Introduction

S7-1200

#### Overview



- Compact controllers for the low to mid-performance ranges
- Large-scale integration, space-saving, powerful
- With exceptional real-time performance and powerful communication options:
  - Controller with integrated PROFINET IO controller interface for communication between SIMATIC controllers, HMI, programming device or other automation components
- All CPUs can be used in stand-alone mode, in networks and within distributed structures
- Extremely simple installation, programming and operation
- 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
- Flexible expansion facilities
  - Signal boards for direct use in a controller
  - Signal modules for expansion of controllers with input/output channels;
    - including an Energy Meter module for recording and preparing energy data
  - Accessories, e.g. power supply, switch module or SIMATIC Memory Card

### SIMATIC S7-1200 Basic Controllers Introduction

S7-1200

General technical specifications SIMATIC S7-1200			
Degree of protection	IP20 acc. to IEC 529		
Ambient temperature • Operation (95% humidity) - Horizontal installation	-20 +60 °C		
<ul><li> Vertical installation</li><li> Transportation and storage</li><li> With 95% humidity</li></ul>	-20 +50 °C -40 +70 °C 25 55 °C		
Insulation  • 5/24 V DC circuits  • 115/230 V AC circuits to ground  • 115/230 V AC circuits to 115/230 V AC circuits	500 V AC test voltage 1500 V AC test voltage 1500 V AC test voltage		
230 V AC circuits to 5/24 V DC circuits	1500 V AC test voltage 1500 V AC test voltage		
Electromagnetic compatibility     Noise immunity acc. to     EN 50082-2	Requirements of the EMC directive Test acc. to: IEC 801-2, IEC 801-3, IEC 801-4, EN 50141, EN 50204, IEC 801-5, VDE 0160		
<ul> <li>Emitted interference acc. to EN 50081-1 and EN 50081-2</li> </ul>	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		
<ul> <li>Shocks, test acc. to / tested with</li> </ul>	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		

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	
Extended range of environmental conditions	
<ul> <li>with reference to ambient temperature, air pressure and altitude</li> </ul>	Tmin Tmax at 1080 hPa 795 hPa (-1000 m +2000 m) // Tmin (Tmax - 10K) at 795 hPa 658 hPa (+2000 m +3500 m) // Tmin (Tmax - 20K) at 658 hPa 540 hPa (+3500 m +5000 m)
<ul> <li>At cold restart, min.</li> </ul>	0° C
Relative humidity • with condensation, max.	100 %; RH incl. bedewing/frost (no commissioning in bedewed state
Resistance	
<ul> <li>to biologically active substances/ compliance with EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation.
to chemically active substances/ compliance with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray in accordance with EN 60068-2-52 (severity 3); the supplied plug covers must remai in place on the unused interfaces during operation.
<ul> <li>to mechanically active substances, compliance with EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain ir place on unused interfaces during operation.

Central processing units Standard CPUs

### CPU 1211C

### Overview



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

Article number	6ES7211-1BE40-0XB0	6ES7211-1AE40-0XB0	6ES7211-1HE40-0XB0
	CPU 1211C, AC/DC/Relay, 6DI/4DQ/2AI	CPU 1211C, DC/DC/DC, 6DI/4DQ/2AI	CPU 1211C, DC/DC/Relay, 6DI/4DQ/2AI
General information			
Product type designation	CPU 1211C AC/DC/relay	CPU 1211C DC/DC/DC	CPU 1211C DC/DC/relay
Engineering with			
<ul> <li>Programming package</li> </ul>	STEP 7 V14 or higher	STEP 7 V14 or higher	STEP 7 V14 or higher
Supply voltage			
Rated value (DC)			
• 24 V DC		Yes	Yes
Rated value (AC)			
• 120 V AC	Yes		
• 230 V AC	Yes		
Encoder supply			
24 V encoder supply			
• 24 V	20.4 to 28.8V	L+ minus 4 V DC min.	L+ minus 4 V DC min.
Power loss			
Power loss, typ.	10 W	8 W	8 W
Memory			
Work memory			
<ul><li>integrated</li></ul>	50 kbyte	50 kbyte	50 kbyte
Load memory			
• integrated	1 Mbyte	1 Mbyte	1 Mbyte
<ul> <li>Plug-in (SIMATIC Memory Card), max.</li> </ul>	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
Backup			
without battery	Yes	Yes	Yes
CPU processing times			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 μs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity			
Flag			
• Number, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
Process image			
<ul> <li>Inputs, adjustable</li> </ul>	1 kbyte	1 kbyte	1 kbyte
Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
Time of day			
Clock			
Hardware clock (real-time)	Yes	Yes	Yes

Central processing units Standard CPUs

CPU 1211C

Article number	6ES7211-1BE40-0XB0	6ES7211-1AE40-0XB0	6ES7211-1HE40-0XB0
	CPU 1211C, AC/DC/Relay, 6DI/4DQ/2AI	CPU 1211C, DC/DC/DC, 6DI/4DQ/2AI	CPU 1211C, DC/DC/Relay, 6DI/4DQ/2AI
Digital inputs			
Number of digital inputs	6; Integrated	6; Integrated	6; Integrated
<ul> <li>of which inputs usable for technological functions</li> </ul>	3; HSC (High Speed Counting)	3; HSC (High Speed Counting)	3; HSC (High Speed Counting)
Digital outputs			
Number of digital outputs	4; Relays	4	4; Relays
<ul> <li>of which high-speed outputs</li> </ul>		4; 100 kHz Pulse Train Output	
Analog inputs			
Number of analog inputs	2	2	2
nput ranges			
• Voltage	Yes	Yes	Yes
Analog outputs			
Number of analog outputs	0	0	0
. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Protocols			
PROFINET IO Controller	Yes	Yes	Yes
PROFINET IO Device	Yes	Yes	Yes
SIMATIC communication	Yes	Yes	Yes
Open IE communication	Yes	Yes	Yes
• Web server	Yes	Yes	Yes
Media redundancy	No	No	No
Protocols	140	140	140
Open IE communication			
• TCP/IP	Yes	Yes	Yes
	Yes	Yes	Yes
• ISO-on-TCP (RFC1006) • UDP	Yes	Yes	Yes
Veb server	res	res	res
	Voc	Vaa	Vac
• supported	Yes	Yes	Yes
Communication functions			
S7 communication	V	V	\ <u>\</u>
• supported	Yes	Yes	Yes
lumber of connections			
overall	16; dynamically	16; dynamically	16; dynamically
ntegrated Functions			
Number of counters	3	6	3
Counting frequency (counter) max.	100 kHz	100 kHz	100 kHz
Frequency measurement	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
Number of position-controlled positioning axes, max.	8	8	8
Number of positioning axes via pulse-direction interface	Up to 4 with SB 1222	4; With integrated outputs	Up to 4 with SB 1222
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs		4	
Limit frequency (pulse)		100 kHz	
Ambient conditions			
Ambient temperature during peration • min.	-20 °C	-20 °C	-20 °C
peration • min.	-20 °C 60 °C	-20 °C 60 °C	-20 °C 60 °C
pperation			

Central processing units Standard CPUs

### CPU 1211C

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

Ordering data	Article No.	Article No.
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Ordering data	Article No.
CPU 1211C  Compact CPU, AC/DC/relay; Integrated program/data memory 50 KB, load memory 1 MB; Wide-range power supply 85 264 V AC; Boolean execution times 0.1 μs per operation; 6 digital inputs, 4 digital outputs (relays), 2 analog inputs; Expandable by up to 3 communication modules and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	6ES7211-1BE40-0XB0
Compact CPU, DC/DC/DC; Integrated program/data memory 50 KB, load memory 1 MB; Power supply 24 V DC; Boolean execution times 0.1 µs per operation; 6 digital inputs, 4 digital outputs, 2 analog inputs; Expandable by up to 3 communication modules and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	6ES7211-1AE40-0XB0
Compact CPU, DC/DC/relay: Integrated program/data memory 50 KB, load memory 1 MB; Power supply 24 V DC; Boolean execution times 0.1 µs per operation; 6 digital inputs, 4 digital outputs (relays), 2 analog inputs; Expandable by up to 3 communication modules and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	6ES7211-1HE40-0XB0

Article No.
6ES7221-3AD30-0XB0
6ES7221-3BD30-0XB0
6ES7222-1AD30-0XB0
6ES7222-1BD30-0XB0
6ES7223-0BD30-0XB0
6ES7223-3AD30-0XB0
6ES7223-3BD30-0XB0
6ES7231-4HA30-0XB0
6ES7231-5QA30-0XB0
6ES7231-5PA30-0XB0
6ES7232-4HA30-0XB0
6ES7241-1CH30-1XB0

Central processing units Standard CPUs

CPU 1211C

Ordering data	Article No.		Article No.
BB1297 battery board	6ES7297-0AX30-0XA0	STEP 7 Professional / Basic V15.1	
For long-term backup of real-time clock, can be plugged into the signal board slot; battery (CR1025) is not included in scope of supply		Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Home Premium SP1	
Digital input simulator SIM 1274 simulator module (optional)		(64-bit) Windows 7 Professional SP1 (64-bit)	
8 input switches, for CPU 1211C / CPU 1212C	6ES7274-1XF30-0XA0	Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home	
Analog input simulator SIM 1274 simulator module (optional)		Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise	
2 potentiometers	6ES7274-1XA30-0XA0	Version 1709, 1803	
SIMATIC Memory Card (optional)		- Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015	
4 MB	6ES7954-8LC03-0AA0	LTSB Windows 10 IoT Enterprise 2016	
12 MB	6ES7954-8LE03-0AA0	LTSB	
24 MB	6ES7954-8LF03-0AA0	Windows Server 2012 R2 StdE (full installation)	
256 MB	6ES7954-8LL03-0AA0	Windows Server 2016 Standard	
2 GB	6ES7954-8LP02-0AA0	(full installation)  Type of delivery:	
32 GB	6ES7954-8LT03-0AA0	en, de, fr, it, es, zh	
Terminal block (spare part)		STEP 7 Professional V15.1,	6ES7822-1AA05-0YA5
For CPU 1211C AC/DC/relay		floating license	
• For DI, with 14 screws, tin-coated, coded; 4 units	6ES7292-1AP40-0XA0	STEP 7 Professional V15.1, floating license software download	6ES7822-1AE05-0YA5
<ul> <li>For DQ, with 8 screws, tin-coated, coded; 4 units</li> </ul>	6ES7292-1AH40-0XA0	incl. license key 1)	
• For AI, with 3 screws, gold-plated;	6ES7292-1BC30-0XA0	Email address required for delivery	
4 units		STEP 7 Basic V15.1, floating license	6ES7822-0AA05-0YA5
For CPU 1211C DC/DC/DC  • For DI, with 14 screws, tin-coated; 4 units	6ES7292-1AP30-0XA0	STEP 7 Basic V15.1, floating license,	6ES7822-0AE05-0YA5
• For DQ, with 8 screws, tin-coated; 4 units	6ES7292-1AH30-0XA0	software download incl. license key <sup>1)</sup>	
• For AI, with 3 screws, gold-plated; 4 units	6ES7292-1BC30-0XA0	Email address required for delivery	
For CPU 1211C DC/DC/relay			
<ul> <li>For DI, with 14 screws, tin-coated;</li> <li>4 units</li> </ul>	6ES7292-1AP30-0XA0		
<ul> <li>For DQ, with 8 screws, tin-coated, coded; 4 units</li> </ul>	6ES7292-1AH40-0XA0		
• For AI, with 3 screws, gold-plated; 4 units	6ES7292-1BC30-0XA0		
RJ45 cable grip			
4 units per pack			
Single port	6ES7290-3AA30-0XA0		
Front flap set (spare part)			
For CPU 1211C/1212C	6ES7291-1AA30-0XA0		

<sup>1)</sup> For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

Central processing units Standard CPUs

### CPU 1212C

### Overview



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

Article number	6ES7212-1BE40-0XB0	6ES7212-1AE40-0XB0	6ES7212-1HE40-0XB0
	CPU 1212C, AC/DC/Relay, 8DI/6DQ/2AI	CPU 1212C ,DC/DC/DC, 8DI/6DQ/2AI	CPU 1212C, DC/DC/Relay, 8DI/6DQ/2AI
General information			
Product type designation	CPU 1212C AC/DC/relay	CPU 1212C DC/DC/DC	CPU 1212C DC/DC/relay
Engineering with			
Programming package	STEP 7 V14 or higher	STEP 7 V14 or higher	STEP 7 V14 or higher
Supply voltage			
Rated value (DC)			
• 24 V DC		Yes	Yes
Rated value (AC)			
• 120 V AC	Yes		
• 230 V AC	Yes		
Encoder supply			
24 V encoder supply			
• 24 V	20.4 to 28.8V	L+ minus 4 V DC min.	L+ minus 4 V DC min.
Power loss			
Power loss, typ.	11 W	9 W	9 W
Memory			
Work memory			
<ul><li>integrated</li></ul>	75 kbyte	75 kbyte	75 kbyte
Load memory			
• integrated	2 Mbyte	2 Mbyte	2 Mbyte
<ul> <li>Plug-in (SIMATIC Memory Card), max.</li> </ul>	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
Backup			
without battery	Yes	Yes	Yes
CPU processing times			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity			
Flag			
Number, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
Process image			
Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte

Central processing units Standard CPUs

CPU 1212C

Article number	6ES7212-1BE40-0XB0	6ES7212-1AE40-0XB0	6ES7212-1HE40-0XB0
	CPU 1212C, AC/DC/Relay, 8DI/6DQ/2AI	CPU 1212C ,DC/DC/DC, 8DI/6DQ/2AI	CPU 1212C, DC/DC/Relay, 8DI/6DQ/2AI
ime of day			
Clock			
<ul> <li>Hardware clock (real-time)</li> </ul>	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	8; Integrated	8; Integrated	8; Integrated
<ul> <li>of which inputs usable for technological functions</li> </ul>	4; HSC (High Speed Counting)	4; HSC (High Speed Counting)	4; HSC (High Speed Counting)
igital outputs			
Number of digital outputs	6; Relays	6	6; Relays
of which high-speed outputs		4; 100 kHz Pulse Train Output	
nalog inputs			
Number of analog inputs	2	2	2
nput ranges			
Voltage	Yes	Yes	Yes
nalog outputs			
Number of analog outputs	0	0	0
. Interface			
nterface type	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Protocols			
PROFINET IO Controller	Yes	Yes	Yes
PROFINET IO Device	Yes	Yes	Yes
SIMATIC communication	Yes	Yes	Yes
Open IE communication	Yes	Yes	Yes
Web server	Yes	Yes	Yes
• Media redundancy	No	No	No
Protocols	110	140	110
pen IE communication			
TCP/IP	Yes	Yes	Yes
ISO-on-TCP (RFC1006)	Yes	Yes	Yes
• UDP	Yes	Yes	Yes
	162	les	ies
/eb server	Yes	Yes	Yes
supported	160	169	100
7 communication			
	Voo	Von	Voo
supported umber of connections	Yes	Yes	Yes
	16: dynamically	16: dynamically	16: dynamically
overall	16; dynamically	16; dynamically	16; dynamically
ntegrated Functions	4	4	4
lumber of counters	4	4	4
Counting frequency (counter) max.	100 kHz	100 kHz	100 kHz
requency measurement	Yes	Yes	Yes
ontrolled positioning	Yes	Yes	Yes
Number of position-controlled positioning axes, max.	8	8	8
Number of positioning axes via pulse-direction interface	Up to 4 with SB 1222	4; With integrated outputs	Up to 4 with SB 1222
PID controller	Yes	Yes	Yes
lumber of alarm inputs	4	4	4
Number of pulse outputs		4	
imit frequency (pulse)		100 kHz	

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### CPU 1212C

Article number	6ES7212-1BE40-0XB0	6ES7212-1AE40-0XB0	6ES7212-1HE40-0XB0
	CPU 1212C, AC/DC/Relay, 8DI/6DQ/2AI	CPU 1212C ,DC/DC/DC, 8DI/6DQ/2AI	CPU 1212C, DC/DC/Relay, 8DI/6DQ/2AI
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical
Pollutant concentrations			
<ul> <li>SO2 at RH &lt; 60% without condensation</li> </ul>	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
Configuration			
Programming			
Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
Dimensions			
Width	90 mm	90 mm	90 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	425 g	370 g	385 g

Ordering data	Article No.	Article No.
Orueriilu uala	Article No.	Article No.

CPU 1212C Compact CPU, AC/DC/relay; Integrated program/data memory 75 KB, load memory 2 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	6ES7212-1BE40-0XB0	Compact CPU, DC/DC/relay; Integrated program/data memory 75 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  SB 1221 signal board	6ES7212-1HE40-0XB0
at 100 kHz  Compact CPU, DC/DC/DC; Integrated program/data memory	6ES7212-1AE40-0XB0	4 inputs, 5 V DC, 200 kHz 4 inputs, 24 V DC, 200 kHz	6ES7221-3AD30-0XB0 6ES7221-3BD30-0XB0
75 KB, load memory 2 MB; Power supply 24 V DC;		SB 1222 signal board	
Boolean execution times 0.1 μs		4 outputs, 5 V DC, 0.1 A, 200 kHz	6ES7222-1AD30-0XB0
per operation; 8 digital inputs,		4 outputs, 24 V DC, 0.1 A, 200 kHz	6ES7222-1BD30-0XB0
6 digital outputs,		SB 1223 signal board	
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.		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	6ES7223-0BD30-0XB0
24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs		2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	6ES7223-3AD30-0XB0
(PWM) at 100 kHz		2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	6ES7223-3BD30-0XB0
		SB 1231 signal board	6ES7231-4HA30-0XB0
		1 analog input, $\pm 10$ V with 12 bits or 0 20 mA with 11 bits	

Central processing units Standard CPUs

CPU 1212C

Ordering data	Article No.		Article No.
SB 1231 thermocouple	6ES7231-5QA30-0XB0	Terminal block (spare part) (cont.)	
signal board		For CPU 1212C DC/DC/DC	
1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K		<ul> <li>For DI, with 14 screws, tin-coated; 4 units</li> </ul>	6ES7292-1AP30-0XA0
SB 1231 RTD signal board	6ES7231-5PA30-0XB0	<ul> <li>For DQ, with 8 screws, tin-coated;</li> </ul>	6ES7292-1AH30-0XA0
I input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign		4 units • For AI, with 3 screws, gold-plated; 4 units	6ES7292-1BC30-0XA0
SB 1232 signal board	6ES7232-4HA30-0XB0	For CPU 1212C DC/DC/relay	
analog output, ±10 V with 12 bits	0201202 111/100 0/20	• For DI, with 14 screws, tin-coated; 4 units	6ES7292-1AP30-0XA0
CB 1241 RS 485	6ES7241-1CH30-1XB0	<ul> <li>For DQ, with 8 screws, tin-coated, coded; 4 units</li> </ul>	6ES7292-1AH40-0XA0
communication board	0E37241-101130-17.D0	<ul> <li>For AI, with 3 screws, gold-plated; 4 units</li> </ul>	6ES7292-1BC30-0XA0
For point-to-point connection, vith 1 RS 485 interface		RJ45 cable grip	
3B1297 battery board	6ES7297-0AX30-0XA0	4 units per pack	
For long-term backup of	20. 0. 0.000 0,000	Single port	6ES7290-3AA30-0XA0
eal-time clock, can be plugged		Front flap set (spare part)	
nto the signal board slot; pattery (CR1025) is not included		For CPU 1211C/1212C	6ES7291-1AA30-0XA0
n scope of supply		STEP 7 Professional / Basic V15.1	OLOTZOT TARGUTURAU
Digital input simulator SIM 1274 simulator module optional) B input switches, or CPU 1211C / CPU 1212C	6ES7274-1XF30-0XA0	Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement:	
Analog input simulator SIM 1274 simulator module optional)		Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit)	
? potentiometers	6ES7274-1XA30-0XA0	Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit)	
SIMATIC Memory Card (optional)		Windows 10 Home Version 1709, 1803	
MB	6ES7954-8LC03-0AA0	Windows 10 Professional	
2 MB	6ES7954-8LE03-0AA0	Version 1709, 1803 Windows 10 Enterprise	
24 MB	6ES7954-8LF03-0AA0	Version 1709, 1803	
256 MB	6ES7954-8LL03-0AA0	Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015	
2 GB	6ES7954-8LP02-0AA0	LTSB	
32 GB	6ES7954-8LT03-0AA0	Windows 10 IoT Enterprise 2016 LTSB	
Extension cable	6ES7290-6AA30-0XA0	Windows Server 2012 R2 StdE	
or two-tier configuration	0E37290-0AA30-0AA0	(full installation) Windows Server 2016 Standard	
For connecting digital/analog ignal modules;		(full installation) Type of delivery:	
ength 2 m		en, de, fr, it, es, zh	
Starter box CPU 1212C AC/DC/relay	6ES7212-1BD34-4YB0	STEP 7 Professional V15.1, floating license	6ES7822-1AA05-0YA5
Complete offer SIMATIC S7-1200, tarter box, comprising: CPU 1212C AC/DC/relay, simulator, STEP 7 BASIC CD, manual CD, nfo material, in Systainer		STEP 7 Professional V15.1, floating license software download incl. license key <sup>1)</sup> Email address required for delivery	6ES7822-1AE05-0YA5
erminal block (spare part)		STEP 7 Basic V15.1,	6ES7822-0AA05-0YA5
For CPU 1212C AC/DC/relay		floating license	000000 0 4 500 000
For DI, with 14 screws, tin-coated, coded; 4 units	6ES7292-1AP40-0XA0	STEP 7 Basic V15.1, floating license, software download	6ES7822-0AE05-0YA5
<ul> <li>For DQ, with 8 screws, tin-coated, coded; 4 units</li> </ul>	6ES7292-1AH40-0XA0	incl. license key <sup>1)</sup>	
For AI, with 3 screws, gold-plated;	6ES7292-1BC30-0XA0	Email address required for delivery	

<sup>1)</sup> For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

Central processing units Standard CPUs

#### CPU 1214C

### Overview



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

Article number	6ES7214-1BG40-0XB0	6ES7214-1AG40-0XB0	6ES7214-1HG40-0XB0
	CPU 1214C, AC/DC/Relay, 14DI/10DQ/2AI	CPU 1214C, DC/DC/DC, 14DI/10DQ/2AI	CPU 1214C, DC/DC/Relay, 14DI/10DQ/2AI
General information			
Product type designation	CPU 1214C AC/DC/relay	CPU 1214C DC/DC/DC	CPU 1214C DC/DC/relay
Engineering with			
<ul> <li>Programming package</li> </ul>	STEP 7 V14 or higher	STEP 7 V14 or higher	STEP 7 V14 or higher
Supply voltage			
Rated value (DC)			
• 24 V DC		Yes	Yes
Rated value (AC)			
• 120 V AC	Yes		
• 230 V AC	Yes		
Encoder supply			
24 V encoder supply			
• 24 V	20.4 to 28.8V	L+ minus 4 V DC min.	L+ minus 4 V DC min.
Power loss			
Power loss, typ.	14 W	12 W	12 W
Memory			
Work memory			
• integrated	100 kbyte	100 kbyte	100 kbyte
Load memory			
• integrated	4 Mbyte	4 Mbyte	4 Mbyte
<ul> <li>Plug-in (SIMATIC Memory Card), max.</li> </ul>	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
Backup			
without battery	Yes	Yes	Yes
CPU processing times			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 μs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity			
Flag			
Number, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Process image			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
Time of day			
Clock			
Hardware clock (real-time)	Yes	Yes	Yes

Central processing units Standard CPUs

CPU 1214C

Article number	6ES7214-1BG40-0XB0	6ES7214-1AG40-0XB0	6ES7214-1HG40-0XB0
	CPU 1214C, AC/DC/Relay, 14DI/10DQ/2AI	CPU 1214C, DC/DC/DC, 14DI/10DQ/2AI	CPU 1214C, DC/DC/Relay, 14DI/10DQ/2AI
Digital inputs	14DI/10DQ/2AI	14DI/ 10DQ/ZAI	14DI/10DQ/ZAI
Number of digital inputs	14; Integrated	14; Integrated	14; Integrated
of which inputs usable for	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
technological functions	o, nee (riigh opeca coanting)	o, rice (riight opeca counting)	o, rice (riight opeda coanting)
Digital outputs			
Number of digital outputs	10; Relays	10	10; Relays
of which high-speed outputs		4; 100 kHz Pulse Train Output	
Analog inputs			
Number of analog inputs	2	2	2
Input ranges			
Voltage	Yes	Yes	Yes
Analog outputs			
Number of analog outputs	0	0	0
1. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Protocols			
PROFINET IO Controller	Yes	Yes	Yes
PROFINET IO Device	Yes	Yes	Yes
SIMATIC communication	Yes	Yes	Yes
Open IE communication	Yes	Yes	Yes
Web server	Yes	Yes	Yes
Media redundancy	No	No	No
Protocols			
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
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
Number of connections			
• overall	16; dynamically	16; dynamically	16; dynamically
Integrated Functions	,,,	, sy	,,,
Number of counters	6	6	6
Counting frequency (counter) max.	100 kHz	100 kHz	100 kHz
Frequency measurement	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
Number of position-controlled positioning axes, max.	8	8	8
Number of positioning axes via pulse-direction interface	Up to 4 with SB 1222	4; With integrated outputs	Up to 4 with SB 1222
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs		4	
Limit frequency (pulse)		100 kHz	
Ambient conditions			
Ambient temperature during			
operation	00.00	20.00	22.20
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizonta or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical
Pollutant concentrations			2.50
• SO2 at RH < 60% without	S02: < 0.5 ppm; H2S: < 0.1 ppm;	S02: < 0.5 ppm; H2S: < 0.1 ppm;	S02: < 0.5 ppm; H2S: < 0.1 ppm;
■ 302 at nn < 607% willion			

Central processing units Standard CPUs

### CPU 1214C

Article number	6ES7214-1BG40-0XB0	6ES7214-1AG40-0XB0	6ES7214-1HG40-0XB0
	CPU 1214C, AC/DC/Relay, 14DI/10DQ/2AI	CPU 1214C, DC/DC/DC, 14DI/10DQ/2AI	CPU 1214C, DC/DC/Relay, 14DI/10DQ/2AI
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
Weights			
Weight, approx.	455 g	415 g	435 g

Ordering data	Article No.		Article No.
CPII 1214C		SR 1221 signal hoard	

Ordering data	Article No.	
CPU 1214C		SB 1221 signal be
Compact CPU, AC/DC/relay;	6ES7214-1BG40-0XB0	4 inputs, 5 V DC, 2
Integrated program/data memory 100 KB, load memory 2 MB;		4 inputs, 24 V DC,
Vide-range power supply		SB 1222 signal b
35 264 V AC; 3oolean execution times 0.1 μs		4 outputs, 5 V DC
per operation; 14 digital inputs,		4 outputs, 24 V DO
10 digital outputs (relays),		SB 1223 signal b
2 analog inputs; Expandable by up to 3 communication modules, 3 signal modules and 1 signal ooard/communication board; Digital inputs can be used as HSC at 100 kHz		2 inputs, 24 V DC, IEC type 1 current 2 x 24 V DC transi 0.5 A, 5 W; can be used as H up to 30 kHz
Compact CPU, DC/DC/DC; Integrated program/data memory	6ES7214-1AG40-0XB0	2 inputs, 5 V DC, 2 2 outputs 5 V DC,
00 KB, load memory 2 MB; Power supply 24 V DC; Boolean execution times 0.1 µs		2 inputs, 24 V DC, 2 outputs 24 V DC
per operation;		SB 1231 signal be
4 digital inputs, 0 digital outputs, ! analog inputs;		1 analog input, ±1 0 20 mA with 11
expandable by up to second communication modules,		SB 1231 thermoc signal board
s signal modules, and 1 signal poard/communication board; Digital inputs can be used as HSC		1 input +/- 80 mV, + sign, thermocou
at 100 kHz, 24 V DC digital outputs can be		SB 1231 RTD sign
used as pulse outputs (PTO) or pulse-width modulated outputs PWM) at 100 kHz		1 input for resistar sensors Pt 100, Pt Pt 1000, resolutior
Compact CPU, DC/DC/relay;	6ES7214-1HG40-0XB0	SB 1232 signal be
Integrated program/data memory 100 KB, load memory 2 MB; Power supply 24 V DC;		1 analog output, ± or 0 to 20 mA with
Boolean execution times 0.1 µs per operation; 14 digital inputs, 10 digital outputs		CB 1241 RS 485 communication b
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		For point-to-point with 1 RS 485 inte

	Article No.
SB 1221 signal board	
4 inputs, 5 V DC, 200 kHz	6ES7221-3AD30-0XB0
4 inputs, 24 V DC, 200 kHz	6ES7221-3BD30-0XB0
SB 1222 signal board	
4 outputs, 5 V DC, 0.1 A, 200 kHz	6ES7222-1AD30-0XB0
4 outputs, 24 V DC, 0.1 A, 200 kHz	6ES7222-1BD30-0XB0
SB 1223 signal board	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	6ES7223-0BD30-0XB0
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	6ES7223-3AD30-0XB0
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	6ES7223-3BD30-0XB0
SB 1231 signal board	6ES7231-4HA30-0XB0
1 analog input, ±10 V with 12 bits or 0 20 mA with 11 bits	
SB 1231 thermocouple signal board	6ES7231-5QA30-0XB0
1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K	
SB 1231 RTD signal board	6ES7231-5PA30-0XB0
1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	
SB 1232 signal board	6ES7232-4HA30-0XB0
1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits	
CB 1241 RS 485 communication board	6ES7241-1CH30-1XB0
For point-to-point connection, with 1 RS 485 interface	

Central processing units Standard CPUs

CPU 1214C

Ordering data	Article No.		Article No.
BB1297 battery board	6ES7297-0AX30-0XA0	RJ45 cable grip	
For long-term backup of		4 units per pack	
real-time clock, can be plugged into the signal board slot:		Single port	6ES7290-3AA30-0XA0
battery (CR1025) is not included		Front flap set (spare part)	
in scope of supply		For CPU 1214C	6ES7291-1AB30-0XA0
Digital input simulator SIM 1274 simulator module		STEP 7 Professional / Basic V15.1	
(optional)		Target system:	
14 input switches, for CPU 1214C/1215C	6ES7274-1XH30-0XA0	SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC	
Analog input simulator		Requirement: Windows 7 Home Premium SP1	
SIM 1274 simulator module (optional)		(64-bit)	
2 potentiometers	6ES7274-1XA30-0XA0	Windows 7 Professional SP1 (64-bit)	
<u>'</u>	6E37274-1XA30-0XA0	Windows 7 Enterprise SP1 (64-bit)	
SIMATIC Memory Card (optional)		Windows 7 Ultimate SP1 (64-bit) Windows 10 Home	
4 MB	6ES7954-8LC03-0AA0	Version 1709, 1803	
12 MB	6ES7954-8LE03-0AA0	Windows 10 Professional Version 1709, 1803	
24 MB	6ES7954-8LF03-0AA0	Windows 10 Enterprise	
256 MB	6ES7954-8LL03-0AA0	Version 1709, 1803 Windows 10 Enterprise 2016 LTSB	
2 GB	6ES7954-8LP02-0AA0	Windows 10 Enterprise 2016 E15B Windows 10 IoT Enterprise 2015	
32 GB	6ES7954-8LT03-0AA0	LTSB Windows 10 IoT Enterprise 2016	
Extension cable	6ES7290-6AA30-0XA0	LTSB	
for two-tier configuration		Windows Server 2012 R2 StdE (full installation)	
For connecting digital/analog signal modules;		Windows Server 2016 Standard	
length 2 m		(full installation)	
Terminal block (spare part)		Type of delivery: en, de, fr, it, es, zh	
For CPU 1214C AC/DC/relay		STEP 7 Professional V15.1,	6ES7822-1AA05-0YA5
• For DI, with 20 screws,	6ES7292-1AV40-0XA0	floating license	
tin-coated, coded; 4 units  For DQ, with 12 screws.	6ES7292-1AM40-0XA0	STEP 7 Professional V15.1,	6ES7822-1AE05-0YA5
tin-coated, coded; 4 units	OLOT 202-TAINITO-OVAO	floating license software download	
• For AI, with 3 screws,	6ES7292-1BC30-0XA0	incl. license key 1)	
gold-plated; 4 units		Email address required for delivery	
For CPU 1214C DC/DC/DC  For DI, with 20 screws,	6ES7292-1AV30-0XA0	STEP 7 Basic V15.1,	6ES7822-0AA05-0YA5
tin-coated; 4 units	OLOT 202-TAYOU-UAAU	floating license	
<ul> <li>For DQ, with 12 screws, tin-coated; 4 units</li> </ul>	6ES7292-1AM30-0XA0	STEP 7 Basic V15.1, floating license,	6ES7822-0AE05-0YA5
<ul> <li>For AI, with 3 screws, gold-plated; 4 units</li> </ul>	6ES7292-1BC30-0XA0	software download incl. license key <sup>1)</sup>	
For CPU 1214C DC/DC/relay		Email address required for delivery	
<ul> <li>For DI, with 20 screws, tin-coated; 4 units</li> </ul>	6ES7292-1AV30-0XA0		
<ul> <li>For DQ, with 12 screws, tin-coated, coded; 4 units</li> </ul>	6ES7292-1AM40-0XA0		
<ul> <li>For AI, with 3 screws,</li> </ul>	6ES7292-1BC30-0XA0		

<sup>1)</sup> For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

Central processing units Standard CPUs

### CPU 1215C

### Overview



- Powerful controller with enhanced networking option
- Expandable by:
  1 signal board (SB), battery board (BB) or communication board (CB)
  8 signal modules (SM)
  Max. 3 communication modules (CM)

Article number	6ES7215-1BG40-0XB0	6ES7215-1AG40-0XB0	6ES7215-1HG40-0XB0
	CPU 1215C, AC/DC/RLY, 14DI/10DQ/2AI/2AQ	CPU 1215C, DC/DC/DC, 14DI/10DQ/2AI/2AQ	CPU 1215C, DC/DC/RLY, 14DI/10DQ/2AI/2AQ
General information			
Product type designation	CPU 1215C AC/DC/relay	CPU 1215C DC/DC/DC	CPU 1215C DC/DC/relay
Engineering with			
<ul> <li>Programming package</li> </ul>	STEP 7 V14 or higher	STEP 7 V14 or higher	STEP 7 V14 or higher
Supply voltage			
Rated value (DC)			
• 24 V DC		Yes	Yes
Rated value (AC)			
• 120 V AC	Yes		
• 230 V AC	Yes		
Encoder supply			
24 V encoder supply			
• 24 V	20.4 to 28.8V	L+ minus 4 V DC min.	L+ minus 4 V DC min.
Power loss			
Power loss, typ.	14 W	12 W	12 W
Memory			
Work memory			
<ul><li>integrated</li></ul>	125 kbyte	125 kbyte	125 kbyte
Load memory			
• integrated	4 Mbyte	4 Mbyte	4 Mbyte
<ul> <li>Plug-in (SIMATIC Memory Card), max.</li> </ul>	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
Backup			
without battery	Yes	Yes	Yes
CPU processing times			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 μs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity			
Flag			
Number, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Process image			
<ul> <li>Inputs, adjustable</li> </ul>	1 kbyte	1 kbyte	1 kbyte
Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
Time of day			
Clock			
<ul> <li>Hardware clock (real-time)</li> </ul>	Yes	Yes	Yes

Central processing units Standard CPUs

CPU 1215C

Article number	6ES7215-1BG40-0XB0	6ES7215-1AG40-0XB0	6ES7215-1HG40-0XB0
	CPU 1215C, AC/DC/RLY, 14DI/10DQ/2AI/2AQ	CPU 1215C, DC/DC/DC, 14DI/10DQ/2AI/2AQ	CPU 1215C, DC/DC/RLY, 14DI/10DQ/2AI/2AQ
Digital inputs			
Number of digital inputs	14; Integrated	14; Integrated	14; Integrated
of which inputs usable for	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
technological functions			
Digital outputs			
Number of digital outputs	10; Relays	10	10; Relays
of which high-speed outputs		4; 100 kHz Pulse Train Output	
Analog inputs			
Number of analog inputs	2	2	2
Input ranges			
Voltage	Yes	Yes	Yes
Analog outputs			
Number of analog outputs	2	2	2
Output ranges, current			
• 0 to 20 mA	Yes	Yes	Yes
1. Interface	100	100	
Interface type	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Protocols	Luicilici	Luicifict	Landingt
	Voo	Voo	Von
PROFINET IO Controller     PROFINET IO Devices	Yes	Yes	Yes
PROFINET IO Device	Yes	Yes	Yes
SIMATIC communication	Yes	Yes	Yes
Open IE communication	Yes	Yes	Yes
Web server	Yes	Yes	Yes
Media redundancy	Yes; as MRP client	Yes; as MRP client	Yes; as MRP client
Protocols			
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
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
Number of connections			
• overall	16; dynamically	16; dynamically	16; dynamically
Integrated Functions	To, dynamicany	ro, dynamicany	10, dynamicany
Number of counters	6	6	6
Counting frequency (counter) max.	100 kHz	100 kHz	100 kHz
9 , , , ,	Yes	Yes	Yes
Frequency measurement			
controlled positioning	Yes	Yes	Yes
Number of position-controlled positioning axes, max.	8	8	8
Number of positioning axes	Up to 4 with SB 1222	4: With integrated outputs	Up to 4 with SB 1222
via pulse-direction interface	OP 10 4 WILLIOD 1222	i, minintegrated outputs	OP to T WILL OD 1222
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs		4	
Limit frequency (pulse)		100 kHz	
Ambient conditions			
Ambient temperature during			
operation			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C; Number of simultaneously	60 °C; Number of simultaneously	60 °C; Number of simultaneously
max.	activated inputs or outputs 7 or 5	activated inputs or outputs 7 or 5	activated inputs or outputs 7 or 5
	(no adjacent points) at 60 °C horizontal	(no adjacent points) at 60 °C horizontal	(no adjacent points) at 60 °C horizontal
	or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical
Pollutant concentrations		, , , , , , , , , , , , , , , , , , ,	3.10. 2. 12 2 10.000.
	S02: < 0.5 ppm; H2S: < 0.1 ppm;	S02: < 0.5 ppm; H2S: < 0.1 ppm;	S02: < 0.5 ppm; H2S: < 0.1 ppm;
<ul> <li>SO2 at RH &lt; 60% without</li> </ul>			

Central processing units Standard CPUs

### CPU 1215C

Article number	6ES7215-1BG40-0XB0	6ES7215-1AG40-0XB0	6ES7215-1HG40-0XB0
	CPU 1215C, AC/DC/RLY, 14DI/10DQ/2AI/2AQ	CPU 1215C, DC/DC/DC, 14DI/10DQ/2AI/2AQ	CPU 1215C, DC/DC/RLY, 14DI/10DQ/2AI/2AQ
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
Weights			
Weight, approx.	550 g	500 g	585 g

Ordering data	Article No.		Article No.
CPII 1215C		SR 1221 signal hoard	

Ordering data	Article No.
CPU 1215C	
Compact CPU, AC/DC/relay; Integrated program/data memory 125 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	6ES7215-1BG40-0XB0
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 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 (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	6ES7215-1AG40-0XB0
Compact CPU, DC/DC/relay; 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 outputs (relays), 2 analog inputs, 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	6ES7215-1HG40-0XB0

	Article No.
SB 1221 signal board	
4 inputs, 5 V DC, 200 kHz	6ES7221-3AD30-0XB0
4 inputs, 24 V DC, 200 kHz	6ES7221-3BD30-0XB0
SB 1222 signal board	
4 outputs, 5 V DC, 0.1 A, 200 kHz	6ES7222-1AD30-0XB0
4 outputs, 24 V DC, 0.1 A, 200 kHz	6ES7222-1BD30-0XB0
SB 1223 signal board	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	6ES7223-0BD30-0XB0
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	6ES7223-3AD30-0XB0
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	6ES7223-3BD30-0XB0
SB 1231 signal board	6ES7231-4HA30-0XB0
1 analog input, ±10 V with 12 bits or 0 20 mA with 11 bits	
SB 1231 thermocouple signal board	6ES7231-5QA30-0XB0
1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K	
SB 1231 RTD signal board	6ES7231-5PA30-0XB0
1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	
SB 1232 signal board	6ES7232-4HA30-0XB0
1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits	
CB 1241 RS 485 communication board	6ES7241-1CH30-1XB0
For point-to-point connection, with 1 RS 485 interface	
BB 1297 battery board	6ES7297-0AX30-0XA0
For long-term backup of real-time clock; can be plugged into the signal board slot; battery (CR 1025) is not included	

Central processing units Standard CPUs

CPU 1215C

Ordering data	Article No. Article No.		
Digital input simulator SIM 1274 simulator module		Front flap set (spare part)	
(optional)		For CPU 1215C	6ES7291-1AC30-0XA0
14 input switches, for CPU 1214C/1215C	6ES7274-1XH30-0XA0	RJ45 cable grip	
Analog input simulator		4 units per pack	
SIM 1274 simulator module (optional)		Dual port STEP 7 Professional / Basic V15.1	6ES7290-3AB30-0XA0
2 potentiometers	6ES7274-1XA30-0XA0	Target system:	
SIMATIC Memory Card (optional)		SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC	
4 MB	6ES7954-8LC03-0AA0	Requirement:	
12 MB	6ES7954-8LE03-0AA0	Windows 7 Home Premium SP1 (64-bit)	
24 MB	6ES7954-8LF03-0AA0	Windows 7 Professional SP1	
256 MB	6ES7954-8LL03-0AA0	(64-bit) Windows 7 Enterprise SP1 (64-bit)	
2 GB	6ES7954-8LP02-0AA0	Windows 7 Ultimate SP1 (64-bit) Windows 10 Home	
32 GB	6ES7954-8LT03-0AA0	Version 1709, 1803	
Extension cable for two-tier configuration	6ES7290-6AA30-0XA0	Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise	
For connecting digital/analog signal modules; length 2 m		Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB	
Terminal block (spare part)		Windows 10 IoT Enterprise 2016	
For CPU 1215C AC/DC/relay		LTSB Windows Server 2012 R2 StdE	
<ul> <li>For DI, with 20 screws, tin-coated, coded; 4 units</li> </ul>	6ES7292-1AV40-0XA0	(full installation) Windows Server 2016 Standard	
<ul> <li>For DQ, with 12 screws, tin-coated, coded; 4 units</li> </ul>	6ES7292-1AM40-0XA0	(full installation) Type of delivery:	
<ul> <li>For analog units, with 6 screws, gold-plated; 4 units</li> </ul>	6ES7292-1BF30-0XB0	en, de, fr, it, es, zh	
For CPU 1215C DC/DC/DC		STEP 7 Professional V15.1, floating license	6ES7822-1AA05-0YA5
<ul> <li>For DI, with 20 screws, tin-coated; 4 units</li> </ul>	6ES7292-1AV30-0XA0	STEP 7 Professional V15.1,	6ES7822-1AE05-0YA5
<ul> <li>For DQ, with 12 screws, tin-coated; 4 units</li> </ul>	6ES7292-1AM30-0XA0	floating license software download incl. license key <sup>1)</sup>	
<ul> <li>For analog units, with 6 screws, gold-plated; 4 units</li> </ul>	6ES7292-1BF30-0XB0	Email address required for delivery	
For CPU 1215C DC/DC/relay		STEP 7 Basic V15.1, floating license	6ES7822-0AA05-0YA5
<ul> <li>For DI, with 20 screws, tin-coated: 4 units</li> </ul>	6ES7292-1AV30-0XA0	STEP 7 Basic V15.1.	6ES7822-0AE05-0YA5
• For DQ, with 12 screws, tin-coated, coded; 4 units	6ES7292-1AM40-0XA0	floating license, software download	OLOT OLL ON LOO -O TAO
<ul> <li>For analog units, with 6 screws,</li> </ul>	6ES7292-1BF30-0XB0	incl. license key <sup>1)</sup>	
<ul> <li>For analog units, with 6 screws, gold-plated; 4 units</li> </ul>	6ES7292-1BF30-0XB0	Email address required for delivery	

<sup>1)</sup> For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

Central processing units Standard CPUs

### CPU 1217C

### Overview



- Powerful controller for extremely fast signal processing
- Expandable by:
  1 signal board (SB), battery board (BB) or communication board (CB)
  8 signal modules (SM)
  Max. 3 communication modules (CM)

