

## 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 communications modules (CM)

### Design

The compact CPU 1212C has:

- 3 device versions with different power supply and control voltages.
- Integrated power supply either as wide-range AC or DC power supply (85 ... 264 V AC or 24 V DC)
- Integrated 24 V encoder/load current supply:
  - For direct connection of sensors and encoders. With 300 mA output current also for use as load power supply.
- 8 integrated digital inputs 24 V DC (current sinking/sourcing input (IEC type 1 current sinking)).
- 6 integrated digital outputs, either 24 V DC or relay.
- 2 integrated analog inputs 0 ... 10 V.
- 2 pulse outputs (PTO) with a frequency of up to 100 kHz.
- Pulse-width modulated outputs (PWM) with a frequency of up to 100 kHz.
- Integrated Ethernet interface (TCP/IP native, ISO-on-TCP).
- 4 fast counters (3 with max. 100 kHz; 1 with max. 30 kHz), with parameterizable enable and reset inputs, can be used simultaneously as up and down counters with 2 separate inputs or for connecting incremental encoders.
- Expansion by additional communication interfaces, e.g. RS485 or RS232.
- Expansion by analog or digital signals directly on the CPU via signal board (with retention of CPU mounting dimensions).
- Expansion by a wide range of analog and digital input and output signals via signal modules.
- Optional memory expansion (SIMATIC Memory Card).
- PID controller with auto-tuning functionality.
- Integral real-time clock.
- Interrupt inputs:
  - For extremely fast response to rising or falling edges of process signals.
- Removable terminals on all modules.
- Simulator (optional):
  - For simulating the integrated inputs and for testing the user program.

### Device versions

Option	Supply voltage	Input voltage DI	Output voltage DO	Output current
• DC/DC/DC	24 V DC	24 V DC	24 V DC	0.5 A, transistor
• DC/DC/relay	24 V DC	24 V DC	5 ... 30 V DC / 5 ... 250 V AC	2 A; 30 W DC / 200 W AC
• AC/DC/relay	85 ... 264 V AC	24 V DC	5 ... 30 V DC / 5 ... 250 V AC	2 A; 30 W DC / 200 W AC

### Function

- Comprehensive instruction set:
  - A wide range of operations facilitate programming:
    - basic operations such as binary logic operations, result allocation, save, count, create times, load, transfer, compare, shift, rotate, create complement, call subprogram (with local variables)
    - integral communication commands (e.g. USS protocol, Modbus RTU, S7 communication "T-Send/T-Receive" or Freeport)
    - user-friendly functions such as pulse-width modulation, pulse sequence function, arithmetic functions, floating point arithmetic, PID closed-loop control, jump functions, loop functions and code conversions
    - mathematical functions, e.g. SIN, COS, TAN, LN, EXP
- Counting:
  - User-friendly counting functions in conjunction with the integrated counters and special commands for high-speed counters open up new application areas for the user
- Interrupt processing:
  - edge-triggered interrupts (activated by rising or falling edges of process signals on interrupt inputs) support a rapid response to process events.
  - time-triggered interrupts.

- counter interrupts can be triggered when a setpoint is reached or when the direction of counting changes.
- communication interrupts allow the rapid and easy exchange of information with peripheral devices such as printers or bar code readers
- Password protection
- Test and diagnostics functions:  
Easy-to-use functions support testing and diagnostics, e.g. online/offline diagnostics
- "Forcing" of inputs and outputs during testing and diagnostics:  
Inputs and outputs can be set independently of cycle and thus permanently, for example, to test the user program
- Motion Control in accordance with PLCopen for simple movements
- Library functionality

**Programming**

The STEP 7 Basic programming package permits complete programming of all S7-1200 Controllers and the associated I/O.

