF backlighting (at 25 °C)	50 000 h	50 000 h	30 000 h	50 000 h
• Dimmable backlight	No	No	No	No
Control elements				
Keyboard fonts				
• Number of function keys	10	8	4	4
Touch operation				
• Design as touch screen	No	No	Yes	Yes
Installation type/mounting				
Mounting in portrait format possible	No	No	Yes	Yes
Supply voltage				
Type of supply voltage	DC	DC	DC	DC
Rated voltage/DC	24 V	24 V	24 V	24 V
Memory				
Usable memory for user data	512 kbyte	512 kbyte	512 kbyte	512 kbyte
Type of output				
Acoustics				
• Buzzer	No	No	Yes	Yes

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
Time of day				
Clock				
• Software clock	Yes	Yes	Yes	Yes
• Battery-backed	No	No	No	No
• Synchronizable	Yes	Yes	Yes	Yes
Interfaces				
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
Protocols				
PROFINET	Yes	Yes	Yes	Yes
PROFIBUS	No	No	No	No
MPI	No	No	No	No
Degree and class of protection				
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
Standards, approvals, certificates				
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
Ambient conditions				
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 %
Configuration				
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

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
Languages				
Online languages				
• Number of online/runtime languages	5	5	5	5
Functionality under WinCC flexible				
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/Multilink)	No	No	No	No
• Modicon (Modbus TCP/IP)	Yes	Yes	Yes	Yes
• Modicon (Modbus)	No	No	No	No

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
I/O				
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
Mechanics/material				
Type of housing (front)				
• Plastic	Yes	Yes	Yes	Yes
Dimensions				
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
Weight				
Weight without packaging	0.25 kg	0.51 kg	0.32 kg	0.34 kg

	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
Display			
Design of display	STN	TFT	TFT
Screen diagonal	5.7 in	5.7 in	5.7 in
Number of colors	4; Grayscales	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
Control elements			
Keyboard fonts			
• Number of function keys	6	6	6
Touch operation			
• Design as touch screen	Yes	Yes	Yes
Installation type/mounting			
Mounting in portrait format possible	Yes	Yes	Yes
Supply voltage			
Type of supply voltage	DC	DC	DC
Rated voltage/DC	24 V	24 V	24 V
Memory			
Usable memory for user data	512 kbyte	512 kbyte	512 kbyte
Type of output			
Acoustics			
• Buzzer	Yes	Yes	Yes

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
Time of day			
Clock			
• Software clock	Yes	Yes	Yes
• Battery-backed	No	No	No
• Synchronizable	Yes	Yes	Yes
Interfaces			
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
Protocols			
PROFINET	Yes	No	Yes
PROFIBUS	No	Yes	No
MPI	No	Yes	No
Degree and class of protection			
Type of protection	IP20	IP20	IP20
IP (at the front)	IP65	IP65	IP65
Enclosure type 4x at the front	Yes	Yes	Yes
Standards, approvals, certificates			
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
Ambient conditions			
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 %
Configuration			
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)

	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
Languages			
Online languages			
• Number of online/runtime languages	5	5	5
Functionality under WinCC flexible			
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

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
I/O			
I/O devices			
• Printer	No	No	No
• Multi Media Card	No	No	No
• SD card	No	No	No
• USB memory	No	No	No
Mechanics/material			
Type of housing (front)			
• Plastic	Yes	Yes	Yes
Dimensions			
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
Weight			
Weight without packaging	1.07 kg	1.07 kg	1.07 kg

	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
Display			
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
Control elements			
Keyboard fonts			
• Number of function keys	8	8	0
Touch operation			
• Design as touch screen	Yes	Yes	Yes
Installation type/mounting			
Mounting in portrait format possible	No	No	No
Supply voltage			
Type of supply voltage	DC	DC	DC
Rated voltage/DC	24 V	24 V	24 V
Memory			
Usable memory for user data	1 024 kbyte	1 024 kbyte	1 024 kbyte
Type of output			
Acoustics			
• Buzzer	Yes	Yes	Yes

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
Time of day			
Clock			
• Software clock	Yes	Yes	Yes
• Battery-backed	No	No	No
• Synchronizable	Yes	Yes	Yes
Interfaces			
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
Protocols			
PROFINET	No	Yes	Yes
PROFIBUS	Yes	No	No
MPI	Yes	No	No
Degree and class of protection			
Type of protection	IP20	IP20	IP20
IP (at the front)	IP65	IP65	IP65
Enclosure type 4x at the front	Yes	Yes	Yes
Standards, approvals, certificates			
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
Ambient conditions			
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 %
Configuration			
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)

	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
Languages			
Online languages			
• Number of online/runtime languages	5	5	5
Functionality under WinCC flexible			
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
I/O			
I/O devices			
• Printer	No	No	No
• Multi Media Card	No	No	No
• SD card	No	No	No
• USB memory	No	No	No
Mechanics/material			
Type of housing (front)			
• Plastic	Yes	Yes	Yes

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
Dimensions			
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
Weight			
Weight without packaging	2.65 kg	2.65 kg	4.2 kg

Ordering data

	Order No.
SIMATIC HMI Basic Panels, Key and Touch	
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**
SIMATIC HMI Basic Panels, Key	
SIMATIC HMI KP300 Basic mono PN	**6AV6 647-0AH11-3AX0**
SIMATIC HMI KP400 Basic color PN	**6AV6 647-0AJ11-3AX0**
SIMATIC HMI Basic Panels, Touch	
SIMATIC HMI TP1500 Basic color PN	**6AV6 647-0AG11-3AX0**
Starter kit SIMATIC S7-1200 + KP300 Basic mono PN	**6AV6 651-7HA01-3AA3**
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**

	Order No.
Starter kits consist of: • the respective SIMATIC HMI Basic Panel - SIMATIC HMI KP300 Basic mono PN - SIMATIC HMI KTP400 Basic mono PN - SIMATIC HMI KTP600 Basic color PN • SIMATIC S7-1200 CPU 1212C AC/DC/Rly • SIMATIC S7-1200 Simulator Module SIM 1274 • SIMATIC STEP 7 BASIC CD • SIMATIC S7-1200 HMI Manual Collection CD • Ethernet CAT5 cable, 2 m	
Configuration	
All device versions: SIMATIC WinCC Basic/Comfort/ Professional or SIMATIC STEP 7 Basic (with integrated WinCC Basic)	See Catalog ST 80/ST PC, HMI software
6"-15": SIMATIC WinCC flexible Compact	See Catalog ST 80/ST PC, HMI software
Documentation (to be ordered separately)	
You can find the manual for the Basic Panels on the Internet at: http://support.automation.siemens.com	
SIMATIC HMI Manual Collection	**6AV6 691-1SA01-0AX0**
Electronic documentation, on DVD 5 languages (English, French, German, Italian and Spanish); contains: all currently available user manuals, manuals and communication manuals for SIMATIC HMI	
Accessories	See Catalog ST 80/ST PC, HMI accessories

Overview

- 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
Order number	**6AG1647-0AH11-2AX0**	**6AG1647-0AA11-2AX0**	**6AG1647-0AD11-2AX0**	**6AG1647-0AE11-4AX0**	**6AG1647-0AF11-4AX0**	**6AG1647-0AG11-4AX0**
Order No. based on	**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.					
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 (+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

Ordering data

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

Software

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.