Article number	6ES7217-1AG40-0XB0
, a dolo ridingoi	CPU 1217C, DC/DC/DC,
	14DI/10DQ/2AI/2AQ
General information	
Product type designation	CPU 1217C DC/DC/DC
Engineering with	
Programming package	STEP 7 V14 or higher
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
Encoder supply	
24 V encoder supply	
• 24 V	L+ minus 4 V DC min.
Power loss	
Power loss, typ.	12 W
Memory	
Work memory	
• integrated	150 kbyte
Load memory	
• integrated	4 Mbyte
<ul> <li>Plug-in (SIMATIC Memory Card), max.</li> </ul>	with SIMATIC memory card
Backup	
without battery	Yes
CPU processing times	
for bit operations, typ.	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / Operation
Data areas and their retentivity	
Flag	
Number, max.	8 kbyte; Size of bit memory address area
Process image	
• Inputs, adjustable	1 kbyte
<ul> <li>Outputs, adjustable</li> </ul>	1 kbyte

Article number	6ES7217-1AG40-0XB0
	CPU 1217C, DC/DC/DC, 14DI/10DQ/2AI/2AQ
Time of day	
Clock	
<ul> <li>Hardware clock (real-time)</li> </ul>	Yes
Digital inputs	
Number of digital inputs	14; Integrated
<ul> <li>of which inputs usable for technological functions</li> </ul>	6; HSC (High Speed Counting)
Digital outputs	
Number of digital outputs	10
<ul> <li>of which high-speed outputs</li> </ul>	4; 100 kHz Pulse Train Output
Analog inputs	
Number of analog inputs	2
Input ranges	
Voltage	Yes
Analog outputs	
Number of analog outputs	2
Output ranges, current	
• 0 to 20 mA	Yes
1. Interface	
Interface type	PROFINET
Physics	Ethernet
Protocols	
<ul> <li>PROFINET IO Controller</li> </ul>	Yes
<ul> <li>PROFINET IO Device</li> </ul>	Yes
<ul> <li>SIMATIC communication</li> </ul>	Yes
Open IE communication	Yes
Web server	Yes
<ul> <li>Media redundancy</li> </ul>	Yes; as MRP client

Central processing units Standard CPUs

CPU 1217C

Technical specifications (cor	nunuea)	Ordering data	Article No.
Article number	6ES7217-1AG40-0XB0	CPU 1217C	
	CPU 1217C, DC/DC/DC,	Compact CPU, DC/DC/DC;	6ES7217-1AG40-0XB0
Protocols	14DI/10DQ/2AI/2AQ	Integrated program/data memory 150 KB, load memory 4 MB;	
Open IE communication		Power supply 24 V DC;	
• TCP/IP	Yes	Boolean execution times 0.085 μs	
• ISO-on-TCP (RFC1006)	Yes	per operation; 14 digital inputs (10 digital 24 V DC	
• UDP	Yes	inputs, 4 digital 1.5 V DC differential	
Web server	tes	inputs), 10 digital outputs (6 digital	
	Voo	24 V DC outputs, 4 digital 1.5 V DC differential outputs), 2 analog	
• supported	Yes	inputs, 2 analog outputs;	
Communication functions		Expandable by up to 3 communication modules,	
S7 communication	Voc	8 signal modules, and 1 signal	
• supported	Yes	board/communication board;	
Number of connections	40 1	Digital inputs can be used as HSC at 1 MHz.	
• overall	16; dynamically	24 V DC digital outputs can be	
Integrated Functions	0	used as pulse outputs (PTO) or pulse-width modulated outputs	
Number of counters	6	(PWM) at 100 kHz	
Counting frequency (counter) max.	1 MHz	SB 1221 signal board	
Frequency measurement	Yes	4 inputs, 5 V DC, 200 kHz	6ES7221-3AD30-0XB0
controlled positioning	Yes		
Number of position-controlled positioning axes, max.	8	4 inputs, 24 V DC, 200 kHz	6ES7221-3BD30-0XB0
Number of positioning axes via pulse-direction interface	4; With integrated outputs	<b>SB 1222 signal board</b> 4 outputs, 5 V DC, 0.1 A, 200 kHz	6ES7222-1AD30-0XB0
PID controller	Yes	4 outputs, 24 V DC, 0.1 A, 200 kHz	6ES7222-1BD30-0XB0
Number of alarm inputs	4	SB 1223 signal board	020/22 12200 0/20
Number of pulse outputs	4	J	
Limit frequency (pulse)	1 MHz	2 inputs, 24 V DC, IEC type 1 current sinking;	6ES7223-0BD30-0XB0
Ambient conditions		2 x 24 V DC transistor outputs,	
Ambient temperature during operation		0.5 A, 5 W; can be used as HSC at up to 30 kHz	
• min.	-20 °C	•	0E07000 0AE00 0VE0
• max.	60 °C; Number of simultaneously	2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	6ES7223-3AD30-0XB0
	activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10	2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	6ES7223-3BD30-0XB0
	at 55 °C horizontal or 45 °C vertical	SB 1231 signal board	6ES7231-4HA30-0XB0
Pollutant concentrations		1 analog input, ±10 V with 12 bits or	
<ul> <li>SO2 at RH &lt; 60% without condensation</li> </ul>	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	0 20 mA with 11 bits	
Configuration		SB 1231 thermocouple signal board	6ES7231-5QA30-0XB0
Programming		1 input +/- 80 mV. resolution 15 bits	
Programming language		+ sign, thermocouples type J, K	
- LAD	Yes	SB 1231 RTD signal board	6ES7231-5PA30-0XB0
- FBD	Yes	•	CLOTED TOTALOUTONED
- SCL	Yes	1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500,	
Dimensions		Pt 1000, resolution 15 bits + sign	
Width	150 mm	SB 1232 signal board	6ES7232-4HA30-0XB0
Height	100 mm	1 analog output, ±10 V with 12 bits	
Depth	75 mm	or 0 to 20 mA with 11 bits	
Weights			
Weight, approx.	530 g		

Central processing units Standard CPUs

### CPU 1217C

Ordering data	Article No.		Article No.
CB 1241 RS 485 communication board	6ES7241-1CH30-1XB0	STEP 7 Professional / Basic V15.1	
For point-to-point connection, with 1 RS 485 interface		Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC	
BB 1297 battery board	6ES7297-0AX30-0XA0	Requirement: Windows 7 Home Premium SP1	
For long-term backup of real-time clock; can be plugged into the signal board slot; battery (CR 1025) is not included		(64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit)	
Digital input simulator SIM 1274 simulator module (optional)		Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional	
14 input switches, for CPU 1217C	6ES7274-1XK30-0XA0	Version 1709, 1803 Windows 10 Enterprise	
Analog input simulator SIM 1274 simulator module (optional)		Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015	
2 potentiometers	6ES7274-1XA30-0XA0	LTSB Windows 10 IoT Enterprise 2016	
SIMATIC Memory Card (optional)		LTSB	
4 MB	6ES7954-8LC03-0AA0	Windows Server 2012 R2 StdE (full installation)	
12 MB	6ES7954-8LE03-0AA0	Windows Server 2016 Standard (full installation)	
24 MB	6ES7954-8LF03-0AA0	Type of delivery:	
256 MB	6ES7954-8LL03-0AA0	en, de, fr, it, es, zh	
2 GB	6ES7954-8LP02-0AA0	STEP 7 Professional V15.1,	6ES7822-1AA05-0YA5
32 GB	6ES7954-8LT03-0AA0	floating license	0507000 4 4 505 0 4 5
Extension cable for two-tier configuration	6ES7290-6AA30-0XA0	STEP 7 Professional V15.1, floating license software download	6ES7822-1AE05-0YA5
For connecting digital/analog signal modules:		incl. license key 1) Email address required for delivery	
length 2 m		STEP 7 Basic V15.1.	6ES7822-0AA05-0YA5
Terminal block (spare part)		floating license	0E37022-0AA03-01A3
For CPU 1217C • For DI, with 10 screws, tin-coated; 4 units	6ES7292-1AK30-0XA0	STEP 7 Basic V15.1, floating license, software download	6ES7822-0AE05-0YA5
• For DI, with 10 screws, tin-coated; 4 units	6ES7292-1AR30-0XA0	incl. license key <sup>1)</sup> Email address required for delivery	
<ul> <li>For DQ, with 18 screws, tin-coated; 4 units</li> </ul>	6ES7292-1AT30-0XA0	,	
<ul> <li>For analog units, with 6 screws, gold-plated; 4 units</li> </ul>	6ES7292-1BF30-0XB0		
Front flap set (spare part)			
For CPU 1217C	6ES7291-1AD30-0XA0		
RJ45 cable grip			
4 units per pack			
Dual port	6ES7290-3AB30-0XA0		

<sup>1)</sup> For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

Central processing units SIPLUS standard CPUs

SIPLUS CPU 1211C

### Overview



- The clever compact solution
- With 10 integrated I/Os
- Expandable with:
  - 1 signal board (SB) or communication board (CB); not possible with: 6AG1211-1AE31-2XB0, 6AG1211-1BE31-2XB0, 6AG1211-1HE31-2XB0
- Max. 3 communication modules (CM)

#### Note

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

Article number	6AG1211-1AE31-4XB0	Article number	6AG1211-1AE31-4XB0
Based on	6ES7211-1AE31-0XB0	Based on	6ES7211-1AE31-0XB0
	SIPLUS S7-1200 CPU1211 DC/DC/DC		SIPLUS S7-1200 CPU1211 DC/DC/DC
Ambient conditions		Use on ships/at sea	
Ambient temperature during operation		<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
• min.	-20 °C; = Tmin; Startup @ 0 °C	- to chemically active substances	Yes; Class 6C3 (RH < 75 %) incl.
• max.	60 °C; = Tmax	according to EN 60721-3-6	salt spray acc. to EN 60068-2-52
At cold restart, min.	0 °C	3	(severity degree 3); *
Altitude during operation relating to sea level		<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *
<ul> <li>Installation altitude above sea level,</li> </ul>	5 000 m	Remark	
<ul> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	1 140 hPa 795 hPa	<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!
	(-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at	Conformal coating	
	795 hPa` 658 hPa (+2 000 m +3 500 m) //	<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability
	Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection
Relative humidity	,	<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	<ul> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies</li> </ul>	Yes; Conformal coating, Class A
Resistance		according to IPC-CC-830A	
Coolants and lubricants		Configuration	
Resistant to commercially	Yes; Incl. diesel and oil droplets	Programming	
available coolants and lubricants	in the air	Programming language	
Use in stationary industrial systems		- LAD	Yes
<ul> <li>to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of	- FBD	Yes
according to EN 00721-3-3	fauna); Class 3B3 on request	- SCL	Yes
- to chemically active substances	Yes; Class 3C4 (RH < 75 %)	Dimensions	
according to EN 60721-3-3	incl. salt spray acc. to EN 60068-2-52 (severity degree 3): *	Width	90 mm
- to mechanically active substances	, , , , ,	Height	100 mm
according to EN 60721-3-3	res, Olass 304 mer. sand, dust,	Depth	75 mm
- -		Weights	
		Weight, approx.	370 g

Central processing units SIPLUS standard CPUs

### SIPLUS CPU 1211C

Technical specifications	(continued)
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Article number	6AG1211-1BE31-4XB0	6AG1211-1BE31-2XB0
Based on	6ES7211-1BE31-0XB0	6ES7211-1BE31-0XB0
24004 0.1	SIPLUS S7-1200 CPU1211 AC/DC/RLY	SIPLUS S7-1200 CPU1211 AC/DC/RLY
Ambient conditions		
Ambient temperature during operation		
• 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
At cold restart, min.	0 °C	-25 °C
Altitude during operation relating to sea level		
<ul> <li>Installation altitude above sea level, max.</li> </ul>	2 000 m	2 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC
Relative humidity		
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
<ul> <li>to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea		
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection	Yes; Type 1 protection
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Central processing units SIPLUS standard CPUs

### SIPLUS CPU 1211C

Article number	6AG1211-1HE31-4XB0	6AG1211-1HE31-2XB0
Based on	6ES7211-1HE31-0XB0	6ES7211-1HE31-0XB0
	SIPLUS S7-1200 CPU1211 DC/DC/RLY	SIPLUS S7-1200 CPU1211 DC/DC/RLY
Ambient conditions		
Ambient temperature during operation		
• 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
• At cold restart, min.	0°C	-25 °C
Altitude during operation relating to sea level		
<ul> <li>Installation altitude above sea level, max.</li> </ul>	2 000 m	2 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC
Relative humidity		
<ul> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
<ul> <li>to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea		
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection	Yes; Type 1 protection
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
<ul> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Central processing units SIPLUS standard CPUs

### SIPLUS CPU 1211C

Ordering data	Article No.		Article No.
SIPLUS CPU 1211C compact CPU, AC/DC/relay		For areas with extreme exposure to media (conformal coating); ambient temperature	6AG1211-1HE31-4XB0
(Extended temperature range and exposure to environmental substances)		<ul> <li>-20 +60 °C</li> <li>For areas with extreme exposure to media (conformal coating);</li> </ul>	6AG1211-1HE31-2XB0
Integrated program and data memory of 25 KB, load memory of 1 MB;		ambient temperature -40 +70 °C	
wide-range alternating voltage supply 85 264 V AC;		Accessories	
Boolean execution times of 0.1 ms per operation;		SIPLUS SB 1221 digital input signal board	
6 digital inputs, 4 digital outputs (relay), 2 analog inputs;		(Extended temperature range and exposure to media; cannot be used with 6AG1211-1 <b>2</b> XB0)	
expandable with up to 3 communication modules and 1 signal board/communication		4 inputs, 5 V DC, 200 kHz, sourcing	6AG1221-3AD30-5XB0
board; digital inputs usable as HSC with 100 kHz		4 inputs, 24 V DC, 200 kHz, sourcing	6AG1221-3BD30-5XB0
<ul> <li>For areas with extreme exposure to media (conformal coating);</li> </ul>	6AG1211-1BE31-4XB0	SIPLUS SB 1222 digital output signal board	
ambient temperature -20 +60 °C • For areas with extreme exposure	6AG1211-1BE31-2XB0	(Extended temperature range and exposure to media; cannot be used with 6AG1211-1 <b>2</b> XB0)	
to media (conformal coating); ambient temperature		4 outputs, 5 V DC, 0.1 A, 200 kHz	6AG1222-1AD30-5XB0
-40 +70 °C		4 outputs, 24 V DC, 0.1 A, 200 kHz	6AG1222-1BD30-5XB0
SIPLUS CPU 1211C compact CPU, DC/DC/DC		SIPLUS SB 1223 digital input/output signal board	
(Extended temperature range and exposure to environmental substances)		(Extended temperature range and exposure to media; cannot be used with 6AG1211-1 <b>2</b> XB0)	
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;		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	
6 digital inputs, 4 digital outputs, 2 analog inputs; expandable with up to		<ul> <li>Suitable for areas with extreme exposure to media (conformal coating)</li> </ul>	6AG1223-0BD30-4XB0
3 communication modules and 1 signal board/communication board;		• Ambient temperature -25 +55 °C	6AG1223-0BD30-5XB0
digital inputs usable as HSC with 100 kHz, 24 V DC digital outputs		2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	6AG1223-3AD30-5XB0
usable as pulse outputs (PTO) or pulse-width-modulated outputs (PWM) with 100 kHz		2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	6AG1223-3BD30-5XB0
<ul> <li>For areas with extreme exposure to media (conformal coating);</li> </ul>	6AG1211-1AE31-4XB0	SIPLUS SB 1232 analog output signal board	
ambient temperature -20 +60 °C		(Extended temperature range and exposure to media; cannot be used with 6AG1211-12XB0)	
SIPLUS CPU 1211C compact CPU, DC/DC/relay		Ambient temperature range -25 +55 °C	
(Extended temperature range and exposure to environmental substances)		1 analog output, ±10 V with 12 bits or 0 20 mA with 11 bits	6AG1232-4HA30-5XB0
Integrated program and data memory of 25 KB,		Ambient temperature range 0 +55 °C	
load memory of 1 MB; power supply 24 V DC; Boolean execution times of 0.1 ms		1 analog output, ±10 V with 12 bits or 0 20 mA with 11 bits	6AG1232-4HA30-4XB0
per operation; 6 digital inputs, 4 digital outputs (relay),		SIPLUS CB 1241 RS 485 communication board	
2 analog inputs; expandable with up to 3 communication modules and		(Extended temperature range and exposure to media; cannot be used with 6AG1211-12XB0)	
1 signal board/communication board; digital inputs usable as HSC with		for point-to-point connection, with 1 RS 485 interface	6AG1241-1CH30-5XB1
100 kHz		Other accessories	See SIMATIC S7-1200 CPU 1211C, page 3/6

Central processing units SIPLUS standard CPUs

SIPLUS CPU 1212C

### Overview



- The superior compact solution
- With 14 integral input/outputs
- Expandable with:
  - 1 signal board (SB) or communication board (CB); not possible with: 6AG1212-1AE40-2XB0, 6AG1212-1BE40-2XB0
  - 2 signal modules (SM)
  - Max. 3 communication modules (CM)

#### Note

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

Article number	6AG1212-1AE40-4XB0	6AG1212-1AE40-2XB0
Based on	6ES7212-1AE40-0XB0	6ES7212-1AE40-0XB0
	SIPLUS S7-1200 CPU 1212C DC/DC/DC	SIPLUS S7-1200 CPU 1212C DC/DC/DC
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 4, digital outputs 3, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 3, digital outputs 2, analog inputs 0 (no adjacent points) with horizontal mounting position
At cold restart, min.	0 ℃	-25 ℃
Altitude during operatio n relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)
Relative humidity		
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
<ul> <li>to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

Central processing units SIPLUS standard CPUs

### SIPLUS CPU 1212C

Technical	specifications	(continued)

Article number	6AG1212-1AE40-4XB0	6AG1212-1AE40-2XB0
Based on	6ES7212-1AE40-0XB0	6ES7212-1AE40-0XB0
	SIPLUS S7-1200 CPU 1212C DC/DC/DC	SIPLUS S7-1200 CPU 1212C DC/DC/DC
Use on ships/at sea		
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection	Yes; Type 1 protection
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
<ul> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Article number	6AG1212-1BE40-4XB0	6AG1212-1BE40-2XB0
Based on	6ES7212-1BE40-0XB0	6ES7212-1BE40-0XB0
Based on	SIPLUS S7-1200 CPU 1212C AC/DC/RLY	SIPLUS S7-1200 CPU 1212C AC/DC/RLY
Ambient conditions	011 200 01 1200 01 0 12120 10p 0p1121	ON EGG OF TEGG OF OF TETEGONOPHOLITE
Ambient temperature during		
operation	00.00 Tail 01.1 . 0.00	40.00 Tuil Out - 8.05.00
• min.	-20 °C; = Tmin; Startup @ 0 °C 60 °C; Number of simultaneously activated inputs or	-40 °C; = Tmin; Startup @ -25 °C 70 °C; = Tmax; Tmax > +55 °C number of simultaneously
• max.	outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	witched-on digital inputs 4, digital outputs 3, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 3, digital outputs 2, analog inputs 0 (no adjacent points) with horizontal mounting position  -25 °C
At cold restart, min.  Altitude during operation	0 -C	-25 °C
relating to sea level	0.000	0.000
<ul> <li>Installation altitude above sea level, max.</li> </ul>	2 000 m	2 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC
Relative humidity		
<ul> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

Central processing units SIPLUS standard CPUs

SIPLUS CPU 1212C

lecnnical specifications (cont	inuea)	
Article number	6AG1212-1BE40-4XB0	6AG1212-1BE40-2XB0
Based on	6ES7212-1BE40-0XB0	6ES7212-1BE40-0XB0
	SIPLUS S7-1200 CPU 1212C AC/DC/RLY	SIPLUS S7-1200 CPU 1212C AC/DC/RLY
Use on ships/at sea		
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection	Yes; Type 1 protection
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Article number	6AG1212-1HE40-4XB0	6AG1212-1HE40-2XB0
Based on	6ES7212-1HE40-0XB0	6ES7212-1HE40-0XB0
	SIPLUS S7-1200 CPU 1212C DC/DC/RLY	SIPLUS S7-1200 CPU 1212C DC/DC/RLY
Ambient conditions  Ambient temperature during operation		
• min.	-20 °C; = Tmin; Startup @ 0 °C	-40 °C; = Tmin; Startup @ -25 °C
◆ max.	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 4, digital outputs 3, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 3, digital outputs 2, analog inputs 0 (no adjacent points) with horizontal mounting position
At cold restart, min.	0 ℃	-25 °C
Altitude during operation relating to sea level		
<ul> <li>Installation altitude above sea level, max.</li> </ul>		2 000 m
<ul> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC
Relative humidity		
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants - Resistant to commercially	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
available coolants and lubricants		
Use in stationary industrial systems		V 0L 0D0 LL
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
to chemically active substances according to EN 60721-3-3  to maghenically active substances	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	res, Class 354 Incl. sand, dust, "	Yes; Class 3S4 incl. sand, dust, *

Central processing units SIPLUS standard CPUs

#### SIPLUS CPU 1212C

#### Technical specifications (continued)

Article number	6AG1212-1HE40-4XB0	6AG1212-1HE40-2XB0
Based on	6ES7212-1HE40-0XB0	6ES7212-1HE40-0XB0
	SIPLUS S7-1200 CPU 1212C DC/DC/RLY	SIPLUS S7-1200 CPU 1212C DC/DC/RLY
Use on ships/at sea		
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection	Yes; Type 1 protection
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

#### Ordering data Article No. Article No.

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

(Extended temperature range and exposure to media)

Integrated program/data memory 75 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

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

6AG1212-1BE40-4XB0

6AG1212-1BE40-2XB0

SIPLUS CPU 1212C compact CPU, DC/DC/DC (Extended temperature range and

exposure to media) Integrated program/data memory 75 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.

- (PWM) at 100 kHz • For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C
- For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C

6AG1212-1AE40-4XB0

6AG1212-1AE40-2XB0

Central processing units SIPLUS standard CPUs

### SIPLUS CPU 1212C

Ordering data	Article No.		Article No.
SIPLUS CPU 1212C compact CPU, DC/DC/relay		SIPLUS SB 1223 digital input/output signal board	
(Extended temperature range and exposure to media)		(Extended temperature range and exposure to media; cannot be used with 6AG1212-12XB0)	
Integrated program/data memory 75 KB, load memory 1 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		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  • Suitable for areas with extreme exposure to media (conformal coating)	6AG1223-0BD30-4XB0
board/communication board; Digital inputs can be used as HSC		<ul> <li>Ambient temperature</li> <li>-25 +55 °C</li> </ul>	6AG1223-0BD30-5XB0
at 100 kHz • For areas with extreme exposure	6AG1212-1HE40-4XB0	2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	6AG1223-3AD30-5XB0
to media (conformal coating); ambient temperature -20 +60 °C		2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	6AG1223-3BD30-5XB0
<ul> <li>For areas with extreme exposure to media (conformal coating); ambient temperature</li> <li>-40 +70 °C</li> </ul>	6AG1212-1HE40-2XB0	SIPLUS SB 1232 analog output signal board  (Extended temperature range and exposure to media; cannot be used	
Accessories		with 6AG1212-1 <b>2</b> XB0)	
SIPLUS SB 1221 digital input signal board		Ambient temperature range -25 +55 °C	
(Extended temperature range and exposure to media; cannot be used with 6AG1212-12XB0)		1 analog output, ±10 V with 12 bits or 0 20 mA with 11 bits	6AG1232-4HA30-5XB0
4 inputs, 5 V DC, 200 kHz, sourcing	6AG1221-3AD30-5XB0	Ambient temperature range 0 +55 °C	
4 inputs, 24 V DC, 200 kHz, sourcing	6AG1221-3BD30-5XB0	1 analog output, ±10 V with 12 bits or 0 20 mA with 11 bits	6AG1232-4HA30-4XB0
SIPLUS SB 1222 digital output		SIPLUS CB 1241 RS 485 communication board	
signal board  (Extended temperature range and exposure to media; cannot be used		(Extended temperature range and exposure to media; cannot be used with 6AG1212-12XB0)	
with 6AG1212-12XB0) 4 outputs, 5 V DC, 0.1 A, 200 kHz	6AG1222-1AD30-5XB0	For point-to-point connection, with 1 RS 485 interface	6AG1241-1CH30-5XB1
4 outputs, 24 V DC, 0.1 A, 200 kHz	6AG1222-1AD30-5XB0	Additional accessories	See SIMATIC S7-1200 CPU 1212C, page 3/10

Central processing units SIPLUS standard CPUs

#### SIPLUS CPU 1214C

#### Overview



- The compact high-performance CPU
- With 24 integrated I/Os
- Expandable with:
  - 1 signal board (SB) or communication board (CB); not possible with: 6AG1214-1AG40-2XB0, 6AG1214-1BG40-2XB0, 6AG1214-1HG40-2XB0
- 8 signal modules (SM)
- Max. 3 communication modules (CM)

#### Note:

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

Article number	6AG1214-1AG40-4XB0	6AG1214-1AG40-5XB0	6AG1214-1AG40-2XB0
Based on	6ES7214-1AG40-0XB0	6ES7214-1AG40-0XB0	6ES7214-1AG40-0XB0
	SIPLUS S7-1200 CPU 1214C DC/DC/DC	SIPLUS S7-1200 CPU 1214C DC/DC/DC	SIPLUS S7-1200 CPU 1214C DC/DC/DC
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; = Tmin; Startup @ 0 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1 (no adjacent points) with horizontal mounting position
At cold restart, min.	0 °C	-25 °C	-25 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)
Relative humidity			
With condensation, tested in accordance with IEC 60068-2-38, max.	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			
Coolants and lubricants			
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air

Central processing units SIPLUS standard CPUs

SIPLUS CPU 1214C

Article number	6AG1214-1AG40-4XB0	6AG1214-1AG40-5XB0	6AG1214-1AG40-2XB0
Based on	6ES7214-1AG40-0XB0	6ES7214-1AG40-0XB0	6ES7214-1AG40-0XB0
	SIPLUS S7-1200 CPU 1214C DC/DC/DC	SIPLUS S7-1200 CPU 1214C DC/DC/DC	SIPLUS S7-1200 CPU 1214C DC/DC/DC
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
<ul> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Article number	6AC1214 1BC40 4VB0	64C1214 1BC40 EVB0	6AC1214 1BC40 2VB0
Article number	6AG1214-1BG40-4XB0	6AG1214-1BG40-5XB0	6AG1214-1BG40-2XB0
Based on	6ES7214-1BG40-0XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY	6ES7214-1BG40-0XB0 SIPLUS S7-1200 CPU 1214C AC/DC/RLY	<b>6ES7214-1BG40-0XB0</b> SIPLUS S7-1200 CPU 1214C AC/DC/RLY
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C	-25 °C

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### SIPLUS CPU 1214C

Article number	6AG1214-1BG40-4XB0	6AG1214-1BG40-5XB0	6AG1214-1BG40-2XB0
Based on	6ES7214-1BG40-0XB0	6ES7214-1BG40-0XB0	6ES7214-1BG40-0XB0
	SIPLUS S7-1200 CPU 1214C AC/DC/RLY	SIPLUS S7-1200 CPU 1214C AC/DC/RLY	SIPLUS S7-1200 CPU 1214C AC/DC/RLY
Altitude during operation relating to sea level			
<ul> <li>Installation altitude above sea level, max.</li> </ul>	2 000 m	2 000 m	2 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC
Relative humidity			
<ul> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
<ul> <li>to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
<ul> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Central processing units SIPLUS standard CPUs

SIPLUS CPU 1214C

*Max.  60 °C. Number of simultaneously activated inputs or outputs 7 or 5 (no adlicent point 3 of 5 °C consideration of 5 °C conside	- reclinical specifications (conti	indoa)		
Ambient conditions  Ambient conditions  - 20 °C; = mini (incl. condensation) roter; start-up 8 0 °C of minimal poperation  - max.  - 20 °C; = mini (incl. condensation) roter; start-up 8 0 °C of minimal poperation  - max.  - 20 °C; = mini (incl. condensation) roter; start-up 8 0 °C of minimal poperation  - max.  - 20 °C; = mini (incl. condensation) roter; start-up 8 0 °C of control of minimal poperation  - max.  - 20 °C; = mini (incl. condensation) roter; start-up 8 °C of Control of minimal poperation  - max.  - 40 °C; = mini (incl. condensation) roter; start-up 9 °C of Control	Article number	6AG1214-1HG40-4XB0	6AG1214-1HG40-5XB0	6AG1214-1HG40-2XB0
Ambient conditions  Ambient temperature during operation  • min.  • min.  • 20 °C = Tmin (incl. condensation)* frost); start-up 8 · 25 °C condensation,* fro	Based on	6ES7214-1HG40-0XB0	6ES7214-1HG40-0XB0	6ES7214-1HG40-0XB0
Ambient temperature during operation  • min.  -20 °C; = Tmin (net, condensation/ frost); start-up @ 0.20 °C; = Tmin (net,				
## At cold restart, min.  ## At cold restart, min.  ## At cold restart, min.  ## At titude during operation relating to sea level max.  ## At titude during operation relating to sea level max.  ## At titude during operation relating to sea level max.  ## At titude during operation relating to sea level max.  ## At titude during operation relating to sea level max.  ## At titude during operation relating to sea level max.  ## At titude during operation relating to sea level max.  ## At titude during operation relating to sea level max.  ## At titude during operation relating to sea level max.  ## At titude during operation relating to sea level max.  ## At titude during operation relating to sea level max.  ## At titude during operation relating to sea level max.  ## At titude during operation relating to sea level max.  ## At titude during operation relating to sea level max.  ## At titude during operation relating to sea level max.  ## At titude during operation relating to sea level max.  ## At titude during operation relating to sea level max.  ## At titude during operation relating to sea level max.  ## At titude during operation.  ## At titude during operati	Ambient conditions	DC/DC/RLY	DC/DC/RLY	DC/DC/RLY
- Particle of the properties o				
• max.  6 0°C \ number of simultaneously activated inputs or outputs 7 or 5 for adjacent points and 60°C overteal. 4 or 10 at 55°C unber of simultaneously switched-on or 10 at 55°C unber of simultaneously switched-on digital imputs 7, digital outputs 8, and or 10 at 15°C overteal. 4 or 10 at 15°C unber of simultaneously switched-on digital imputs 7, digital outputs 8, and or 10 at 15°C unber of simultaneously switched-on digital imputs 2 (in adjacent points) with intercental insurance possible.  • At cold restart, min.  • At cold restart, min.  • A col				
**All cold restart, min.	• min.			-40 °C; = Tmin (incl. condensation/
activated inputs or outputs 7 of in adjacent points at 60°C vertical. He or 10 at 56°C or 30°C vertical. He or 10 at 56°C		· '	· '	''
anishog inputs 2 (no adjacent points) anishog position for a second proper at the proposition of the proper at t	• max.			
*At cold restart, min. 0 °C 25 °				digital inputs 7, digital outputs 5,
* At cold restart, min.  A cold restart, min.  O °C  Altitude during operation relating to sea level  Installation abhuse above sea level  Installation abhuse above sea level  Ambient air temperature-barometric pressure-altitude  Pressure-altitude  Institution abhuse above sea level  Installation abhuse above sea level  Installation abhuse above sea level  Ambient air temperature-barometric pressure-altitude  Institution abhuse above sea level  Institution abhuse according to En 00721-3-3  Its on the abhuse abhuse abhuse abhuse according to En 00721-3-3  Its on exhapically active substances according to En 00721-3-3  Its on exhapically active substances according to En 00721-3-3  Its on exhapically active substances according to En 00721-3-3  Its on exhapically active substances according to En 00721-3-3  Its on exhapically active substances according to En 00721-3-3  Its on exhapically active substances according to En 00721-3-3  Its on exhapically active substances according to En 00721-3-4  Its one contained abhuse abhuse abhuse abhuse abhuse abhuse according to En 00721-3-4  Its one contained abhuse abh		horizontal or 45 °C vertical		with horizontal mounting position;
*At cold restart, min.  O **C**  -26 **C**  -28 **C**  -28 **C**  Altitude during operation relating to sea level interest and altitude above sea level, max.  *Ambient air temperature-barometric pressure-altitude  *Inim Tima x at 1.140 mPa 736 mPa (1.400 m +2 000 m) // (1.400 m +3 000 m)				
*Al cold restart, min. 0 °C 25 °				digital inputs 7, digital outputs 5,
Altitude during operation relating to see level  In stallation affinide above sea level, rax.  Ambient air temperature-barometric pressure-shitude  Immin				with horizontal mounting position
**Platiting to sea level ** - Installation altitude above sea level, 2000 m  ** Possure-altitude** - Ambient air temperature-barometric pressure-altitude** - Ambient air temperature-barometric pressure-altitude** - Ambient air temperature-barometric pressure-altitude** - In 140 PR 795 PR 2	<ul> <li>At cold restart, min.</li> </ul>	0 °C	-25 °C	-25 °C
Ambient air temperature-barometric pressure-altitude above sea level, pressure-altitude sea level, pressure-altitude above sea level, pressure-altitude sea level, pressure-altitude sea l				
**Mark of a remperature-barometric pressure-altitude **International Content of the Pressure of the Press		0.000	0.000	0.000
pressure-altitude  1 140 hPa 795 hPa (-1 000 m ± 2000 m)// Trini (Timax - 10 K) at 795 hPa658 hPa (-2 000 m ± 3 500 m)// Trini (Timax - 10 K) at 795 hPa658 hPa (-2 000 m ± 3 500 m)// Trini (Timax - 20 K) at 658 hPa ± 3 0 hPa (-4 500 m ± 3 00 m)// (-4 550 m ± 500 m)// to show 2 2000 m max. 132 V AC  Relative humidity  • With condensation, the condensation/frost (no commissioning under condensation conditions)  Resistant to commercially according to EN 60721-3-3  • To themically active substances according to EN 60721-3-3  • To mechanically active substances according to EN 60721-3-6  • Lo chemically active substances according to EN 60721-3-6  • To themically active substances according to EN 60721-3-6  • To themically active substances according to EN 60721-3-6  • Lo c		2 000 m	2 000 m	2 000 m
(-1 000 m + 2 000 m)// Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m)// Tmin (Tmax - 20 K) at 658 hPa (+2 000 m +3 500 m)// Tmin (Tmax - 20 K) at 658 hPa (+2 000 m +3 500 m)// Tmin (Tmax - 20 K) at 658 hPa (+3 00 m +5 000 m)// Tmin (Tmax - 20 K) at 658 hPa (+3 00 m +5 000 m)// Tmin (Tmax - 20 K) at 658 hPa (+3 00 m +5 000 m)// Tmin (Tmax - 20 K) at 658 hPa (+3 00 m +5 000 m)// Tmin (Tmax - 20 K) at 658 hPa (+3 00 m +5 000 m)// Tmin (Tmax - 20 K) at 658 hPa (+3 00 m +5 000 m)// Tmin (Tmax - 20 K) at 658 hPa (+3 00 m +5 000 m)// Tmin (Tmax - 20 K) at 658 hPa (+3 00 m +5 000 m)// Tmin (Tmax - 20 K) at 658 hPa (+3 00 m +5 000 m)// Tmin (Tmax - 20 K) at 658 hPa (+2 000 m +3 000 m)/// Tmin (Tmax - 20 K) at 658 hPa (+2 000 m +3 000 m)/// Tmin (Tmax - 20 K) at 658 hPa (+2 000 m +3 000 m)//// Tmin (Tmax - 20 K) at 658 hPa (+2 000 m +3 000 m)/////////////////////////////////				
Trinin (Tmax - 10 K) at 795 hPa 658 hPa 65	pressure-altitude			
(+2 000 m +3 500 m) // Tmin (Timax - 20 k) at 658 hPa 540 hPa (+3 500 m +5 000 m) // above 2 000 m max, 132 V AC above 2 000		Tmin (Tmax - 10 K) at	Ťmin (Tmax - 10 K) at	Ťmin (Tmax - 10 K) at
658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC   43 500 m +5 000 m, above 2 000 m max. 132 V AC   43 500 m +5 000 m, above 2 000 m max. 132 V AC   43 500 m +5 000 m, above 2 000 m max. 132 V AC   43 500 m +5 000 m, above 2 000 m max. 132 V AC   43 500 m +5 000 m, above 2 000 m max. 132 V AC   43 500 m +5				
(+3 500 m +5 000 m); above 2 000 m max. 132 v AC above 2 000 max. 2000				
Pelative humidity  • With condensation, tested in accordance with EC 60068-2-38, max.  Pesistance  Coolants and lubricants  - Resistant to commercially active substances according to EN 60721-3-3  - to chemically active substances according to EN 60721-3-3  - to mechanically active substances according to EN 60721-3-6  - to chemically active substances according to EN 60721-3-6  - to the mechanically active substances according to EN 60721-3-6  - to the mechanically active substances according to EN 60721-3-6  - to the mechanically active substances according to EN 60721-3-6  - to the mechanically active substances according to EN 60721-3-6  - to the mechanically active substances according to EN 60721-3-6  - to the mechanically active substances according to EN 60721-3-6  - to the mechanically active substances according to EN 60721-3-6  - to the mechanically active substances according to EN 60721-3-6  - to the mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 6		(+3 500 m +5 000 m);	(+3 500 m +5 000 m);	(+3 500 m +5 000 m);
• With condensation, tested in accordance with tested in a condensation conditions)  **Resistance**  Coolants and lubricants  - Resistance to commercially active substances according to EN 60721-3-3  - to chemically active substances according to EN 60721-3-3  Use on ships/at sea  - to be independent to the form of the for	Balanca barra	above 2 000 m max. 132 V AC	above 2 000 m max. 132 V AC	above 2 000 m max. 132 V AC
tested in accordance with EC 60068-2-38, max. condensation conditions) condensation conditions)  Resistance Coolants and lubricants  - Resistant to commercially available coolants and lubricants  - to biologically active substances according to EN 60721-3-3  - to mechanically active substances according to EN 60721-3-3  - to mechanically active substances according to EN 60721-3-6  - to chemically active substances according to EN 60721-3-6  - to mechanically active	•	100 % - PH incl. condensation/frost	100 % - PH incl. condensation/frost	100 % PH incl. condensation/frost
Resistance Coolants and lubricants  - Resistant to commercially available coolants and lubricants  Use in stationary industrial systems  - to biologically active substances according to EN 60721-3-3  - to chemically active substances according to EN 60721-3-3  - to mechanically active substances according to EN 60721-3-3  - to mechanically active substances according to EN 60721-3-3  - to mechanically active substances according to EN 60721-3-3  - to mechanically active substances according to EN 60721-3-3  - to mechanically active substances according to EN 60721-3-3  - to chemically active substances according to EN 60721-3-3  - to mechanically active substances according to EN 60721-3-3  - to chemically active substances according to EN 60721-3-6  - to chemically active substances according to EN 60721-3-6  - to chemically active substances according to EN 60721-3-6  - to chemically active substances according to EN 60721-3-6  - to chemically active substances according to EN 60721-3-6  - to chemically active substances according to EN 60721-3-6  - to chemically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances a	tested in accordance with	(no commissioning under	(no commissioning under	(no commissioning under
Coolants and lubricants  - Resistant to commercially available coolants and lubricants  Use in stationary industrial systems  - to biologically active substances according to EN 60721-3-3  - to chemically active substances according to EN 60721-3-3  - to mechanically active substances according to EN 60721-3-3  Use on ships/at sea  - to biologically active substances according to EN 60721-3-3  Use on ships/at sea  - to biologically active substances according to EN 60721-3-3  Use on ships/at sea  - to biologically active substances according to EN 60721-3-6  - to chemically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to biologically active substances according to EN 60721-3-6  - to mechanically active substance		condensation conditions)	condensation conditions)	condensation conditions)
Pes; Incl. diesel and oil droplets in the air  Ves; Incl. diesel and oil droplets in the air  Ves; Incl. diesel and oil droplets in the air  Ves; Incl. diesel and oil droplets in the air  Ves; Incl. diesel and oil droplets in the air  Ves; Incl. diesel and oil droplets in the air  Ves; Incl. diesel and oil droplets in the air  Ves; Incl. diesel and oil droplets in the air  Ves; Incl. diesel and oil droplets in the air  Ves; Incl. diesel and oil droplets in the air  Ves; Incl. diesel and oil droplets in the air  Ves; Incl. diesel and oil droplets in the air  Ves; Incl. diesel and oil droplets in the air  Ves; Incl. diesel and oil droplets in the air  Ves; Incl. diesel and oil droplets in the air  Ves; Class 382 mold, fungus and dry rot spores (with the exception of fauna); Class 383 on request  Ves; Class 383 on request  Ves; Class 384 incl. sand, dust, Class 383 on request  Ves; Class 384 incl. sand, dust, Ves; Class 683 on request  Ves; Class 684 incl. sand, dust, Ves; Class 685 incl. sand, dust, Ves; Class 685 incl. sand, dust, Ves; Class 686 incl. sand, dust, Ves; Class				
available coolants and fubricants  Use in stationary industrial systems  To biologically active substances according to EN 60721-3-3  To chemically active substances according to EN 60721-3-3  To mechanically active substances according to EN 60721-3-3  Use on ships/at sea  To chemically active substances according to EN 60721-3-3  Use on ships/at sea  To chemically active substances according to EN 60721-3-6  To biologically active substances according to EN 60721-3-6  To biologically active substances according to EN 60721-3-6  To mechanically active substances according to EN 60721-3-6		Yes: Incl. diesel and oil dronlets in the	Yes: Incl. diesel and oil dronlets in the	Vest Incl. diesel and oil dronlets in the
- to biologically active substances according to EN 60721-3-3  - to chemically active substances according to EN 60721-3-3  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to the michanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to the michanically active substances according to EN 60721-3-6  - to the michanically active substances according to EN 60721-3-6  - to the michanically active substances according to EN 60721-3-6  - to the michanically active substances according to EN 60721-3-6  - to the michanically active substances according to EN 60721-3-6  - to the michanically active substances according to EN 60721-3-6  - to the michanically active substances according to EN 60721-3-6  - to the michanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3				
rot spores (with the exception of fauna); Class 3B3 on request  - to chemically active substances according to EN 60721-3-3  - to mechanically active substances according to EN 60721-3-6  - to be be be believed in the exception of fauna); Class 3B3 on request  - to the believed in the exception of fauna); Class 3B3 on request  - to the believed in the exception of fauna); Class 3B3 on request  - to the believed in the exception of fauna); Class 3B3 on request  - to the believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fauna); Class 3B3 on request  - to be believed in the exception of fa	Use in stationary industrial systems			
fauna); Class 3B3 on request  fauna); Class 6B3 on request  fauna)				Yes; Class 3B2 mold, fungus and dry
according to EN 60721-3-3 salt spray acc. to EN 60068-2-52 (severity degree 3); * salt	according to LIN 00721-3-3			
- to mechanically active substances according to EN 60721-3-6  - to chemically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to chemically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - The supplied plug covers must remain in place over the unused interfaces during operation!  - Note regarding classification of environmental conditions acc. to EN 60721  - Note regarding classification of environmental conditions according to EN 60721  - Note regarding classification of environmental conditions according to EN 60721  - Note regarding classification of environmental conditions according to EN 60721  - Note regarding classification of environmental conditions according to EN 60721  - Note regarding classification of environmental conditions according to EN 60721  - Note regarding classification of environmental conditions according to EN 6				Yes; Class 3C4 (RH < 75 %) incl.
- to mechanically active substances according to EN 60721-3-3  Use on ships/at sea  - to biologically active substances according to EN 60721-3-6  - to chemically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - The supplied plug covers must remain in place over the unused interfaces during operation!  - The supplied plug covers must remain in place over the unused interfaces during operation!  - Conformal coating  - Coatings for printed circuit board assemblies acc. to EN 61086  - Protection against fouling acc. to EN 60664-3  - The supplied plug accives accidence accid	according to EN 60721-3-3			
Use on ships/at sea  - to biologically active substances according to EN 60721-3-6  - to chemically active substances according to EN 60721-3-6  - to chemically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - The supplied plug covers must remain in place over the unused according to EN 60721  - Note regarding classification of environmental conditions acc. to EN 60068-2-52  - to EN 60721  - The supplied plug covers must remain in place over the unused interfaces during operation!  - The supplied plug covers must remain in place over the unused interfaces during operation!  - Conformal coating  - Coatings for printed circuit board assemblies acc. to EN 61086  - Protection against fouling acc. to EN 61086  - Protection against fouling acc. to EN 60664-3	- to mechanically active substances	, , ,		Yes; Class 3S4 incl. sand, dust, *
- to biologically active substances according to EN 60721-3-6  - to chemically active substances according to EN 60721-3-6  - to chemically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - to mechanically active substances according to EN 60721-3-6  - The supplied plug covers must of environmental conditions acc. to EN 60721  - The supplied plug covers must remain in place over the unused interfaces during operation!  - The supplied plug covers must remain in place over the unused interfaces during operation!  - Conformal coating  - Coatings for printed circuit board assemblies acc. to EN 61086  - Protection against fouling acc. to EN 61086  - Protection against fouling acc. to EN 60664-3				
according to EN 60721-3-6  (excluding fauna); Class 6B3 on request  (excluding	•	Vac. Class CDO mald and funcil anares	Vac. Class CDO mald and funcial anares	Vac. Class CDO mald and fungal anares
according to EN 60721-3-6 salt spray acc. to EN 60068-2-52 (severity degree 3); *  - to mechanically active substances according to EN 60721-3-6  Remark  - Note regarding classification of environmental conditions acc. to EN 60721  - Conformal coating  - Coatings for printed circuit board assemblies acc. to EN 61086  - Protection against fouling acc. to EN 61086  - Severity degree 3); *  Yes; Class 6S3 incl. sand, dust; *  Yes; Class 6S3 incl. sand, dust; *  Yes; Class 6S3 incl. sand, dust; *  The supplied plug covers must remain in place over the unused interfaces during operation!  * The supplied plug covers must remain in place over the unused interfaces during operation!  * The supplied plug covers must remain in place over the unused interfaces during operation!  * The supplied plug covers must remain in place over the unused interfaces during operation!  * The supplied plug covers must remain in place over the unused interfaces during operation!  * The supplied plug covers must remain in place over the unused interfaces during operation!  * The supplied plug covers must remain in place over the unused interfaces during operation!  * The supplied plug covers must remain in place over the unused interfaces during operation!  * The supplied plug covers must remain in place over the unused interfaces during operation!  * The supplied plug covers must remain in place over the unused interfaces during operation!  * The supplied plug covers must remain in place over the unused interfaces during operation!  * The supplied plug covers must remain in place over the unused interfaces during operation!  * The supplied plug covers must remain in place over the unused interfaces during operation!  * The supplied plug covers must remain in place over the unused interfaces during operation!  * The supplied plug covers must remain in place over the unused interfaces during operation!  * The supplied plug covers must remain in place over the unused interfaces during operation!  * The supplied plug covers must remain in pla		(excluding fauna); Class 6B3 on	(excluding fauna); Class 6B3 on	(excluding fauna); Class 6B3 on
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> <li>Remark         <ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> <li>* The supplied plug covers must remain in place over the unused interfaces during operation!</li> <li>* The supplied plug covers must remain in place over the unused interfaces during operation!</li> </ul> </li> <li>* The supplied plug covers must remain in place over the unused interfaces during operation!</li> <li>* The supplied plug covers must remain in place over the unused interfaces during operation!</li> <li>* Conformal coating</li> </ul> <li>* Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 61086</li> <li>* Protection against fouling acc. to EN 60664-3</li> <li>Yes; Type 1 protection</li> <li>Yes; Type 1 protection</li> <li>Yes; Type 1 protection</li>		salt spray acc. to EN 60068-2-52	salt spray acc. to EN 60068-2-52	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3): *
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> <li>* The supplied plug covers must remain in place over the unused interfaces during operation!</li> <li>* The supplied plug covers must remain in place over the unused interfaces during operation!</li> <li>* Conformal coating</li> <li>* Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>* Protection against fouling acc. to EN 60664-3</li> <li>* The supplied plug covers must remain in place over the unused interfaces during operation!</li> <li>* The supplied plug covers must remain in place over the unused interfaces during operation!</li> <li>* Yes; Class 2 for high availability</li> <li>Yes; Class 2 for high availability</li> <li>Yes; Type 1 protection</li> <li>Yes; Type 1 protection</li> </ul>		,	, , ,	Yes; Class 6S3 incl. sand, dust; *
of environmental conditions acc. to EN 60721 remain in place over the unused interfaces during operation! remain in place over the unused interfaces during operation! remain in place over the unused interfaces during operation!  Conformal coating  Coatings for printed circuit board assemblies acc. to EN 61086  Protection against fouling acc. to EN 60664-3  Yes; Class 2 for high availability assignment of the unused interfaces during operation!  Yes; Class 2 for high availability assignment of the unused interfaces during operation!  Yes; Class 2 for high availability assignment of the unused interfaces during operation!  Yes; Class 2 for high availability assignment of the unused interfaces during operation!  Yes; Class 2 for high availability assignment of the unused interfaces during operation!  Yes; Class 2 for high availability assignment of the unused interfaces during operation!  Yes; Class 2 for high availability assignment of the unused interfaces during operation!	Remark			
acc. to EN 60721 interfaces during operation! interfaces during operation! interfaces during operation!  Conformal coating  Contings for printed circuit board assemblies acc. to EN 61086  Protection against fouling acc. to EN 60664-3  Protection against fouling acc. to EN 60664-3  Interfaces during operation!  Yes; Class 2 for high availability availability assemblies acc. to EN 61086  Yes; Type 1 protection  Yes; Type 1 protection  Yes; Type 1 protection	- Note regarding classification			* The supplied plug covers must
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Yes; Class 2 for high availability Yes; Type 1 protection</li> </ul>				
<ul> <li>assemblies acc. to EN 61086</li> <li>Protection against fouling acc. to EN 60664-3</li> <li>Yes; Type 1 protection</li> <li>Yes; Type 1 protection</li> <li>Yes; Type 1 protection</li> <li>Yes; Type 1 protection</li> </ul>	Conformal coating			
EN 60664-3		Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
	EN 60664-3			
MIL-I-46058C, Amendment 7 during service life during service life during service life		· ·	, and the second	-
<ul> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> <li>Yes; Conformal coating, Class A</li> <li>Yes; Conformal coating, Class A</li> <li>Yes; Conformal coating, Class A</li> </ul>	Electrical Insulating Compound for Printed Board Assemblies	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Central processing units SIPLUS standard CPUs

### SIPLUS CPU 1214C

Ordering data	Article No.		Article No.
SIPLUS CPU 1214C compact CPU, AC/DC/relay		SIPLUS CPU 1214C compact CPU, DC/DC/relay	
(Extended temperature range and exposure to media)		(Extended temperature range and exposure to media)	
Integrated program/data memory 100 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		Integrated program/data memory 100 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	
at 100 kHz • For areas with extreme exposure to media (conformal coating); ambient temperature	6AG1214-1BG40-4XB0	<ul> <li>For areas with extreme exposure to media (conformal coating); ambient temperature</li> <li>-20 +60 °C</li> </ul>	6AG1214-1HG40-4XB0
<ul> <li>-20 +60 °C</li> <li>For areas with extreme exposure to media (conformal coating); ambient temperature</li> </ul>	6AG1214-1BG40-5XB0	<ul> <li>For areas with extreme exposure to media (conformal coating); ambient temperature</li> <li>-40 +60 °C</li> </ul>	6AG1214-1HG40-5XB0
-40 +60 °C • For areas with extreme exposure to media (conformal coating); ambient temperature -40 +70 °C	6AG1214-1BG40-2XB0	<ul> <li>For areas with extreme exposure to media (conformal coating); ambient temperature</li> <li>-40 +70 °C</li> </ul>	6AG1214-1HG40-2XB0
		Accessories	
SIPLUS CPU 1214C compact CPU, DC/DC/DC		SIPLUS SB 1221 digital input signal board	
(Extended temperature range and exposure to media)  Integrated program/data memory		(Extended temperature range and exposure to media; cannot be used with 6AG1214-12XB0)	
100 KB, load memory 2 MB; Power supply 24 V DC; Boolean execution times 0.1 µs		4 inputs, 5 V DC, 200 kHz, sourcing	6AG1221-3AD30-5XB0
per operation; 14 digital inputs, 10 digital outputs,		4 inputs, 24 V DC, 200 kHz, sourcing	6AG1221-3BD30-5XB0
2 analog inputs; expandable by up to		SIPLUS SB 1222 digital output signal board	
3 communication modules, 8 signal modules, and 1 signal board/communication board; Digital inputs can be used as HSC		(Extended temperature range and exposure to media; cannot be used with 6AG1214-12XB0)	
at 100 kHz,		4 outputs, 5 V DC, 0.1 A, 200 kHz	6AG1222-1AD30-5XB0
24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs		4 outputs, 24 V DC, 0.1 A, 200 kHz	6AG1222-1BD30-5XB0
<ul> <li>(PWM) at 100 kHz</li> <li>For areas with extreme exposure to media (conformal coating); ambient temperature</li> <li>-20 +60 °C</li> </ul>	6AG1214-1AG40-4XB0		
<ul> <li>For areas with extreme exposure to media (conformal coating); ambient temperature</li> <li>-40 +60 °C</li> </ul>	6AG1214-1AG40-5XB0		
<ul> <li>For areas with extreme exposure to media (conformal coating); ambient temperature</li> <li>-40 +70 °C</li> </ul>	6AG1214-1AG40-2XB0		

Central processing units SIPLUS standard CPUs

### SIPLUS CPU 1214C

Ordering data	Article No.		Article No.
SIPLUS SB 1223 digital input/output signal board		SIPLUS SB 1232 analog output signal board	
(Extended temperature range and exposure to media; cannot be used with 6AG1214-12XB0)		(Extended temperature range and exposure to media; cannot be used with 6AG1214-12XB0)	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs,		Ambient temperature range -25 +55 °C  1 analog output, ±10 V with 12 bits	6AG1232-4HA30-5XB0
0.5 A, 5 W; can be used as HSC at up to 30 kHz		or 0 20 mA with 11 bits  Ambient temperature range	
Suitable for areas with extreme exposure to media	6AG1223-0BD30-4XB0	0 +55 °C	
(conformal coating)  • Ambient temperature	6AG1223-0BD30-5XB0	1 analog output, ±10 V with 12 bits or 0 20 mA with 11 bits	6AG1232-4HA30-4XB0
-25 +55 °C	0AG1223-0BD30-3AB0	SIPLUS CB 1241 RS 485 communication board	
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	6AG1223-3AD30-5XB0	(Extended temperature range and	
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	6AG1223-3BD30-5XB0	exposure to media; cannot be used with 6AG1214-12XB0)	
2 outputs 24 v 50, 0.1 A, 200 K12		For point-to-point connection, with 1 RS 485 interface	6AG1241-1CH30-5XB1
		Additional accessories	See SIMATIC S7-1200 CPU 1214C, page 3/14

Central processing units SIPLUS standard CPUs

#### SIPLUS CPU 1215C

#### Overview



- The compact high-performance CPU
- With 24 integrated I/Os
- Expandable with:
  - 1 signal board (SB) or communication board (CB); not possible with: 6AG1215-1AG40-2XB0, 6AG1215-1BG40-2XB0, 6AG1215-1HG40-2XB0 8 signal modules (SM)
- Max. 3 communication modules (CM)

#### Note:

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

Article number	6AG1215-1AG40-4XB0	6AG1215-1AG40-5XB0	6AG1215-1AG40-2XB0
Based on	6ES7215-1AG40-0XB0	SES7215-1AG40-0XB0 6ES7215-1AG40-0XB0	
	SIPLUS S7-1200 CPU 1215C DC/DC/DC	SIPLUS S7-1200 CPU 1215C DC/DC/DC	SIPLUS S7-1200 CPU 1215C DC/DC/DC
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; = Tmin (incl. condensation/ frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2, analog outputs 2 (no adjacent points) with horizontal mounting position	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2, analog outputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1, analog outputs 1 (no adjacent points) with horizontal mounting position
At cold restart, min.	0 °C	-25 °C	-25 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m) (+3 500 m +5 000 m)		Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)
Relative humidity			
<ul> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

Central processing units SIPLUS standard CPUs

SIPLUS CPU 1215C

Article number	6AG1215-1AG40-4XB0	6AG1215-1AG40-5XB0	6AG1215-1AG40-2XB0	
Based on	6ES7215-1AG40-0XB0	6ES7215-1AG40-0XB0	6ES7215-1AG40-0XB0	
	SIPLUS S7-1200 CPU 1215C DC/DC/DC	SIPLUS S7-1200 CPU 1215C DC/DC/DC	SIPLUS S7-1200 CPU 1215C DC/DC/DC	
Use on ships/at sea				
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	
<ul> <li>to chemically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	
Remark				
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	
Conformal coating				
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	
Article number	6AG1215-1BG40-4XB0	6AG1215-1BG40-5XB0	6AG1215-1BG40-2XB0	
Based on	6ES7215-1BG40-0XB0 SIPLUS S7-1200 CPU 1215C AC/DC/RLY	6ES7215-1BG40-0XB0 SIPLUS S7-1200 CPU 1215C AC/DC/RLY	6ES7215-1BG40-0XB0 SIPLUS S7-1200 CPU 1215C AC/DC/RLY	
Ambient conditions				
Ambient temperature during operation				
• min.	-20 °C; = Tmin (incl. condensation/ frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C	
• max.			points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1, analog outputs 1 (no adjacent points) with horizontal mounting position	
At cold restart, min.	0 °C	-25 °C	-25 °C	
Altitude during operation relating to sea level				
<ul> <li>Installation altitude above sea level, max.</li> </ul>		2 000 m	2 000 m	
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC	
Relative humidity				
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)  100 %; RH incl. condensation (no commissioning under condensation conditions)		
Resistance				
Coolants and lubricants				
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	

Central processing units SIPLUS standard CPUs

#### SIPLUS CPU 1215C

	6AC121E 1DC40 AVD0	CAC121E 1DC40 EVD0	6AC121E 1DC40 2VD0
Article number	6AG1215-1BG40-4XB0	6AG1215-1BG40-5XB0	6AG1215-1BG40-2XB0
Based on	<b>6ES7215-1BG40-0XB0</b> SIPLUS S7-1200 CPU 1215C	<b>6ES7215-1BG40-0XB0</b> SIPLUS S7-1200 CPU 1215C	<b>6ES7215-1BG40-0XB0</b> SIPLUS S7-1200 CPU 1215C
	AC/DC/RLY	AC/DC/RLY	AC/DC/RLY
Use in stationary industrial systems			
<ul> <li>to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
<ul> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Article number	6AG1215-1HG40-4XB0	6AG1215-1HG40-5XB0	6AG1215-1HG40-2XB0
, italia nambai	SIPLUS S7-1200 CPU 1215C DC/DC/RLY	SIPLUS S7-1200 CPU 1215C DC/DC/RLY	SIPLUS S7-1200 CPU 1215C DC/DC/RLY
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; = Tmin (incl. condensation/ frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• max.	activated inputs or outputs 7 or 5 of simultaneously switched-on di (no adjacent points) at 60 °C horizontal inputs 7, digital outputs 5, analog		70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2, analog outputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1, analog outputs 1 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C	-25 °C
Altitude during operation relating to sea level			
Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC

Central processing units SIPLUS standard CPUs

SIPLUS CPU 1215C

Article number	6AG1215-1HG40-4XB0	6AG1215-1HG40-5XB0	6AG1215-1HG40-2XB0
	SIPLUS S7-1200 CPU 1215C SIPLUS S7-1200 CPU 1215C DC/DC/RLY DC/DC/RLY		SIPLUS S7-1200 CPU 1215C DC/DC/RLY
Relative humidity			
<ul> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, * Yes; Class 3S4 incl. sand, dust, *		Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Central processing units SIPLUS standard CPUs

#### SIPLUS CPU 1215C

Ordering data	Article No.		Article No.
SIPLUS CPU 1215C compact CPU, AC/DC/relay		SIPLUS CPU 1215C compact CPU, DC/DC/relay	
(Extended temperature range and exposure to media)		(Extended temperature range and exposure to media)	
Integrated program and data memory 125 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		Integrated program and 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 outputs (relay), 2 analog outputs, 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	6AG1215-1HG40-4XB0
<ul> <li>For areas with extreme exposure to media (conformal coating); ambient temperature</li> <li>20 +60 °C</li> </ul>	6AG1215-1BG40-4XB0	to media (conformal coating); ambient temperature -20 +60 °C	
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 +60 °C	6AG1215-1BG40-5XB0	<ul> <li>For areas with extreme exposure to media (conformal coating); ambient temperature</li> <li>-40 +60 °C</li> </ul>	6AG1215-1HG40-5XB0
• For areas with extreme exposure to media (conformal coating); ambient temperature  -40 +70 °C	6AG1215-1BG40-2XB0	<ul> <li>For areas with extreme exposure to media (conformal coating); ambient temperature</li> <li>-40 +70 °C</li> </ul>	6AG1215-1HG40-2XB0
SIPLUS CPU 1215C		Accessories	
compact CPU, DC/DC/DC		SIPLUS SB 1221 digital input signal board	
(Extended temperature range and exposure to media)  Integrated program and		(Extended temperature range and exposure to media; cannot be used with 6AG1215-12XB0)	
data memory 125 KB, load memory 4 MB; power supply 24 V DC;		4 inputs, 5 V DC, 200 kHz, sourcing	6AG1221-3AD30-5XB0
Boolean execution times 0.085 μs per operation; 14 digital inputs,		4 inputs, 24 V DC, 200 kHz, sourcing	6AG1221-3BD30-5XB0
10 digital outputs, 2 analog inputs,		SIPLUS SB 1222 digital output signal board	
2 analog outputs; expandable by up to 3 communication modules,		(Extended temperature range and exposure to media; cannot be used with 6AG1215-12XB0)	
8 signal modules and 1 signal board/communication board; digital inputs usable as HSC with		4 outputs, 5 V DC, 0.1 A, 200 kHz	6AG1222-1AD30-5XB0
100 kHz; 24 V DC digital outputs usable as pulse outputs (PTO) or pulse-width-modulated outputs (PWM) with 100 kHz		4 outputs, 24 V DC, 0.1 A, 200 kHz	6AG1222-1BD30-5XB0
For areas with extreme exposure to media (conformal coating); ambient temperature     -20 +60 °C	6AG1215-1AG40-4XB0		
<ul> <li>For areas with extreme exposure to media (conformal coating); ambient temperature -40 +60 °C</li> </ul>	6AG1215-1AG40-5XB0		
<ul> <li>For areas with extreme exposure to media (conformal coating); ambient temperature</li> <li>-40 +70 °C</li> </ul>	6AG1215-1AG40-2XB0		

Central processing units SIPLUS standard CPUs

## SIPLUS CPU 1215C

Ordering data	Article No.		Article No.
SIPLUS SB 1223 digital input/output signal board		SIPLUS SB 1232 analog output signal board	
(Extended temperature range and exposure to media; cannot be used with 6AG1215-1 <b>2</b> XB0)		(Extended temperature range and exposure to media; cannot be used with 6AG1215-12XB0)	
2 inputs, 24 V DC, IEC type 1 current sinking;		Ambient temperature range -25 +55 °C	
2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at		1 analog output, $\pm 10$ V with 12 bits or 0 20 mA with 11 bits	6AG1232-4HA30-5XB0
<ul><li>up to 30 kHz</li><li>Suitable for areas with extreme exposure to media</li></ul>	6AG1223-0BD30-4XB0	Ambient temperature range 0 +55 °C	
(conformal coating)  • Ambient temperature	6AG1223-0BD30-5XB0	1 analog output, ±10 V with 12 bits or 0 20 mA with 11 bits	6AG1232-4HA30-4XB0
-25 +55 °C		SIPLUS CB 1241 RS 485 communication board	
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	6AG1223-3AD30-5XB0	(Extended temperature range and	
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	6AG1223-3BD30-5XB0	exposure to media; cannot be used with 6AG1215-12XB0)	
2 331p313 24 ¥ 50, 0.171, 200 N12		for point-to-point connection, with 1 RS 485 interface	6AG1241-1CH30-5XB1
		Additional accessories	See SIMATIC S7-1200 CPU 1215C, page 3/18

Central processing units

#### Fail-safe CPUs

#### Overview



The fail-safe SIMATIC S7-1200 Controllers are based on the S7-1200 standard CPUs and offer additional safety-related

They can be used for safety-oriented tasks according to IEC 61508 up to SIL 3 and ISO 13849-1 up to PL e.

Safety-related programs are created in the TIA Portal. The STEP 7 Safety engineering tool offers commands, operations and blocks for safety-related programs in the LAD and FBD languages. To this end, there is a library with pre-configured, TÜV-approved blocks for safety-related functions.

- Standard controller with integrated safety functions:
  - Standardized and convenient diagnostic functions for standard and safety
- Uniform symbols, data consistency, ...
- Modular system with scalable range of CPUs and expandable I/O quantity structure:
  - One engineering for standard and fail-safe automation
  - Use of the standard I/O modules together with the fail-safe I/O modules in the central system
  - Integrated standard PROFINET functionalities for PROFINET controllers and PROFINET iDevice services
  - Connection of distributed standard I/O via field bus such as PROFINET or PROFIBUS
  - F-library certified by the German Technical Inspectorate (TÜV) for all common safety functions
    - Free programming of the safety logic using FBD and LAD

  - Standard-compliant printout of the F-program
- One integrated engineering for both standard and safety from S7-1200 to S7-300/400/1500 and WinAC RTX F:
  - STEP 7 Safety Basic for easy engineering of the CPU 1200 FC
  - STEP 7 Safety Advanced for the entire fail-safe SIMATIC S7 portfolio
- · Integrated system diagnosis of the CPUs, for standard and safety:
  - Consistent plain text display of system diagnostic information in the TIA Portal, HMI and web server
  - Messages are updated even if the CPU is in STOP state
  - System diagnostics integrated in the CPU firmware. Configuration by user not required
- The diagnostics is automatically updated on configuration changes.
- 2 fail-safe compact controllers with graded performances in the versions DC/DC/DC and DC/DC/relay

Characteristics	CPU 1212 FC	CPU 1214FC	CPU 1215FC
Variants	DC/DC/DC, DC/DC/relay	DC/DC/DC, DC/DC/relay	DC/DC/DC, DC/DC/relay
Main memory, integrated	100 KB	125 KB	150 KB
Load memory, integrated	2 MB	4 MB	4 MB
Memory card	SIMATIC Memory Card (optional)	SIMATIC Memory Card (optional)	SIMATIC Memory Card (optional)
Standard digital inputs/outputs, integrated	8/6	14/10	14/10
Standard analog inputs, integrated	2	2	2
Standard analog outputs, integrated	-	-	2
Process image	1024 bytes for inputs, 1024 bytes for outputs	1024 bytes for inputs, 1024 bytes for outputs	1024 bytes for inputs, 1024 bytes for outputs
Expansion by signal board	Max. 1	Max. 1	Max. 1
Expansion by signal modules	Max. 2	Max. 8	Max. 8
Expansion by communication modules	Max. 3	Max. 3	Max. 3

Central processing units

Fail-safe CPUs

Article number	6ES7212-1AF40- 0XB0	6ES7212-1HF40- 0XB0	6ES7214-1AF40- 0XB0	6ES7214-1HF40- 0XB0	6ES7215-1AF40- 0XB0	6ES7215-1HF40- 0XB0
	CPU 1212FC, DC/DC/DC, 8DI/6DQ/2AI	CPU 1212FC, DC/DC/Relay, 8DI/6DQ/2AI	CPU 1214FC, DC/DC/DC, 14DI/10DQ/2AI	CPU 1214FC, DC/DC/Relay, 14DI/10DQ/2AI	CPU 1215FC, DC/DC/DC, 14DI/ 10DQ/2AI/2AQ	CPU 1215FC, DC/DC/RLY,14DI/ 10DQ/2AI/2AQ
General information						
Product type designation	CPU 1212FC DC/DC/DC	CPU 1212FC DC/DC/relay	CPU 1214FC DC/DC/DC	CPU 1214FC DC/DC/Relay	CPU 1215FC DC/DC/DC	CPU 1215FC DC/DC/relay
Engineering with						
Programming package	STEP 7 V14 or higher					
Supply voltage						
Rated value (DC)						
• 24 V DC	Yes	Yes	Yes	Yes	Yes	Yes
Encoder supply						
24 V encoder supply						
• 24 V	Permissible range: 20.4V to 28.8V	Permissible range: 20.4V to 28.8V	L+ minus 4 V DC min.			
Power loss						
Power loss, typ.	9 W	9 W	12 W	12 W	12 W	12 W
Memory						
Work memory						
• integrated	100 kbyte	100 kbyte	125 kbyte	125 kbyte	150 kbyte	150 kbyte
Load memory	,	,	- ,	- ,	- ,	,
• integrated	2 Mbyte	2 Mbyte	4 Mbyte	4 Mbyte	4 Mbyte	4 Mbyte
Plug-in (SIMATIC Memory Card),	with SIMATIC					
max.	memory card					
Backup						
• without battery	Yes	Yes	Yes	Yes	Yes	Yes
CPU processing times						
for bit operations, typ.	0.08 μs; / instruction	0.08 μs; / instruction				
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instructio				
for floating point arithmetic, typ.	2.5 µs; / instruction	2.5 µs; / instruction	2.3 μs; / instructio			
Data areas and their retentivity	·			·		
Flag						
Number, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	8 kbyte; Size of bi memory address area			
Address area						
I/O address area						
• Inputs	1 024 byte	1 024 byte				
• Outputs	1 024 byte	1 024 byte				
Process image						
Inputs, adjustable	1 kbyte					
Outputs, adjustable	1 kbyte					
Time of day	TROYIO	1 Noyto	Thoyto	1 Noyto	1 Noyto	TROYEO
Clock						
Hardware clock (real-time)	Yes	Yes	Yes	Yes	Yes	Yes
Digital inputs	. 50	. 30	. 30	. 30	. 30	. 55
Number of digital inputs	8; Integrated	8; Integrated	14	14	14: Integrated	14: Integrated
of which inputs usable for techno-	4; HSC (High	4; HSC (High	6; HSC (High	6; HSC (High	14; Integrated 6; HSC (High	14; Integrated 6; HSC (High
logical functions	Speed Counting)					
Digital outputs	3,	. 3,	. 3,	. 3/		
Number of digital outputs	6	6	10	10	10	10; Relays
of which high-speed outputs	4; 100 kHz Pulse Train Output		4; 100 kHz Pulse Train Output		4; 100 kHz Pulse Train Output	, , .
Analog inputs						
rilaiog inpato	2	2	2	2	2	2
Number of analog inputs						
Number of analog inputs						
Number of analog inputs Input ranges		Yes	Yes	Yes	Yes	Yes
Number of analog inputs Input ranges  • Voltage	Yes	Yes	Yes	Yes	Yes	Yes
Number of analog inputs Input ranges  • Voltage  Analog outputs	Yes					
Number of analog inputs Input ranges  • Voltage		Yes 0	Yes 0	Yes 0	Yes 2	Yes 2

Central processing units

#### Fail-safe CPUs

Article number	6ES7212-1AF40- 0XB0 CPU 1212FC, DC/CDC,	6ES7212-1HF40- 0XB0 CPU 1212FC, DC/DC/Relay,	6ES7214-1AF40- 0XB0 CPU 1214FC, DC/DC/DC,	6ES7214-1HF40- 0XB0 CPU 1214FC, DC/DC/Relay,	6ES7215-1AF40- 0XB0 CPU 1215FC, DC/DC/DC, 14DI/	<b>6ES7215-1HF40- 0XB0</b> CPU 1215FC, DC/DC/RLY,14DI/
1. Interface	8DI/6DQ/2AI	8DI/6DQ/2AI	14DI/10DQ/2AI	14DI/10DQ/2AI	10DQ/2AI/2AQ	10DQ/2AI/2AQ
Interface type	PROFINET	PROFINET	PROFINET	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet	Ethernet	Ethernet	Ethernet
Protocols	Linomot	Linomot	Ethernet	Linomot	Linomot	Linemet
PROFINET IO Controller	Yes	Yes	Yes	Yes	Yes	Yes
PROFINET IO Device	Yes	Yes	Yes	Yes	Yes	Yes
SIMATIC communication	Yes	Yes	Yes	Yes	Yes	Yes
Open IE communication	Yes	Yes	Yes	Yes	Yes	Yes
Web server	Yes	Yes	Yes	Yes	Yes	Yes
Media redundancy	100		No	No		Yes; as MRP client
Protocols			110	110	res, as with spent	100, 00 111111 011011
Open IE communication						
• TCP/IP	Yes	Yes	Yes	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes	Yes	Yes	Yes
• UDP	Yes	Yes	Yes	Yes	Yes	Yes
Web server	100	100	100	100	100	100
• supported	Yes	Yes	Yes	Yes	Yes	Yes
Communication functions	100	100	100	100	100	100
S7 communication						
• supported	Yes	Yes	Yes	Yes	Yes	Yes
Number of connections	100	100	100	100	100	100
• overall			16; dynamically	16; dynamically	16; dynamically	16; dynamically
Integrated Functions			ro, aynamoany	ro, ayrıarındany	ro, ayriarinoany	re, dynamiedny
Number of counters	4	4	6	6	6	6
Counting frequency (counter) max.	100 kHz					
Frequency measurement	Yes	Yes	Yes	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes	Yes	Yes	Yes
Number of position-controlled positioning axes, max.	8	8	8	8	8	8
Number of positioning axes via pulse-direction interface	Up to 4 with SB 1222	4; With integrated outputs	Up to 4 with SB 1222			
PID controller	Yes	Yes	Yes	Yes	Yes	Yes
Number of alarm inputs	4		4	4	4	4
Number of pulse outputs	4	4			4	
Limit frequency (pulse)	100 kHz				100 kHz	
Ambient conditions						
Ambient temperature during operation						
• min.	0 °C					
• max.	55 °C					
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	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
Configuration						
Programming						
Programming language						
- LAD	Yes; incl. failsafe					
- FBD	Yes; incl. failsafe					
- SCL	Yes	Yes	Yes	Yes	Yes	Yes
Dimensions						
Width	90 mm	90 mm	110 mm	110 mm	130 mm	130 mm
Height	100 mm					
Depth	75 mm					
Weights						
Weight, approx.	370 g	385 g	435 g	435 g	585 g	585 g

Central processing units

Fail-safe CPUs

Ordering data	Article No.		Article No.
CPU 1212 FC		CPU 1215FC	
Fail-safe compact CPU, DC/DC/DC; integrated program/data memory 100 KB, load memory 2 MB; supply voltage 24 V DC; Boolean execution times 0.085 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;	6ES7212-1AF40-0XB0	Fail-safe compact CPU, DC/DC/DC; integrated program/data memory 150 KB, load memory 4 MB; supply voltage 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	6ES7215-1AF40-0XB0
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		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	
Fail-safe compact CPU, DC/DC/relay; integrated program/data memory 125 KB, load memory 2 MB; supply voltage 24 V DC; Boolean execution times 0.085 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	6ES7212-1HF40-0XB0	Fail-safe compact CPU, DC/DC/relay; integrated program/data memory 150 KB, load memory 4 MB; supply voltage 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;	6ES7215-1HF40-0XB0
CPU 1214FC		digital inputs can be used as HSC at 100 kHz	
Fail-safe compact CPU,	6ES7214-1AF40-0XB0	Accessories	
DC/DC/DC; integrated program/data memory		SIMATIC S7-1200 Fail-Safe	
125 KB, load memory 4 MB; supply voltage 24 V DC; Boolean execution times 0.085 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/com-		Starter Kit  With CPU 1212FC DC/DC/relay; also includes: F digital input SM 1226 16 x 24 V DC, F digital output SM 1226 4 x 24 V DC, input simulator, STEP 7 Basic and STEP 7 Safety Basic on CD, manual on CD, info material; in Systainer	6ES7212-1HF41-4YB0
munication 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		With CPU 1214FC DC/DC/relay; also includes: F digital input SM 1226 16 x 24 V DC, F digital output SM 1226 4 x 24 V DC, input simulator, STEP 7 Safety Basic on CD, manual on CD, info material; in Systainer	6ES7212-1HF42-4YB0
Fail-safe compact CPU, DC/DC/relay;	6ES7214-1HF40-0XB0	Simulator (optional)	6ES7274-1XH30-0XA0
integrated program/data memory		14 incoming circuit breakers	
125 KB, load memory 4 MB; supply voltage 24 V DC;		SIMATIC Memory Card (optional)	
Boolean execution times 0.085 μs per operation;		4 MB	6ES7954-8LC03-0AA0
14 digital inputs,		12 MB	6ES7954-8LE03-0AA0
10 digital outputs (relays), 2 analog inputs;		24 MB	6ES7954-8LF03-0AA0
expandable by up to		256 MB	6ES7954-8LL03-0AA0
3 communication modules, 8 signal modules, and 1 signal		2 GB	6ES7954-8LP02-0AA0
board/communication board; digital inputs can be used as HSC at 100 kHz		32 GB	6ES7954-8LT03-0AA0

Central processing units

#### Fail-safe CPUs

Ordering data	Article No.		Article No.
Extension cable for two-tier configuration	6ES7290-6AA30-0XA0	STEP 7 Safety Advanced V15.1	
For connecting digital/analog signal modules; length 2 m		Engineering tool for configuring and programming fail-safe user	
Terminal block (spare part)		programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software	
For CPU 1214FC, DC/DC/DC  • For DI, with 20 screws, tin-coated; 4 units	6ES7292-1AV30-0XA0	Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M,	
<ul> <li>For DQ, with 12 screws, tin-coated; 4 units</li> </ul>	6ES7292-1AM30-0XA0	ET 200iSP, ET 200pro and	
• For AI, with 3 screws, gold-plated; 4 units	6ES7292-1BC30-0XA0	ET 200eco I/O Requirement: STEP 7 Professional V15.1	
For CPU 1214FC, DC/DC/relay  • For DI, with 20 screws, tin-coated; 4 units	6ES7292-1AV30-0XA0	Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	6ES7833-1FA15-0YA5
<ul> <li>For DQ, with 12 screws, tin-coated, coded; 4 units</li> </ul>	6ES7292-1AM40-0XA0	Floating license for 1 user; software, documentation and license key for	6ES7833-1FA15-0YH5
<ul> <li>For AI, with 3 screws, gold-plated; 4 units</li> </ul>	6ES7292-1BC30-0XA0	download 1); email address required for delivery	
For CPU 1215FC, DC/DC/DC		STEP 7 Safety Basic V15.1	
<ul> <li>For DI, with 20 screws, tin-coated; 4 units</li> </ul>	6ES7292-1AV30-0XA0	Task: Engineering tool for configuring	
<ul> <li>For DQ, with 12 screws, tin-coated; 4 units</li> </ul>	6ES7292-1AM30-0XA0	fail-safe user programs for SIMATIC S7-1200 FC	
<ul> <li>For AI, with 6 screws, gold-plated; 4 units</li> </ul>	6ES7292-1BF30-0XB0	Requirement: STEP 7 Basic V15.1 and higher	
For CPU 1215FC, DC/DC/relay  • For DI, with 20 screws, tin-coated; 4 units	6ES7292-1AV30-0XA0	Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	6ES7833-1FB15-0YA5
<ul> <li>For DQ, with 12 screws, tin-coated, coded; 4 units</li> </ul>	6ES7292-1AM40-0XA0	Floating license for 1 user; software, documentation and license key for	6ES7833-1FB15-0YH5
<ul> <li>For AI, with 6 screws, gold-plated; 4 units</li> </ul>	6ES7292-1BF30-0XB0	download 1); email address required for delivery	
Front flap set (spare part)			
for CPU 1214FC	6ES7291-1AB30-0XA0		
for CPU 1215FC	6ES7291-1AC30-0XA0		
RJ45 cable grip			
4 units per pack			
Single port	6ES7290-3AA30-0XA0		
Dual port	6ES7290-3AB30-0XA0		

<sup>1)</sup> For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

Central processing units

SIPLUS fail-safe CPUs

#### Overview



The fail-safe SIPLUS S7-1200 Controllers are based on the SIPLUS S7-1200 standard CPUs and offer additional safety-related functions.

They can be used for safety-oriented tasks according to IEC 61508 up to SIL 3 and ISO 13849-1 up to PL e.

Safety-related programs are created in the TIA Portal engineering framework. The STEP 7 Safety engineering tool offers commands, operations and blocks for safety-related programs in the LAD and FBD languages. To this end, there is a library with pre-configured blocks for safety-related functions certified by the German Technical Inspectorate (TÜV).

- Standard controller with integrated safety functions:
  - Standardized and convenient diagnostic functions for standard and safety
  - Uniform symbols, data consistency, ...
- Modular system with scalable range of CPUs and expandable I/O quantity structure:
- One engineering for standard and fail-safe automation
- Use of the standard I/O modules together with the fail-safe I/O modules in the central system
- Integrated standard PROFINET functionalities for PROFINET controllers and PROFINET iDevice services
- Connection of distributed standard I/O via fieldbus such as PROFINET or PROFIBUS
- TÜV-approved F-library for all common safety functions
- Free programming of the safety logic using FBD and LAD
- Standard-compliant printout of the F-program
- One integrated engineering for both standard and safety from S7-1200 to S7-300/400/1500 and WinAC RTX F:
  - STEP 7 Safety Basic for easy engineering of the CPU 1200 FC
  - STEP 7 Safety Advanced for the entire fail-safe SIMATIC S7 portfolio
- Integrated system diagnosis of the CPUs, for standard and safety;
  - Consistent plain text display of system diagnostic information in the TIA Portal, HMI and web server
  - Messages are updated even if the CPU is in STOP state
  - System diagnostics integrated in the CPU firmware. Configuration by user not required
  - The diagnostics is automatically updated on configuration changes.
- 2 fail-safe compact controllers with graded performances in the versions DC/DC/DC and DC/DC/relay

Characteristics	SIPLUS CPU 1214FC	SIPLUS CPU 1215FC
Variants	DC/DC/DC, DC/DC/relay	DC/DC/DC
Work memory, integrated	125 KB	150 KB
Load memory, integrated	4 MB	4 MB
Memory card	SIMATIC Memory Card (optional)	SIMATIC Memory Card (optional)
Standard digital inputs/outputs, integrated	14/10	14/10
Standard analog inputs, integrated	2	2
Standard analog outputs, integrated	-	2
Process image	1024 bytes for inputs, 1024 bytes for outputs	1024 bytes for inputs, 1024 bytes for outputs
Expansion by signal board	Max. 1	Max. 1
Expansion by signal modules	Max. 8	Max. 8
Expansion by communication modules	Max. 3	Max. 3

#### Note:

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

Central processing units

## SIPLUS fail-safe CPUs

Article number	6AG1214-1AF40-5XB0	6AG1214-1HF40-5XB0	6AG1215-1AF40-5XB0	
Based on	6ES7214-1AF40-0XB0	6ES7214-1HF40-0XB0	6ES7215-1AF40-0XB0	
	SIPLUS S7-1200 CPU 1214FC DC/DC/DC	SIPLUS S7-1200 CPU 1214FC DC/DC/RLY	SIPLUS S7-1200 CPU 1215FC DC/DC/DC	
Ambient conditions				
Ambient temperature during operation				
• min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin	
• max.	55 °C; = Tmax	55 °C; = Tmax	55 °C; = Tmax	
Altitude during operation relating to sea level				
<ul> <li>Installation altitude above sea level, max.</li> </ul>	2 000 m	2 000 m	2 000 m	
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m)	
Relative humidity				
<ul> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	
Resistance				
Coolants and lubricants				
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes	Yes	Yes	
Use in stationary industrial systems				
to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	
Use on ships/at sea				
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	
Remark				
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	
Conformal coating				
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	

Central processing units

SIPLUS fail-safe CPUs

Ordering data	Article No.		Article No.
CPU 1214FC		CPU 1215 FC	
(Extended temperature range and exposure to environmental substances)		(Extended temperature range and exposure to environmental substances)	
Fail-safe compact CPU, DC/DC/DC; Integrated program/data memory 125 KB, load memory 4 MB; supply voltage 24 V DC; Boolean execution times 0.085 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	6AG1214-1AF40-5XB0	Fail-safe compact CPU, DC/DC/DC Integrated program/data memory 150 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 (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	6AG1215-1AF40-5XB0
Fail-safe compact CPU, DC/DC/relay 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 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	6AG1214-1HF40-5XB0	Accessories	See SIMATIC CPU 121x FC, page 3/47

I/O modules Digital modules

#### SM 1221 digital input modules

#### Overview



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

Article number	6ES7221-1BF32-0XB0	6ES7221-1BH32-0XB0		
	Digital Input SM 1221, 8DI, 24V DC	Digital Input SM 1221, 16DI, 24V DC		
Supply voltage				
Rated value (DC)	24 V	24 V		
Input current				
from backplane bus 5 V DC, max.	105 mA	130 mA		
Digital inputs				
<ul> <li>from load voltage L+ (without load), max.</li> </ul>	4 mA; per channel	4 mA; per channel		
Output voltage				
Power supply to the transmitters				
• present	Yes	Yes		
Digital inputs				
Number of digital inputs	8	16		
<ul><li>in groups of</li></ul>	2	4		
Input characteristic curve in accordance with 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				
<ul> <li>Rated value (DC)</li> </ul>	24 V	24 V		
• for signal "0"	5 V DC at 1 mA	5 V DC at 1 mA		
• for signal "1"	15 V DC at 2.5 mA	15 V DC at 2.5 mA		
Input current				
<ul> <li>for signal "0", max. (permissible quiescent current)</li> </ul>	1 mA	1 mA		
• for signal "1", min.	2.5 mA	2.5 mA		
• for signal "1", typ.	4 mA	4 mA		
Input delay (for rated value of input voltage)				
for standard inputs				
- parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four		
for interrupt inputs				
- parameterizable	Yes	Yes		

I/O modules Digital modules

SM 1221 digital input modules

Article number	6ES7221-1BF32-0XB0	6ES7221-1BH32-0XB0
	Digital Input SM 1221, 8DI, 24V DC	Digital Input SM 1221, 16DI, 24V DC
Interrupts/diagnostics/ status information		
Alarms		
Diagnostic alarm	Yes	Yes
Diagnostics indication LED		
for status of the inputs	Yes	Yes
Potential separation		
Potential separation digital inputs		
• between the channels, in groups of	2	4
Degree and class of protection		
IP degree of protection	IP20	IP20
Ambient conditions		
Free fall		
Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
Connection method		
required front connector	Yes	Yes
Mechanics/material		
Enclosure material (front)		
• Plastic	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	170 g	210 g

Ordering data	Article No.	Article No.
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Ordering data	Al licie No.
SM 1221 digital input signal module	
8 inputs, 24 V DC, isolated, current sourcing/sinking	6ES7221-1BF32-0XB0
16 inputs, 24 V DC, isolated, current sourcing/sinking	6ES7221-1BH32-0XB0
Extension cable for two-tier configuration	6ES7290-6AA30-0XA0
For connecting digital/analog signal modules; length 2 m	

Terminal block (spare part)	
For 6ES7221-1BF32-0XB0, 6ES7221-1BH32-0XB0	
• With 7 screws, zinc-plated; 4 pcs.	6ES7292-1AG30-0XA0
Front flap set (spare part)	
For modules with a width of 45 mm	6ES7291-1BA30-0XA0

I/O modules Digital modules

#### SB 1221 digital input modules

#### Overview



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

Article number	6ES7221-3AD30-0XB0	6ES7221-3BD30-0XB0	
	Signal Board SB 1221, 4 DI 5VDC 200KHz	Signal Board SB 1221, 4 DI 24VDC 200KHz	
General information			
Product type designation	SB 1221, DI 4x5 V DC 200 kHz	SB 1221, DI 4x24 V DC 200 kHz	
Input current			
from backplane bus 5 V DC, typ.	40 mA	40 mA	
Power loss			
Power loss, typ.	1 W	1 W	
Digital inputs			
Number of digital inputs	4; Current-sourcing	4; Current-sourcing	
• in groups of	4	4	
Input voltage			
Type of input voltage	DC	DC	
Rated value (DC)	5 V	24 V	
• for signal "0"	(L+ minus 1.0 V DC) L+ (2.2 0 mA)	(L+ minus 5.0 V DC) L+ (1.4 0 mA)	
• for signal "1"	0 V (L+ minus 2.0 V DC (20 5.1 mA))	0 V (L+ minus 10 V DC (10 2.9 mA))	
Input current			
<ul> <li>for signal "0", max. (permissible quiescent current)</li> </ul>	2.2 mA	1.4 mA	
• for signal "1", min.	5.1 mA	2.9 mA	
• for signal "1", typ.		7 mA	
Input delay (for rated value of input voltage)			
for standard inputs			
- parameterizable	Yes; $0.1/0.2/0.4/0.8/1.6/3.2/6.4/10.0/12.8/20.0\mu s$ ; $0.05/0.1/0.2/0.4/0.8/1.6/3.2/6.4/10.0/12.8/20.0m s$	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 $\mu s$ ; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms	
for interrupt inputs			
- parameterizable	Yes	Yes	
for technological functions			
- parameterizable	Yes	Yes	
Cable length			
• shielded, max.	50 m; shielded, twisted pair	50 m; shielded, twisted pair	
Diagnostics indication LED			
• for status of the inputs	Yes	Yes	

I/O modules Digital modules

SB 1221 digital input modules

# Technical specifications (continued)

Article number	6ES7221-3AD30-0XB0	6ES7221-3BD30-0XB0	
	Signal Board SB 1221, 4 DI 5VDC 200KHz	Signal Board SB 1221, 4 DI 24VDC 200KHz	
Degree and class of protection			
Degree of protection acc. to EN 60529			
• <b>I</b> P20	Yes	Yes	
Ambient conditions			
Free fall			
<ul> <li>Fall height, max.</li> </ul>	0.3 m; five times, in product package	0.3 m; five times, in product package	
Ambient temperature during operation			
• min.	-20 °C	-20 °C	
• max.	60 °C	60 °C	
Mechanics/material			
Enclosure material (front)			
Plastic	Yes	Yes	
Dimensions			
Width	38 mm	38 mm	
Height	62 mm	62 mm	
Depth	21 mm	21 mm	
Weights			
Weight, approx.	35 g	35 g	

Ordering data	Article No.		Article No.
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SB	1221	Signal	<b>Board</b>	digital
inp	ut mo	dules		

4 inputs, 5 V DC, 200 kHz, sourcing

4 inputs, 24 V DC, 200 kHz, sourcing

6ES7221-3AD30-0XB0

6ES7221-3BD30-0XB0

#### Terminal block (spare part)

for Signal Board

with 6 screws, gold-plated; 4 pcs.

6ES7292-1BF30-0XA0

I/O modules Digital modules

#### SM 1222 digital output modules

#### Overview



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

Article number	6ES7222-1BF32- 0XB0	6ES7222-1BH32- 0XB0	6ES7222-1HF32- 0XB0	6ES7222-1HH32- 0XB0	6ES7222-1XF32- 0XB0
	Digital Output SM1222, 8 DQ, 24V DC	Digital Output SM1222, 16 DQ, 24V DC	Digital Output SM 1222, 8 DQ, Relay	Digital Output SM1222, 16 DQ, Relay	Digital Output SM 1222, 8 DQ, Changeover
Input current					
from backplane bus 5 V DC, max.	120 mA	140 mA	120 mA	135 mA	140 mA
Digital outputs					
<ul> <li>from load voltage L+, max.</li> </ul>			11 mA/relay coil	11 mA/relay coil	16.7 mA/relay coil
Digital outputs					
Number of digital outputs	8	16	8	16	8
• in groups of	1	1	2	1	1
Short-circuit protection	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					
<ul> <li>with resistive load, max.</li> </ul>	0.5 A	0.5 A	2 A	2 A	2 A
• on lamp load, max.	5 W	5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
Output voltage					
<ul> <li>Rated value (DC)</li> </ul>	24 V	24 V	5 V DC to 30 V DC	5 V DC to 30 V DC	5 V DC to 30 V DC
<ul> <li>Rated value (AC)</li> </ul>			5 V AC to 250 V AC	5 V AC to 250 V AC	5 V AC to 250 V AC
• 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" rated value	0.5 A	0.5 A	2 A	2 A	2 A
• for signal "0" residual current, max.	10 μΑ	10 μΑ			
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
Total current of the 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	10 A; Current per mass	2 A; Current per mass

I/O modules Digital modules

SM 1222 digital output modules

Article number	6ES7222-1BF32- 0XB0	6ES7222-1BH32- 0XB0	6ES7222-1HF32- 0XB0	6ES7222-1HH32- 0XB0	6ES7222-1XF32- 0XB0
	Digital Output SM1222, 8 DQ, 24V DC	Digital Output SM1222, 16 DQ, 24V DC	Digital Output SM 1222, 8 DQ, Relay	Digital Output SM1222, 16 DQ, Relay	Digital Output SM 1222, 8 DQ, Changeover
Relay outputs					
<ul> <li>Number of relay outputs</li> </ul>			8	16	8
<ul> <li>Rated supply voltage of relay coil L+ (DC)</li> </ul>			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	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
- with resistive load, max.	0.5 A	0.5 A	2 A	2 A	2 A
Cable length					
• shielded, max.	500 m	500 m	500 m	500 m	500 m
• unshielded, max.	150 m	150 m	150 m	150 m	150 m
Interrupts/diagnostics/ status information					
Alarms					
Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED					
for status of the outputs	Yes	Yes	Yes	Yes	Yes
Potential separation					
Potential separation digital outputs					
<ul> <li>between the channels</li> </ul>			Relays	Relays	Relays
• between the channels, in groups of		1	2	4	1
between the channels and 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
Degree and class of protection					
Degree of protection acc. to EN 60529					
• IP20	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
CE mark	Yes	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes	Yes
cULus	Yes	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes	Yes	Yes
Ambient conditions					
Free fall					
Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation					
• min.	-20 °C	-20 °C	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C	60 °C; Number of simultaneously activated outputs: 8 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 16 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated outputs: 4 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 at 55 °C horizontal or 45 °C vertical

I/O modules Digital modules

## SM 1222 digital output modules

Article number	6ES7222-1BF32- 0XB0	6ES7222-1BH32- 0XB0	6ES7222-1HF32- 0XB0	6ES7222-1HH32- 0XB0	6ES7222-1XF32- 0XB0
	Digital Output SM1222, 8 DQ, 24V DC	Digital Output SM1222, 16 DQ, 24V DC	Digital Output SM 1222, 8 DQ, Relay	Digital Output SM1222, 16 DQ, Relay	Digital Output SM 1222, 8 DQ, Changeover
Connection method					
required front connector	Yes	Yes	Yes	Yes	Yes
Mechanics/material					
Enclosure material (front)					
• Plastic	Yes	Yes	Yes	Yes	Yes
Dimensions					
Width	45 mm	45 mm	45 mm	45 mm	70 mm
Height	100 mm	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm	75 mm
Weights					
Weight, approx.	180 g	220 g	190 g	260 g	310 g

Ordering data	Article No.		Article No.
SM 1222 digital output signal		Terminal block (spare part)	
module 8 outputs, 24 V DC; 0.5 A, 5 W, isolated	6ES7222-1BF32-0XB0	For 6ES7222-1BF32-0XB0, 6ES7222-1BH32-0XB0 • With 7 screws, zinc-plated; 4 pcs.	6ES7292-1AG30-0XA0
16 outputs, 24 V DC; 0.5 A, 5 W, isolated	6ES7222-1BH32-0XB0	For 6ES7222-1HF32-0XB0 • With 7 screws, tin-coated,	6ES7292-1AG40-0XA1
8 relay outputs, 5 30 V DC / 5 250 V AC, 2 A, 30 W DC / 200 W AC	6ES7222-1HF32-0XB0	left coded; 4 units For 6ES7222-1HH32-0XB0 • With 7 screws, tin-coated,	6ES7292-1AG40-0XA0
8 relay outputs, change-over contact, 5 30 V DC / 5 250 V AC, 2 A, 30 W DC / 200 W AC	6ES7222-1XF32-0XB0	right coded; 4 units  For 6ES7222-1XF32-0XB0  • With 11 screws, tin-coated; 4 units	6ES7292-1AL30-0XA0
16 relay outputs, 5 30 V DC / 5 250 V AC, 2 A, 30 W DC / 200 W AC	6ES7222-1HH32-0XB0	Front flap set (spare part) For modules with a width of 45 mm	6ES7291-1BA30-0XA0
Extension cable for two-tier configuration	6ES7290-6AA30-0XA0	For modules with a width of 70 mm	6ES7291-1BB30-0XA0
For connecting digital/analog signal modules; length 2 m			

I/O modules Digital modules

SB 1222 digital output modules

# Overview



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

Article number	6ES7222-1AD30-0XB0	6ES7222-1BD30-0XB0
	Signal Board SB1222, 4 DQ 5VDC 200KHz	Signal Board SB1222, 4 DQ 24VDC 200KHz
General information		
Product type designation	SB 1222, DQ 4x5 V DC 200 kHz	SB 1222, DQ 4x24 V DC 200 kHz
Input current		
from backplane bus 5 V DC, typ.	35 mA	35 mA
Power loss		
Power loss, typ.	0.5 W	0.5 W
Digital outputs		
Number of digital outputs	4; MOSFET, solid-state (current-sinking/current-sourcing)	4; MOSFET, solid-state (current-sinking/current-sourcing)
• in groups of	4	4
Short-circuit protection	No	No
Switching capacity of the outputs		
• with resistive load, max.	0.1 A	0.1 A
Load resistance range		
• upper limit	$7\Omega$	11 Ω
Output voltage		
Rated value (DC)	5 V	24 V
• for signal "0", max.	0.2 V	1 V; with 10 kOhm load
• for signal "1", min.	L+ minus 0.7 V DC	L+ (-1.5 V)
• for signal "1", max.	6 V	
Output current		
<ul> <li>for signal "1" permissible range, max.</li> </ul>	0.1 A	0.1 A
Cable length		
• shielded, max.	50 m	50 m
Diagnostics indication LED		
<ul> <li>for status of the outputs</li> </ul>	Yes	Yes
Degree and class of protection		
Degree of protection acc. to EN 60529		
• IP20	Yes	Yes

I/O modules Digital modules

# SB 1222 digital output modules

# Technical specifications (continued)

Article number	6ES7222-1AD30-0XB0	6ES7222-1BD30-0XB0	
	Signal Board SB1222, 4 DQ 5VDC 200KHz	Signal Board SB1222, 4 DQ 24VDC 200KHz	
Ambient conditions			
Free fall			
Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	
Ambient temperature during operation			
• min.	-20 °C	-20 °C	
• max.	60 °C	60 °C	
Mechanics/material			
Enclosure material (front)			
Plastic	Yes	Yes	
Dimensions			
Width	38 mm	38 mm	
Height	62 mm	62 mm	
Depth	21 mm	21 mm	
Weights			
Weight, approx.	35 g	35 g	

Ordering data	Article No.	Article No.
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SB 1222 Signal Board digital output modules	
4 outputs, 5 V DC, 0.1 A, 200 kHz	6ES7222-1AD30-0XB0
4 outputs, 24 V DC, 0.1 A, 200 kHz	6ES7222-1BD30-0XB0

Terminal block (spare part) for Signal Board with 6 screws, gold-plated; 4 pcs.

6ES7292-1BF30-0XA0

I/O modules Digital modules

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 relevant task
- For subsequent expansion of the system with additional inputs and outputs

Article number	6ES7223-1BH32- 0XB0	6ES7223-1BL32- 0XB0	6ES7223-1PH32- 0XB0	6ES7223-1PL32- 0XB0	6ES7223-1QH32- 0XB0
	Digital I/O SM 1223, 8 DI / 8 DQ	Digital I/O SM 1223, 16DI/16DQ	Digital I/O SM 1223, 8DI/8DQ	Digital I/O SM 1223, 16DI/16DQ	Digital I/O SM 1223, 8DI AC/8DQ RIy
General information					
Product type designation	SM 1223, DI 8x24 V DC, DQ 8x24 V DC	SM 1223, DI 16x24 V DC, DQ 16x24 V DC	SM 1223, DI 8x24 V DC, DQ 8x relay	SM 1223, DI 16x24 V DC, DQ 16x relay	SM 1223, DI 8x120/ 230 V AC, DQ 8x relay
Supply voltage					
Rated value (DC)					
• 24 V DC	Yes	Yes	Yes	Yes	Yes
Input current					
from backplane bus 5 V DC, max.	145 mA	185 mA	145 mA	180 mA	120 mA
Digital inputs					
<ul> <li>from load voltage L+ (without load), max.</li> </ul>	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 loss					
Power loss, typ.	2.5 W	4.5 W	5.5 W	10 W	7.5 W
Digital inputs					
Number of digital inputs	8	16	8	16	8
• in groups of	2	2	2	2	4
Input characteristic curve in accordance with 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
Input voltage					
Type of input voltage	DC	DC	DC	DC	AC
Rated value (DC)	24 V	24 V	24 V	24 V	
Rated value (AC)					120/230 V AC
• for signal "0"	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA	20 V AC at 1 mA
• for signal "1"	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA	79 V AC at 2.5 mA

I/O modules Digital modules

## SM 1223 digital input/output modules

Digital I/O SM 1223, 8DI AC/8DQ Rly  1 mA  2.5 mA  9 mA  Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four  Yes  500 m  300 m
1 mA 2.5 mA 9 mA  Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four  Yes  500 m 300 m
2.5 mA 9 mA Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four Yes 500 m 300 m
9 mA  Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four  Yes  500 m  300 m
Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four Yes 500 m 300 m
0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four Yes 500 m 300 m
0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four Yes 500 m 300 m
0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four  Yes  500 m  300 m
500 m 300 m 8 4
500 m 300 m 8 4
300 m 8 4
300 m 8 4
8
4
4
No; to be provided externally
2 A
30 W with DC, 200 W with AC
5 V DC to 30 V DC 5 V AC to 250 V AC
2 A
10 ms
10 ms
8 A; Current per mass
8
24 V
mechanically 10 million, at rated load voltage 100 000
2 A
30 W with DC, 200 W with AC
2 A
500 m
150 m
30 with 5 \ \ 5 \ \ \ 2 / \ \ 100 \ 100 \ 8 / \ \ 8 \ 24 \ \ mea 100 \ loca 2 / \ 300 \ with 100 \ 550 \ \ 100 \ 1

I/O modules Digital modules

SM 1223 digital input/output modules

Article number	6ES7223-1BH32- 0XB0	6ES7223-1BL32- 0XB0	6ES7223-1PH32- 0XB0	6ES7223-1PL32- 0XB0	6ES7223-1QH32- 0XB0
	Digital I/O SM 1223, 8 DI / 8 DQ	Digital I/O SM 1223, 16DI/16DQ	Digital I/O SM 1223, 8DI/8DQ	Digital I/O SM 1223, 16DI/16DQ	Digital I/O SM 1223, 8DI AC/8DQ RIy
Interrupts/diagnostics/ status information					
Alarms					
Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED					
<ul> <li>for status of the inputs</li> </ul>	Yes	Yes	Yes	Yes	Yes
for status of the outputs	Yes	Yes	Yes	Yes	Yes
Potential separation					
Potential separation digital inputs					
• between the channels, in groups of	2	2	2	2	2
Potential separation digital outputs					
• between the channels			Relays	Relays	Relays
• between the channels, in groups of	1	1	2	4	2
<ul> <li>between the channels and backplane bus</li> </ul>	500 V AC	500 V AC	1500 V AC for 1 minute	1500 V AC for 1 minute	1500 V AC for 1 minute
Degree and class of protection					
Degree of protection acc. to EN 60529					
• IP20	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
CE mark	Yes	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes	Yes
cULus	Yes	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes	Yes	Yes	Yes
Marine approval	Yes		Yes	Yes	Yes
Ambient conditions					
Free fall					
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package			
Ambient temperature during operation					
• min.	-20 °C	-20 °C	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C	60 °C; Number of simultaneously activated outputs: 8 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 16 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated outputs: 4 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 at 55 °C horizontal or 45 °C vertical
Connection method					
required front connector	Yes	Yes	Yes	Yes	Yes
Mechanics/material					
Enclosure material (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
Weights					
Weight, approx.	210 g	310 g	230 g	350 g	230 g

I/O modules Digital modules

## SM 1223 digital input/output modules

Ordering data	Article No.		Article No.
SM 1223 digital input/output		Terminal block (spare part)	
signal module 8 inputs, 24 V DC, IEC type 1 current sinking; 8 x 24 V DC transistor outputs.	6ES7223-1BH32-0XB0	For 6ES7223-1BH32-0XB0 • With 7 screws, tin-coated; 4 units	6ES7292-1AG30-0XA0
0.5 A, 5 W  16 inputs, 24 V DC, IEC type 1 current sinking;	6ES7223-1BL32-0XB0	For 6ES7223-1BL32-0XB0 • With 11 screws, tin-coated; 4 units	6ES7292-1AL30-0XA0
16 x 24 V DC transistor outputs, 0.5 A, 5 W		For 6ES7223-1PH32-0XB0 • With 7 screws, zinc-plated; 4 pcs.	6ES7292-1AG30-0XA0
8 inputs, 24 V DC, IEC type 1 current sinking; 8 relay outputs,	6ES7223-1PH32-0XB0	<ul> <li>With 7 screws, tin-coated, right coded; 4 units</li> </ul>	6ES7292-1AG40-0XA0
5 30 V DC/5 250 V AC, 2 A, 30 W DC/200 W AC 16 inputs, 24 V DC,	6ES7223-1PL32-0XB0	For 6ES7223-1PL32-0XB0  • With 11 screws, tin-coated; 4 units	6ES7292-1AL30-0XA0
IEC type 1 current sinking; 16 relay outputs, 5 30 V DC/5 250 V AC, 2 A,		With 11 screws, tin-coated, coded; 4 units	6ES7292-1AL40-0XA0
30 W DC/200 W AC 8 inputs, 120/230 V AC; 8 relay outputs,	6ES7223-1QH32-0XB0	For 6ES7223-1PL32-0XB0  With 7 screws, tin-coated, right coded; 4 units	6ES7292-1AG40-0XA0
5 30 V DC/5 250 V AC, 2 A, 30 W DC/200 W AC		Front flap set (spare part)	
Extension cable for	6ES7290-6AA30-0XA0	For modules with a width of 45 mm	6ES7291-1BA30-0XA0
two-tier configuration	0E3/290-0AA30-0XA0	For modules with a width of 70 mm	6ES7291-1BB30-0XA0
for connecting digital/analog signal modules; length 2 m			

I/O modules Digital modules

SB 1223 digital input/output modules

# Overview



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

General information Product type designation	Signal Board SB1223, 2 DI/2 DQ SB 1223, DI 2x24 V DC/DQ 2x24 V DC	Signal Board SB 1223, 2DI/2DQ 5V 200KHz	Signal Board SB 1223, 2DI/2DQ 24V 200KHz
	SB 1223, DI 2x24 V DC/DQ 2x24 V DC	OD 1000 DIO 5 V DO/DO 0 5 V DO	
Product type designation	SB 1223, DI 2x24 V DC/DQ 2x24 V DC	00 1000 010 51/00/00 0 51/00	
		200 kHz	SB 1223, DI 2x24 V DC/DQ 2x24 V DC 200 kHz
Input current			
from backplane bus 5 V DC, typ.	50 mA	35 mA	35 mA
Output voltage			
Power supply to the transmitters			
• Supply current, max.	4 mA; per channel		
Power loss			
Power loss, typ.	1 W	0.5 W	0.5 W
Digital inputs			
Number of digital inputs	2; Current-sinking	2; Current-sourcing	2; Current-sourcing
• in groups of	1	2	2
Input characteristic curve in accordance with IEC 61131, type 1	Yes		
Number of simultaneously controllable inputs			
all mounting positions			
- up to 40 °C, max.	2		2
Input voltage			
Type of input voltage	DC	DC	DC
• Rated value (DC)	24 V	5 V	24 V
• for signal "0"	0 to 5 V	(L+ minus 1.0 V DC) L+	(L+ minus 5.0 V DC) L+
• for signal "1"	+15 to +30V	0 V (L+ minus 2.0 V DC)	0 V (L+ minus 10 V DC)
Input current			
<ul> <li>for signal "0", max. (permissible quiescent current)</li> </ul>	1 mA	2.2 mA	1.4 mA
• for signal "1", min.		5.1 mA	2.9 mA
• for signal "1", typ.	0.5 A		7 mA

I/O modules Digital modules

## SB 1223 digital input/output modules

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

I/O modules Digital modules

SB 1223 digital input/output modules

# Technical specifications (continued)

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

Ordering data	Article No.	Article No.
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# SB 1223 digital input/output signal board

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

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

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

#### 6ES7223-0BD30-0XB0

6ES7223-3AD30-0XB0

6ES7223-3BD30-0XB0

#### Terminal block (spare part)

for signal board

with 6 screws, gold-plated; 4 pcs.

6ES7292-1BF30-0XA0

I/O modules SIPLUS digital modules

#### SIPLUS 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 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 SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Article number	6AG1221-1BF32-2XB0	6AG1221-1BF32-4XB0	6AG1221-1BH32-2XB0	6AG1221-1BH32-4XB0
Based on	6ES7221-1BF32-0XB0	6ES7221-1BF32-0XB0	6ES7221-1BH32-0XB0	6ES7221-1BH32-0XB0
	SIPLUS S7-1200 SM 1221 8DI	SIPLUS S7-1200 SM 1221 8DI	SIPLUS S7-1200 SM 1221 16DI	SIPLUS S7-1200 SM 1221 16DI
Ambient conditions				
Free fall				
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated inputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa ( +2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)
Relative humidity				
With condensation, tested in accordance with IEC 60068-2-38, max.	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)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes	Yes	Yes	Yes

I/O modules SIPLUS digital modules

SIPLUS SM 1221 digital input modules

#### Technical specifications (continued)

Article number	6AG1221-1BF32-2XB0	6AG1221-1BF32-4XB0	6AG1221-1BH32-2XB0	6AG1221-1BH32-4XB0
Based on	6ES7221-1BF32-0XB0	6ES7221-1BF32-0XB0	6ES7221-1BH32-0XB0	6ES7221-1BH32-0XB0
	SIPLUS S7-1200 SM 1221 8DI	SIPLUS S7-1200 SM 1221 8DI	SIPLUS S7-1200 SM 1221 16DI	SIPLUS S7-1200 SM 1221 16DI
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *			
Use on ships/at sea				
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *			
Remark				
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability			
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection			
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A			

#### Ordering data Article No. Article No.

# Digital input SIPLUS signal module SM 1221

(Extended temperature range and exposure to media)

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

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

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

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

#### 6AG1221-1BF32-4XB0

6AG1221-1BF32-2XB0

6AG1221-1BH32-4XB0

6AG1221-1BH32-2XB0

#### Accessories

See SIMATIC S7-1200 SM 1221 digital input modules, page 3/53

I/O modules SIPLUS digital modules

#### SIPLUS SB 1221 digital input modules

#### Overview



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

#### Note:

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

Article number	6AG1221-3AD30-5XB0	6AG1221-3BD30-5XB0
Based on	6ES7221-3AD30-0XB0	6ES7221-3BD30-0XB0
	SIPLUS S7-1200 SB 1221 4DI 5VDC	SIPLUS S7-1200 SB 1221 4DI 24VDC
Ambient temperature		
Ambient temperature during operation		
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax; Tmax > 55 °C number of simultaneously activated inputs 2 (no adjacent points) for horizontal mounting position	60 °C; = Tmax; Tmax > 55 °C number of simultaneously activated inputs 2 (no adjacent points) for horizontal mounting position
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)
Relative humidity		
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
Coolants and lubricants		
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
<ul> <li>to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spore s (with the exception of fauna); Class 3B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea		
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); $^{\star}$
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

I/O modules SIPLUS digital modules

SIPLUS SB 1221 digital input modules

Article number	6AG1221-3AD30-5XB0	6AG1221-3BD30-5XB0
Based on	6ES7221-3AD30-0XB0	6ES7221-3BD30-0XB0
	SIPLUS S7-1200 SB 1221 4DI 5VDC	SIPLUS S7-1200 SB 1221 4DI 24VDC
Conformal coating		
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection	Yes; Type 1 protection
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data	Article No.		Article No.
SIPLUS SB 1221 digital input signal board		Accessories	See SIMATIC S7-1200 digital input SB 1221,
(Extended temperature range and exposure to media)			page 3/55
4 inputs, 5 V DC, 200 kHz, sourcing	6AG1221-3AD30-5XB0		
4 inputs, 24 V DC, 200 kHz, sourcing	6AG1221-3BD30-5XB0		

I/O modules SIPLUS digital modules

#### **SIPLUS SM 1222 digital output modules**

#### 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 SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Article number	6AG1222-1BF32-2XB0	6AG1222-1BF32-4XB0	6AG1222-1BH32-2XB0	6AG1222-1BH32-4XB0
Based on	6ES7222-1BF32-0XB0	6ES7222-1BF32-0XB0	6ES7222-1BH32-0XB0	6ES7222-1BH32-0XB0
	SIPLUS S7-1200 SM 1222 8DQ	SIPLUS S7-1200 SM 1222 8DQ	SIPLUS S7-1200 SM 1222 16DQ	SIPLUS S7-1200 SM 1222 16DQ
Ambient conditions				
Free fall				
• Fall height, max.	0.3 m; five times, in product package			
Ambient temperature during operation				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
<ul> <li>At cold restart, min.</li> </ul>	-25 °C	0 °C	-25 °C	0 °C
Altitude during operation relating to sea level				
<ul> <li>Installation altitude above sea level, max.</li> </ul>	5 000 m	5 000 m	5 000 m	5 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)
Relative humidity				
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)			

I/O modules SIPLUS digital modules

SIPLUS SM 1222 digital output modules

reclinical specifications (conti				
Article number	6AG1222-1BF32-2XB0	6AG1222-1BF32-4XB0	6AG1222-1BH32-2XB0	6AG1222-1BH32-4XB0
Based on	6ES7222-1BF32-0XB0	6ES7222-1BF32-0XB0	6ES7222-1BH32-0XB0	6ES7222-1BH32-0XB0
	SIPLUS S7-1200 SM 1222 8DQ	SIPLUS S7-1200 SM 1222 8DQ	SIPLUS S7-1200 SM 1222 16DQ	SIPLUS S7-1200 SM 1222 16DQ
Resistance				
Coolants and lubricants				
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
<ul> <li>to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Artiala numbar	6AC1000 1UE00 0VB0	6AG1222-1HF32-4XB0	6AC1000 1UU00 0VD0	6AG1222-1HH32-4XB0
Article number Based on	<b>6AG1222-1HF32-2XB0 6ES7222-1HF32-0XB0</b> SIPLUS S7-1200 SM 1222 8DQ RLY	<b>6ES7222-1HF32-0XB0</b> SIPLUS S7-1200 SM 1222 8DQ RLY	<b>6AG1222-1HH32-2XB0</b> <b>6ES7222-1HH32-0XB0</b> SIPLUS S7-1200 SM 1222 16DQ RLY	<b>6ES7222-1HH32-0XB0</b> SIPLUS S7-1200 SM 1222 16DQ RLY
Ambient conditions				
Free fall				
Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation	10.00 T.	20.00	10.00 T.	20.00
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
<ul> <li>At cold restart, min.</li> </ul>	-25 °C	0 °C	-25 °C	0 °C

I/O modules SIPLUS digital modules

## SIPLUS SM 1222 digital output modules

lecnnical specifications (conti	maca)			
Article number	6AG1222-1HF32-2XB0	6AG1222-1HF32-4XB0	6AG1222-1HH32-2XB0	6AG1222-1HH32-4XB0
Based on	6ES7222-1HF32-0XB0	6ES7222-1HF32-0XB0	6ES7222-1HH32-0XB0	6ES7222-1HH32-0XB0
	SIPLUS S7-1200 SM 1222 8DQ RLY	SIPLUS S7-1200 SM 1222 8DQ RLY	SIPLUS S7-1200 SM 1222 16DQ RLY	SIPLUS S7-1200 SM 1222 16DQ RLY
Altitude during operation relating to sea level				
<ul> <li>Installation altitude above sea level, max.</li> </ul>	2 000 m	2 000 m	2 000 m	2 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC
Relative humidity				
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)			
Resistance				
Coolants and lubricants				
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *			
Use on ships/at sea				
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *			
Remark		,	,	
Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability			
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection			
Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
<ul> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Conformal coating, Class A			

I/O modules SIPLUS digital modules

SIPLUS SM 1222 digital output modules

Ordering data	Article No.		Article No.
Digital output SIPLUS signal module SM 1222		8 outputs, 5 30 V DC/5 250 V AC,	
(Extended temperature range and exposure to media)		relay 2 A, 30 W DC/200 W AC  • Suitable for areas with extraordinary exposure to media	6AG1222-1HF32-4XB0
8 outputs, 24 V DC; 0.5 A, 5 W, isolated		(conformal coating)  • -25 +70 °C.	6AG1222-1HF32-2XB0
Suitable for areas with extraordinary exposure to media (conformal coating)	6AG1222-1BF32-4XB0	from +60 +70°C number of simultaneously controllable inputs and outputs max. 50%	
• -25 +70 °C, from +60 +70°C number of simultaneously controllable inputs and outputs max. 50%	6AG1222-1BF32-2XB0	16 outputs, 5 30 V DC/5 250 V AC, relay 2 A, 30 W DC/200 W AC	
and outputs max. 50% 16 outputs, 24 V DC; 0.5 A, 5 W, isolated		<ul> <li>Suitable for areas with extraordinary exposure to media (conformal coating)</li> </ul>	6AG1222-1HH32-4XB0
Suitable for areas with extraordinary exposure to media (conformal coating)	6AG1222-1BH32-4XB0	• -25 +70 °C, from +60 +70°C number of simultaneously controllable inputs	6AG1222-1HH32-2XB0
• -25 +70 °C,	6AG1222-1BH32-2XB0	and outputs max. 50%	
from +60 +70°C number of simultaneously controllable inputs and outputs max. 50%		Accessories	See SIMATIC S7-1200 digital outp SM 1222, page 3/58

I/O modules SIPLUS digital modules

#### SIPLUS SB 1222 digital output modules

#### Overview



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

#### Note:

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

Article number	6AG1222-1AD30-5XB0	6AG1222-1BD30-5XB0
Based on	6ES7222-1AD30-0XB0	6ES7222-1BD30-0XB0
	SIPLUS S7-1200 SB 1222 4DQ 5VDC	SIPLUS S7-1200 SB 1222 4DQ 24VDC
Ambient temperature		
Ambient temperature during operation		
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax; Tmax > 55 °C number of simultaneously activated outputs 2 (no adjacent points) for horizontal mounting position	$60~^\circ\text{C}; = \text{Tmax}; \text{Tmax} > 55~^\circ\text{C}$ number of simultaneously activated outputs 2 (no adjacent points) for horizontal mounting position
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)
Relative humidity		
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
Coolants and lubricants		
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
<ul> <li>to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

I/O modules SIPLUS digital modules

SIPLUS SB 1222 digital output modules

Article number	6AG1222-1AD30-5XB0	6AG1222-1BD30-5XB0
Based on	6ES7222-1AD30-0XB0	6ES7222-1BD30-0XB0
	SIPLUS S7-1200 SB 1222 4DQ 5VDC	SIPLUS S7-1200 SB 1222 4DQ 24VDC
Use on ships/at sea		
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection	Yes; Type 1 protection
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data Article No.	Article No.
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PLUS SB 1222 digital output gnal board		Accessories	See SIMATIC S7-120 digital output module
Extended temperature range and exposure to media)			SB 1222, page 3/60
outputs, 5 V DC, 0.1 A, 200 kHz	6AG1222-1AD30-5XB0		
outputs, 24 V DC, 0.1 A, 200 kHz	6AG1222-1BD30-5XB0		

I/O modules SIPLUS digital modules

#### SIPLUS SM 1223 digital input/output modules

#### Overview



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

#### Note:

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

Article number	6AG1223-1BH32-2XB0	6AG1223-1BH32-4XB0	6AG1223-1PH32-2XB0	6AG1223-1PH32-4XB0
Based on	6ES7223-1BH32-0XB0	6ES7223-1BH32-0XB0	6ES7223-1PH32-0XB0	6ES7223-1PH32-0XB0
	SIPLUS S7-1200 SM 1223 8DI/8DQ	SIPLUS S7-1200 SM 1223 8DI/8DQ	SIPLUS S7-1200 SM 1223 8DI/8DQ RLY	SIPLUS S7-1200 SM 1223 8DI/8DQ RLY
Ambient conditions				
Free fall				
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4, inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4, inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
<ul> <li>At cold restart, min.</li> </ul>	-25 °C	0 °C	-25 °C	0 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	2 000 m	2 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 4540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC
Relative humidity				
With condensation, tested in accordance with IEC 60068-2-38, max.	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)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes	Yes	Yes	Yes

I/O modules SIPLUS digital modules

SIPLUS SM 1223 digital input/output modules

Article number	6AG1223-1BH32-2XB0	6AG1223-1BH32-4XB0	6AG1223-1PH32-2XB0	6AG1223-1PH32-4XB0
Based on	6ES7223-1BH32-0XB0	6ES7223-1BH32-0XB0	6ES7223-1PH32-0XB0	6ES7223-1PH32-0XB0
	SIPLUS S7-1200 SM 1223 8DI/8DQ	SIPLUS S7-1200 SM 1223 8DI/8DQ	SIPLUS S7-1200 SM 1223 8DI/8DQ RLY	SIPLUS S7-1200 SM 1223 8DI/8DQ RLY
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
<ul> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Autoto a solo o	04.04000 4.DI 00.0V.D0	04.04000 4.DI 00 4.V.D.0	0404000 4BL00 0VB0	0404000 4BI 00 4VB0
Article number	6AG1223-1PL32-2XB0	6AG1223-1PL32-4XB0	6AG1223-1BL32-2XB0	6AG1223-1BL32-4XB0
Based on	<b>6ES7223-1PL32-0XB0</b> SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	6ES7223-1PL32-0XB0 SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	<b>6ES7223-1BL32-0XB0</b> SIPLUS S7-1200 SM 1223 16DI/16DQ	<b>6ES7223-1BL32-0XB0</b> SIPLUS S7-1200 SM 1223 16DI/16DQ
Ambient conditions				
Free fall				
Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8, inputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8, inputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
<ul> <li>At cold restart, min.</li> </ul>	-25 °C	0 °C	-25 °C	0 °C

I/O modules SIPLUS digital modules

## SIPLUS SM 1223 digital input/output modules

Article number	6AG1223-1PL32-2XB0	6AG1223-1PL32-4XB0	6AG1223-1BL32-2XB0	6AG1223-1BL32-4XB0
Based on	6ES7223-1PL32-0XB0	6ES7223-1PL32-0XB0	6ES7223-1BL32-0XB0	6ES7223-1BL32-0XB0
	SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	SIPLUS S7-1200 SM 1223 16DI/16DQ	SIPLUS S7-1200 SM 1223 16DI/16DQ
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m	2 000 m	5 000 m	5 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m); above 2 000 m max. 132 V AC	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa ( +2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)
Relative humidity				
With condensation, tested in accordance with IEC 60068-2-38, max.	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)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants		.,		.,
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes	Yes	Yes	Yes
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		,	,	
Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

I/O modules SIPLUS digital modules

SIPLUS SM 1223 digital input/output modules

Technical specifications (conf	tinued)	Ordering data	Article No.
Article number Based on	6AG1223-1QH32-4XB0 6ES7223-1QH32-0XB0	Digital input/output SIPLUS signal module SM 1223	
Daseu Oil	SIPLUS S7-1200 SM 1223 8DI AC/8DQ RLY	(Extended temperature range and	
Ambient temperature	SIVI 1223 ODI AC/ODQ NEI	exposure to media)	
Ambient temperature during operation		8 inputs, 24 V DC, IEC type 1 current sinking; 8 transistor outputs, 24 V DC,	
• min.	-20 °C; = Tmin (incl. condensation/ frost); start-up @ 0 °C	<ul><li>0.5 A, 5 W</li><li>For areas with exceptional</li></ul>	6AG1223-1BH32-4XB0
• max.	60 °C; = Tmax	exposure to media (conformal coating)	
Altitude during operation relating to sea level		• -25 +70 °C, from +60 +70 °C number of	6AG1223-1BH32-2XB0
<ul> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	Tmin Tmax at 1 080 hPa 795 hPa	simultaneously controllable inputs and outputs max. 50 %	
	(-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) //	16 inputs, 24 V DC, IEC type 1 current sinking; 16 transistor outputs, 24 V DC, 0.5 A, 5 W	
	Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	For areas with exceptional exposure to media (conformal coating)	6AG1223-1BL32-4XB0
Relative humidity		• -25 +70 °C,	6AG1223-1BL32-2XB0
<ul> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	from +60 +70 °C number of simultaneously controllable inputs and outputs max. 50 %	
Resistance		8 inputs, 24 V DC,	
Coolants and lubricants		IEC type 1 current sinking; 8 relay outputs,	
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	5 30 V DC / 5 250 V AC, 2 A, 30 W DC / 200 W AC	
Use in stationary industrial systems		For areas with exceptional	6AG1223-1PH32-4XB0
<ul> <li>to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	exposure to media (conformal coating) • -25 +70 °C,	6AG1223-1PH32-2XB0
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	from +60 +70 °C number of simultaneously controllable inputs and outputs max. 50 %	
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	16 inputs, 24 V DC, IEC type 1 current sinking; 16 relay outputs,	
Use on ships/at sea		5 30 V DC / 5 250 V AC, 2 A,	
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	30 W DC / 200 W AC  • For areas with exceptional exposure to media	6AG1223-1PL32-4XB0
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	(conformal coating)  • -25 +70 °C, from +60 +70 °C number of simultaneously controllable inputs	6AG1223-1PL32-2XB0
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	and outputs max. 50 %	
Remark	* The company Production	8 inputs, 120/230 V AC; 8 relay outputs, 5 30 V DC/	
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	5 250 VAC, 2 A, 30 W DC/ 200 W AC • For areas with exceptional	6AG1223-1QH32-4XB0
Conformal coating		exposure to media	
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	(conformal coating)  Accessories	See SIMATIC S7-1200 digital
Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection		input/output SM 1223, page 3/64
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life		
<ul> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Conformal coating, Class A		

I/O modules SIPLUS digital modules

#### SIPLUS SB 1223 digital input/output modules

### 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 SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Article number	6AG1223-0BD30-4XB0	6AG1223-0BD30-5XB0	6AG1223-3AD30-5XB0	6AG1223-3BD30-5XB0
Based on	6ES7223-0BD30-0XB0	6ES7223-0BD30-0XB0	6ES7223-3AD30-0XB0	6ES7223-3BD30-0XB0
	SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	SIPLUS S7-1200 SB 1223 2DI/2DQ 5VDC	SIPLUS S7-1200 SB 1223 2DI/2DQ, 24VDC
Ambient conditions				
Free fall				
• Fall height, max.	0.3 m; five times, in product package			
Ambient temperature during operation				
• min.	0 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	55 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
Altitude during operation relating to sea level				
<ul> <li>Installation altitude above sea level, max.</li> </ul>	5 000 m	5 000 m	5 000 m	5 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax - 20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)
Relative humidity				
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost permitted (no commissioning in bedewed state)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
Coolants and lubricants				
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

I/O modules SIPLUS digital modules

SIPLUS SB 1223 digital input/output modules

### Technical specifications (continued)

Article number	6AG1223-0BD30-4XB0	6AG1223-0BD30-5XB0	6AG1223-3AD30-5XB0	6AG1223-3BD30-5XB0
Based on	6ES7223-0BD30-0XB0	6ES7223-0BD30-0XB0	6ES7223-3AD30-0XB0	6ES7223-3BD30-0XB0
	SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	SIPLUS S7-1200 SB 1223 2DI/2DQ 5VDC	SIPLUS S7-1200 SB 1223 2DI/2DQ, 24VDC
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *			
Remark				
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability			
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection			
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A			

#### Ordering data Article No. Article No.

Digital	input/output SIPLUS
signal	board SB 1223

(Extended temperature range and exposure to media)

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

- Suitable for areas with extreme exposure to media (conformal coating)
- Ambient temperature -25 ... +55 °C
- 2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz
- 2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz

6AG1223-0BD30-4XB0

6AG1223-0BD30-5XB0

6AG1223-3AD30-5XB0

6AG1223-3BD30-5XB0

#### Accessories

See SIMATIC S7-1200 digital input/output SB 1223, page 3/67

I/O modules Analog modules

#### SM 1231 analog input modules

### Overview



- Analog inputs for SIMATIC S7-1200
- Extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- For solving even more complex automation tasks

Article number	6ES7231-4HD32-0XB0	6ES7231-4HF32-0XB0	6ES7231-5ND32-0XB0
	Analog Input SM 1231, 4AI	Analog Input SM 1231, 8AI	Analog Input SM 1231, 4AI 16bit
General information			
Product type designation	SM 1231, AI 4x13 bit	SM 1231, AI 8x13 bit	SM 1231, AI 4x16 bit
Supply voltage			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
Input current			
Current consumption, typ.	45 mA	45 mA	65 mA
from backplane bus 5 V DC, typ.	80 mA	90 mA	80 mA
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 voltage for voltage input (destruction limit), max.	35 V	35 V	±35 V
permissible input current for current input (destruction limit), max.	40 mA	40 mA	40 mA
Cycle time (all channels) max.	625 µs	625 µs	100 µs
Input ranges			
Voltage	Yes; ±10V, ±5V, ±2.5V	Yes; ±10V, ±5V, ±2.5V	Yes; ±10V, ±5V, ±2.5V or ±1.25V
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
Thermocouple	No	No	No
Resistance thermometer	No	No	No
Resistance	No	Yes	No
Input ranges (rated values), voltages			
• -1.25 V to +1.25 V			Yes
• -10 V to +10 V	Yes	Yes	Yes
• -2.5 V to +2.5 V	Yes	Yes	Yes
• -5 V to +5 V	Yes	Yes	Yes
Input ranges (rated values), currents	5		
• 0 to 20 mA	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes
Thermocouple (TC)			
Temperature compensation			
- parameterizable		No	

I/O modules Analog modules

SM 1231 analog input modules

Article number	6ES7231-4HD32-0XB0	6ES7231-4HF32-0XB0	6ES7231-5ND32-0XB0
Article humber	Analog Input SM 1231, 4AI	Analog Input SM 1231, 8AI	Analog Input SM 1231, 4AI 16bit
Analog value generation for the inputs	7 (1 dio 9 mput ow 1201, 47 (1	Allalog Input OW 1201, 074	7 maiog input on 1201, 47 trook
Integration and conversion time/ resolution per channel			
<ul> <li>Resolution with overrange (bit including sign), max.</li> </ul>	12 bit; + sign	12 bit; + sign	15 bit; + sign
<ul> <li>Integration time, parameterizable</li> </ul>	Yes	Yes	Yes
• Interference voltage suppression for		40 dB, DC to 60 V for interference	40 dB, DC to 60 V for interference
interference frequency f1 in Hz	frequency 50 / 60 Hz	frequency 50 / 60 Hz	frequency 50 / 60 Hz
Smoothing of measured values	V	W	V
<ul><li>parameterizable</li><li>Step: None</li></ul>	Yes	Yes	Yes
•	Yes Yes	Yes Yes	Yes Yes
<ul><li>Step: low</li><li>Step: Medium</li></ul>	Yes	Yes	Yes
Step: Median     Step: High	Yes	Yes	Yes
Errors/accuracies	165	165	165
Temperature error (relative to input range), (+/-)	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)			
<ul> <li>Voltage, relative to input range, (+/-)</li> </ul>	0.1 %	0.1 %	0.1 %
• Current, relative to input range, (+/-)	0.1 %	0.1 %	0.1 %
Interference voltage suppression for $f = n \times (f1 +/-1 \%)$ , $f1 = interference$ frequency			
<ul> <li>Common mode voltage, max.</li> </ul>	12 V	12 V	12 V
Interrupts/diagnostics/ status information			
Alarms	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes
Alarms			
Diagnostic alarm	Yes	Yes	Yes
Diagnostic messages			
<ul> <li>Monitoring the supply voltage</li> </ul>	Yes	Yes	Yes
Wire-break	Yes	Yes	Yes
Diagnostics indication LED			
for status of the inputs	Yes	Yes	Yes
• for maintenance	Yes	Yes	Yes
Degree and class of protection  Degree of protection acc. to EN 60529			
• IP20	Yes	Yes	Yes
Standards, approvals, certificates			
CE mark	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes
Ambient conditions			
Free fall			
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C
Pollutant concentrations			
<ul> <li>SO2 at RH &lt; 60% without condensation</li> </ul>	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

I/O modules Analog modules

## SM 1231 analog input modules

Article number	6ES7231-4HD32-0XB0	6ES7231-4HF32-0XB0	6ES7231-5ND32-0XB0
	Analog Input SM 1231, 4AI	Analog Input SM 1231, 8AI	Analog Input SM 1231, 4AI 16bit
Connection method			
required front connector	Yes	Yes	Yes
Mechanics/material			
Enclosure material (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
Weights			
Weight, approx.	180 g	180 g	180 g

Ordering data	Article No.		Article No.
SM 1231 analog input signal		Terminal block (spare part)	
module		For 6ES7231-5ND32-0XB0,	
4 analog inputs, ±10V, ±5V, ±2.5V, or 0 20 mA, 16 bits	6ES7231-5ND32-0XB0	6ES7231-4HD32-0XB0, 6ES7231-4HF32-0XB0	
4 analog inputs, ±10V, ±5V, ±2.5V,	6ES7231-4HD32-0XB0	<ul> <li>With 7 screws, gold-plated; 4 pcs.</li> </ul>	6ES7292-1BG30-0XA0
or 0 20 mA,12 bits + sign	0207201 411202 0720	Front flap set (spare part)	
8 analog inputs, ±10V, ±5V, ±2.5V, or 0 20 mA,12 bits + sign	6ES7231-4HF32-0XB0	For modules with a width of 45 mm	6ES7291-1BA30-0XA0
Extension cable for two-tier configuration	6ES7290-6AA30-0XA0		
For connecting digital/analog signal modules; length 2 m			

I/O modules Analog modules

SB 1231 analog input modules

## Overview

- Analog input for SIMATIC S7-1200
- Extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- For solving even more complex automation tasks
- Can be plugged directly into the CPU

Article number	6ES7231-4HA30-0XB0
	Signal Board SB 1231, 1 Al
General information	
Product type designation	SB 1231, AI 1x12 bit
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
Input current	
from backplane bus 5 V DC, typ.	55 mA
Power loss	
Power loss, typ.	0.4 W
Analog inputs	
Number of analog inputs	1; Current or voltage differential inputs
permissible input voltage 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; ±10V, ±5V, ±2.5V
Current	Yes; 0 to 20 mA
Thermocouple	No
Resistance thermometer	No
Resistance	No
Input ranges (rated values), voltages	
• -10 V to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -5 V to +5 V	Yes
Input ranges (rated values), currents	5
• 0 to 20 mA	Yes
Analog outputs	
Number of analog outputs	0
Cable length	
• shielded, max.	100 m; shielded, twisted pair

Article number	6ES7231-4HA30-0XB0
	Signal Board SB 1231, 1 Al
Analog value generation for the inputs	
Measurement principle	integrating
Integration and conversion time/ resolution per channel	
<ul> <li>Resolution with overrange (bit including sign), max.</li> </ul>	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	
<ul> <li>parameterizable</li> </ul>	Yes
Step: None	Yes
• Step: low	Yes
Step: Medium	Yes
Step: High	Yes
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.3%, to 55 °C ±0.6% total measurement range
Interrupts/diagnostics/ status information	
Alarms	Yes
Diagnostics function	Yes
Alarms	
Diagnostic alarm	Yes
Diagnostic messages	
• Wire-break	No
Diagnostics indication LED	
• for status of the inputs	Yes
• for maintenance	Yes
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes

I/O modules Analog modules

## SB 1231 analog input modules

Technical specifications (continued)	
Article number	6ES7231-4HA30-0XB0
	Signal Board SB 1231, 1 Al
Ambient conditions	
Free fall	
Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Pollutant concentrations	
<ul> <li>SO2 at RH &lt; 60% without condensation</li> </ul>	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Connection method	
required front connector	Yes
Mechanics/material	
Enclosure material (front)	
Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weights	
Weight, approx.	35 g

Ordering data	Article No.
SB 1231 signal board analog input module	
1 analog input, ±10 V with 12 bits or 0 20 mA with 11 bits	6ES7231-4HA30-0XB0
Terminal block (spare part)	
for signal board	
with 6 screws, gold-plated; 4 pcs.	6ES7292-1BF30-0XA0

I/O modules Analog modules

SM 1232 analog output modules

## Overview



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

Article number	6ES7232-4HB32-0XB0	6ES7232-4HD32-0XB0
	Analog Output SM 1232, 2AQ	Analog Output SM 1232, 4AQ
General information		
Product type designation	SM 1232, AQ 2x14 bit	SM 1232, AQ 4x14 bit
Supply voltage		
Rated value (DC)		
• 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
Analog outputs		
Number of analog outputs	2; Current or voltage	4; Current or voltage
Output ranges, voltage		
• -10 V to +10 V	Yes	Yes
Output ranges, current		
• 0 to 20 mA	Yes	Yes
Load impedance (in rated range of output)		
<ul> <li>with voltage outputs, min.</li> </ul>	1 000 Ω	1 000 Ω
<ul> <li>with current outputs, max.</li> </ul>	$600~\Omega$	600 Ω
Cable length		
• shielded, max.	100 m; shielded, twisted pair	100 m; shielded, twisted pair
Analog value generation for the outputs		
Integration and conversion time/ resolution per channel		
<ul> <li>Resolution (incl. overrange)</li> </ul>	Voltage: 14 bit; Current: 13 bit	Voltage: 14 bit; Current : 13 bit
Errors/accuracies		
Temperature error (relative to output range), (+/-)	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)		
<ul> <li>Voltage, relative to output range, (+/-)</li> </ul>	0.3 %	0.3 %
<ul> <li>Current, relative to output range, (+/-)</li> </ul>	0.3 %	0.3 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
<ul> <li>Common mode voltage, max.</li> </ul>	12 V	12 V

I/O modules Analog modules

## SM 1232 analog output modules

Article number	6ES7232-4HB32-0XB0	6ES7232-4HD32-0XB0
	Analog Output SM 1232, 2AQ	Analog Output SM 1232, 4AQ
Interrupts/diagnostics/ status information		
Alarms	Yes	Yes
Diagnostics function	Yes	Yes
Alarms		
Diagnostic alarm	Yes	Yes
Diagnostic messages		
<ul> <li>Monitoring the supply voltage</li> </ul>	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		
Degree of protection acc. to EN 60529		
• <b>I</b> P20	Yes	Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
Ambient conditions		
Free fall		
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
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		
Enclosure material (front)		
Plastic	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	180 g	180 g

Ordering data	Article No.	Article No.
Oracinia data	AI LICIE INO.	Alticle No.

SM 1232 analog output signal module	
2 analog outputs, ±10 V with 14 bits or 0 20 mA with 13 bits	6ES7232-4HB32-0XB0
4 analog outputs, ±10 V with 14 bits or 0 20 mA with 13 bits	6ES7232-4HD32-0XB0
Terminal block (spare part)	
For 6ES7232-4HB32-0XB0, 6ES7232-4HD32-0XB0	
with 7 screws, gold-plated; 4 units	6ES7292-1BG30-0XA0

Extension cable for two-tier configuration	6ES7290-6AA30-0XA0
for connecting digital/analog signal modules; length 2 m	
Front flap set (spare part)	
For modules with a width of 45 mm	6ES7291-1BA30-0XA0

I/O modules Analog modules

SB 1232 analog output modules

## Overview



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

Article number	6ES7232-4HA30-0XB0
	Signal Board SB 1232, 1 AQ
General information	
Product type designation	SB 1232, AQ 1x12 bit
Input current	
from backplane bus 5 V DC, typ.	15 mA
Output voltage	
Power supply to the transmitters	
• Supply current, max.	25 mA
Power loss	
Power loss, typ.	1.5 W
Analog inputs	
Number of analog inputs	0
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 V 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	
• shielded, max.	100 m; shielded, twisted pair
• shielded, max.	100 m; shielded, twisted pair

Article number	6ES7232-4HA30-0XB0
	Signal Board SB 1232, 1 AQ
Analog value generation for the outputs	
Conversion principle	Differential
Integration and conversion time/ resolution per channel	
<ul> <li>Resolution with overrange (bit including sign), max.</li> </ul>	12 bit
Errors/accuracies	
Temperature error (relative to output range), (+/-)	25 °C ±0.5%, to 55 °C ±1%
Interrupts/diagnostics/ status information	
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
<ul> <li>for status of the outputs</li> </ul>	Yes
Degree and class of protection	
Degree of protection acc. to EN 60529	
• <b>I</b> P20	Yes
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C

I/O modules Analog modules

## SB 1232 analog output modules

Technical specifications (continued)		
Article number	6ES7232-4HA30-0XB0	
	Signal Board SB 1232, 1 AQ	
Pollutant concentrations		
<ul> <li>SO2 at RH &lt; 60% without condensation</li> </ul>	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	
Mechanics/material		
Enclosure material (front)		
Plastic	Yes	
Dimensions		
Width	38 mm	
Height	62 mm	
Depth	21 mm	
Weights		
Weight, approx.	40 g	

Ordering data	Article No.
SB 1232 analog output signal board	
1 analog output, ±10 V with 12 bits or 0 20 mA with 11 bits	6ES7232-4HA30-0XB0
Terminal block (spare part)	
for signal board	
with 6 screws, gold-plated; 4 pcs.	6ES7292-1BF30-0XA0

I/O modules Analog modules

SM 1234 analog input/output modules

## Overview



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

Article number	6ES7234-4HE32-0XB0
	Analog I/O SM 1234, 4AI/2AQ
General information	
Product type designation	SM 1234, AI 4x13 bit/AQ 2x14 bit
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
Input current	
Current consumption, typ.	60 mA
from backplane bus 5 V DC, typ.	80 mA
Analog inputs	
Number of analog inputs	4; Current or voltage differential inputs
permissible input voltage for voltage input (destruction limit), max.	35 V
permissible input current for current input (destruction limit), max.	40 mA
Cycle time (all channels) max.	625 µs
Input ranges	
• Voltage	Yes; ±10V, ±5V, ±2.5V
Current	Yes; 4 to 20 mA, 0 to 20 mA
Input ranges (rated values), voltages	
• -10 V to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -5 V to +5 V	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Analog outputs	
Number of analog outputs	2; Current or voltage
Output ranges, voltage	
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• 4 mA 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	
• shielded, max.	100 m; shielded, twisted pair

Article number	6ES7234-4HE32-0XB0
	Analog I/O SM 1234, 4AI/2AQ
Analog value generation for the inputs	
Measurement principle	Differential
Integration and conversion time/ resolution per channel	
<ul> <li>Resolution with overrange (bit including sign), max.</li> </ul>	12 bit; + sign
• 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	
<ul> <li>parameterizable</li> </ul>	Yes
Step: None	Yes
• Step: low	Yes
Step: Medium	Yes
• Step: High	Yes
Analog value generation for the outputs	
Integration and conversion time/ resolution per channel	
Resolution (incl. overrange)	Voltage: 14 bit; Current : 13 bit
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Temperature error (relative to output range), (+/-)	25 °C ±0.3%, to 55 °C ±0.6% total measurement range
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.1 %
• Current, relative to input range, (+/-)	0.1 %
<ul> <li>Voltage, relative to output range, (+/-)</li> </ul>	0.3 %
<ul> <li>Current, relative to output range, (+/-)</li> </ul>	0.3 %
Interference voltage suppression for $f = n \times (f1 + /- 1 \%)$ , $f1 = interference$ frequency	
Common mode voltage, max.	12 V

I/O modules Analog modules

## SM 1234 analog input/output modules

Technical specifications (continued)		
Article number	6ES7234-4HE32-0XB0	
	Analog I/O SM 1234, 4AI/2AQ	
Interrupts/diagnostics/ status information		
Alarms	Yes	
Diagnostics function	Yes	
Alarms		
Diagnostic alarm	Yes	
Diagnostic messages		
<ul> <li>Monitoring the supply voltage</li> </ul>	Yes	
Wire-break	Yes	
Short-circuit	Yes	
Diagnostics indication LED		
<ul> <li>for status of the inputs</li> </ul>	Yes	
• for status of the outputs	Yes	
• for maintenance	Yes	
Potential separation analog outputs		
between the channels and the power supply of the electronics	No	
Degree and class of protection		
Degree of protection acc. to EN 60529		
• IP20	Yes	
Standards, approvals, certificates		
CE mark	Yes	
CSA approval	Yes	
FM approval	Yes	
RCM (formerly C-TICK)	Yes	
Marine approval	Yes	
Ambient conditions		
Free fall		
• Fall height, max.	0.3 m; five times, in product package	
Ambient temperature during operation		
• min.	-20 °C	
• max.	60 °C	
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		
Enclosure material (front)		
Plastic	Yes	
Dimensions		
Width	45 mm	
Height	100 mm	
Depth	75 mm	
Weights		
Weight, approx.	220 g	

Ordering data	Article 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	6ES7234-4HE32-0XB0
Terminal block (spare part)	
For 6ES7234-4HE32-0XB0	
with 7 screws, gold-plated; 4 pcs.	6ES7292-1BG30-0XA0
Extension cable for two-tier configuration	6ES7290-6AA30-0XA0
for connecting digital/analog signal modules; length 2 m	
Front flap set (spare part)	
For modules with a width of 45 mm	6ES7291-1BA30-0XA0

I/O modules Analog modules

SM 1231 thermocouple module

## 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

Article number	6ES7231-5QD32-0XB0	6ES7231-5QF32-0XB0
	S7-1200, Analog Input SM 1231 TC, 4 AI	S7-1200, Analog Input SM 1231 TC, 8 AI
General information		
Product type designation	SM 1231, AI 4x16 bit TC	SM 1231, AI 8x16 bit TC
Supply voltage		
Rated value (DC)		
• 24 V DC	Yes	Yes
Input current		
Current consumption, typ.	40 mA	40 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
Analog inputs		
Number of analog inputs	4; Thermocouples	8; Thermocouples
permissible input voltage for voltage input (destruction limit), max.	±35 V	±35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit
Input ranges		
Voltage	Yes	Yes
Current	No	No
• Thermocouple	Yes; J, K, T, E, R, S, N, C, TXK/XK(L); voltage range: $\pm 80$ mV	Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: ±80 mV
Resistance thermometer	No	No
Resistance	No	No
Input ranges (rated values), voltages		
• -80 mV to +80 mV	Yes	Yes
Input ranges (rated values), thermocouples		
• Type B	Yes	Yes
• 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
<ul> <li>Type TXK/TXK(L) to GOST</li> </ul>	Yes	Yes
Thermocouple (TC)		
Temperature compensation		
- parameterizable	No	No

I/O modules Analog modules

## SM 1231 thermocouple module

Article number	6ES7231-5QD32-0XB0	6ES7231-5QF32-0XB0
	S7-1200, Analog Input SM 1231 TC, 4 AI	S7-1200, Analog Input SM 1231 TC, 8 AI
Analog value generation for the inputs		
Measurement principle	integrating	integrating
Integration and conversion time/ resolution per channel		
<ul> <li>Resolution with overrange (bit including sign), max.</li> </ul>	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
Smoothing of measured values		
<ul> <li>parameterizable</li> </ul>	Yes	Yes
Errors/accuracies		
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.5 %	0.5 %
Interference voltage suppression for $f = n \times (f1 + /- 1 \%)$ , $f1 = interference$ frequency		
• Common mode interference, min.	120 dB	120 dB
Interrupts/diagnostics/ status information		
Alarms	Yes	Yes
Diagnostics function	Yes; Can be read out	Yes; Can be read out
Alarms		
Diagnostic alarm	Yes	Yes
Diagnostic messages		
<ul> <li>Monitoring the supply voltage</li> </ul>	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		
Degree of protection acc. to EN 60529		
• IP20	Yes	Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
Ambient conditions		
Free fall		
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
Pollutant concentrations		
<ul> <li>SO2 at RH &lt; 60% without condensation</li> </ul>	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

I/O modules Analog modules

SM 1231 thermocouple module

## Technical specifications (continued)

Ordering data

Article number	6ES7231-5QD32-0XB0	6ES7231-5QF32-0XB0
	S7-1200, Analog Input SM 1231 TC, 4 Al	S7-1200, Analog Input SM 1231 TC, 8 AI
Mechanics/material		
Enclosure material (front)		
Plastic	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	180 g	220 g

SM 1231 thermocouple module	
4 inputs +/- 80 mV, resolution 15 bits + sign, thermocouple types J, K, S, T, R, E, N	6ES7231-5QD32-0XB0
8 inputs +/- 80 mV, resolution 15 bits + sign,	6ES7231-5QF32-0XB0

Article No.

thermocouple types
J, K, T, E, R, S, N, C, TXK/XK(L)

Accessories

Terminal block (spare part)
For 6ES7231-5QD32-0XB0,
6ES7231-5QF32-0XB0

With 7 screws, gold-plated; 4 units

6ES7292-1BG30-0XA0

Extension cable for two-tier configuration	6ES7290-6AA30-0XA0
for connecting digital/analog signal modules; length 2 m	

Front flap set (spare part)
For modules with a width of 45 mm

6ES7291-1BA30-0XA0

Article No.

I/O modules Analog modules

#### SB 1231 thermocouple signal board

#### 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

Article number	6ES7231-5QA30-0XB0	
One and information	Signal Board SB 1231 TC, 1 AI	
General information	00 1001 111 1011 70	
Product type designation	SB 1231, AI 1x16 bit TC	
Supply voltage		
Rated value (DC)		
• 24 V DC	Yes	
Input current		
Current consumption, typ.	5 mA	
from backplane bus 5 V DC, typ.	20 mA	
Power loss		
Power loss, typ.	0.5 W	
Analog inputs		
Number of analog inputs	1; Thermocouples	
permissible input voltage for current input (destruction limit), max.	±35 V	
permissible input voltage for voltage input (destruction limit), max.	±35 V	
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit	
Input ranges		
Voltage	Yes	
Current	No	
Thermocouple	Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: ±80 mV	
Resistance thermometer	No	
Resistance	No	
Input ranges (rated values), voltages		
• -80 mV to +80 mV	Yes	
Input ranges (rated values), thermocouples		
• Type J	Yes	
• Type K	Yes	
Thermocouple (TC)		
Temperature compensation		
- parameterizable	No	
Analog outputs		
Number of analog outputs	0	
Cable length	-	
• shielded, max.	100 m; shielded, twisted pair	

Article number	6ES7231-5QA30-0XB0	
	Signal Board SB 1231 TC, 1 Al	
Analog value generation for the inputs		
Measurement principle	integrating	
Integration and conversion time/ resolution per channel		
<ul> <li>Resolution with overrange (bit including sign), max.</li> </ul>	15 bit; + sign	
• Integration time, parameterizable	No	
<ul> <li>Interference voltage suppression for interference frequency f1 in Hz</li> </ul>	85 dB at 10 / 50 / 60 / 400 Hz	
Smoothing of measured values		
• parameterizable	Yes	
Errors/accuracies		
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.5 %	
Interference voltage suppression for $f = n \times (f1 + 1/2 + 1/2)$ , $f1 = interference$ frequency	400 dD	
Common mode interference, min.	120 dB	
Interrupts/diagnostics/ status information		
Alarms	Yes	
Diagnostics function	Yes; Can be read out	
Alarms		
Diagnostic alarm	Yes	
Diagnostic messages		
Wire-break	Yes	
Diagnostics indication LED		
<ul> <li>for status of the inputs</li> </ul>	Yes	
• for maintenance	Yes	
Degree and class of protection		
Degree of protection acc. to EN 60529		
• IP20	Yes	
Standards, approvals, certificates		
CE mark	Yes	
CSA approval	Yes	
FM approval	Yes	
RCM (formerly C-TICK)	Yes	

I/O modules Analog modules

SB 1231 thermocouple signal board

Technical specifications (co	ontinued)
Article number	6ES7231-5QA30-0XB0
	Signal Board SB 1231 TC, 1 Al
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Pollutant concentrations	
<ul> <li>SO2 at RH &lt; 60% without condensation</li> </ul>	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Connection method	
required front connector	Yes
Mechanics/material	
Enclosure material (front)	
Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weights	
Weight, approx.	35 g

Ordering data	Article No.
SB 1231 thermocouple signal board	6ES7231-5QA30-0XB0
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.	6ES7292-1BF30-0XA0

I/O modules Analog modules

### SM 1231 RTD signal module

### Overview

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

Residency   Fundamental   Residency   R	Article number	6ES7231-5PD32-0XB0	6ES7231-5PF32-0XB0	
Product type designation         SM 1231, Al 4x16 bit RTD         SM 1231, Al 8x16 bit RTD           Supply voltage         Reted value (DC)         Yes         Yes           • 24 V DC         Yes         Yes           Input current         Current consumption, typ.         40 mA         40 mA           Current consumption, typ.         60 mA         40 mA           Analog inputs         80 mA         80 mA           Number of shading inputs         4. Resistance thermometer         4.35 V           Permissible input voltage for to valtage input (destruction limit), max.         2.35 V         Degrees Celsius/degrees Fahrenheit           Februaries         Pogrees Celsius/degrees Fahrenheit         Degrees Celsius/degrees Fahrenheit         Pogrees Celsius/degrees Fahrenheit           • Voltage         No         No         No         No           • Current         No         No         No         No           • Thermocouple         No         No         No         No           • Resistance thermometer         Yes; Resistance-type transmitter; Pt10, Pt50, Pt100, Pt1	S7-1200, Analog Input SM 1231 RTD, 4 AI		S7-1200, Analog Input SM 1231 RTD, 8 AI	
Residency   Augus (PC)   Yes   Yes   Yes   Yes   Yes   Input current   Augus (PC)   Yes	General information			
Rated value (DC)         Yes           24 V DC         Yes           Input current         Curret consumption, typ.         40 mA         40 mA           Come backplane bus 5 V DC, typ.         80 mA         40 mA           Analog input         William of analog inputs         4 (Resistance thermometer)         8; Resistance thermometer           Pumber of analog input ovaltage for too tags input (destruction limit, max.         235 V         235 V           Technical unit to temperature measurement adjustable         436 V         No           Input ranges         No         No         Current           Vollage         No         No         Current         No           * Resistance thermometer         Yes; Resistance-type transmitter: P110, P150, P1100, P1200, P1200, P1200, P1200, P1200, P1200, P1200, P1100, N120, N120, N1200, N	Product type designation	SM 1231, AI 4x16 bit RTD	SM 1231, AI 8x16 bit RTD	
Input current	Supply voltage			
Number   Current   Current   Consumption, typ.   40 mA   80	Rated value (DC)			
Current consumption, typ. from backplane bus 5 V DC, typ.         40 mA         40 mA           Analog inputs         Value of analog inputs permissible input voltage for voltage put (destruction limit), max. put (destruction limit), max. put (destruction limit), max.         4; Resistance thermometer         4: Resistance thermometer           Input ranges         Voltage         No         No           • Current         No         No         No           • Thermocouple         No         No         No           • Resistance thermometer         Yes, Resistance-type transmitter: P110, P150, P1100, P1200, P1500, P11000, N1120, N1200, N1500, N15	• 24 V DC	Yes	Yes	
from backplane bus 5 V DC, typ.         80 mA         80 mA           Analog inputs         Analog inputs         4. Resistance thermometer         8. Resistance thermometer           bumber of analog input spill of part or data pict (destruction limit), max.         4.35 V         ±35 V           Tachnical unit for temperature measurement adjustable         Degrees Celsius/degrees Fahrenheit         Degrees Celsius/degrees Fahrenheit           Imput ranges resistance thermometer         No         No           4. Voltage         No         No           4. Degrees Celsius/degrees Fahrenheit         No           4. Current         No         No           4. Voltage         No         No           4. Degrees Celsius/degrees Fahrenheit         No           4. Voltage         No         No           4. Voltage         No         No           4. Degrees Celsius/degrees Fahrenheit         Degrees Celsius/degrees Fahrenheit           4. Voltage         No         No           4. Voltage         No         No           4. Voltage         No         No           4. Resistance thermometer         Yes; 1500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni100, Cu10, Cu100, Cu10, Cu100, Cu10, Cu100, Cu10, Cu100, Cu10, Cu100, Cu10, Cu100, Cu100, Cu10, Cu100, Cu10, Cu100, Cu10, Cu100, Cu10, Cu10, Cu10, Cu100, Cu10, Cu10, Cu10, Cu	Input current			
Number of analog inputs	Current consumption, typ.	40 mA	40 mA	
Number of analog inputs permissible input voltage for voltage with the voltage for voltage with adjustable with voltage with adjustable with voltage with adjustable with voltage w	from backplane bus 5 V DC, typ.	80 mA	80 mA	
permissible input voltage for voltage input (destruction limin), max.         ±35 V         ±35 V           Tachnical unif for temperature measurement adjustable         Degrees Celsius/degrees Fahrenheit         Degrees Celsius/degrees Fahrenheit           • Voltage         No         No           • Voltage         No         No           • Thermocouple         No         No           • Resistance thermometer         Yes, Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt200, Pt200, Pt200, Nt200, Nt	Analog inputs			
input (destruction limit), max.         Degrees Celsius/degrees Fahrenheit         Degrees Celsius/degrees Fahrenheit           Tachnical unit for temperature measurement adjustable         Degrees Celsius/degrees Fahrenheit           Input ranges         Voltage         No         No           • Current         No         No         No           • Thermocouple         No         No         No           • Resistance thermometer         Yes; Resistance-type transmitter: Pt10, Pt50, Pt1000, Pt1000, Pt1000, Pt1000, Pt1000, Nt100, Nt120, Nt200, Nt500, Nt1000, Nt100, Nt120, Nt200, Nt500, Nt1000, Nt100, Nt120, Nt200, Nt500, Nt1000, Nt20, Nt200, Nt500, Nt1000, Nt120, Nt200, Nt500, Nt1000, Nt20, Nt200, Nt500, Nt1000, Nt20, Nt200, Nt500, Nt1000, Nt20, Nt200, Nt200	Number of analog inputs	4; Resistance thermometer	8; Resistance thermometer	
measurement adjustable         Input ranges         Voltage         No           • Current         No         No           • Current         No         No           • Thermocouple         No         No           • Resistance thermometer         Yes: Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni120, Ni120, Ni200, Ni500, Ni1000, Ni120, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu100, Cu500, Cu100, LG-Ni1000         Yes; 150 Q, 300 Q, 600 Q         Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu500, Cu100, LG-Ni1000         Yes; 150 Q, 300 Q, 600 Q         Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu500, Cu100, LG-Ni1000         Yes; 150 Q, 300 Q, 600 Q         Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu500, Cu100, LG-Ni1000         Yes; 150 Q, 300 Q, 600 Q         Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu500, Cu100, LG-Ni1000         Yes; 150 Q, 300 Q, 600 Q         Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Ni120, Ni120, Ni200, Ni1000, Ni120, Ni120, Ni120, Ni1200, Ni500, Ni1000, Ni120, Ni12		±35 V	±35 V	
• Voltage         No         No           • Current         No         No           • Thermocouple         No         No           • Resistance thermometer         Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni1200, Ni		Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit	
• Current         No         No           • Thermocouple         No         No           • Resistance thermometer         Yes; Resistance-type transmitter: Pt10, Pt30, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000         Yes; Resistance-type transmitter: Pt10, Pt30, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000           • Resistance         Yes; 150 Ω 300 Ω 600 Ω         Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000           • Resistance thermometer         Yes; 150 Ω 300 Ω 600 Ω         Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000           • Cu 10         Yes         Yes           • Ni 100         Yes         Yes           • Ni 1000         Yes         Yes           • Ni 1000         Yes         Yes           • Ni 1200         Yes         Yes           • Ni 1200         Yes         Yes           • Ni 1500         Yes         Yes           • Pt 1000         Yes         Yes           • Pt 1000         Yes         Yes           • Pt 200         Yes         Yes           • Pt 500         Yes         Yes           • O to 150 ohms         Yes         Yes           • O to 600 ohms         Ye	Input ranges			
No	<ul> <li>Voltage</li> </ul>	No	No	
• Resistance thermometer         Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Ni120, Ni200, Ni1000, Ni120, Ni200, Ni1000, Ni120, Ni200, Ni1000, 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 thermometer         Yes         Yes           • Cu 10         Yes         Yes           • Ni 100         Yes         Yes           • Ni 1000         Yes         Yes           • Ni 1200         Yes         Yes           • Ni 120         Yes         Yes           • Ni 1500         Yes         Yes           • Pt 100         Yes         Yes           • Pt 100         Yes         Yes           • Pt 200         Yes         Yes           • Pt 500         Yes         Yes           • O to 50 ohms         Yes         Yes           • O to 600 ohms         Yes         Yes           • O to 600 ohms         Yes	• Current	No	No	
PLSOD, PLTODO, NIT2O, NIZOD, NIZOD	Thermocouple	No	No	
Input ranges (rated values), resistance thermometer	Resistance thermometer	Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10,	Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10,	
resistance thermometer         Yes         Yes           • Cu 10         Yes         Yes           • Ni 100         Yes         Yes           • Ni 1000         Yes         Yes           • LG-Ni 1000         Yes         Yes           • Ni 1200         Yes         Yes           • Ni 200         Yes         Yes           • Pt 100         Yes         Yes           • Pt 1000         Yes         Yes           • Pt 200         Yes         Yes           • Pt 500         Yes         Yes           • D to 150 ohms         Yes         Yes           • 0 to 150 ohms         Yes         Yes           • 0 to 600 ohms         Yes         Yes           • Thermocouple (TC)         Temperature compensation         Temperature compensation	Resistance	Yes; 150 $\Omega$ , 300 $\Omega$ , 600 $\Omega$	Yes; 150 $\Omega$ , 300 $\Omega$ , 600 $\Omega$	
• Ni 100         Yes         Yes           • Ni 1000         Yes         Yes           • Ni 1000         Yes         Yes           • LG-Ni 1000         Yes         Yes           • Ni 120         Yes         Yes           • Ni 500         Yes         Yes           • Pt 100         Yes         Yes           • Pt 1000         Yes         Yes           • Pt 200         Yes         Yes           • Pt 500         Yes         Yes           • Dto 150 ohms         Yes         Yes           • 0 to 300 ohms         Yes         Yes           • 0 to 600 ohms         Yes         Yes           Thermocouple (TC)         Temperature compensation				
Nii 1000       Yes       Yes         LG-Ni 1000       Yes       Yes         Nii 120       Yes       Yes         Nii 200       Yes       Yes         Nii 500       Yes       Yes         Pt 100       Yes       Yes         Pt 200       Yes       Yes         Pt 500       Yes       Yes         Input ranges (rated values), resistors       Yes       Yes         • 0 to 150 ohms       Yes       Yes         • 0 to 300 ohms       Yes       Yes         • 0 to 600 ohms       Yes       Yes         Thermocouple (TC)       Temperature compensation       Yes	• Cu 10	Yes	Yes	
LG-Ni 1000       Yes       Yes         Ni 120       Yes       Yes         Ni 200       Yes       Yes         Ni 500       Yes       Yes         Pt 100       Yes       Yes         Pt 1000       Yes       Yes         Pt 200       Yes       Yes         Pt 500       Yes       Yes         Input ranges (rated values), resistors       Yes       Yes         ● 0 to 150 ohms       Yes       Yes         ● 0 to 300 ohms       Yes       Yes         ● 0 to 600 ohms       Yes       Yes         Thermocouple (TC)       Temperature compensation	• Ni 100	Yes	Yes	
• Ni 120       Yes       Yes         • Ni 200       Yes       Yes         • Ni 500       Yes       Yes         • Pt 100       Yes       Yes         • Pt 200       Yes       Yes         • Pt 500       Yes       Yes         • Pt 500 Yes       Yes         • O to 150 ohms       Yes       Yes         • 0 to 300 ohms       Yes       Yes         • 0 to 600 ohms       Yes       Yes         Thermocouple (TC)         Temperature compensation	• Ni 1000	Yes	Yes	
• Ni 200       Yes       Yes         • Ni 500       Yes       Yes         • Pt 100       Yes       Yes         • Pt 200       Yes       Yes         • Pt 500       Yes       Yes         • Pt 500 bms       Yes       Yes         • 0 to 150 ohms       Yes       Yes         • 0 to 300 ohms       Yes       Yes         • 0 to 600 ohms       Yes       Yes         Thermocouple (TC)         Temperature compensation	• LG-Ni 1000	Yes	Yes	
• Ni 500       Yes       Yes         • Pt 100       Yes       Yes         • Pt 200       Yes       Yes         • Pt 500       Yes       Yes         • Input ranges (rated values), resistors       Tesistors       Yes         • 0 to 150 ohms       Yes       Yes         • 0 to 300 ohms       Yes       Yes         • 0 to 600 ohms       Yes       Yes         Thermocouple (TC)         Temperature compensation	• Ni 120	Yes	Yes	
● Pt 100       Yes       Yes         ● Pt 1000       Yes       Yes         ● Pt 200       Yes       Yes         ● Pt 500       Yes       Yes         Input ranges (rated values), resistors       Ves         ● 0 to 150 ohms       Yes       Yes         ● 0 to 300 ohms       Yes       Yes         ● 0 to 600 ohms       Yes       Yes         Thermocouple (TC)         Temperature compensation	• Ni 200	Yes	Yes	
● Pt 1000       Yes       Yes         ● Pt 200       Yes       Yes         ● Pt 500       Yes       Yes         Input ranges (rated values), resistors       Tesistors       Yes         ● 0 to 150 ohms       Yes       Yes         ● 0 to 300 ohms       Yes       Yes         ● 0 to 600 ohms       Yes       Yes         Thermocouple (TC)         Temperature compensation	• Ni 500	Yes	Yes	
● Pt 200         Yes         Yes           ● Pt 500         Yes         Yes           Input ranges (rated values), resistors         Ves           ● 0 to 150 ohms         Yes         Yes           ● 0 to 300 ohms         Yes         Yes           ● 0 to 600 ohms         Yes         Yes           Thermocouple (TC)           Temperature compensation         Yes	• Pt 100	Yes	Yes	
● Pt 500         Yes         Yes           Input ranges (rated values), resistors         Ves           ● 0 to 150 ohms         Yes         Yes           ● 0 to 300 ohms         Yes         Yes           ● 0 to 600 ohms         Yes         Yes           Thermocouple (TC)           Temperature compensation	• Pt 1000	Yes	Yes	
Input ranges (rated values), resistors         Yes         Yes           • 0 to 150 ohms         Yes         Yes           • 0 to 300 ohms         Yes         Yes           • 0 to 600 ohms         Yes         Yes           Thermocouple (TC)           Temperature compensation	• Pt 200	Yes	Yes	
resistors         Yes         Yes           • 0 to 150 ohms         Yes         Yes           • 0 to 300 ohms         Yes         Yes           • 0 to 600 ohms         Yes         Yes           Thermocouple (TC)           Temperature compensation	• Pt 500	Yes	Yes	
• 0 to 300 ohms         Yes         Yes           • 0 to 600 ohms         Yes         Yes           Thermocouple (TC)           Temperature compensation				
• 0 to 600 ohms Yes Yes  Thermocouple (TC) Temperature compensation	• 0 to 150 ohms	Yes	Yes	
Thermocouple (TC) Temperature compensation	• 0 to 300 ohms	Yes	Yes	
Temperature compensation	• 0 to 600 ohms	Yes	Yes	
	Thermocouple (TC)			
- parameterizable No No	Temperature compensation			
	- parameterizable	No	No	

I/O modules Analog modules

SM 1231 RTD signal module

Article number	,	6EC7221 FDE22 0VD0	
Article number	<b>6ES7231-5PD32-0XB0</b> S7-1200, Analog Input SM 1231 RTD, 4 AI	<b>6ES7231-5PF32-0XB0</b> S7-1200, Analog Input SM 1231 RTD, 8 AI	
Analog value generation for the inputs	67 1250, 7 Halog Input ON 125111112, 471	or 1200, Allalog input on 12011115, 671	
Measurement principle	integrating	integrating	
Integration and conversion time/	<u> </u>		
resolution per channel			
<ul> <li>Resolution with overrange (bit including sign), max.</li> </ul>	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	
Errors/accuracies			
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.05 %	0.05 %	
Interference voltage suppression for $f = n \times (f1 + l - 1 \%)$ , $f1 = interference$ frequency			
<ul> <li>Common mode interference, min.</li> </ul>	120 dB	120 dB	
Interrupts/diagnostics/			
status information	M <sub>2</sub> -	Ve -	
Alarms	Yes	Yes	
Diagnostics function	Yes; Can be read out	Yes; Can be read out	
Alarms	Voc	Von	
Diagnostic alarm	Yes	Yes	
Diagnostic messages	V	V	
Monitoring the supply voltage	Yes	Yes	
Wire-break  Planta at least an LEB.	Yes	Yes	
Diagnostics indication LED	Van	Van	
• for status of the inputs	Yes	Yes Yes	
• for maintenance	Yes	res	
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP20	Yes	Yes	
Standards, approvals, certificates			
CE mark	Yes	Yes	
CSA approval	Yes	Yes	
FM approval	Yes	Yes	
RCM (formerly C-TICK)	Yes	Yes	
Ambient conditions			
Free fall			
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	
Ambient temperature during operation			
• min.	-20 °C	-20 °C	
• max.	0° 00°C	60 °C	
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			
Enclosure material (front)	Voa	Von	
• Plastic	Yes	Yes	
Dimensions Width	45 mm	70 mm	
Width	45 mm	70 mm	
Height	100 mm	100 mm	
Depth	75 mm	75 mm	
Weights	000 -	000 -	
Weight, approx.	220 g	220 g	

I/O modules Analog modules

## SM 1231 RTD signal module

Ordering data	Article No.		Article No.
SM 1231 RTD signal module		Accessories	
4 inputs for resistance temperature sensors Pt10/50/100/200/500/1000.	6ES7231-5PD32-0XB0	Terminal block (spare part)	
Ni100/120/200/500/1000, Cu10/50/100, LG-Ni1000; resistance 150/300/600 ohms,		For 6ES7231-5PD32-0XB0 • With 7 screws, gold-plated; 4 units	6ES7292-1BG30-0XA0
resolution 15 bits + sign		For 6ES7231-5PF32-0XB0	
8 inputs for resistance temperature sensors Pt10/50/100/200/500/1000,	6ES7231-5PF32-0XB0	<ul><li>With 11 screws, gold-plated;</li><li>4 units</li></ul>	6ES7292-1BL30-0XA0
Ni100/120/200/500/1000, Cu10/50/100, LG-Ni1000; resistance 150/300/600 ohms,		Extension cable for two-tier configuration	6ES7290-6AA30-0XA0
resolution 15 bits + sign		for connecting digital/analog signal modules; length 2 m	
		Front flap set (spare part)	
		For modules with a width of 45 mm	6ES7291-1BA30-0XA0
		For modules with a width of 70 mm	6ES7291-1BB30-0XA0

I/O modules Analog modules

SB 1231 RTD signal board

## Overview

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

Article number	6ES7231-5PA30-0XB0	
Article number	Signal Board SB 1231 RTD	
General information	Signal Board SB 1231 NTD	
Product type designation	SB 1231, AI 1x16 bit RTD	
Supply voltage	OB 1201, ALIXIO BILITID	
Rated value (DC)		
• 24 V DC	Yes	
Input current	100	
Current consumption, typ.	5 mA	
from backplane bus 5 V DC, typ.	20 mA	
Power loss		
Power loss, typ.	0.5 W	
Analog inputs		
Number of analog inputs	1; Resistance thermometer	
permissible input voltage for current input (destruction limit), max.	±35 V	
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenhe	
Input ranges		
Voltage	Yes	
Current	No	
Thermocouple	No	
Resistance thermometer	Yes; Platinum (Pt)	
Resistance	Yes; 150 $\Omega$ , 300 $\Omega$ , 600 $\Omega$	
Input ranges (rated values), resistance thermometer		
• Pt 100	Yes	
• Pt 1000	Yes	
• Pt 200	Yes	
• Pt 500	Yes	
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 outputs		
Number of analog outputs	0	
Cable length		
• shielded, max.	100 m; shielded, twisted pair	

Article number	6ES7231-5PA30-0XB0
Article Hallibel	Signal Board SB 1231 RTD
Analog value generation	Signal Board SB 1201 TTB
for the inputs	
Measurement principle	integrating
Integration and conversion time/ resolution per channel	
<ul> <li>Resolution with overrange (bit including sign), max.</li> </ul>	15 bit; + sign
• Integration time, parameterizable	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 10 / 50 / 60 / 400 Hz
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C $\pm$ 0.1%, to 55 °C $\pm$ 0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.05 %
Interference voltage suppression for $f = n \times (f1 +/- 1 \%)$ , $f1 = interference$ frequency	
• Common mode interference, min.	120 dB
Interrupts/diagnostics/ status information	
Alarms	Yes
Diagnostics function	Yes; Can be read out
Alarms	
Diagnostic alarm	Yes
Diagnostic messages	
Wire-break	Yes
Diagnostics indication LED	
<ul> <li>for status of the inputs</li> </ul>	Yes
• for maintenance	Yes
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes

I/O modules Analog modules

## SB 1231 RTD signal board

Technical specifications (continued)		
Article number	6ES7231-5PA30-0XB0	
	Signal Board SB 1231 RTD	
Ambient conditions		
Free fall		
Fall height, max.	0.3 m; five times, in product package	
Ambient temperature during operation		
• min.	-20 °C	
• max.	60 °C	
Pollutant concentrations		
<ul> <li>SO2 at RH &lt; 60% without condensation</li> </ul>	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	
Connection method		
required front connector	Yes	
Mechanics/material		
Enclosure material (front)		
Plastic	Yes	
Dimensions		
Width	38 mm	
Height	62 mm	
Depth	21 mm	
Weights		
Weight, approx.	35 g	

Ordering data	Article No.
RTD signal board SB 1231	6ES7231-5PA30-0XB0
1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	
Accessories	
Terminal block (spare part)	
for signal board	
with 6 screws, gold-plated; 4 pcs.	6ES7292-1BF30-0XA0

I/O modules Analog modules

SM 1238 Energy Meter 480 V AC analog input modules

## Overview

- Energy management based on SIMATIC S7-1200
- Data acquisition of electrical characteristics in 1 and 3-phase networks up to 480 V AC
- Direct connection of voltage inputs
- Current measurement performed by 1 A and 5 A current transformers
- Can be used in TN and TT networks
- Data backup of measurement data in the event of a power failure

Article number	6ES7238-5XA32-0XB0	
	SM 1238 Energy Meter 480V AC	
General information		
Product type designation	SM 1238, AI energy meter 480 V AC	
Product function		
Voltage measurement	Yes	
- with voltage transformer	Yes	
Current measurement	Yes	
- without current transformer	No	
- with current transformer	Yes	
Energy measurement	Yes	
Frequency measurement	Yes	
Power measurement	Yes	
Active power measurement	Yes	
Reactive power measurement	Yes	
• I&M data	Yes; I&M 0	
Isochronous mode	No	
Engineering with		
STEP 7 TIA Portal configurable/ integrated as of version	V13 SP1	
Operating mode		
• cyclic measurement	Yes	
• acyclic measurement	Yes	
Acyclic measured value access	Yes	
Fixed measured value sets	Yes	
<ul> <li>Freely definable measured value sets</li> </ul>	No	
CiR – Configuration in RUN		
Reparameterization possible in RUN	Yes	
Calibration possible in RUN	Yes	
Installation type/mounting		
Mounting position	Horizontal, vertical	
Supply voltage		
Design of the power supply	from CPU	
Type of supply voltage	DC	
Input current		
Current consumption, max.	180 mA	
Power loss		
Power loss, typ.	0.75 W	
Address area		
Address space per module		
Address space per module, max.	124 byte; 112 byte input / 12 byte output	

Article number	<b>6ES7238-5XA32-0XB0</b> SM 1238 Energy Meter 480V AC
Analog inputs	
Cycle time (all channels), typ.	50 ms; Time for consistent update of all measured and calculated values (cyclic and acyclic data)
Interrupts/diagnostics/ status information	
Alarms	
Diagnostic alarm	Yes
Limit value alarm	Yes
Hardware interrupt	No
Diagnostics indication LED	
<ul> <li>Monitoring of the supply voltage (PWR-LED)</li> </ul>	Yes
<ul> <li>Channel status display</li> </ul>	Yes; Green LED
<ul> <li>for channel diagnostics</li> </ul>	Yes; red Fn LED
for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Measuring functions	
<ul> <li>Measuring procedure for voltage measurement</li> </ul>	TRMS
<ul> <li>Measuring procedure for current measurement</li> </ul>	TRMS
Type of measured value acquisition	seamless
<ul> <li>Curve shape of voltage</li> </ul>	Sinusoidal or distorted
<ul> <li>Buffering of measured variables</li> </ul>	Yes
Parameter length	74 byte
<ul> <li>Bandwidth of measured value acquisition</li> </ul>	2 kHz; Harmonics: 39 / 50 Hz, 32 / 60 Hz
Measuring range	
- Frequency measurement, min.	45 Hz
- Frequency measurement, max.	65 Hz
Measuring inputs for voltage	
<ul> <li>Measurable line voltage between phase and neutral conductor</li> </ul>	277 V
<ul> <li>Measurable line voltage between the line conductors</li> </ul>	480 V
<ul> <li>Measurable line voltage between phase and neutral conductor, min.</li> </ul>	0 V
<ul> <li>Measurable line voltage between phase and neutral conductor, max.</li> </ul>	293 V
<ul> <li>Measurable line voltage between the line conductors, min.</li> </ul>	0 V
<ul> <li>Measurable line voltage between the line conductors, max.</li> </ul>	508 V
Measurement category for voltage measurement in accordance with IEC 61010-2-030	CAT II; CAT III in case of guaranteed protection level of 1.5 kV
<ul> <li>Internal resistance line conductor and neutral conductor</li> </ul>	$3.4~\text{M}\Omega$
- Power consumption per phase	20 mW
- Impulse voltage resistance 1,2/50µs	1 kV

I/O modules Analog modules

## SM 1238 Energy Meter 480 V AC analog input modules

Technical specifications (continued)			
Article number	6ES7238-5XA32-0XB0		
Article number	SM 1238 Energy Meter 480V AC		
Measuring inputs for current	SW 1200 Energy Weter 400 V AC		
- measurable relative current (AC),	1 %; Relative to the secondary rated		
min measurable relative current (AC),	current 5 A 100 %; Relative to the secondary		
max.	rated current 5 A		
<ul> <li>Continuous current with AC, maximum permissible</li> </ul>	5 A		
<ul> <li>Apparent power consumption per phase for measuring range 5 A</li> </ul>	0.6 V·A		
<ul> <li>Rated value short-time withstand current restricted to 1 s</li> </ul>	100 A		
- Input resistance measuring range 0 to 5 A	25 m $\Omega$ ; At the terminal		
- Zero point suppression	Parameterizable: 2 250 mA, default 50 mA		
- Surge strength	10 A; for 1 minute		
Accuracy class according to			
IEC 61557-12			
- Measured variable voltage	0,2		
- Measured variable current	0,2		
<ul> <li>Measured variable apparent power</li> </ul>	0.5		
- Measured variable active power	0.5		
- Measured variable reactive power	1		
- Measured variable power factor	0.5		
- Measured variable active energy	0.5		
- Measured variable reactive energy	1		
- Measured variable neutral current	0.5; calculated		
- Measured variable phase angle	±1°; not covered by IEC 61557-12		
- Measured variable frequency	0.05		
Potential separation			
Potential separation channels			
between the channels and backplane bus	Yes; 3 700V AC (type test) CAT III		
Ambient conditions			
Ambient temperature during operation			
horizontal installation, min.	-20 °C		
• horizontal installation, max.	60 °C		
<ul> <li>vertical installation, min.</li> </ul>	-20 °C		
• vertical installation, max.	50 °C		
Dimensions			
Width	45 mm		
Height	100 mm		
Depth	75 mm		
Weights			
Weight (without packaging)	165 g		
Data for selecting a current transformer	J		
Burden power current transformer x/1A, min.	As a function of cable length and cross section, see device manual		
Burden power current transformer	As a function of cable length and		
x/5A, min.	cross section, see device manual		

Ordering data	Article No.
SM 1238 Energy Meter 480 V AC analog input	
Energy measurement module for data acquisition in 1 and 3-phase networks (TN, TT) up to 480 V AC; current range: 1 A, 5 A; recording of voltage, current, phase angles, power ratings, energy values, frequencies; with channel diagnostics	6ES7238-5XA32-0XB0
Extension cable for two-tier configuration	6ES7290-6AA30-0XA0
For connecting digital/analog signal modules; length 2 m	
Terminal block (spare part)	
For voltage input (top), 7-pole, tinned, coded in middle	6ES7292-1AG40-0XA2
For current input (bottom), 7-pole, tinned	6ES7292-1AG30-0XA0
Front flap set (spare part)	

I/O modules SIPLUS analog modules

SIPLUS SM 1231 analog input modules

### 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 SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Article number	6AG1231-4HD32-4XB0	Article number	6AG1231-4HD32-4XB0
Based on	6ES7231-4HD32-0XB0	Based on	6ES7231-4HD32-0XB0
	SIPLUS S7-1200 SM 1231 4AI 13Bit		SIPLUS S7-1200 SM 1231 4AI 13Bit
Ambient conditions		Use in stationary industrial systems	
Free fall		- to biologically active substances	Yes; Class 3B2 mold, fungus and dry
• Fall height, max.	0.3 m; five times, in product package	according to EN 60721-3-3	rot spores (with the exception of fauna); Class 3B3 on request
Ambient temperature during operation		- to chemically active substances	Yes; Class 3C4 (RH < 75 %) incl.
• min.	-20 °C; = Tmin (incl. condensation/ frost); start-up @ 0 °C	according to EN 60721-3-3	salt spray acc. to EN 60068-2-52 (severity degree 3); *
• max.	60 °C; = Tmax	<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *
Altitude during operation		Use on ships/at sea	
<ul><li>relating to sea level</li><li>Installation altitude above sea level, max.</li></ul>	5 000 m	- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
Ambient air temperature-barometric pressure-altitude	1 140 hPa 795 hPa (-1 000 m +2 000 m) //	- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
	Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) //	<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *
	Tmin (Tmax -20 K) at	Remark	
Relative humidity	658 hPa 540 hPa (+3 500 m +5 000 m)	<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!
With condensation.	100 %: RH incl. condensation/frost	Conformal coating	interfaces during operation:
tested in accordance with	(no commissioning under	Coatings for printed circuit board	Yes; Class 2 for high availability
IEC 60068-2-38, max.	condensation conditions)	assemblies acc. to EN 61086	res, Glass 2 for high availability
Resistance Coolants and lubricants		<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life
		<ul> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Conformal coating, Class A

I/O modules SIPLUS analog modules

## SIPLUS SM 1231 analog input modules

Ordering data	Article No.		Article No.
Analog input SIPLUS signal module SM 1231		Accessories	See SIMATIC S7-1200 analog input SM 1231, page 3/86
(Extended temperature range and exposure to media)			
Ambient temperature range 0 +55 °C			
4 analog inputs $\pm 10$ V, $\pm 5$ V, $\pm 2.5$ V, or 0 20 mA; 12 bits $+$ sign	6AG1231-4HD32-4XB0		

I/O modules SIPLUS analog modules

**SIPLUS SM 1232 analog output modules** 

### 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 SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Article number	6AG1232-4HB32-4XB0	Article number	6AG1232-4HB32-4XB0
Based on	6ES7232-4HB32-0XB0	Based on	6ES7232-4HB32-0XB0
	SIPLUS S7-1200 SM 1232 2AQ 13Bit		SIPLUS S7-1200 SM 1232 2AQ 13Bit
Ambient conditions		Use in stationary industrial systems	
Free fall • Fall height, max.	0.3 m; five times, in product package	<ul> <li>to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
Ambient temperature during operation  • min.	-20 °C; = Tmin (incl. condensation/	to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52
• max.	frost); start-up @ 0 °C  60 °C; = Tmax	to mechanically active substances     according to EN 60721-3-3	(severity degree 3); * Yes; Class 3S4 incl. sand, dust, *
Altitude during operation		Use on ships/at sea	
<ul><li>relating to sea level</li><li>Installation altitude above sea level, max.</li></ul>	5 000 m	- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
Ambient air temperature-barometric pressure-altitude	1 140 hPa 795 hPa (-1 000 m +2 000 m) //	- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
	Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) //	<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *
	Tmin (Tmax -20 K) at	Remark	
Delative beautifue	658 hPa 540 hPa (+3 500 m +5 000 m)	- Note regarding classification of environmental conditions acc. to	* The supplied plug covers must remain in place over the unused
Relative humidity	100 0/ - DI Line Landon estimation (funct	EN 60721	interfaces during operation!
With condensation, tested in accordance with	100 %; RH incl. condensation/frost (no commissioning under	Conformal coating	V 01 06 1:1 7 17
IEC 60068-2-38, max.	condensation conditions)	<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability
Resistance Coolants and lubricants		<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection
	Yes; Incl. diesel and oil droplets in the air	<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life
		<ul> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Conformal coating, Class A

I/O modules SIPLUS analog modules

## SIPLUS SM 1232 analog output modules

Ordering data	Article No.		Article No.
Analog output SIPLUS signal module SM 1232		Accessories	See SIMATIC S7-1200 analog output SM 1232, page 3/90
(Extended temperature range and exposure to media)			
Ambient temperature range -20 +60 °C			
2 analog outputs, $\pm 10$ V with 14 bits or 0 20 mA with 13 bits	6AG1232-4HB32-4XB0		

I/O modules SIPLUS analog modules

SIPLUS SB 1232 analog output modules

## 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 SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Article number	6AG1232-4HA30-4XB0	6AG1232-4HA30-5XB0
Based on	6ES7232-4HA30-0XB0	6ES7232-4HA30-0XB0
	SIPLUS S7-1200 SB 1232 1AQ	SIPLUS S7-1200 SB 1232 1AQ
Ambient conditions		
Free fall		
<ul> <li>Fall height, max.</li> </ul>	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation		
• min.	0 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	55 °C; = Tmax	55 °C; = Tmax
Altitude during operation relating to sea level		
<ul> <li>Installation altitude above sea level, max.</li> </ul>	5 000 m	5 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)
Relative humidity		
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
<ul> <li>to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

I/O modules SIPLUS analog modules

## SIPLUS SB 1232 analog output modules

# Technical specifications (continued)

Article number	6AG1232-4HA30-4XB0	6AG1232-4HA30-5XB0
Based on	6ES7232-4HA30-0XB0	6ES7232-4HA30-0XB0
	SIPLUS S7-1200 SB 1232 1AQ	SIPLUS S7-1200 SB 1232 1AQ
Use on ships/at sea		
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection	Yes; Type 1 protection
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data	Article No.	Article No.
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SIPLUS SB 1232 analog output signal board		Accessories	See SIMATIC S7-1200 analog output SB 1232, page 3/92
(Extended temperature range and exposure to media)			
Ambient temperature range -25 +55 °C			
1 analog output, $\pm 10$ V with 12 bits or 0 20 mA with 11 bits	6AG1232-4HA30-5XB0		
Ambient temperature range 0 +55 °C			
1 analog output, ±10 V with 12 bits or 0 20 mA with 11 bits	6AG1232-4HA30-4XB0		

I/O modules SIPLUS analog modules

SIPLUS SM 1234 analog input/output modules

## 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 SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Article number	6AG1234-4HE32-2XB0	6AG1234-4HE32-4XB0
Based on	6ES7234-4HE32-0XB0	6ES7234-4HE32-0XB0
	SIPLUS S7-1200 SM 1234 4AI/2AQ 13Bit	SIPLUS S7-1200 SM 1234 4AI/2AQ 13Bit
Ambient conditions		
Free fall		
<ul> <li>Fall height, max.</li> </ul>	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation		
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	$70~^\circ\text{C}; = \text{Tmax}; \text{Tmax} > +60~^\circ\text{C}$ number of simultaneously used outputs 1, inputs 2 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
Altitude during operation relating to sea level		
<ul> <li>Installation altitude above sea level, max.</li> </ul>	5 000 m	5 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)
Relative humidity		
<ul> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
<ul> <li>to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); $^{\star}$
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

I/O modules SIPLUS analog modules

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

## Technical specifications (continued)

Article number	6AG1234-4HE32-2XB0	6AG1234-4HE32-4XB0
Based on	6ES7234-4HE32-0XB0	6ES7234-4HE32-0XB0
	SIPLUS S7-1200 SM 1234 4AI/2AQ 13Bit	SIPLUS S7-1200 SM 1234 4AI/2AQ 13Bit
Use on ships/at sea		
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
<ul> <li>to chemically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection	Yes; Type 1 protection
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data Article No. Article No.

# Analog input/output SIPLUS signal module SM 1234 (Extended temperature range and exposure to media) 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 Ambient temperature range 0 ... +55 °C 4 ... +75 °C 6 ... +755 °C 4 ... +755 °C 5 ... +70 °C number of simultaneously controllable inputs and outputs, ±10 V with 14 bits or 0 ... 20 mA with 13 bits Ambient temperature range 0 ... +55 °C 5 ... +70 °C number of simultaneously controllable inputs and outputs, ±10 V with 14 bits or 0 ... 20 mA with 13 bits Adaptive for the form of th

I/O modules SIPLUS analog modules

**SIPLUS SM 1231 thermocouple modules** 

## 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

#### Note:

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

Article number	6AG1231-5QF32-4XB0	6AG1231-5QD32-4XB0	
Based on	6ES7231-5QF32-0XB0	6ES7231-5QD32-0XB0	
	SIPLUS S7-1200 SM 1231 8AI TC 16Bit	SIPLUS S7-1200 SM 1231 4AI TC 16Bit	
Ambient conditions			
Free fall			
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	
Ambient temperature during operation			
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	
• max.	60 °C; = Tmax	60 °C; = Tmax	
Altitude during operation relating to sea level			
<ul> <li>Installation altitude above sea level, max.</li> </ul>	5 000 m	5 000 m	
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K), at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	
Relative humidity			
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	
Resistance			
Coolants and lubricants			
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	
Use in stationary industrial systems			
<ul> <li>to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	
<ul> <li>to chemically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	
Use on ships/at sea			
<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	
<ul> <li>to chemically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	
Remark			
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	
Conformal coating			
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability	Yes; Class 2 for high availability	
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection	Yes; Type 1 protection	
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	

I/O modules SIPLUS analog modules

## SIPLUS SM 1231 thermocouple modules

Ordering data	Article No.		Article No.
SIPLUS SM 1231 thermocouple module		Accessories	See SIMATIC S7-1200 thermocouple module
(Extended temperature range and exposure to media)			SM 1231, page 3/97
Ambient temperature range -40 +70 °C			
8 inputs +/- 80 mV, resolution 15 bits + sign, thermocouple types J, K, T, E, R, S, N, C, TXK/XK(L)	6AG1231-5QF32-4XB0		
4 inputs +/- 80 mV, resolution 15 bits + sign, thermocouple types J, K, T, E, R, S, N, C, TXK/XK(L)	6AG1231-5QD32-4XB0		

I/O modules SIPLUS analog modules

SIPLUS RTD SM 1231 signal modules

## Overview

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

#### Note:

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

Article number	6AG1231-5PD32-4XB0	6AG1231-5PD32-2XB0	6AG1231-5PF32-4XB0	6AG1231-5PF32-2XB0
Based on	6ES7231-5PD32-0XB0	6ES7231-5PD32-0XB0	6ES7231-5PF32-0XB0	6ES7231-5PF32-0XB0
	SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	SIPLUS S7-1200 SM 1231 8AI RTD 16Bit	SIPLUS S7-1200 SM 1231 8AI RTD 16Bit
Ambient conditions				
Free fall				
• Fall height, max.	0.3 m; five times, in product package			
Ambient temperature during operation				
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax
Altitude during operation relating to sea level				
<ul> <li>Installation altitude above sea level, max.</li> </ul>	5 000 m	5 000 m	5 000 m	5 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)
Relative humidity				
With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)			
Resistance				
Coolants and lubricants				
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *			

I/O modules SIPLUS analog modules

#### SIPLUS RTD SM 1231 signal modules

#### Technical specifications (continued)

Article number	6AG1231-5PD32-4XB0	6AG1231-5PD32-2XB0	6AG1231-5PF32-4XB0	6AG1231-5PF32-2XB0
Based on	6ES7231-5PD32-0XB0	6ES7231-5PD32-0XB0	6ES7231-5PF32-0XB0	6ES7231-5PF32-0XB0
	SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	SIPLUS S7-1200 SM 1231 8AI RTD 16Bit	SIPLUS S7-1200 SM 1231 8AI RTD 16Bit
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *			
Remark				
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability			
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection			
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A			

#### Ordering data Article No. Article No.

# SIPLUS RTD SM 1231 signal module

(Extended temperature range and exposure to media)

4 inputs for resistance temperature sensors Pt10/50/100/200/500/1000, Ni100/120/200/500/1000, Cu10/50/100, LG-Ni1000; resistance 150/300/600 ohms, resolution 15 bits + sign

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

8 inputs for resistance temperature sensors Pt10/50/100/200/500/1000, Ni100/120/200/500/1000, Cu10/50/100, LG-Ni1000; resistance 150/300/600 ohms, resolution 15 bits + sign

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

# 6AG1231-5PD32-4XB0

## 6AG1231-5PD32-2XB0

#### 6AG1231-5PF32-4XB0

#### 6AG1231-5PF32-2XB0

#### Accessories

See SIMATIC S7-1200 RTD SM 1231 signal module, page 3/102

I/O modules SIPLUS analog modules

SIPLUS RTD SB 1231 signal board

## Overview

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

#### Note:

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

## Technical specifications

Article number	6AG1231-5PA30-5XB0	Article number	6AG1231-5PA30-5XB0
Based on	6ES7231-5PA30-0XB0	Based on	6ES7231-5PA30-0XB0
	SIPLUS S7-1200 SB 1231 1AI RTD		SIPLUS S7-1200 SB 1231 1AI RTD
Ambient conditions		Use in stationary industrial systems	
Free fall Fall height, max.	0.3 m; five times, in product package	<ul> <li>to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
Ambient temperature during operation  • min.	-40 °C; = Tmin (incl. condensation/	- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
• max.	frost); start-up @ -25 °C 60 °C; = Tmax	- to mechanically active substances according to EN 60721-3-3	, , ,
Altitude during operation relating to		Use on ships/at sea	
<ul> <li>sea level</li> <li>Installation altitude above sea level, max.</li> </ul>	5 000 m	- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
Ambient air temperature-barometric pressure-altitude	1 140 hPa 795 hPa (-1 000 m +2 000 m) //	- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
	Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) //	<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *
	Tmin (Tmax -20 K) at	Remark	
Balada kandata	658 hPa 540 hPa (+3 500 m +5 000 m)	- Note regarding classification of environmental conditions acc. to	* The supplied plug covers must remain in place over the unused
Relative humidity	400 04 BULL 1 1 1 1 1 1 1 1 1 1	EN 60721	interfaces during operation!
<ul> <li>With condensation, tested in accordance with</li> </ul>	100 %; RH incl. condensation / frost (no commissioning in bedewed	Conformal coating	
IEC 60068-2-38, max.	state), horizontal installation	<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability
Resistance		Protection against fouling acc. to	Yes; Type 1 protection
Coolants and lubricants		EN 60664-3	
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life
		<ul> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Conformal coating, Class A

Ordering data	Article No.	Article No.

# SIPLUS RTD SB 1231 signal board

(Extended temperature range and exposure to environmental substances)

1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign

#### 6AG1231-5PA30-5XB0

#### Accessories

See: SIMATIC S7-1200 RTD SB 1231 signal board, page 3/104

I/O modules Special modules

## SM 1278 4xIO-Link Master

## Overview



 Module for connecting up to 4 IO-Link devices according to IO Link Specification V1.1. The IO-Link parameters are configured using the Port Configuration Tool (PCT), version V3.2 and higher.

## Technical specifications

6ES7278-4BD32-0XB0 S7-1200, SM1278, 4 X IO-Link Master
SM 1278 4xIO-Link Master
Yes
1 W
Yes
Yes
Yes
Yes
0.3 m; five times, in product package
-20 °C
60 °C
Yes
Yes
45 mm
100 mm
75 mm
150 g

Ordering data	
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#### Article No.

SM 1278 signal module 4xIO-Link Master	6ES7278-4BD32-0XB0
for the connection of up to 4 IO-Link devices according to IO Link Specification V1.1	
Terminal block (spare part)	
with 7 screws, tin-coated; 4 units	6ES7292-1AG30-0XA0

I/O modules Special modules

#### **SIPLUS CMS1200 SM 1281 Condition Monitoring**

## Overview



SIPLUS CMS1200 SM 1281 Condition Monitoring forms part of SIMATIC S7-1200 and is used for the:

- Monitoring of motors, generators, pumps, fans, or other mechanical components
- Recording and analysis of vibrations
- Expansion capability of up to 7 modules

Article number	6AT8007-1AA10-0AA0
	SM1281_Condition_Monitoring
General information	
Product brand name	SIPLUS
Product category	Condition Monitoring
Product description	S7-1200 module for the monitoring of vibrations on mechanical components based on parameters and frequency-selective analysis functions
Installation type/mounting	
Mounting type	Rail or wall mounting
Mounting position	Horizontal, vertical
Recommended mounting position	Horizontal
Supply voltage	
Type of supply voltage Rated value (DC)	DC
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption, typ.	200 mA
Current consumption, max.	250 mA
from backplane bus 5 V DC, typ.	80 mA
from backplane bus 5 V DC, max.	85 mA
Power loss	
Power loss, typ.	4.8 W
Memory	
Total memory capacity	1 Gbyte
Hardware configuration	
Design of hardware configuration	Modular, up to 7 modules per CPU
Speed input	
Number of speed inputs	1
Input voltage	
• 24 V DC digital	Yes
Sensor input	
Number of IEPE sensor inputs	4
Sampling frequency, max.	46 875 Hz

Article number	6AT8007-1AA10-0AA0
	SM1281_Condition_Monitoring
Interfaces	
Type of data transmission	Export of raw data as WAV file for further analysis (e.g. using CMS X-Tools) can be downloaded via browser/FTP, online data transfer to CMS X-Tools
Ethernet interface	Yes
Protocols	
Bus communication	Yes
Web server	
• HTTP	Yes
Interrupts/diagnostics/ status information	
Alarms	
Diagnostic alarm	Yes
Diagnostics indication LED	
<ul> <li>for status of the inputs</li> </ul>	Yes
• for maintenance	Yes
• Status indicator digital input (green)	No
Integrated Functions	
Monitoring functions	
<ul> <li>Monitoring of the sensor inputs</li> </ul>	Yes; Cable break and short-circuit
<ul> <li>Vibration characteristic monitoring via RMS value of the vibration speed</li> </ul>	Yes
Vibration characteristic monitoring via RMS value of the vibration acceleration	Yes
<ul> <li>Vibration characteristic monitoring via diagnostic characteristic value</li> </ul>	Yes
Frequency-selective monitoring via vibration speed spectrum	Yes
Frequency-selective monitoring via vibration acceleration spectrum	Yes
Frequency-selective monitoring via envelope curve analysis	Yes

I/O modules Special modules

# SIPLUS CMS1200 SM 1281 Condition Monitoring

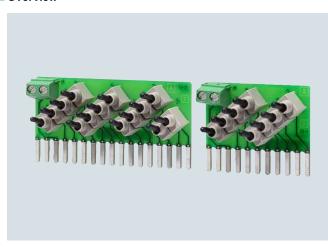
	Technical specifications (continued)		
Article number	6AT8007-1AA10-0AA0		
	SM1281_Condition_Monitoring		
Measuring functions			
Physical measuring principle	Vibration acceleration		
Measuring range - Measurement range vibration	0.1 Hz		
frequency, min.			
<ul> <li>Measurement range vibration frequency, max.</li> </ul>	10 000 Hz		
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP20	Yes		
Standards, approvals, certificates			
Certificate of suitability	CE		
Reference designation according to DIN EN 81346-2	P		
Ambient conditions			
Free fall			
Fall height, max.	0.3 m; five times, in product package		
Ambient temperature during			
pperation			
<ul> <li>horizontal installation, min.</li> </ul>	-20 °C		
<ul> <li>horizontal installation, max.</li> </ul>	60 °C		
<ul> <li>vertical installation, min.</li> </ul>	-20 °C		
<ul> <li>vertical installation, max.</li> </ul>	45 °C		
Ambient temperature during storage/transportation			
• min.	-40 °C		
• max.	70 °C		
Air pressure acc. to IEC 60068-2-13			
<ul> <li>Operation, min.</li> </ul>	795 hPa		
<ul> <li>Operation, max.</li> </ul>	1 080 hPa		
Storage/transport, min.	660 hPa		
Storage/transport, max.	1 080 hPa		
Relative humidity			
Operation without condensation, min.	5 %		
Operation without condensation, max.	95 %		
Software			
Browser software required	Web browser Mozilla Firefox (ESR31 or Microsoft Internet Explorer (10/1		
Connection method	The state of the s		
required front connector	Yes		
Design of electrical connection	Screw connection		
Mechanics/material	COLOW COMMODICATION		
Material of housing	Plastic: polycarbonate, abbreviation		
_	PC- GF 10 FR		
Enclosure material (front)	V		
Plastic	Yes		
Dimensions			
Width	70 mm		
Height	112 mm		
Depth	75 mm		
2 op (1)			
Weights			

Ordering data	Article No.
SIPLUS CMS1200 SM 1281 Condition Monitoring	6AT8007-1AA10-0AA0
Module for SIMATIC S7-1200 for monitoring vibrations in mechanical components based on characteristic values and frequency-selective analysis functions.	
Accessories	
SIPLUS CMS1200 SM1281 shield clamp set	6AT8007-1AA20-0AA0
For the EMC-compliant connection of signal and encoder cables to the SIPLUS CMS1200 SM 1281 Condition Monitoring.	
VIB-SENSOR S01 vibration sensor	6AT8002-4AB00
Piezoelectric sensor for connection to the SIPLUS CMS1200 SM 1281 Condition Monitoring.	
SIPLUS CABLE-MIL	
For connection of the VIB-SENSOR S01 vibration sensor to the SIPLUS CMS1200 SM 1281 Condition Monitoring.	
SIPLUS CABLE-MIL-300; length 3 m	6AT8002-4AC03
SIPLUS CABLE-MIL-1000; length 10 m	6AT8002-4AC10

I/O modules Special modules

SIM 1274 simulators

## Overview



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

A Palaca salaca	0507074 47500	0E07074 4VIIO0
Article number	0XA0	6ES7274-1XH30- 0XA0
	S7-1200	S7-1200
		Simulator Module
	SIM1274, 8 Inp	SIM1274, 14 Inp
General information		
Product type designation	SIM 1274, 8DI	SIM 1274, 14 DI
Supply voltage		
Rated value (DC)	24 V	24 V
Digital inputs		
Number of digital inputs	8	14
Digital outputs		
Number of digital outputs	0	0
Degree and class of protection		
Degree of protection acc. to EN 60529		
• IP20	Yes	Yes
Dimensions		
Width	43 mm	67 mm
Height	35 mm	35 mm
Depth	23 mm	23 mm

Ordering data Article	e N

Digital input simulator SIM 1274 simulator module	
with 8 input switches, for CPU 1211C/1212C	6ES7274-1XF30-0XA0
with 14 input switches, for CPU 1214C/1215C	6ES7274-1XH30-0XA0
with 14 input switches, for CPU 1217C	6ES7274-1XK30-0XA0
Analog input simulator SIM 1274 simulator module	
2 potentiometers	6ES7274-1XA30-0XA0

I/O modules Special modules

## BB 1297 battery board

## Overview

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

Article number	6ES7297-0AX30-0XA0
	Battery Board BB 1297 f. CPU 12xx
General information	·
Product type designation	BB 1297
Interrupts/diagnostics/ status information	
Alarms	Yes
Diagnostics function	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	
Degree of protection acc. to EN 60529	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
Marine approval	Yes
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Air pressure acc. to IEC 60068-2-13	
Operation, min.	795 hPa
Operation, max.	1 080 hPa
<ul> <li>Storage/transport, min.</li> </ul>	660 hPa
Storage/transport, max.	1 080 hPa
Relative humidity     Operation at 25 °C without condensation, max.	95 %
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weights	
Weight, approx.	40 g

Ordering data	Article No.
BB 1297 battery board	6ES7297-0AX30-0XA0
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	
Terminal block (spare part)	
For signal board	
with 6 screws, gold-plated; 4 units	6ES7292-1BF30-0XA0

I/O modules Special modules

SIWAREX WP231

## Overview



SIWAREX WP231 is a versatile, legal for trade weighing module for all simple weighing and force measuring tasks. The compact module is easy to install in the SIMATIC S7-1200 automation system. It can also be operated without a SIMATIC CPU.

SIWAREX WP231	
Integration in automation systems	
S7-1200	SIMATIC S7-1200 system bus
Operator panel and/or automation systems from other vendors	Via Ethernet (Modbus TCP/IP) or RS 485 (Modbus RTU)
Communication interfaces	SIMATIC S7-1200 backplane bus Ss 485 (Modbus RTU, Siebert remote display) Ethernet (SIWATOOL V7, Modbus TCP/IP) Analog output 0/4 - 20 mA 4 x digital outputs, 24 V DC floating, short-circuit proof 4 x digital inputs, 24 V DC floating
Commissioning options	Using SIWATOOL V7 Using function block in SIMATIC S7-1200 CPU / Touch Panel Using Modbus TCP/IP Using Modbus RTU
Measuring accuracy	
EU type approval as non-automatic weighing instrument, trade class III	3000 d ≥ 0.5 μV/e
Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
Internal resolution	Up to ± 4 million parts
Measuring frequency	100 / 120 Hz
Digital filter	Variable adjustable low-pass and average filter
Typical applications	Non-automatic weighing instruments     Force measurements     Fill-level monitoring     Belt tension monitors
Weighing functions	
Weight values	• Gross • Net • Tare
Limit values	• 2 x min/max • Empty
Zeroing	Per command
Tare	Per command
Tare specification	Per command
Load cells	Full-bridge strain gauges in 4-wire or 6-wire system

SIWAREX WP231	
Load cell powering	
Supply voltage (regulated via feedback)	4.85 V DC
Permissible load resistance • R <sub>Lmin</sub>	> 40 Ω
• R <sub>Lmax</sub>	< 4 100 Ω
With SIWAREX IS Ex interface	
• R <sub>Lmin</sub>	> 50 Ω < 4 100 Ω
• R <sub>Lmax</sub>	
Load cell characteristic	1 4 mV/V
Permissible range of the measure- ment signal (with 4 mV/V sensors)	-21.3 +21.3 mV
Max. distance of load cells	500 m (229.66 ft)
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface (compatibility of the load cells must be checked)
Approvals/certificates	ATEX Zone 2  UL EAC KCC RCM OIML R76 Design approval 2009/23/EC (NAWI)
Calibration approval	EU type approval OIML R76
Auxiliary power supply	
Rated voltage	24 V DC
Max. power consumption	200 mA
Max. power consumption SIMATIC Bus	3 mA
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{\min(\text{IND})} \dots T_{\max(\text{IND})}$ (operating temperature)	
<ul><li>Vertical installation</li><li>Horizontal installation</li></ul>	-10 +40 °C (14 104 °F) -10 +55 °C (14 131 °F)
EMC requirements	according to EN 45501
Dimensions	70 x 75 x 100 mm (2.76 x 2.95 x 3.94 in)

I/O modules Special modules

## SIWAREX WP231

Ordering data	Article No.		Article No.
SIWAREX WP231 weighing module	7MH4960-2AA01	Ethernet cable patch cord 2 m (7 ft)	6XV1850-2GH20
Single-channel, legal-for-trade, for NAWI non-automatic weighing instruments (e.g. platform or hopper scales) with analog load		For connecting SIWAREX WP231 to a PC (SIWATOOL), SIMATIC CPU, panel, etc.	
cells (1-4 mV/V), 1 x LC, 4 x DQ,		Remote display (optional)	
4 x DÍ, 1 x AQ, 1 x RS 485, Ethernet port.		The digital remote displays	
SIWAREX S7-1200 manual		can be connected directly to the SIWAREX WP231 via the RS 485 interface.	
Available in a range of languages		Suitable remote display:	
Free download on the Internet at: http://www.siemens.com/weighing- technology		S102 Siebert Industrieelektronik GmbH	
SIWAREX WP231 "Ready for Use"		Postfach 1180 D-66565 Eppelborn, Germany	
Complete software package for non-automatic weighing instrument		Tel.: +49 6806/980-0 Fax: +49 6806/980-999	
(for S7-1200 and a directly con-		Internet: http://www.siebert.de	
nected operator panel).  Free download on the Internet at:		Detailed information is available from the manufacturer.	
http://www.siemens.com/weighing- technology		Accessories	
SIWAREX WP231 "Ready for Use - legal-for-trade"		SIWAREX JB junction box, aluminum housing	7MH5001-0AA20
Software package for non-automatic weighing instruments for S7-1200 requiring		For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.	
official calibration.  Free download on the Internet at:		SIWAREX JB junction box, stainless steel housing	7MH5001-0AA00
http://www.siemens.com/weighing- technology		For connecting up to 4 load cells in parallel.	
Software SecureDisplay		SIWAREX JB junction box,	7MH4710-1EA01
Software for a legal trade display on Windows CE-based Panel. SIMATIC Basic and Key Panels are excluded.		stainless steel housing (ATEX)  For parallel connection of up to 4 load cells (for zone allocation, see manual or	
Free download on the Internet at: http://www.siemens.com/weighing-		type-examination certificate).	
technology		Ex interface SIWAREX IS	
SIWATOOL V4 & V7	7MH4900-1AK01	For intrinsically-safe connection of load cells. With ATEX approval	
Service and commissioning software for SIWAREX weighing modules		(not UL/FM). Suitable for ŚİWAREX electronic weighing system. Compatibility of load cells must be	
Calibration set for SIWAREX WP2xx	7MH4960-0AY10	checked separately.  • Short-circuit current < 199 mA DC	7MH4710-5BA
Valid for SIWAREX WP231 K and SIWAREX WP251.		Short-circuit current < 137 mA DC	7MH4710-5CA
For verification of up to 3 scales, comprising:			
3 x inscription foil for labeling			
1 x protective film     2 x calibration protection plate			
3 x calibration protection plate     Cuidalines for verification			
<ul> <li>Guidelines for verification, certificates and approvals, adaptable label, SIWAREX WP</li> </ul>			

I/O modules Special modules

## SIWAREX WP231

Ordering data	Article No.		Article No.
Cable (optional)		Commissioning	
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY		Commissioning charge for one static scale with SIWAREX module	9LA1110-8SN50-0AA0
For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and		(Travel and setup charge must be ordered separately)	
Ex interface or between two EBs. For permanent installation. Occasional bending is possible.		Scope:  • Recording of data • Checking of mechanical	
External diameter: approx. 10.8 mm (0.43 in)		installation of the scale  • Checking of electrical wiring and	
Permissible ambient temperature -40 +80 °C (-40 +176 °F).		function • Static adjustment of the scale	
Sold by the meter.  Sheath color: orange	7MH4702-8AG	Requirements:  • Mechanical design functional • Medulos electrically wired and	
<ul> <li>For hazardous atmospheres.</li> <li>Sheath color: blue.</li> </ul>	7MH4702-8AF	Modules electrically wired and tested     Calibration weights available	
Ground terminal for connecting	6ES5728-8MA11	Free access to scale	
the load cell cable shield to the grounded DIN rail		Flat charge for travel and setup in Germany	9LA1110-8RA10-0AA0

I/O modules Special modules

## SIWAREX WP241

## Overview



SIWAREX WP241 is a flexible weighing module for belt scales. The compact module is easy to install in the SIMATIC S7-1200 automation system. It can also be operated as a standalone module, i.e. without a SIMATIC CPU.

SIWAREX WP241

Integration in automation systems	
S7-1200	SIMATIC S7-1200 system bus
Operator panel and/or automation systems from other vendors	Via Ethernet (Modbus TCP/IP) or RS 485 (Modbus RTU)
Communication interfaces	SIMATIC S7-1200 backplane bus RS 485 (Modbus RTU) Ethernet (SIWATOOL V7, Modbus TCP/IP) Analog output 0/4 - 20 mA A x digital outputs, 24 V DC floating, short-circuit proof A x digital outputs, 24 V DC, floating
Commissioning options	Using SIWATOOL V7 Using function block in SIMATIC S7-1200 CPU / Touch Panel Using Modbus TCP/IP Using Modbus RTU
Measuring accuracy	
Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
Internal resolution	Up to ± 4 million parts
Measuring frequency	100 / 120 Hz
Digital filter	Separate, variable adjustable low-pass and average filter for loading and speed
Filter for conveyor load	Low-pass filter (limit frequency 0.05 50 Hz)
Filter for belt speed	Low-pass filter (limit frequency 0.05 50 Hz)
Weighing functions	
Readout data	Weight Belt load Material flow rate Accumulated total Main total Free totals 1 4 Belt speed
Limits (min/max)	Belt load     Material flow rate     Belt speed

CIMA DEV MD044	
SIWAREX WP241	
Load cells	Full-bridge strain gauges in 4-wire or 6-wire system
Load cell powering	
Supply voltage (regulated via feedback)	4.85 V DC
Permissible load resistance	
• R <sub>Lmin</sub>	> 40 Ω
• R <sub>Lmax</sub>	< 4100 Ω
With SIWAREX IS Ex interface	
• R <sub>Lmin</sub>	> 50 Ω
• R <sub>Lmax</sub>	< 4100 Ω
Load cell characteristic	1 4 mV/V
Permissible measurement signal range	-21.3 +21.3 mV
Max. distance of load cells	500 m (229.66 ft)
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex inter- face (compatibility of the load cells must be checked)
Approvals/certificates	ATEX Zone 2 UL EAC KCC RCM
Auxiliary power supply	
Rated voltage	24 V DC
Max. power consumption	200 mA
Max. power consumption SIMATIC Bus	3 mA
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{\min(IND)} \dots T_{\max(IND)}$ (operating temperature)	
<ul> <li>Vertical installation</li> </ul>	-10 +40 °C (14 104 °F)
Horizontal installation	-10 +55 °C (14 131 °F)
EMC requirements	according to EN 45501
Dimensions	70 x 75 x 100 mm (2.76 x 2.95 x 3.94 in)

I/O modules Special modules

SIWAREX WP241

Ordering data	Article No.		Article No.
SIWAREX WP241 weighing	7MH4960-4AA01	Cable (optional)	
module Single-channel, for conveyor scales with analog load cells / full-bridge strain gauges		Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY  For connecting SIWAREX	
(1 - 4 mV/V), 1 x LC, 4 x DQ, 4 x DI, 1 x AQ, 1 x RS 485, Ethernet port.		electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between	
SIWAREX S7-1200 manual		two EBs.	
Available in a range of languages		For permanent installation. Occasional bending is possible.	
Free download on the Internet at: http://www.siemens.com/weighing- technology		External diameter: approx. 10.8 mm (0.43 in)	
SIWAREX WP241 "Ready for Use"		Permissible ambient temperature -40 +80 °C (-40 +176 °F).	
Complete software package for		Sold by the meter.  • Sheath color: orange	7MH4702-8AG
belt scales (for S7-1200 and a directly connected operator panel) Free download on the Internet at:		<ul> <li>For hazardous atmospheres.</li> <li>Sheath color: blue.</li> </ul>	7MH4702-8AF
http://www.siemens.com/weighing-technology		Ground terminal for connecting the load cell cable shield to the grounded DIN rail	6ES5728-8MA11
SIWATOOL V4 & V7	7MH4900-1AK01	Commissioning	
Service and commissioning software for SIWAREX weighing modules		Commissioning charge for one belt scale with SIWAREX module	9LA1110-8SM50-0AA0
Ethernet cable patch cord 2 m (7 ft)	6XV1850-2GH20	(Travel and setup charge must be ordered separately)	
For connecting SIWAREX WP241 to a PC (SIWATOOL), SIMATIC CPU, panel, etc.		Scope:  • Recording of data • Checking of mechanical installation of the scale	
Accessories		<ul> <li>Checking of electrical wiring and</li> </ul>	
SIWAREX JB junction box, aluminum housing	7MH5001-0AA20	function • Dynamic adjustment of the scale	
For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.		Requirements:  • Mechanical design functional  • Modules electrically wired and tested	
SIWAREX JB junction box, stainless steel housing	7MH5001-0AA00	<ul><li>Calibration weights available</li><li>Free access to scale</li></ul>	
For connecting up to 4 load cells in parallel.		Flat charge for travel and setup in Germany	9LA1110-8RA10-0AA0
SIWAREX JB junction box, stainless steel housing (ATEX)	7MH4710-1EA01		
For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).			
Ex interface SIWAREX IS			
For intrinsically-safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing system. Compatibility of load cells must be checked separately.			
• Short-circuit current < 199 mA DC	7MH4710-5BA		
<ul> <li>Short-circuit current</li> <li>137 mA DC</li> </ul>	7MH4710-5CA		

I/O modules Special modules

## SIWAREX WP251

## Overview



SIWAREX WP251 is a flexible weighing module for dosing and filling processes. The compact module can be installed seamlessly in the SIMATIC S7-1200 automation system. It can also be used without a SIMATIC CPU in stand-alone mode.

SIWAREX WP251 electronic weighing module

SIWAREX WP251	
Weighing modes	Non-automatic weighing instrumen (NAWI) (filling + removal) (legal-for-trade in accordance with OIML R-76)
	<ul> <li>Automatic catchweighing instruments (ACI) (filling + removal) (legal-for-trade in accordance with OIML R-51)</li> </ul>
	Gravimetric filling instruments (GFI (legal-for-trade in accordance with OIML R-61)
	Discontinuous totalizing automatic weighing instruments (THW) — legal-for-trade in accordance with OIML R-107
Integration in automation systems	
S7-1200	SIMATIC S7-1200 system bus
Operator panel and/or automation systems from other vendors	Via Ethernet (Modbus TCP/IP) or RS 485 (Modbus RTU)
Ports	1 x SIMATIC S7-1200 system bus     1 x Ethernet (SIWATOOL and Modbus TCP/IP)     1 x RS 485 (Modbus RTU or remote display)     1 x analog output (0/4 20 mA)     4 x digital inputs (24 V DC, floating 4 x digital outputs (24 V DC, floating, short-circuit proof)
Functions	3 limits     Tare     Tare specification     Zeroing     Zero adjustment     Statistics     Automatic correction of the shut-off points     Internal protocol memory for 550 000 entries     Trace function for signal analysis     Internal restore point     Stand-alone mode or SIMATIC S7-1200 integrated

SIWAREX WP251	
Parameter assignment	Full access using function block in SIMATIC S7-1200     Full access using Modbus TCP/IP     Full access using Modbus RTU
Remote display	
Connection	via RS 485
Scale adjustment	PC software SIWATOOL (Ethernet), S7-1200 function block and touch panel or directly connected operator panel (Modbus)
Measuring accuracy	
Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
Internal resolution	Up to ± 4 million parts
Number of measurements/second	100 or 120 (selectable)
Filter	<ul><li>Low-pass filter 0.1 50 Hz</li><li>Average value filter</li></ul>
Load cells	Strain gauges in 4-wire or 6-wire system
Load cell powering	
Supply voltage (regulated via feedback)	4.85 V DC
Permissible load resistance	
• R <sub>Lmin</sub>	> 40 Ω
• R <sub>Lmax</sub>	< 4 100 Ω
With SIWAREX IS Ex interface	
• R <sub>Lmin</sub> • R <sub>Lmax</sub>	> 50 Ω < 4 100 Ω
Load cell characteristic	1 4 mV/V
Permissible range of the measure-	-21.3 +21.3 mV
ment signal (with 4 mV/V sensors)	
Max. distance of load cells	500 m (229.66 ft)
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface
Certificates	ATEX Zone 2 UL KCC EAC RCM

I/O modules Special modules

SIWAREX WP251

# Technical specifications (continued)

EU type-examination certificate 2014/31/EU (NAWI) according to OIML R76     EU type-examination certificate 2014/32/EU (MID) according to OIML R61 and OIML R51     EU type-examination certificate 2014/32/EU (MID) according to OIML R107
24 V DC
200 mA
3 mA
IP20

Climatic requirements  T <sub>min(IND)</sub> T <sub>max(IND)</sub> (operating temperature)	
. A facility of Paragraphs Paragraphs	
<ul> <li>Vertical installation</li> </ul>	-10 +40 °C (14 104 °F)
<ul> <li>Horizontal installation</li> </ul>	-10 +55 °C (14 131 °F)
EMC requirements	according to EN 45501
Dimensions	70 x 75 x 100 mm (2.76 x 2.95 x 3.94 in)

Ordering data	Article No.
SIWAREX WP251 weighing module	7MH4960-6AA01
Single-channel, legal-for-trade, for automatic dosing and filling scales (GFI, ACI, NAWI) with analog load cells / full-bridge strain gauges (1 - 4 mV/V), 1 x LC, 4 x DQ, 4 x DI, 1 x AQ, 1 x RS 485, Ethernet port.	
SIWAREX WP251 equipment manual	
Available in a range of languages	
Free download on the Internet at: http://www.siemens.com/weighing-technology	
SIWAREX WP251 "Ready for Use"	
Free download on the Internet at: http://www.siemens.com/weighing-technology	
SIWATOOL V4 & V7	7MH4900-1AK01
Service and commissioning software for SIWAREX weighing modules	
Calibration set for SIWAREX WP2xx	7MH4960-0AY10
Valid for SIWAREX WP231 K and SIWAREX WP251.	
For verification of up to 3 scales, comprising:  • 3 x inscription foil for labeling	
• 1 x protective film	
• 3 x calibration protection plate	
<ul> <li>Guidelines for verification, certificates and approvals, adaptable label, SIWAREX WP</li> </ul>	

Article No.	
Ethernet cable patch cord 2 m (7 ft)	6XV1850-2GH20
For connecting SIWAREX WP251 to a PC (SIWATOOL), SIMATIC CPU, panel, etc.	
Remote display (optional)	
The digital remote displays can be connected directly to the SIWAREX WP251 via the RS 485 interface.	
Suitable remote display: S102	
Siebert Industrieelektronik GmbH Postfach 1180 D-66565 Eppelborn, Germany Tel.: +49 6806/980-0 Fax: +49 6806/980-999	
Internet: http://www.siebert.de	
Detailed information is available from the manufacturer.	

I/O modules Special modules

# SIWAREX WP251

Ordering data	Article No.		Article No.
Accessories		Cable (optional)	
SIWAREX JB junction box, aluminum housing	7MH5001-0AA20	Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY	
For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.		For connecting SIWAREX electronic weighing systems to junction box (JB), extension box	
SIWAREX JB junction box, stainless steel housing	7MH5001-0AA00	(EB) and Ex interface or between two EBs. For permanent installation.	
For connecting up to 4 load cells in parallel.		Occasional bending is possible.  External diameter:	
SIWAREX JB junction box, stainless steel housing (ATEX)	7MH4710-1EA01	approx. 10.8 mm (0.43 in)  Permissible ambient temperature  -40 +80 °C (-40 +176 °F).	
For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).		Sold by the meter.  Sheath color: orange  For hazardous atmospheres. Sheath color: blue.	7MH4702-8AG 7MH4702-8AF
Ex interface SIWAREX IS  For intrinsically-safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX		Ground terminal for connecting the load cell cable shield to the grounded DIN rail	6ES5728-8MA11
electronic weighing system. Compatibility of load cells must be		Commissioning	
checked separately.  • Short-circuit current < 199 mA DC	7MH4710-5BA	Commissioning charge for one static scale with SIWAREX module	9LA1110-8SN50-0AA0
Short-circuit current     < 137 mA DC	7MH4710-5CA	(Travel and setup charge must be ordered separately)	
		Scope:  • Recording of data • Checking of mechanical installation of the scale • Checking of electrical wiring and function • Static adjustment of the scale	
		Requirements:  Mechanical design functional  Modules electrically wired and tested  Calibration weights available  Free access to scale	
		Flat charge for travel and setup in Germany	9LA1110-8RA10-0AA0

I/O modules Communication

CM 1241 communication module

## Overview



- For quick, high-performance serial data exchange via point-to-point connection
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU, 3964(R)
- Additional protocols can also be loaded
- Simple parameterization with STEP 7 Basic

Article number	6ES7241-1CH32-0XB0	6ES7241-1AH32-0XB0
	Communication Module CM 1241, RS422/485 Communication Module CM 1241, RS232	
General information		
Product type designation	CM 1241 RS 422 / 485	CM 1241 RS 232
Supply voltage		
Rated value (DC)		
• 24 V DC	Yes	Yes
Input current		
Current consumption, max.	220 mA; From backplane bus 5 V DC	200 mA; From backplane bus 5 V DC
Power loss		
Power loss, typ.	1.1 W	1.1 W
Interfaces		
Number of interfaces	1	1
Interface physics, RS 232C (V.24)		Yes
Interface (physical) RS 422/485 (X.27	) Yes	
Point-to-point connection		
<ul> <li>Cable length, max.</li> </ul>	1 000 m	10 m
Integrated protocol driver		
- Freeport	Yes	Yes
- ASCII	Yes; Available as library function	Yes; Available as library function
- Modbus	Yes	Yes
- Modbus RTU master	Yes	Yes
- MODBUS RTU slave	Yes	Yes
- USS	Yes; Available as library function	
Protocols		
Integrated protocols		
Freeport		
- Telegram length, max.	1 kbyte	1 kbyte
- Bits per character	7 or 8	7 or 8
- Number of stop bits	1 (Standard), 2	1 (Standard), 2
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)
3964 (R)		
- Telegram length, max.	1 kbyte	1 kbyte
- Bits per character	7 or 8	7 or 8
- Number of stop bits	1 (Standard), 2	1 (Standard), 2
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)

I/O modules Communication

## CM 1241 communication module

Technical	specifications	(continued)

Article number	6ES7241-1CH32-0XB0	6ES7241-1AH32-0XB0
	Communication Module CM 1241, RS422/485	Communication Module CM 1241, RS232
Modbus RTU master		
- Address area	1 through 49 999 (Standard Modbus addressing)	1 through 49 999 (Standard Modbus addressing)
- Number of slaves, max.	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration
MODBUS RTU slave		
- Address area	1 through 49 999 (Standard Modbus addressing)	1 through 49 999 (Standard Modbus addressing)
Interrupts/diagnostics/ status information		
Diagnostics function	Yes	Yes
Diagnostics indication LED		
<ul> <li>for status of the outputs</li> </ul>	Yes	Yes
Degree and class of protection		
Degree of protection acc. to EN 60529		
• IP20	Yes	Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
cULus	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
KC approval	Yes	Yes
Ambient conditions		
Free fall		
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
Dimensions		
Width	30 mm	30 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	155 g	150 g

Ordering data	Article No.		Article No.
CM 1241 communication module		Accessories	
Communication module for point-to-point connection, with one RS 422/485 interface	6ES7241-1CH32-0XB0	Front flap set (spare part) For communication modules	6ES7291-1CC30-0XA0
Communication module for point-to-point connection, with one RS 232 interface	6ES7241-1AH32-0XB0		

I/O modules Communication

CB 1241 RS485 communication board

## 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

Article number	6ES7241-1CH30-1XB0
	Communication Board CB 1241, RS485
General information	
Product type designation	CB 1241 RS 485
Input current	
from backplane bus 5 V DC, typ.	50 mA
Power loss	
Power loss, typ.	1.5 W
Interfaces	
Point-to-point connection	
Cable length, max.	1 000 m
Integrated protocol driver	
- Freeport	Yes
- ASCII	Yes; Available as library function
- Modbus	Yes
- Modbus RTU master	Yes
- MODBUS RTU slave	Yes
- USS	Yes; Available as library function
Protocols	,
Integrated protocols	
Freeport	
- Telegram length, max.	1 kbyte
- Bits per character	7 or 8
- Number of stop bits	1 (Standard), 2
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)
3964 (R)	"
- Telegram length, max.	1 kbyte
- Bits per character	7 or 8
- Number of stop bits	1 (Standard), 2
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)
Modbus RTU master	
- Address area	1 through 49 999 (Standard Modbus addressing)
- Number of slaves, max.	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration
MODBUS RTU slave	
- Address area	1 through 49 999 (Standard Modbus addressing)

Article number	6ES7241-1CH30-1XB0
	Communication Board CB 1241, RS485
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Degree and class of protection	1.00
Degree of protection acc. to EN 60529	
• IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Mechanics/material	
Enclosure material (front)	
Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weights	
Weight, approx.	40 g
Weight, approx.	40 g

Ordering data	Article No.	Article No.
Uruering data	Article No.	Article No.

Com	mun	ication	board
CB 1	241	RS485	

for point-to-point connection, with 1 RS 485 interface

6ES7241-1CH30-1XB0

Accessories	
Terminal block (spare part)	
for signal board	
with 6 screws, gold-plated: 4 pcs	6ES7292-1BF30-0XA0

I/O modules Communication

#### CM 1242-5

## Overview



DP-M	DP-S	FMS	PG/OP	S7
	•			6_KN0_XX_10022

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 kbps to 12 Mbps
- Compact industry-standard enclosure in S7-1200 design for mounting on a DIN 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 SIMATIC S7-1200 for optimal production.

6GK7242-5DX30-0XE0
CM 1242-5
9.6 kbit/s 12 Mbit/s
0
1
0
9-pin Sub-D socket (RS485)
DC
5 V
0.15 A
0.75 W

Article number	6GK7242-5DX30-0XE0
Product type designation	CM 1242-5
Permitted ambient conditions	
Ambient temperature	
<ul> <li>for vertical installation during operation</li> </ul>	0 45 °C
<ul> <li>for horizontally arranged busbars during operation</li> </ul>	0 55 °C
during storage	-40 +70 °C
during transport	-40 +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-1200 single width
Width	30 mm
Height	100 mm
Depth	75 mm
Net weight	0.115 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
• S7-300 rail mounting	No
wall mounting	Yes

I/O modules Communication

CM 1242-5

Technical specifications (continued)		Ordering data	Article No.
Article number	6GK7242-5DX30-0XE0	CM 1242-5	
Product type designation	CM 1242-5	communication module	
Product properties, functions, components general		Communication module for electrical connection of	6GK7242-5DX30-0XE0
Number of units		SIMATIC S7-1200 to PROFIBUS as a DP slave module	
<ul> <li>per CPU maximum</li> </ul>	3		
Performance data PROFIBUS DP		Accessories	
Service as DP slave		PROFIBUS FastConnect	
• DPV0	Yes	connection plug RS485	
• DPV1	Yes	With 90° cable outlet; insulation displacement technology,	
Amount of data		max. transmission rate 12 Mbps	
<ul> <li>of the address area of the inputs as DP slave total</li> </ul>	240 byte	Without PG interface     With PG interface	6ES7972-0BA52-0XA0 6ES7972-0BB52-0XA0
• of the address area of the outputs as DP slave total	240 byte	PROFIBUS FC standard cable	
Performance data telecontrol		2-core bus cable, shielded, special design for fast mounting,	6XV1830-0EH10
Protocol is supported		sold by the meter;	
• TCP/IP	No	delivery unit: max. 1000 m,	
Product functions management, configuration		minimum order 20 m, sold by the meter	
Configuration software		PROFIBUS FastConnect stripping tool	
required	STEP 7 Basic/Professional	•	201/4005 04 400
·		Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	6GK1905-6AA00
		PROFIBUS bus terminal 12M	
		Bus terminal for connection of PROFIBUS nodes at up to 12 Mbps with connecting cable	6GK1500-0AA10

#### Note:

You can find ordering data for software in the Industry Mall.

I/O modules Communication

#### AS-Interface communication > CM 1243-2 AS-i Master

#### Overview



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

- As many as 62 AS-Interface slaves can be connected
- Integrated analog value transmission
- Supports all AS-Interface master functions in accordance with 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 panel
- Compact enclosure in the design of the SIMATIC S7-1200
- Suitable for AS-Interface with 30 V voltage and AS-i Power24V: 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
- · 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 accessed directly in the process image.

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 detection unit for detecting ground faults on the AS-Interface cable. The integrated overload protection also disconnects the AS-Interface cable if the drive current required exceeds 4 A.

For more information on DCM 1271, see page 3/140.

#### Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions only represent one component of such a concept.

For more information on Industrial Security, see http://www.siemens.com/industrialsecurity.

#### Configuration

To configure CM 1243-2, you require STEP 7 V11 + SP2 or higher.

For STEP 7 V11 + SP2 or higher, the additional Hardware Support Package for CM 1243-2 is required. This is available from the Industry Online Support Portal, see https://support.industry.siemens.com/cs/ww/en/view/72341852.

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/STEP 7.

When operated on a S7-1200 CPU with firmware version V4.0 or higher, the firmware version V1.1 (or higher) is required for the CM 1243-2.

#### Benefits

- More flexibility and versatility in the use of SIMATIC S7-1200 as the result of a significant increase in the number of digital and analog inputs/outputs available
- Very easy configuration and diagnostics of the AS-Interface via the TIA Portal (STEP 7 V11 + SP2 or higher)
- Simple operation with AS-Interface power supply unit (see https://mall.industry.siemens.com/mall/en/ww/Catalog/ Products/82001652tron\_Catalog/Tron) pageible without

nttps://mail.industry.siemens.com/mail/en/ww/Catalog/ Products/8200165?tree=CatalogTree) possible without restrictions

- Alternatively: No need for the AS-i power supply unit with AS-i Power24V. The AS-Interface cable is powered through an existing 24 V DC PELV power supply unit. For decoupling, the AS-i DCM 1271 data decoupling module is required, see page 3/140.
- LEDs for indication of fault statuses for fast diagnostics
- Monitoring of AS-Interface voltage facilitates diagnostics

I/O modules Communication

#### AS-Interface communication > CM 1243-2 AS-i Master

#### Application

The CM 1243-2 is the AS-Interface master connection for the 12xx CPUs of the SIMATIC S7-1200. Through connection to AS-Interface, the number of digital inputs and outputs available for the S7-1200 is greatly increased (max. 496 DI / 496 DQ on the AS-Interface per CM).

The integrated analog value processing also makes the analog values available at the AS-Interface for the S7-1200. Up to 31 analog slaves with a standard address (each with up to four channels) or up to 62 analog slaves with an A/B address (each with up to two channels) are possible per CM.

#### Operating conditions

- The CM 1243-2 communication module exchanges data with the S7-1200 CPU with a cycle time of 10 ms.
- The AS-i cycle time depends on the AS-i bus capacity and is up to 5 ms in the case of 31 slave addresses; for more information, see manual "AS-i Master CM 1243-2 and AS-i DCM 1271 data decoupling module for SIMATIC S7-1200", https://support.industry.siemens.com/cs/ww/en/view/
- For calculation of the maximum switching frequency at inputs/ outputs of AS-i slaves, these cycle times and the runtime of the user program must be added up.

#### Ordering data

#### Article No.

#### CM 1243-2 communication module

- AS-Interface master for SIMATIC S7-1200
- Corresponds to AS-Interface
- Specification V3.0 With screw terminals, removable terminals (included in the scope of
- supply)
   Dimensions (W × H × D / mm):  $30 \times 100 \times 75$

#### Note:

The CM 1243-2 communication module is available as a SIPLUS version under Article No. 6AG1243-2AA30-7XB0 in the extended temperature range (from -25 to 70 °C) and for use in harsh environmental conditions (coated according to environment standard IEC 60721).

For more information, see www.siemens.com/siplus-extreme.

## 3RK7243-2AA30-0XB0

#### Accessories

#### Screw terminals (replacement)

 For screw terminals, 5-pole
 For AS-i Master CM 1243-2 and
 AS-i DCM 1271 data decoupling module

#### 3RK1901-3MA00

#### AS-interface addressing unit V3.0

- For AS-Interface modules and sensors and actuators with integrated AS-Interface according to AS-i Specification V3.0
- · For setting the AS-i address of standard slaves, and slaves with extended addressing mode (A/B slaves)
- With input/output test function and many other commissioning functions
- Battery operation with four type AA batteries (IEC LR6, NEDA 15)
   Degree of protection IP40
- Dimensions (W × H × D / mm):  $84 \times 195 \times 35$
- · Scope of supply: Addressing unit with four batteries
- Addressing cable, with M12 plug to addressing plug (hollow plug), length 1.5 m

#### 3RK1904-2AB02

## More information

#### More information

Manuals, se

https://support.industrv.siemens.com/cs/ww/en/ps/15750/mar

For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see https://support.industry.siemens.com/cs

I/O modules Communication

#### AS-Interface communication > DCM 1271 AS-i data decoupling module

#### Overview

With the aid of the DCM 1271 data decoupling module, the AS-Interface network can also be supplied with 24 V DC or 30 V DC from a standard power supply unit and the transmission of data and power can be implemented on one cable.

The DCM 1271 data decoupling module has the same type of enclosure as an S7-1200 module and can therefore be perfectly combined with the AS-i Master CM 1243-2.

The DCM 1271 data decoupling module has no connection to the backplane bus of the SIMATIC S7-1200 and is therefore not counted as a communication module for the calculation of the maximum configuration.

#### Features of the DCM 1271 data decoupling module

- Design: S7-1200, 30 mm wide, degree of protection IP20
- Detachable terminals (included in delivery)
- · Single data decoupling
- Supply of several AS-i networks with a single power supply unit
- Operation with 24 V DC or 30 V DC, grounded or non-grounded
- Current limitation at 4 A
- Integrated ground-fault detection
- · Diagnostic LEDs for ground faults and overloads
- Signaling contact for ground-fault detection

#### Ground-fault detection

The integrated ground fault detection functions with grounded and non-grounded power supply: The connection of negative pole and ground (upstream from the data decoupling module) customary with 24 V DC power supplies is permitted. A ground fault to the negative or positive pole on the AS-Interface network (behind the data decoupling module) is identified and signaled via LED and a transistor output.

#### Benefits

- An existing standard power supply unit with 24 V DC or 30 V DC can be used for supplying AS-i networks
- The AS-Interface system can also be used in tightly budgeted applications because no AS-Interface power supply unit needs to be purchased
- Applications benefit in addition from the advantages of a modern bus system:
  - High level of standardization
  - Additional diagnostics and maintenance information
  - Faster commissioning

#### Application

The AS-Interface data decoupling module is designed for AS-Interface networks with 30 V or 24 V supply (AS-i Power24V).

Operation of an AS-i network with the data decoupling module and a 30 V standard power supply unit is technically equivalent to the use of an AS-Interface power supply unit and offers the service-proven features of AS-Interface for all applications.

AS-i Power24V uses a 24 V power supply unit in conjunction with a data decoupling module and is particularly suitable for

- Compact machines using AS-Interface input/output modules
- Applications in the control cabinet for AS-Interface integration of SIRIUS 3RT2 contactors using 3RA27 function modules

#### Note:

The power supply units must comply with the PELV (Protective Extra Low Voltage) or SELV (Safety Extra Low Voltage) standards, have a residual ripple of < 250 mVpp, and in the event of a fault must limit the output voltage to a maximum of 40 V. 24 V power supply units are recommended,

see SITOP power supplies.

https://mall.industry.siemens.com/mall/en/WW/Catalog/ Products/10244081?tree=CatalogTree,

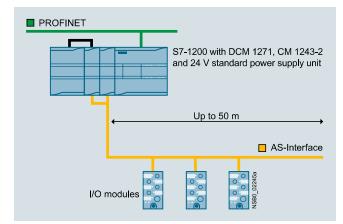
or 30 V power supply units PSN 130S, see https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10174512?tree=CatalogTree.

#### Note on AS-i Power24V:

The length of an AS-i Power24V network is restricted to 50 m in order to limit the voltage drop along the cable.

AS-i Masters, AS-i slaves and the sensors and actuators supplied through the AS-i cable must be designed for the reduced voltage. Sensors and actuators for the standard voltage range of 10 to 30 V can be supplied with sufficient voltage.

Please also observe the requirements specified under "AS-i Power24V" for the operation of AS-i Power24V, see https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10057530?tree=CatalogTree.



Configuration of an AS-i Power24V network with AS-Interface DCM 1271 data decoupling module

I/O modules Communication

AS-Interface communication > DCM 1271 AS-i data decoupling module

Ordering data	Article No.	More information	
DCM 1271 data decoupling module	3RK7271-1AA30-0AA0	More information	
<ul> <li>With screw terminals, removable terminals (included in the scope of supply)</li> <li>Dimensions (W × H × D / mm);</li> </ul>		More information on AS-i Power24V, see "System Manual AS-Interface", https://support.industry.siemens.com/cs/ww/en/view/26250840	
$30 \times 100 \times 75$		Manual for AS-i Master CM 1234-2 and AS-i DCM 1271 data	
Accessories		decoupling module, see https://support.industry.siemens.com/cs/ww/en/view/57358958	
Screw terminals (replacement)			
<ul> <li>With screw terminals, 5-pole For AS-i Master CM 1243-2 and AS-i DCM 1271 data decoupling module</li> </ul>	3RK1901-3MA00		
With screw terminals, 3-pole for AS-i DCM 1271 data decoupling module for connecting the power supply unit	3RK1901-3MB00		

I/O modules Communication

#### CM 1243-5

## Overview



DP-M	DP-S	FMS	PG/OP	S7
•			•	G_M10_XX_10000

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 programming devices and operator panels with PROFIBUS interfaces to be connected to the SIMATIC S7-1200
- Module replacement without PG supported
- Support of all standard baud rates from 9.6 kbps to 12 Mbps
- Compact industrial enclosure in SIMATIC S7-1200 design for mounting on a DIN 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 SIMATIC S7-1200 for optimal production.

Article number	6GK7243-5DX30-0XE0	
Product type designation	CM 1243-5	
Transmission rate		
Transfer rate		
<ul> <li>at the 1st interface acc. to PROFIBUS</li> </ul>	9.6 kbit/s 12 Mbit/s	
Interfaces		
Number of interfaces acc. to Industrial Ethernet	0	
Number of electrical connections		
<ul> <li>at the 1st interface acc. to PROFIBUS</li> </ul>	1	
<ul> <li>for power supply</li> </ul>	1	
Type of electrical connection		
<ul> <li>at the 1st interface acc. to PROFIBUS</li> </ul>	9-pin Sub-D socket (RS485)	
• for power supply	3-pole terminal block	
Supply voltage, current consumption, power loss		
Type of voltage of the supply voltage	DC	
Supply voltage external	24 V	
Supply voltage external at DC Rated value	24 V	
Relative positive tolerance at DC at 24 V	20 %	
Relative negative tolerance at DC at 24 V	20 %	
Consumed current		
<ul> <li>from external supply voltage at DC at 24 V typical</li> </ul>	0.1 A	
	2.4 W	

Article number	6GK7243-5DX30-0XE0
Product type designation	CM 1243-5
Permitted ambient conditions	
Ambient temperature	
<ul> <li>for vertical installation during operation</li> </ul>	0 45 °C
<ul> <li>for horizontally arranged busbars during operation</li> </ul>	0 55 °C
during storage	-40 +70 °C
<ul> <li>during transport</li> </ul>	-40 +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-1200 single width
Width	30 mm
Height	100 mm
Depth	75 mm
Net weight	0.134 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
• S7-300 rail mounting	No
wall mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	3

I/O modules Communication

CM 1243-5

Technical specifications (con	tinued)	Ordering data	Article No.
Article number	6GK7243-5DX30-0XE0	CM 1243-5 communication module	
Product type designation	CM 1243-5	Communication module for electrical	6GK7243-5DX30-0XE0
Performance data PROFIBUS DP		connection of SIMATIC S7-1200 to	SGRIZIO SENSO SALS
Service as DP master		PROFIBUS as a DPV1 master	
• DPV1	Yes	Accessories	
Number of DP slaves on DP master usable	16	PROFIBUS FastConnect connection plug RS485	
Amount of data		With 90° cable outlet;	
<ul> <li>of the address area of the inputs as DP master total</li> </ul>	512 byte	insulation displacement technology, max. transmission rate 12 Mbps	
<ul> <li>of the address area of the outputs as DP master total</li> </ul>	512 byte	<ul><li>Without PG interface</li><li>With PG interface</li></ul>	6ES7972-0BA52-0XA0 6ES7972-0BB52-0XA0
<ul> <li>of the address area of the inputs per DP slave</li> </ul>	244 byte	PROFIBUS FC standard cable	6XV1830-0EH10
<ul> <li>of the address area of the outputs per DP slave</li> </ul>	244 byte	2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m,	OAV 1030-UEN 10
<ul> <li>of the address area of the diagnostic data per DP slave</li> </ul>	240 byte	minimum order 20 m, sold by the meter	
Service as DP slave		PROFIBUS FastConnect	
• DPV0	No	stripping tool	
• DPV1	No	Stripping tool for fast stripping of the	6GK1905-6AA00
Performance data S7 communication		PROFIBUS FastConnect bus cable PROFIBUS bus terminal 12M	
Number of possible connections for S7 communication		Bus terminal for connection of PROFIBUS nodes up to 12 Mbps	6GK1500-0AA10
• maximum	8	with connecting cable	
<ul> <li>with PG connections maximum</li> </ul>	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			
<ul> <li>without DP maximum</li> </ul>	8		
with DP maximum	8		
Performance data telecontrol			
Protocol is supported			
• TCP/IP	No		
Product functions management, configuration			
Configuration software			
• required	STEP 7 Basic/Professional		

#### Note:

You can find ordering data for software in the Industry Mall.

I/O modules Communication

#### CSM 1277 unmanaged

## 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 DIN rail
- Low-cost solution for implementing small, local Ethernet networks
- Connection without any problems using RJ45 standard plug connectors
- Simple and fast status display via LEDs on the device
- Integral autocrossover function permits use of uncrossed connecting cables

Article number	6GK7277-1AA10-0AA0
Product type designation	SCALANCE CSM 1277
Transmission rate	
Transfer rate	10 Mbit/s, 100 Mbit/s
Interfaces for communication integrated	
Number of electrical connections	
<ul> <li>for network components or terminal equipment</li> </ul>	4
Number of 100 Mbit/s SC ports	
• for multimode	0
Number of 1000 Mbit/s LC ports	
• for multimode	0
• for single mode (LD)	0
Interfaces others	
Number of electrical connections	
• for power supply	1
Type of electrical connection	
• for power supply	3-pole terminal block
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage	
• external	24 V
• external minimum	19.2 V
external maximum	28.8 V
Product component fusing at power supply input	Yes
Fuse protection type at input for supply voltage	0.5 A / 60 V
Consumed current maximum	0.07 A
Power loss [W]	

Article number	6GK7277-1AA10-0AA0	
Product type designation	SCALANCE CSM 1277	
Permitted ambient conditions		
Ambient temperature		
<ul> <li>during operation</li> </ul>	0 60 °C	
<ul> <li>during storage</li> </ul>	-40 +70 °C	
<ul> <li>during transport</li> </ul>	-40 +70 °C	
Relative humidity		
<ul> <li>at 25 °C without condensation during operation maximum</li> </ul>	95 %	
Protection class IP	IP20	
Design, dimensions and weight		
Design	SIMATIC S7-1200 device design	
Width	45 mm	
Height	100 mm	
Depth	75 mm	
Net weight	0.15 kg	
Mounting type		
• 35 mm DIN rail mounting	Yes	
<ul> <li>wall mounting</li> </ul>	Yes	
<ul> <li>S7-300 rail mounting</li> </ul>	No	
S7-1500 rail mounting	No	
Product functions management, configuration		
Product function		
<ul> <li>multiport mirroring</li> </ul>	No	
Product function switch-managed	No	
Product functions Redundancy		
Product function		
<ul> <li>Parallel Redundancy Protocol (PRP)/ operation in the PRP-network</li> </ul>	Yes	
<ul> <li>Parallel Redundancy Protocol (PRP)/ Redundant Network Access (RNA)</li> </ul>	No	

I/O modules Communication

CSM 1277 unmanaged

Technical specifications (con	tinued)	Ordering data	Article No.
Article number	6GK7277-1AA10-0AA0	CSM 1277 compact switch	
Product type designation	SCALANCE CSM 1277	module	
Standards, specifications, approvals Standard • for FM	FM3611: Class 1, Divison 2, Group A, B, C, D / T, CL.1, Zone 2, GP. IIC, T Ta	Unmanaged switch for connecting a SIMATIC S7-1200 and up to three further nodes to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, diagnostics on LEDs, S7-1200 module including elec-	6GK7277-1AA10-0AA0
for hazardous zone	EN 600079-15:2005, EN 600079-0:2006, II 3 G Ex nA II T4, KEMA 08 ATEX 0003 X	tronic manual on CD-ROM SIPLUS NET CSM 1277 compact switch module	6AG1277-1AA10-4AA0
<ul> <li>for safety from CSA and UL</li> </ul>	UL 508, CSA C22.2 No. 142	•	
for emitted interference	EN 61000-6-4 (Class A)	Unmanaged switch for connection of SIPLUS S7-1200 and	
<ul> <li>for interference immunity</li> </ul>	EN 61000-6-2	up to three further stations	
Standards, specifications, approvals CE		to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply,	
Certificate of suitability CE marking	Yes	LED diagnostics, S7-1200 module	
Standards, specifications, approvals miscellaneous		including electronic manual on CD-ROM	
Certificate of suitability	EN 61000-6-2, EN 61000-6-4	Accessories	
• C-Tick	Yes	IE FC TP trailing cable 2 x 2	6XV1840-3AH10
KC approval	No	(Type C)	
Standards, specifications, approvals ship classification		4-core, shielded TP installation cable for connection to	
Marine classification association		IE FC outlet RJ45/ IE FC RJ45 plug 180/90 for use as trailing	
<ul> <li>American Bureau of Shipping Europe Ltd. (ABS)</li> </ul>	Yes	cable; PROFINET-compatible; with UL approval;	
<ul> <li>Bureau Veritas (BV)</li> </ul>	Yes	sold by the meter; max. delivery unit 1 000 m,	
<ul> <li>Det Norske Veritas (DNV)</li> </ul>	Yes	minimum order quantity 20 m	
<ul> <li>Germanische Lloyd (GL)</li> </ul>	No	IE FC RJ45 plug 180 2 x 2	
<ul> <li>Lloyds Register of Shipping (LRS)</li> </ul>	Yes	RJ45 plug connector for	
<ul> <li>Nippon Kaiji Kyokai (NK)</li> </ul>	Yes	Industrial Ethernet with a rugged	
Polski Rejestr Statkow (PRS)	No	metal housing and integrated insulation displacement contacts	
Royal Institution of Naval Architects     (RINA)	No	for connecting Industrial Ethernet FC installation cables;	
Standards, specifications, approvals product conformity		180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
MTBF	273 y	<ul> <li>1 pack = 1 unit</li> <li>1 pack = 10 units</li> <li>1 pack = 50 units</li> </ul>	6GK1901-1BB10-2AA0 6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0
		IE FC outlet RJ45	6GK1901-1FC00-0AA0
		For connection of Industrial Ethernet FC cables and TP cords; graduated prices for 10 and 50 units or more	
		IE TP cord RJ45/RJ45  TP cord pre-assembled with 2 RJ45 plug connectors; length: 0.5 m	6XV1850-2GE50
		TP cable 4 x 2 with 2 RJ45 plug connectors; length: 0.5 m	6XV1870-3QE50

I/O modules Communication

CP 1243-1

# Overview



The CP 1243-1 communications processor is used for connecting the SIMATIC S7-1200 to telecontrol centers via remote networks and telecontrol protocols (DNP3, IEC 60870-5-104, TeleControl Basic), and for safe communication via IP-based networks.

The CP has the following features:

- Ethernet-based connection to TeleControl Server Basic, e.g. via Internet
- Data transfer of measured values, control variables, or alarms optimized for telecontrol systems
- Automatic sending of alert emails
- Data buffering of up to 64,000 values ensures a secure database even with temporary connection failures
- Secure communication via VPN connections based on IPSec
- Access protection via stateful inspection firewall
- Support of SINEMA Remote Connect with autoconfiguration
- Clearly laid out LED signaling for fast and easy diagnostics
- Compact industrial enclosure in S7-1200 design for mounting on a DIN rail
- Fast commissioning thanks to easy configuration using STEP 7

Article number	6GK7243-1BX30-0XE0
Product type designation	CP 1243-1
Transmission rate	
Transfer rate	
at the 1st interface	10 100 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
<ul> <li>at the 1st interface acc. to Industrial Ethernet</li> </ul>	1
• for power supply	0
Type of electrical connection	
<ul> <li>at the 1st interface acc. to Industrial Ethernet</li> </ul>	RJ45 port
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Consumed current	
<ul> <li>from backplane bus at DC at 5 V typical</li> </ul>	0.25 A
Power loss [W]	1.25 W

Article number	6GK7243-1BX30-0XE0
Product type designation	CP 1243-1
Permitted ambient conditions	
Ambient temperature	
<ul> <li>for vertical installation during operation</li> </ul>	-20 +60 °C
<ul> <li>for horizontally arranged busbars during operation</li> </ul>	-20 +70 °C
during storage	-40 +70 °C
during transport	-40 +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-1200 single width
Width	30 mm
Height	110 mm
Depth	75 mm
Net weight	0.122 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
wall mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	3
Performance data open communication	
Number of possible connections for open communication	
• by means of T blocks maximum	like CPU

I/O modules Communication

CP 1243-1

# Technical specifications (continued)

Article number	6GK7243-1BX30-0XE0
Product type designation	CP 1243-1
Performance data	
Number of possible connections for S7 communication	
• Note	like CPU
Performance data IT functions	
Number of possible connections	
as e-mail client maximum	1
Performance data telecontrol	
Suitability for use	
Node station	No
<ul><li>substation</li></ul>	Yes
TIM control center	No
Control center connection	For use with TeleControl Server Basic, WinCC and PCS7
<ul> <li>by means of a permanent connection</li> </ul>	supported
• Note	Connection to SCADA system via Telecontrol Server Basic and Standard Telecontrol protocols
Protocol is supported	
• DNP3	Yes
• IEC 60870-5	Yes
Product function data buffering if connection is aborted	Yes; 64,000 events (TeleControl Basic, DNP3 or IEC 60870-5-104)
Number of data points per station maximum	200
Number of stations for direct communication with Telecontrol Server Basic	
<ul> <li>in send direction maximum</li> </ul>	3
in receive direction maximum	15
Performance data Teleservice	
Diagnostics function online diagnostics with SIMATIC STEP 7	Yes
Product function	
<ul> <li>program download with SIMATIC STEP 7</li> </ul>	Yes
Remote firmware update	Yes
Product functions management, configuration	
Configuration software	
• required	STEP 7 Basic/Professional
Product functions Diagnosis	

Article number	6GK7243-1BX30-0XE0
Product type designation	CP 1243-1
Product functions Security	
Firewall version	stateful inspection
Product function with VPN connection	IPSec, SINEMA RC
Type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168
Type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
Type of hashing algorithms with VPN connection	MD5, SHA-1, SHA-2
Number of possible connections with VPN connection	8
Product function	
<ul> <li>password protection for Web applications</li> </ul>	No
<ul> <li>password protection for teleservice access</li> </ul>	No
<ul> <li>encrypted data transmission</li> </ul>	Yes
ACL - IP-based	No
ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
<ul> <li>Blocking of communication via physical ports</li> </ul>	No
<ul> <li>log file for unauthorized access</li> </ul>	No
Product functions Time	
Protocol is supported	
• NTP	Yes
NTP (secure)	Yes
time synchronization	
• from NTP-server	Yes
• from control center	Yes

I/O modules Communication

# CP 1243-1

Ordering data	Article No.		Article No.
CP 1243-1 communications		IE FC RJ45 plugs	
processor  CP 1243-1 communications processor for connecting SIMATIC S7-1200 as an additional Ethernet interface and for connection to control centers	6GK7243-1BX30-0XE0	RJ45 connectors for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
via telecontrol protocols (DNP3, IEC 60870, TeleControl Basic),		IE FC RJ45 plug 180	
security (firewall, VPN)		180° cable outlet; for network components and CPs/CPUs with	
Accessories		Industrial Ethernet interface	
Compact Switch Module CSM 1277		• 1 pack = 1 unit	6GK1901-1BB10-2AA0
Unmanaged switch for connecting	6GK7277-1AA10-0AA0	<ul><li>1 pack = 10 units</li><li>1 pack = 50 units</li></ul>	6GK1901-1BB10-2AB0 6GK1901-1BB10-2AE0
a SIMATIC S7-1200 and up to three further nodes to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports;		IE FC TP standard cable GP 2 x 2 (Type A)	
external 24 V DC power supply, LED diagnostics, S7-1200 module including electronic device manual on CD-ROM		4-core, shielded TP installation cable for connection to IE FC outlet RJ45/IE F RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1 000 m, minimum order quantity 20 m	6XV1840-2AH10
		IE FC stripping tool	
		Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	6GK1901-1GA00

I/O modules Communication

CP 1242-7 GPRS

# Overview



The CP 1242-7 GPRS V2 communications processor is used to connect a SIMATIC S7-1200 to the globally available 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 (General Packet Radio Service) mobile wireless service with data transmission speeds of up to 86 kbps in the downlink and 43 kbps in the uplink
- GPRS mode with fixed IP addresses and dynamic IP addresses with standard mobile phone contract
- Time synchronization based on NTP (Network Time Protocol)
- Sending and receiving of text messages
- LED signaling for fast diagnostics
- Compact industrial enclosure in S7-1200 design for mounting on a DIN 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 additional 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

The CP 1242-7 V2 is a new product version of the CP 1242-7. The concept for process data transmission has been expanded with a simple data point configuration, which enables substantially easier commissioning without high programming overhead and minimizes susceptibility to errors during the projects implementation phase. CP 1242-7 has also been equipped with new functions, such as access to the internal web server of the S7-1200. This opens up numerous new application areas.

Article number	6GK7242-7KX31-0XE0
Product type designation	CP 1242-7 V2
Transmission rate	
Transfer rate	
<ul> <li>for GPRS transmission</li> </ul>	
- with downlink maximum	86 kbit/s
- with uplink maximum	43 kbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• for external antenna(s)	1
• for power supply	1
Number of slots	
• for SIM cards	1
Type of electrical connection	
• for external antenna(s)	SMA socket (50 ohms)
• for power supply	3-pole terminal block
Slot version	
• for SIM card	Standard

Article number	6GK7242-7KX31-0XE0
Product type designation	CP 1242-7 V2
Wireless technology	
Type of mobile wireless service	
• is supported SMS	Yes
• is supported GPRS	Yes
• Note	GPRS (Multislot Class 10)
Type of mobile network is supported	
• GSM	Yes
• UMTS	No
• LTE	No
Operating frequency	
• 850 MHz	Yes
• 900 MHz	Yes
• 1800 MHz	Yes
• 1900 MHz	Yes
Transmit power	
• at operating frequency 900 MHz	2 W
• at operating frequency 1800 MHz	1 W
• at operating frequency 1900 MHz	1 W

I/O modules Communication

# CP 1242-7 GPRS

# Technical specifications (continued)

	•
Article number	6GK7242-7KX31-0XE0
Product type designation	CP 1242-7 V2
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage external	24 V
Supply voltage external at DC Rated value	24 V
Relative positive tolerance at DC at 24 V	20 %
Relative negative tolerance at DC at 24 V	20 %
Consumed current	
<ul> <li>from external supply voltage at DC at 24 V typical</li> </ul>	0.1 A
<ul> <li>from external supply voltage at DC at 24 V maximum</li> </ul>	0.22 A
Power loss [W]	2.4 W
Permitted ambient conditions	
Ambient temperature	
<ul> <li>for vertical installation during operation</li> </ul>	-20 +60 °C
<ul> <li>for horizontally arranged busbars during operation</li> </ul>	-20 +70 °C
<ul> <li>during storage</li> </ul>	-40 +70 °C
<ul> <li>during transport</li> </ul>	-40 +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-1200 single width
Width	30 mm
Height	100 mm
Depth	75 mm
Net weight	0.133 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
<ul> <li>S7-300 rail mounting</li> </ul>	No
wall mounting	Yes
Product properties, functions, components general	
Number of units	
per CPU maximum	3
Performance data	
Number of users/telephone numbers definable maximum	10

Article number	6GK7242-7KX31-0XE0
Product type designation	CP 1242-7 V2
Performance data	
open communication	
Number of possible connections for open communication	
by means of T blocks maximum	like CPU
Performance data IT functions	
Number of possible connections	
as e-mail client maximum	1
Performance data telecontrol	
Control center connection	Telecontrol Server Basic
<ul> <li>by means of a permanent connection</li> </ul>	supported
<ul> <li>by means of demand-oriented connection</li> </ul>	supported
• Note	Connection to SCADA system using OPC interface
Protocol is supported	
• DNP3	No
• IEC 60870-5	No
Product function data buffering if connection is aborted	Yes; 64,000 events
Number of stations for direct communication with Telecontrol Server Basic	
<ul> <li>in send direction maximum</li> </ul>	3
in receive direction maximum	15
Performance data Teleservice	
Diagnostics function online diagnostics with SIMATIC STEP 7	Yes
Product function	
<ul> <li>program download with SIMATIC STEP 7</li> </ul>	Yes
Remote firmware update	Yes
Product functions management, configuration	
Configuration software	
required	STEP 7 Basic/Professional
Product functions Diagnosis	
Product function Web-based diagnostics	Yes
Product functions Security	
Product function	
<ul> <li>password protection for teleservice access</li> </ul>	Yes
encrypted data transmission	Yes
Product functions Time	
Protocol is supported	
• NTP	Yes
time synchronization	
• from control center	Yes

I/O modules Communication

CP 1242-7 GPRS

Ordering data	Article No.		Article No.
Communications processor CP 1242-7 GPRS <sup>1)</sup>		Accessories	
Communications processor CP 1242-7 GPRS V2 for connecting SIMATIC S7-1200 to TeleControl Server Basic via GSM/GPRS mobile radio network	6GK7242-7KX31-0XE0	ANT794-4MR antenna  Omnidirectional antenna for GSM (2G), UMTS (3G) and LTE (4G) networks; omnidirectional; weatherproof for indoor and outdoor use; 5 m cable with fixed connection to antenna; SMA connector; including mounting bracket, screws, wall plugs	6NH9860-1AA00
		ANT794-3M antenna  Flat panel antenna for GSM (2G) networks, for triband with 900/1 800/1 900 MHz; weatherproof for indoor/outdoor use, 1.2 m cable with fixed connection to antenna; SMA connector, incl. assembly adhesive tape	6NH9870-1AA00

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

I/O modules Communication

#### CP 1243-7 LTE

#### Overview



CP 1243-7 LTE is used to connect the S7-1200 to a mobile wireless  $4^{\text{th}}$  Generation LTE (Long Term Evolution) network. The increased data rates compared to GPRS and widespread introduction of LTE open up new areas of application. The CP1243-7 is characterized by the following properties:

- 1 connection to LTE (4G) mobile wireless network (various versions for EU and North America)
- Data transfer of measured values, control variables, or alarms optimized for telecontrol systems
- Operation with fixed IP addresses and dynamic IP addresses with standard cellular phone contract
- Time synchronization based on NTP (Network Time Protocol)
- On-demand connection setup via voice call or text message
- Sending and receiving of text messages
- Teleservice access with STEP 7 to substations via mobile wireless networks
- Compact industrial enclosure in S7-1200 design for mounting on a DIN rail
- Temperature range in operation: -20°C to +70°C
- DIN rail mounting
- Diagnostics LEDs (overall status and details)
- Integrated security functions (VPN and firewall)
- · Access to the CPU web server
- Fast commissioning due to simplified configuration with STEP 7
- Data buffering of up to 64,000 values ensures a secure database even with temporary connection failures
- Support of SINEMA Remote Connect with autoconfiguration

Article number	6GK7243-7KX30- 0XE0	6GK7243-7SX30- 0XE0
Product type designation	CP 1243-7 LTE EU	CP 1243-7 LTE US
Transmission rate		
Transfer rate		
<ul> <li>for LTE transmission</li> </ul>		
- with downlink maximum	42 Mbit/s	42 Mbit/s
- with uplink maximum	5.76 Mbit/s	5.76 Mbit/s
Interfaces		
Number of interfaces acc. to Industrial Ethernet	0	0
Number of electrical connections		
<ul><li>for external antenna(s)</li></ul>	1	1
• for power supply	1	1
Number of slots		
• for SIM cards	1	1
Type of electrical connection		
• for external antenna(s)	SMA socket (50 ohms)	SMA socket (50 ohms)
• for power supply	3-pole terminal block	3-pole terminal block
Slot version		
• for SIM card	Standard	Standard
Wireless technology		
Type of mobile wireless service		
• is supported SMS	Yes	Yes
• is supported GPRS	Yes	Yes
• Note	GPRS (Multislot Class 10)	GPRS (Multislot Class 10)
Type of mobile network is supported		
• GSM	Yes	Yes
• UMTS	Yes	Yes
• LTE	Yes	Yes
Operating frequency		
• 850 MHz		Yes
• 1900 MHz		Yes

	0XE0
CP 1243-7 LTE EU	CP 1243-7 LTE US
Yes	
Yes	
Yes	
Yes	
	Yes
Yes	
	Yes
Yes	
Yes	
DC DC	DC
24 V	24 V
24 V	24 V
20 %	20 %
20 %	20 %
0.1 A	0.1 A
0.22 A	0.22 A
	Yes Yes Yes Yes Yes Yes Yes OC 24 V 24 V 20 % 20 %

I/O modules Communication

CP 1243-7 LTE

# Technical specifications (continued)

Technical specifications (continued)				
Article number	6GK7243-7KX30- 0XE0	6GK7243-7SX30- 0XE0		
Product type designation	CP 1243-7 LTE EU	CP 1243-7 LTE US		
Permitted ambient conditions				
Ambient temperature				
<ul> <li>for vertical installation during operation</li> </ul>	-20 +60 °C	-20 +60 °C		
<ul> <li>for horizontally arranged busbars during operation</li> </ul>	-20 +70 °C	-20 +70 °C		
during storage	-40 +70 °C	-40 +70 °C		
during transport	-40 +70 °C	-40 +70 °C		
Relative humidity at 25 °C without condensation during operation maximum	95 %	95 %		
Protection class IP	IP20	IP20		
Design, dimensions and weight				
Module format	Compact module S7-1200 single width	Compact module S7-1200 single width		
Width	30 mm	30 mm		
Height	100 mm	100 mm		
Depth	75 mm	75 mm		
Net weight	0.133 kg	0.133 kg		
Mounting type				
<ul> <li>35 mm DIN rail mounting</li> </ul>	Yes	Yes		
• S7-300 rail mounting	No	No		
wall mounting	Yes	Yes		
Product properties, functions,				
components general				
Number of units				
per CPU maximum	3	3		
Performance data				
Number of users/telephone numbers definable maximum	10	10		
Performance data open communication				
Number of possible connections for open communication	II. 0711	III ODU		
by means of T blocks maximum	like CPU	like CPU		
Performance data IT functions				
Number of possible connections				
as e-mail client maximum	1	1		
Performance data telecontrol				
Suitability for use	.,	.,		
• substation	Yes	Yes		
Control center connection	Telecontrol Server Basic	Telecontrol Server Basic		
<ul> <li>by means of a permanent connection</li> </ul>	supported	supported		
by means of demand-oriented connection	supported	supported		
• Note	Connection to SCADA system using OPC interface	Connection to SCADA system using OPC interface		
Protocol is supported				
• DNP3	No	No		
• IEC 60870-5	No	No		

Product type designation  Product function data buffering	CD 1042 7 LTE ELL	
Product function data buffering	CF 1243-7 LIE EU	CP 1243-7 LTE US
if connection is aborted	Yes; 64,000 events	Yes; 64,000 events
Number of stations for direct communication with Telecontrol Server Basic		
• in send direction maximum	3	3
in receive direction maximum	15	15
Performance data Teleservice		
Diagnostics function online diagnostics with SIMATIC STEP 7	Yes	Yes
Product function		
program download with SIMATIC STEP 7	Yes	Yes
Remote firmware update	Yes	Yes
Product functions management, configuration		
Configuration software	0750 7.0	0750 7.0
required	STEP 7 Basic/ Professional	STEP 7 Basic/ Professional
Product functions Diagnosis		
Product function Web-based diagnostics	Yes	Yes
Product functions Security		
Firewall version	stateful inspection	stateful inspection
Product function with VPN connection	IPSec, SINEMA RC	IPSec, SINEMA RC
Type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56	AES-256, AES-192, AES-128, 3DES-168, DES-56
Type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates	Preshared key (PSK), X.509v3 certificates
Type of hashing algorithms with VPN connection	MD5, SHA-1	MD5, SHA-1
Number of possible connections with VPN connection	1	1
Product function		
<ul> <li>password protection for teleservice access</li> </ul>	Yes	Yes
encrypted data transmission	Yes	Yes
Product functions Time		
Protocol is supported	.,	V
• NTP	Yes	Yes
time synchronization     from control center	Yes	Yes
• Ironi control center	165	les

I/O modules Communication

# CP 1243-7 LTE

Ordering data	Article No.		Article No.
Communication processor		Accessories	
CP 1243-7 LTE		ANT794-4MR antenna	6NH9860-1AA00
Communication processor for connecting SIMATIC S7-1200 to TeleControl Server Basic via LTE mobile wireless network  • CP 1243-7 LTE EU  Frequencies in European band: 700, 1 700 MHz	6GK7243-7KX30-0XE0	Omnidirectional antenna for GSM (2G), UMTS (3G) and LTE (4G) networks; omnidirectional; weatherproof for indoor and outdoor use; 5 m cable with fixed connection to antenna; SMA connector; including mounting bracket.	
Frequencies in European band: 700, 1 700 MHz • CP 1243-7 LTE US Frequencies in North American band: 800, 1 800, 2 600 MHz	6GK7243-7SX30-0XE0	screws, wall plugs	

I/O modules Communication

CP 1243-8 IRC

# Overview



The CP 1243-8 IRC (Industrial Remote Communication) communications processor is used for connecting a SIMATIC S7-1200 via the SINAUT ST7 telecontrol protocol to higher-level ST7 stations or to an ST7 control center. The CP 1243-8 IRC (as of HW2 and firmware V3.0) also offers connection to a DNP3 or IEC-capable control center via a corresponding open DNP3 or IEC 60870-5-104 telecontrol protocol. The CP 1243-8 IRC (as of HW2 and firmware V3.0) also offers connection to a DNP3 or IEC-capable control center via a corresponding open DNP3 or IEC-60870-5-104 telecontrol protocol.

The CP has the following features:

- Support for telecontrol protocol SINAUT ST7, DNP3, IEC 60870-5-104
- Two WAN connections for selecting the communication paths:
- Ethernet-based connection: RJ45 port on the module for connecting external routers, e.g. SCALANCE M
- Additional connection configurable via plug-in TS modules

- Both WAN interfaces can also be operated simultaneously: Route redundancy
- Data transfer of measured values, control variables, or alarms optimized for telecontrol systems
- Automatic transmission of alarms per email or text message
- Time synchronization based on NTP (Network Time Protocol) or via the SINAUT system
- Data buffering of up to 16,000 data frames prevents data loss in the event of temporary connection failures
- Secure communication via VPN connections based on IPSec
- · Access protection via stateful inspection firewall
- Support of SINEMA Remote Connect with autoconfiguration
- Fast and simple diagnostics via clear LED indicators, STEP 7 and web browser
- Compact industrial enclosure in S7-1200 design for mounting on a DIN rail

The integrated Ethernet interface and the option of using the TS modules provide flexible connection options for the CP. The following TS modules are available:

- TS module RS232
- TS module MODEM
- TS module ISDN

Article number	6GK7243-8RX30-0XE0
Product type designation	CP 1243-8 IRC
Transmission rate	
Transfer rate	
at the 1st interface	10 100 Mbit/s
at the 2nd interface	0.3 115.2 kbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
<ul> <li>at the 1st interface acc. to Industrial Ethernet</li> </ul>	1
<ul> <li>for power supply</li> </ul>	1
Type of electrical connection	
<ul> <li>at the 1st interface acc. to Industrial Ethernet</li> </ul>	RJ45 port
<ul> <li>at interface 2 for external data transmission</li> </ul>	Interface to the TS Module
<ul><li>for power supply</li></ul>	3-pole terminal block

Article number	6GK7243-8RX30-0XE0
Product type designation	CP 1243-8 IRC
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Supply voltage external	24 V
Supply voltage external	19.2 28.8 V
Supply voltage external at DC Rated value	24 V
Supply voltage external at DC rated value	19.2 28.8 V
Consumed current	
<ul> <li>from backplane bus at DC at 5 V typical</li> </ul>	0.25 A
<ul> <li>from external supply voltage at DC at 24 V typical</li> </ul>	0.1 A
Power loss [W] Note	1.25 W from S7-1200 backplane without TS module. 2.4 W from 24 V DC external with TS module
Power loss [W]	2.4 W

I/O modules Communication

# CP 1243-8 IRC

# Technical specifications (continued)

Technical specifications (continued)			
Article number	6GK7243-8RX30-0XE0		
Product type designation	CP 1243-8 IRC		
Permitted ambient conditions			
Ambient temperature			
<ul> <li>for vertical installation during operation</li> </ul>	-20 +60 °C		
<ul> <li>for horizontally arranged busbars during operation</li> </ul>	-20 +70 °C		
during storage	-4070 °C		
<ul> <li>during transport</li> </ul>	-40 +70 °C		
Relative humidity at 25 °C without condensation during operation maximum	95 %		
Protection class IP	IP20		
Design, dimensions and weight			
Module format	Compact module S7-1200 single width		
Width	30 mm		
Height	110 mm		
Depth	75 mm		
Net weight	0.122 kg		
Mounting type			
<ul> <li>35 mm DIN rail mounting</li> </ul>	Yes		
• S7-300 rail mounting	No		
wall mounting	Yes		
Product properties, functions, components general			
Number of units			
per CPU maximum	1		
• Note	One CP pluggable on left side of CPU, one TS Module pluggable left side of CP.		
Performance data open communication			
Number of possible connections for open communication			
• by means of T blocks maximum	like CPU		
Performance data S7 communication			
Number of possible connections for S7 communication			
<ul> <li>with PG connections maximum</li> </ul>	2		
<ul> <li>with OP connections maximum</li> </ul>	1		
• Note	Configured S7-Connection for ST7-Communication		
Service			
• SINAUT ST7 via S7 communication	Yes		
Performance data IT functions			
Number of possible connections			
as e-mail client maximum	1		

Article number	6GK7243-8RX30-0XE0
Product type designation	CP 1243-8 IRC
Performance data telecontrol	
Suitability for use	
Node station	No
• substation	Yes
TIM control center	No
• Note	Ethernet and TS Module can be operated in parallel
Control center connection	control center with ST7 function
<ul> <li>by means of a permanent connection</li> </ul>	supported
Protocol is supported	
• DNP3	Yes
• IEC 60870-5	Yes
SINAUT ST7 protocol	Yes
Product function data buffering if connection is aborted	Yes; 16,000 data messages (ST7), up to 64.000 events (DNP3 or IEC 60870-5-104)
Number of data points per station maximum	200
Transmission format	
<ul> <li>for SINAUT ST7 protocol with multi-master polling 10-bit</li> </ul>	Yes
<ul> <li>for SINAUT ST7 protocol with polling or spontaneous 10-bit or 11-bit</li> </ul>	Yes
Operating mode for scanning of data transmission	
<ul> <li>with dedicated line/radio link with SINAUT ST7 protocol</li> </ul>	Polling
<ul> <li>with dial-up network with SINAUT ST7 protocol</li> </ul>	spontaneous
Hamming distance	
for SINAUT ST7 protocol	4
Performance data Teleservice	
Diagnostics function online diagnostics with SIMATIC STEP 7	Yes
Product function	
<ul> <li>program download with SIMATIC STEP 7</li> </ul>	Yes
Remote firmware update	Yes
Product functions management, configuration	
Protocol is supported	
• SNMP v3	Yes
• DCP	Yes
Configuration software	
• required	SINAUT ES V5.5 and STEP7 V13 SP or higher
<ul> <li>for PG configuring required SINAUT ST7 configuration software for PG</li> </ul>	Yes
Product functions Diagnosis	
Product function Web-based diagnostics	Yes

I/O modules Communication

CP 1243-8 IRC

Technical specifications (conf	tinued)	Ordering data	Article No.	
Article number	6GK7243-8RX30-0XE0	CP 1243-8 IRC	6GK7243-8RX30-0XE0	
Product type designation	CP 1243-8 IRC	communications processor		
Product functions Security		Communications processor for		
Firewall version	stateful inspection	connecting a SIMATIC S7-1200 via the SINAUT ST7 telecontrol protocol		
Suitability for operation Virtual Private Network	Yes	to higher-level ST7 stations or to an ST7 control center, or a DNP3 or		
Product function with VPN connection	IPSec, SINEMA RC	IEC-capable control center		
Type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56	via a corresponding DNP3 or IEC 60870-5-104 open telecontrol protocols		
Type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates	Accessories		
Type of hashing algorithms with VPN connection	MD5, SHA-1	SINAUT engineering software V5.5 + SP3	6NH7997-0CA55-0AA0	
Number of possible connections with VPN connection	8	On CD, consisting of: • SINAUT ST7/DNP3 configuration		
Product function		and diagnostic software for		
<ul> <li>password protection for teleservice access</li> </ul>	No	STEP 7 V5.6 • SINAUT TD7 block library		
<ul> <li>encrypted data transmission</li> </ul>	Yes	Electronic manual in German and		
<ul> <li>MSC client via GPRS modem with MSC capability</li> </ul>	Yes	English  SINAUT engineering software	6NH7997-0CA55-0GA0	
Protocol		V5.5		
• is supported MSC protocol	Yes	Upgrade from V5.0, V5.1, V5.2, V5.3 or V5.4		
<ul> <li>with Virtual Private Network MSC is supported</li> </ul>	TCP/IP	TeleService module		
Key length for MSC with Virtual Private Network	128 bit	Connection to TS Adapter IE Basic/ Advanced or CP 1243-8 IRC.		
Number of possible connections		Power supply via TS Adapter IE Basic/Advanced or CP 1243-8 IRC.		
• as MSC client with VPN connection	1	TS module RS 232	6ES7972-0MS00-0XA0	
• as MSC server with VPN connection	0	TS module modem	6ES7972-0MM00-0XA0	
Product functions Time				
Protocol is supported		TS module ISDN	6ES7972-0MD00-0XA0	
• NTP	Yes	CSM 1277 compact switch module	6GK7277-1AA10-0AA0	
time synchronization				
• from NTP-server	Yes	Unmanaged switch for connecting a SIMATIC S7-1200 and up to three		
• from control center	Yes	further nodes to Industrial Ethernet		
Accessories		with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply,		
accessories	TS Module RS232 or TS Module MODEM or TS Module ISDN	LED diagnostics, S7-1200 module including electronic device manual on CD-ROM		

I/O modules Communication

# SIMATIC RF120C

# Overview



The SIMATIC RF120C is a communication module for connecting the SIMATIC identification systems directly to the SIMATIC S7-1200. The RFID readers as well as the MV400 optical readers can be operated on the SIMATIC RF120C.

Integration into the TIA Portal and the uniform plug-in connection systems permit fast and simple commissioning.

Article number	6GT2002-0LA00
Product type designation	RF120C communication module
Suitability for operation	SIMATIC S7-1200 together with RF200/300/600, MV400, MOBY D/U
Transmission rate	
Transfer rate at the point-to-point connection serial maximum	115.2 kbit/s
Interfaces	
Design of the interface for point-to-point connection	RS422
Number of readers connectable	1
Type of electrical connection	
of the backplane bus	S7-1200 backplane bus
<ul> <li>for supply voltage</li> </ul>	Screw terminals
Design of the interface to the reader for communication	D-sub, 9-pin, socket
Mechanical data	
Material	Xantar MX 1094
Color	Ti-grey 24L01
Tightening torque of the screw for securing the equipment maximum	0.45 N·m
Supply voltage, current consumption, power loss	
Supply voltage	
• at DC Rated value	24 V
• at DC	20 30 V
Consumed current at DC at 24 V	
• without connected devices typical	0.03 A
• with connected devices maximum	1 A

Article number	6GT2002-0LA00	
Product type designation	RF120C communication module	
Permitted ambient conditions		
Ambient temperature		
<ul> <li>during operation</li> </ul>	0 55 °C	
<ul> <li>during storage</li> </ul>	-40 +70 °C	
<ul> <li>during transport</li> </ul>	-40 +70 °C	
Protection class IP	IP20	
Shock resistance	According to IEC 61131-2	
Shock acceleration	300 m/s <sup>2</sup>	
Vibrational acceleration	100 m/s <sup>2</sup>	
Design, dimensions and weight		
Width	30 mm	
Height	100 mm	
Depth	75 mm	
Net weight	0.15 kg	
Mounting type	S7-1200 rack	
Wire length for RS 422 interface maximum	1 000 m	
Product properties, functions, components general		
Display version	4 LEDs for reader connection, 1 LED for device status	
Product function transponder file handler can be addressed	No	
Protocol is supported		
S7 communication	Yes	
Type of parameterization	HSP	
Type of programming	ID profile, library with functions	
Type of computer-mediated communication	acyclic communication	
Standards, specifications, approvals		
Certificate of suitability	CE, FCC, cULus, KCC, C-Tick, FM, Ex: II 3G Ex nAA IIC T4 Gc	
MTBF	196 y	

I/O modules Communication

# SIMATIC RF120C

Ordering data	Article No.		Article No.
SIMATIC RF120C communication	6GT2002-0LA00	Accessories for extended use	
module		Extension cable for all readers	
Integrated in the S7-1200 controller for connection of a reader		PUR material, suitable for cable carriers.	
Accessories for all readers		2 m, straight connector	6GT2891-4FH20
Reader cable for SIMATIC RF200 / RF300 / RF600 / MV400		5 m, straight connector	6GT2891-4FH50
PUR material, suitable for cable		10 m, straight connector	6GT2891-4FN10
carriers, straight reader connector		20 m, straight connector	6GT2891-4FN20
2 m	6GT2091-4LH20	50 m, straight connector	6GT2891-4FN50
5 m	6GT2091-4LH50	2 m, connector angled at reader	6GT2891-4JH20
10 m	6GT2091-4LN10	5 m, connector angled at reader	6GT2891-4JH50
		10 m, connector angled at reader	6GT2891-4JN10
		DVD "RFID Systems Software & Documentation"	6GT2080-2AA20

I/O modules SIPLUS communication

# **SIPLUS CM 1241 communication modules**

# 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 SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Article number	6AG1241-1AH32-4XB0	6AG1241-1AH32-2XB0	6AG1241-1CH32-4XB0	6AG1241-1CH32-2XB0
Based on	6ES7241-1AH32-0XB0	6ES7241-1AH32-0XB0	6ES7241-1CH32-0XB0	6ES7241-1CH32-0XB0
	SIPLUS S7-1200 CM 1241 RS232	SIPLUS S7-1200 CM1241 RS232	SIPLUS S7-1200 CM 1241 RS422/485	SIPLUS S7-1200 CM 1241 RS422/485
Ambient conditions				
Free fall				
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation				
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax	70 °C; Tmax > 60 °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
Altitude during operation relating to sea level				
<ul> <li>Installation altitude above sea level, max.</li> </ul>	5 000 m	5 000 m	5 000 m	5 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa ( +2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m) // Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) // Tmin (Tmax -20 K) at 658 hPa 540 hPa (+3 500 m +5 000 m)
Relative humidity				
With condensation, tested in accordance with IEC 60068-2-38, max.	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)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air

I/O modules SIPLUS communication

**SIPLUS CM 1241 communication modules** 

# Technical specifications (continued)

Article number	6AG1241-1AH32-4XB0	6AG1241-1AH32-2XB0	6AG1241-1CH32-4XB0	6AG1241-1CH32-2XB0
Based on	6ES7241-1AH32-0XB0	6ES7241-1AH32-0XB0	6ES7241-1CH32-0XB0	6ES7241-1CH32-0XB0
	SIPLUS S7-1200 CM 1241 RS232	SIPLUS S7-1200 CM1241 RS232	SIPLUS S7-1200 CM 1241 RS422/485	SIPLUS S7-1200 CM 1241 RS422/485
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *			
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *			
Remark				
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability			
<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection			
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A			

## Ordering data Article No. Article No.

# SIPLUS CM 1241 communication module

(Extended temperature range and exposure to media)

Ambient temperature -40 ... +70° C

Communication module for point-to-point connection, with one RS 232 interface

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

Suitable for areas with extreme exposure to media (conformal coating)

Communication module for point-to-point connection, with one RS 232 interface

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

#### 6AG1241-1AH32-2XB0

6AG1241-1CH32-2XB0

6AG1241-1AH32-4XB0

6AG1241-1CH32-4XB0

#### Accessories

See SIMATIC S7-1200 communication module CM 1241, page 3/134

I/O modules SIPLUS communication

# SIPLUS CB 1241 communication board RS485

#### 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

#### Note

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

#### Technical specifications

Article number	6AG1241-1CH30-5XB1	Article number	6AG1241-1CH30-5XB1
Based on	6ES7241-1CH30-1XB1	Based on	6ES7241-1CH30-1XB1
	SIPLUS S7-1200 CB 1241 RS485		SIPLUS S7-1200 CB 1241 RS485
Ambient conditions		Use in stationary industrial systems	
Free fall • Fall height, max.	0.3 m; five times, in product package	<ul> <li>to biologically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
Ambient temperature during operation	10.00 Turk (but and a self-ort	- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52
• min. • max.	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C 55 °C; = Tmax	to mechanically active substances     according to EN 60721-3-3	(severity degree 3); * Yes; Class 3S4 incl. sand, dust, *
Altitude during operation	55 C, = 1111ax	Ÿ	
relating to sea level		Use on ships/at sea	Vac Olasa OBO malal and foresal
<ul> <li>Installation altitude above sea level, max.</li> </ul>	5 000 m	<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
Ambient air temperature-barometric pressure-altitude	1 140 hPa 795 hPa (-1 000 m +2 000 m) //	- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
	Tmin (Tmax - 10 K) at 795 hPa 658 hPa (+2 000 m +3 500 m) //	<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *
	Tmin (Tmax -20 K) at	Remark	
	658 hPa 540 hPa (+3 500 m +5 000 m)	<ul> <li>Note regarding classification of environmental conditions acc. to</li> </ul>	* The supplied plug covers must remain in place over the unused
Relative humidity	400 of Billing I	EN 60721	interfaces during operation!
With condensation, tested in accordance with	100 %; RH incl. condensation/frost (no commissioning under	Conformal coating	
IEC 60068-2-38, max.	condensation conditions)	<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability
Resistance Coolants and lubricants		<ul> <li>Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life
		<ul> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Conformal coating, Class A

# Ordering data Article No. Article No.

SIPLUS CB 1241 RS485 communication board

for point-to-point connection, with 1 RS 485 interface

6AG1241-1CH30-5XB1

Accessories

See SIMATIC CB 1241 RS485 communication board, page 3/135

I/O modules SIPLUS communication

**SIPLUS CM 1242-5 communication modules** 

# Overview



DP-M	DP-S	FMS	PG/OP	S7
	•			G_K10_XX_10222

The SIPLUS CM 1242-5 communication module is used to connect a SIPLUS S7-1200 controller 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 kbps to 12 Mbps
- Compact industry-standard enclosure in S7-1200 design for mounting on a DIN 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 S7-1200 for optimal production.

#### Note

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

SIPLUS S7-1200 CM 1242-5	
Article No.	6AG1 242-5DX30-2XE0
Article No. based on	6GK7 242-5DX30-0XE0
Ambient temperature range	-25 +55 °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 under condensation conditions.
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 SIPLUS communication module CM 1242-5 (Extended temperature range and exposure to media) Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 slave Accessories See SIMATIC S7-1200 CM 1242-5 communication module, page 3/137

I/O modules SIPLUS communication

#### **SIPLUS Communication Module 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:

- As many as 62 AS-Interface slaves can be connected
- Integrated analog value transmission
- 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 via LED
- Indication of operating mode, AS-Interface voltage faults, configuration faults and I/O faults via LEDs behind the front
- Compact enclosure in the design of the SIMATIC S7-1200
- Suitable for AS-Interface with 30 V voltage and AS-i Power24V: 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

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 incorporates:

- Terminals for two AS-i cables (internally jumpered) via two screw terminals each
- 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 the scope of supply) can be removed to facilitate installation.

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 addressed 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 accessed directly in the process image.

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

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 unit has an integrated detection unit for detecting ground faults on the AS-Interface cable. The integrated overload protection also disconnects the AS-Interface cable if the drive current required exceeds 4 A. For more information on DCM 1271, see page 3/140.

#### Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement - and continuously maintain - a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

For more information about industrial security, please visit www.siemens.com/industrialsecurity.

#### Configuration

To configure CM 1243-2, you require STEP 7 V11 + SP2 or

For STEP 7 V11 + SP2 or higher, the additional Hardware Support Package for CM 1243-2 is required. This is available from the Industry Online Support Portal, see https://support.industry.siemens.com/cs/ww/en/view/72341852.

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/STEP 7.

Firmware V1.1 (or higher) is required for the CM 1243-2 module for operation on an S7-1200 CPU from firmware V4.0.

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

#### Ordering data Article No. **SIPLUS CM 1243-2** 6AG1243-2AA30-7XB0 communication module (Extended temperature range and exposure to media) AS-Interface master for SIMATIC S7-1200 Corresponds to AS-Interface Specification V3.0 With screw terminals, removable terminals (included in the scope of supply) • Dimensions (W × H × D/mm) 30 × 100 × 75 **Accessories** See S7-1200 CM 1243-2

communication module

I/O modules SIPLUS communication

**SIPLUS CM 1243-5 communication modules** 

# Overview



DP-M	DP-S	FMS	PG/OP	S7
•			•	● 6_K10_XX_10223

The CM 1243-5 communication module is used to connect a SIMATIC S7-1200 controller 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 S7-1200
- Module replacement without PG supported
- Support of all standard baud rates from 9.6 kbps to 12 Mbps
- Compact industry-standard enclosure in S7-1200 design for mounting on a DIN 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 S7-1200 for optimal production.

#### Note:

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

SIPLUS S7-1200 CM 1243-5	
Article No.	6AG1 243-5DX30-2XE0
Article No. 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 under condensation conditions.
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
aposition,	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	Article No.
SIPLUS CM 1243-5 communication module	
(Extended temperature range and exposure to media)	
Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 master	6AG1243-5DX30-2XE0
Accessories	See SIMATIC S7-1200 CM 1243-5 communica- tion module, page 3/143

I/O modules SIPLUS communication

## **SIPLUS NET CSM 1277**

# Overview



- Unmanaged switch for connecting a SIPLUS S7-1200 controller to an Industrial Ethernet network with a line, tree or star topology
- Multiplication of Ethernet interfaces on a SIPLUS S7-1200 controller for additional connection of up to three programming devices, operator controls, and further Ethernet nodes
- Simple, space-saving mounting on the SIPLUS S7-1200 DIN rail
- Low-cost solution for implementing small, local Ethernet networks
- Problem-free connection using RJ45 plugs
- Simple and fast status display via LEDs on the device
- Integral autocrossover function permits use of uncrossed connecting cables

#### Note:

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

#### **SIPLUS NET CSM 1277**

Article No.	6AG1 277-1AA10-4AA0
Article No. based on	6GK7 277-1AA10-0AA0

Ambient temperature range 0 ... +60 °C

## Ordering data

# SIPLUS NET CSM 1277 compact switch module

(Extended temperature range and exposure to media)

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

#### Accessories

## Article No.

#### 6AG1277-1AA10-4AA0

See CSM 1277 unmanaged, page 3/145

I/O modules Fail-safe I/O modules

SM 1226 fail-safe digital input

# Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs
- Operable exclusively in the central system

Article number	6ES7226-6BA32-0XB0
	Digital Input SM 1226, F-DI 16x 24VDC
Supply voltage	
Rated value (DC)	24 V
Input current	
from backplane bus 5 V DC, max.	155 mA; Current consumption (SM Bus, 5 V DC): 155 mA
Digital inputs	
• from load voltage L+ (without load), max.	130 mA; 130 mA + 6 mA / input used + any Vs1/Vs2 current used
Digital inputs	
Number of digital inputs	16; 16 (1001) or 8 (1002); Note: You can individually assign each pair of inputs "a,x" and "b.x" as a single (1002)-channel or as 2 separate (1001)-channels
horizontal installation	
- up to 50 °C, max.	16; 16 inputs at 55 °C horizontal
vertical installation	
- up to 40 °C, max.	16; 16 inputs at 45 °C vertical
Input voltage	
• for signal "0"	-30 V DC to +5 V DC
• for signal "1"	15 V DC to 30 V DC
Input current	
<ul> <li>for signal "0", max. (permissible quiescent current)</li> </ul>	0.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- parameterizable	Yes; 0.8 / 1.6 / 3.2 / 6.4 / 12.8 ms
Diagnostics indication LED	
• for status of the inputs	Yes

6ES7226-6BA32-0XB0
Digital Input SM 1226, F-DI 16x 24VDC
IP20
1-channel, Category 3, PL d; 2-channel, Category 3 or 4, PL e
SIL 2 (single-channel), SIL 3 (two-channel)
0.3 m; five times, in product package
0 °C
55 °C
Yes
70 mm
100 mm
75 mm
250 g

I/O modules Fail-safe I/O modules

# SM 1226 fail-safe digital input

Ordering data	Article No.		Article No.
SM 1226 fail-safe digital input signal module	6ES7226-6BA32-0XB0	STEP 7 Safety Advanced V15	
16 inputs, 24 V DC (SIL 2/category 3/PL d) or 8 inputs 24 V DC (SIL 3/ category 3 or category 4/PL e) or a combination of both		Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F,	
Accessories		<ul> <li>WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP.</li> </ul>	
Terminal block (spare part)		ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and	
With 11 screws, tin-coated; 4 units	6ES7292-1AL30-0XA0	ET 200eco I/O	
Front flap set (spare part)		Requirement: STEP 7 Professional V15	
For modules with a width of 70 mm	6ES7291-1BB30-0XA0	Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	6ES7833-1FA15-0YA5
		Floating license for 1 user, software, documentation and license key for download 1); email address required for delivery	6ES7833-1FA15-0YH5
		STEP 7 Safety Basic V15	
		Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC Requirement: STEP 7 Basic V15 and higher	
		Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	6ES7833-1FB15-0YA5
		Floating license for 1 user, software, documentation and license key for download <sup>1)</sup> Email address required for delivery	6ES7833-1FB15-0YH5

<sup>1)</sup> For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

I/O modules Fail-safe I/O modules

SM 1226 fail-safe digital output

# Overview



- Digital outputs as a supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- Operable exclusively in the central system

Article number	6ES7226-6DA32-0XB0
	Digital Output SM 1226,
	F-ĎQ 4x 24VDC
Input current	
from backplane bus 5 V DC, max.	125 mA
Digital outputs	
• from load voltage L+, max.	170 mA
Digital outputs	
Number of digital outputs	4
• in groups of	1
Short-circuit protection	Yes
Switching capacity of the outputs	
• with resistive load, max.	30 Hz
• on lamp load, max.	10 Hz
Output voltage	
Rated value (DC)	24 V
Output current	
• for signal "1" rated value	2 A
<ul> <li>for signal "1" permissible range, max.</li> </ul>	10 mA to 2.4 A
• for signal "0" residual current, max.	P-switch: 0.5 mA, maximum; M-switch: 0.5 mA, maximum
Cable length	
• shielded, max.	200 m
• unshielded, max.	200 m
Diagnostics indication LED	
• for status of the outputs	Yes
Standards, approvals, certificates	
CE mark	Yes
cULus	Yes
FM approval	Yes
Highest safety class achievable in safety mode	
<ul> <li>Performance level according to ISO 13849-1</li> </ul>	Category 4, PL e
SIL acc. to IEC 61508	SIL 3

Article number	6ES7226-6DA32-0XB0
	Digital Output SM 1226, F-DQ 4x 24VDC
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	0 °C
• max.	55 °C
Mechanics/material	
Enclosure material (front)	
Plastic	Yes
Dimensions	
Width	70 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	270 g

I/O modules Fail-safe I/O modules

# SM 1226 fail-safe digital output

Ordering data	Article No.		Article No.
SM 1226 fail-safe digital output signal module	6ES7226-6DA32-0XB0	STEP 7 Safety Advanced V15 Task:	
4 outputs; 24 V DC, current sourcing/sinking		Engineering tool for configuring and programming fail-safe user	
Accessories		programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software	
Terminal block (spare part)		Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP,	
With 11 screws, tin-coated; 4 units	6ES7292-1AL30-0XA0		
Front flap set (spare part)		ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and	
For modules with a width of 70 mm	6ES7291-1BB30-0XA0	ET 2001sr, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15	
		Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	6ES7833-1FA15-0YA5
		Floating license for 1 user, software, documentation and license key for download <sup>1)</sup> ; email address required for delivery	6ES7833-1FA15-0YH5
		STEP 7 Safety Basic V15	
		Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC Requirement: STEP 7 Basic V15 and higher	
		Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	6ES7833-1FB15-0YA5
		Floating license for 1 user, software, documentation and license key for download <sup>1)</sup> Email address required for delivery	6ES7833-1FB15-0YH5

<sup>1)</sup> For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

I/O modules Fail-safe I/O modules

SM 1226 fail-safe relay output

# Overview



- Relay outputs as a supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- Operable exclusively in the central system

Article number	6ES7226-6RA32-0XB0
Article Hamber	Digital Output SM 1226,
	F-DQ 2x Relay
Input current	
from backplane bus 5 V DC, max.	120 mA
Digital outputs	
<ul> <li>from load voltage L+, max.</li> </ul>	300 mA
Digital outputs	
Number of digital outputs	2
Short-circuit protection	No
Output voltage	
Rated value (DC)	5 V DC to 30 V DC
Rated value (AC)	5 V AC to 250 V AC
Output current	
<ul> <li>for signal "1" permissible range, max.</li> </ul>	5 A maximum per circuit and 10 A maximum of all circuits per module
Relay outputs	
<ul> <li>Number of relay outputs</li> </ul>	2; 2 circuits per output
Switching capacity of contacts	
- with inductive load, max.	0.1 Hz, accordance with IEC 60947-5-1, DC-13; 2 Hz, accordance with IEC 60947-5-1, AC-15
- with resistive load, max.	2 Hz
Cable length	
• shielded, max.	200 m
• unshielded, max.	200 m
Diagnostics indication LED	
• for status of the outputs	Yes

Article number	6ES7226-6RA32-0XB0
	Digital Output SM 1226, F-DQ 2x Relay
Standards, approvals, certificates	
CE mark	Yes
cULus	Yes
FM approval	Yes
Highest safety class achievable in safety mode	
<ul> <li>Performance level according to ISO 13849-1</li> </ul>	Category 4, PL e
SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	0 °C
• max.	55 °C
Mechanics/material	
Enclosure material (front)	
Plastic	Yes
Dimensions	
Width	70 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	300 g

I/O modules Fail-safe I/O modules

# SM 1226 fail-safe relay output

Ordering data	Article No.		Article No.
SM 1226 fail-safe relay output signal module	6ES7226-6RA32-0XB0	STEP 7 Safety Advanced V15	
2 relay outputs		Engineering tool for configuring	
Accessories		and programming fail-safe user programs for SIMATIC S7-1200 FC,	
Terminal block (spare part)		S7-1500F, S7-1500F Software	
With 11 screws, tin-coated, coded; 4 units	6ES7292-1AL40-0XA0	Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP,	
Front flap set (spare part)		ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and	
For modules with a width of 70 mm	6ES7291-1BB30-0XA0	ET 200eco I/O Requirement: STEP 7 Professional V15	
		Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	6ES7833-1FA15-0YA5
		Floating license for 1 user, software, documentation and license key for download <sup>1)</sup> ; email address required for delivery	6ES7833-1FA15-0YH5
		STEP 7 Safety Basic V15	
		Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC Requirement: STEP 7 Basic V15 and higher	
		Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	6ES7833-1FB15-0YA5
		Floating license for 1 user, software, documentation and license key for download <sup>1)</sup> Email address required for delivery	6ES7833-1FB15-0YH5

<sup>1)</sup> For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

I/O modules

SIPLUS fail-safe digital inputs and outputs

SIPLUS SM 1226 fail-safe digital input

# Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs
- Operable exclusively in the central system

#### Note

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

Article number	6AG1226-6BA32-5XB0
Based on	6ES7226-6BA32-0XB0
	SIPLUS S7-1200 SM 1226 F-DI 16x24VDC
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	55 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
Ambient air temperature-barometric pressure-altitude	Tmin Tmax at 1 140 hPa 795 hPa (-1 000 m +2 000 m)
Relative humidity	
<ul> <li>With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
<ul> <li>Resistant to commercially available coolants and lubricants</li> </ul>	Yes
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	6AG1226-6BA32-5XB0
Based on	6ES7226-6BA32-0XB0
	SIPLUS S7-1200 SM 1226 F-DI 16x24VDC
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *
Remark	
<ul> <li>Note regarding classification of environmental conditions acc. to EN 60721</li> </ul>	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability
<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life
Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

I/O modules SIPLUS fail-safe digital inputs and outputs

# SIPLUS SM 1226 fail-safe digital input

Ordering data	Article No.		Article No.
SIPLUS SM 1226 fail-safe digital input signal module	6AG1226-6BA32-5XB0	Accessories	See SIMATIC SM 1226 fail-safe digital input signal
(Extended temperature range and environmental stress)			module, page 3/168
16 inputs, 24 V DC (SIL 2/category 3/PL d) or 8 inputs 24 V DC (SIL 3/ category 3 or category 4/PL e) or a combination of both			

I/O modules

SIPLUS fail-safe digital inputs and outputs

SIPLUS SM 1226 fail-safe digital output

# Overview



- Digital outputs as a supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- Operable exclusively in the central system

#### Note:

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

#### Technical specifications

Article number	6AG1226-6DA32-5XB0	Article number	6AG1226-6DA32-5XB0
Based on	6ES7226-6DA32-0XB0	Based on	6ES7226-6DA32-0XB0
	SIPLUS S7-1200 SM 1226 F-DQ 4x24VDC		SIPLUS S7-1200 SM 1226 F-DQ 4x24VDC
Ambient conditions		Use in stationary industrial systems	
Free fall		- to biologically active substances	Yes; Class 3B2 mold, fungus and
Fall height, max.	0.3 m; five times, in product package	according to EN 60721-3-3	dry rot spores (with the exception of fauna): Class 3B3 on request
Ambient temperature during operation		- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52
• min.	-25 °C; = Tmin	decorating to EIV 00721 0 0	(severity degree 3); *
max.  Altitude during operation	55 °C; = Tmax	<ul> <li>to mechanically active substances according to EN 60721-3-3</li> </ul>	Yes; Class 3S4 incl. sand, dust, *
relating to sea level		Use on ships/at sea	
<ul> <li>Installation altitude above sea level, max.</li> </ul>		<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3
<ul> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	Tmin Tmax at 1 140 hPa 795 hPa		on request
pressure-amuue	(-1 000 m +2 000 m)	<ul> <li>to chemically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52
Relative humidity			(severity degree 3); *
<ul> <li>With condensation, tested in accordance with</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under	<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *
IEC 60068-2-38, max.	condensation conditions)	Remark	
Resistance		<ul> <li>Note regarding classification of</li> </ul>	* The supplied plug covers must
Coolants and lubricants		environmental conditions acc. to EN 60721	remain in place over the unused interfaces during operation!
Resistant to commercially available coolants and lubricants	Yes	Conformal coating	3 -1
aranasio ocolario and justicario		<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability
		<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life
		<ul> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Conformal coating, Class A

#### Ordering data Article No.

SIPLUS SM 1226 fail-safe digital output module

4 outputs; 24 V DC, current sourcing/sinking

6AG1226-6DA32-5XB0

Accessories

See SIMATIC SM 1226 fail-safe digital output signal module, page 3/170

I/O modules SIPLUS fail-safe digital inputs and outputs

## SIPLUS SM 1226 fail-safe relay output

# Overview



- Relay outputs as a supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- Operable exclusively in the central system

#### Note:

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

#### Technical specifications

Article number	6AG1226-6RA32-5XB0	Article number	6AG1226-6RA32-5XB0
Based on	6ES7226-6RA32-0XB0	Based on	6ES7226-6RA32-0XB0
	SIPLUS S7-1200 SM 1226 F-DQ 2xRelay		SIPLUS S7-1200 SM 1226 F-DQ 2xRelay
Ambient conditions		Use in stationary industrial systems	
Free fall		- to biologically active substances	Yes; Class 3B2 mold, fungus and dry
• Fall height, max.	0.3 m; five times, in product package	according to EN 60721-3-3	rot spores (with the exception of fauna); Class 3B3 on request
Ambient temperature during operation		- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52
• min.	-25 °C; = Tmin	decorating to EIV 00721 0 0	(severity degree 3); *
• max.	55 °C; = Tmax	- to mechanically active substances	Yes; Class 3S4 incl. sand, dust, *
Altitude during operation relating to sea level		according to EN 60721-3-3	
	0.000	Use on ships/at sea	
<ul> <li>Installation altitude above sea level, max.</li> </ul>		<ul> <li>to biologically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3
<ul> <li>Ambient air temperature-barometric pressure-altitude</li> </ul>	Tmin Tmax at 1 140 hPa 795 hPa		on request
pressure-amidue	(-1 000 m +2 000 m)	<ul> <li>to chemically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52
Relative humidity		Ü	(severity degree 3); *
<ul> <li>With condensation, tested in accordance with</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under	<ul> <li>to mechanically active substances according to EN 60721-3-6</li> </ul>	Yes; Class 6S3 incl. sand, dust; *
IEC 60068-2-38, max.	condensation conditions)	Remark	
Resistance		<ul> <li>Note regarding classification of</li> </ul>	* The supplied plug covers must
Coolants and lubricants		environmental conditions acc. to EN 60721	remain in place over the unused interfaces during operation!
Resistant to commercially     available coolants and lubricants	Yes	Conformal coating	пистанов запид сроганен
available ooolanto and jubiloanto		<ul> <li>Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high availability
		<ul> <li>Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life
		<ul> <li>Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A</li> </ul>	Yes; Conformal coating, Class A

#### Ordering data Article No. Article No.

SIPLUS SM 1226 fail-safe relay output signal module

2 relay outputs

6AG1226-6RA32-5XB0

Accessories

See SIMATIC SM 1226 fail-safe relay output signal module, page 3/172

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Power supplies

1-phase, 24 V DC (for S7-1200)

# Overview



In terms of design and functionality, the SIMATIC PM 1207 single-phase load power supply (PM = power module) with automatic range selection of the input voltage is an optimal match to the SIMATIC S7-1200 PLC. It provides the supply to CPUs with 24 V input as well as to signal modules, and to 24 V loads connected to the modules. Comprehensive certifications, such as UL, ATEX and DNV GL enable universal use.

Article number	6EP1332-1SH71
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
Input	
Input	1-phase AC
• Note	Automatic range selection
Supply voltage	
<ul> <li>1 at AC Rated value</li> </ul>	120 V
• 2 at AC Rated value	230 V
Input voltage	
• 1 at AC	85 132 V
• 2 at AC	176 264 V
Wide-range input	No
Overvoltage resistance	$2.3 \times V_{\text{in rated}}$ , 1.3 ms
Mains buffering at Iout rated, min.	20 ms; at $V_{\text{in}} = 93/187 \text{ V}$
Rated line frequency 1	50 Hz
Rated line frequency 2	60 Hz
Rated line range	47 63 Hz
Input current	
<ul> <li>at rated input voltage 120 V</li> </ul>	1.2 A
<ul> <li>at rated input voltage 230 V</li> </ul>	0.67 A
Switch-on current limiting (+25 °C), max.	13 A
Duration of inrush current limiting at 25 °C	
maximum	3 ms
I <sup>2</sup> t, max.	0.5 A <sup>2</sup> ·s
Built-in incoming fuse	T 3,15 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 16 A characteristic B or 10 A characteristic C

Article number	6EP1332-1SH71
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
Output	
Output	Controlled, isolated DC voltage
Rated voltage $V_{\text{out}}$ 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 function Output voltage adjustable	No
Output voltage setting	-
Status display	Green LED for 24 V OK
On/off behavior	No overshoot of $V_{\text{out}}$ (soft start)
Startup delay, max.	6 s; 2 s at 230 V, 6 s at 120 V
Voltage rise, typ.	10 ms
Rated current value lout rated	2.5 A
Current range	0 2.5 A
Supplied active power typical	60 W
Short-term overload current	
<ul> <li>on short-circuiting during the start-up typical</li> </ul>	6 A
<ul> <li>at short-circuit during operation typical</li> </ul>	6 A
Duration of overloading capability for excess current	
<ul> <li>on short-circuiting during the start-up</li> </ul>	100 ms
<ul> <li>at short-circuit during operation</li> </ul>	100 ms
Parallel switching for enhanced performance	Yes
Numbers of parallel switchable units for enhanced performance	2

Power supplies

# 1-phase, 24 V DC (for S7-1200)

# Technical specifications (continued)

rediffical specifications (continues)		
Article number	6EP1332-1SH71	
Product	S7-1200 PM1207	
Power supply, type	24 V/2.5 A	
Efficiency		
Efficiency at $V_{\text{out rated}}$ , $I_{\text{out rated}}$ , approx.	83 %	
Power loss at $V_{\text{out rated}}$ , $I_{\text{out rated}}$ , approx.	12 W	
Closed-loop control		
Dynamic mains compensation ( $V_{\text{in rated}} \pm 15 \%$ ), max.	0.3 %	
Dynamic load smoothing ( $I_{out}$ : 50/100/50 %), $U_{out} \pm typ$ .	3 %	
Load step setting time 50 to 100%, typ.	5 ms	
Load step setting time 100 to 50%, typ.	5 ms	
Setting time maximum	5 ms	
Protection and monitoring		
Output overvoltage protection	< 33 V	
Current limitation, typ.	2.65 A	
Property of the output Short-circuit proof	Yes	
Short-circuit protection	Constant current characteristic	
Enduring short circuit current RMS value		
• typical	2.7 A	
Overload/short-circuit indicator	-	
Safety		
Primary/secondary isolation	Yes	
Galvanic isolation	Safety extra-low output voltage $U_{\rm out}$ acc. to EN 60950-1 and EN 50178	
Protection class	Class I	
Leakage current		
<ul><li>maximum</li></ul>	3.5 mA	
CE mark	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) Class I, Div. 2, Group ABCD, T4, File E330455	
FM approval	Class I, Div. 2, Group ABCD, T4	
CB approval	Yes	
Marine approval	ABS, BV, DNV GL, LRS, NK	
Degree of protection (EN 60529)	IP20	

Article number	6EP1332-1SH71
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
EMC	
Emitted interference	EN 55022 Class B
Supply harmonics limitation	not applicable
Noise immunity	EN 61000-6-2
Operating data	
Ambient temperature	
during operation	0 60 °C
- Note	with natural convection
during transport	-40 +85 °C
during storage	-40 +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation
Mechanics	
Connection technology	screw-type terminals
Connections	
Supply input	L, N, PE: 1 screw terminal each for 0.5 2.5 mm <sup>2</sup>
• Output	L+, M: 2 screw terminals each for 0.5 2.5 mm <sup>2</sup>
Auxiliary	-
Width of the enclosure	70 mm
Height of the enclosure	100 mm
Depth of the enclosure	75 mm
Required spacing	
• top	20 mm
• bottom	20 mm
• left	0 mm
• right	0 mm
Weight, approx.	0.3 kg
Product feature of the enclosure housing for side-by-side mounting	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15, wall mounting
MTBF at 40 °C	1 492 537 h
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

# Ordering data

Article No.

SIMATIC S7-1200 PM 1207

Input: 120/230 V AC Output: 24 V DC/2.5 A 6EP1332-1SH71

SIPLUS power supplies

1-phase, 24 V DC (for SIPLUS S7-1200)

# 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 above 60 °C)

#### Note:

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

SIPLUS power supply PM 1207		
Article No.	6AG1 332-1SH71-4AA0	6AG1 332-1SH71-7AA0
Article No. based on	6EP1 332-1SH71	
Ambient temperature range	0 +60° C	-40 +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 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 (+3500 +5000 m) derating 20 K	

For technical documentation on SIPLUS, see:

http://www.siemens.com/siplus-extreme