**Technical specifications**

Article number	6ES7212-1AE40-0XB0 CPU 1212C, DC/DC/DC, 8DI/6DO/2AI	6ES7212-1BE40-0XB0 CPU 1212C, AC/DC/Relay, 8DI/6DO/2AI	6ES7212-1HE40-0XB0 CPU 1212C, DC/DC/Relay, 8DI/6DO/2AI
<b>General information</b>			
Product type designation	CPU 1212C DC/DC/DC	CPU 1212C AC/DC/relay	CPU 1212C DC/DC/relay
Firmware version	V4.5	V4.5	V4.5
<b>Engineering with</b>			
• Programming package	STEP 7 V17 or higher	STEP 7 V17 or higher	STEP 7 V17 or higher
<b>Supply voltage</b>			
Rated value (DC)			
• 24 V DC	Yes		Yes
permissible range, lower limit (DC)	20.4 V		20.4 V
permissible range, upper limit (DC)	28.8 V		28.8 V
Rated value (AC)			
• 120 V AC		Yes	
• 230 V AC		Yes	
permissible range, lower limit (AC)		85 V	
permissible range, upper limit (AC)		264 V	
Reverse polarity protection	Yes		Yes
<b>Line frequency</b>			
• permissible range, lower limit		47 Hz	
• permissible range, upper limit		63 Hz	
<b>Load voltage L+</b>			
• Rated value (DC)	24 V		24 V
• permissible range, lower limit (DC)	20.4 V		20.4 V
• permissible range, upper limit (DC)	28.8 V		28.8 V
<b>Input current</b>			
Current consumption (rated value)	400 mA; CPU only	80 mA at 120 V AC; 40 mA at 240 V AC	400 mA; CPU only
Current consumption, max.	1 200 mA; CPU with all expansion modules	240 mA at 120 V AC; 120 mA at 240 V AC	1 200 mA; CPU with all expansion modules
Inrush current, max.	12 A; at 28.8 V DC	20 A; at 264 V	12 A; at 28.8 V
$I^2t$	0.5 A <sup>2</sup> ·s	0.8 A <sup>2</sup> ·s	0.8 A <sup>2</sup> ·s
<b>Output current</b>			
for backplane bus (5 V DC), max.	1 000 mA; Max. 5 V DC for SM and CM	1 000 mA; Max. 5 V DC for SM and CM	1 000 mA; Max. 5 V DC for SM and CM
<b>Encoder supply</b>			
<b>24 V encoder supply</b>			
• 24 V	L+ minus 4 V DC min.	20.4 to 28.8V	L+ minus 4 V DC min.
<b>Power loss</b>			
Power loss, typ.	9 W	11 W	9 W
<b>Memory</b>			
<b>Work memory</b>			
• integrated	75 kbyte	75 kbyte	75 kbyte
• expandable	No	No	No
<b>Load memory</b>			
• integrated	2 Mbyte	2 Mbyte	2 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
<b>Backup</b>			
• present	Yes	Yes	Yes
• maintenance-free	Yes	Yes	Yes
• without battery	Yes	Yes	Yes
<b>CPU processing times</b>			
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
<b>CPU-blocks</b>			
Number of blocks (total)	DBs, FCs, FBs, counters and timers. The maximum number of addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used	DBs, FCs, FBs, counters and timers. The maximum number of addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used	DBs, FCs, FBs, counters and timers. The maximum number of addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used
<b>OB</b>			

Article number	6ES7212-1AE40-0XB0 CPU 1212C, DC/DC/DC, 8DI/6DO/2AI	6ES7212-1BE40-0XB0 CPU 1212C, AC/DC/Relay, 8DI/6DO/2AI	6ES7212-1HE40-0XB0 CPU 1212C, DC/DC/Relay, 8DI/6DO/2AI
• Number, max.	Limited only by RAM for code	Limited only by RAM for code	Limited only by RAM for code
<b>Data areas and their retentivity</b>			
Retentive data area (incl. timers, counters, flags), max.	14 kbyte	14 kbyte	14 kbyte
<b>Flag</b>			
• Size, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
<b>Local data</b>			
• per priority class, max.	16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2 to 26: 6 KB	16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2 to 26: 6 KB	16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2 to 26: 6 KB
<b>Address area</b>			
<b>Process image</b>			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
<b>Hardware configuration</b>			
Number of modules per system, max.	3 comm. modules, 1 signal board, 2 signal modules	3 comm. modules, 1 signal board, 2 signal modules	3 comm. modules, 1 signal board, 2 signal modules
<b>Time of day</b>			
<b>Clock</b>			
• Hardware clock (real-time)	Yes	Yes	Yes
• Backup time	480 h; Typical	480 h; Typical	480 h; Typical
• Deviation per day, max.	±60 s/month at 25 °C	±60 s/month at 25 °C	±60 s/month at 25 °C
<b>Digital inputs</b>			
Number of digital inputs	8; Integrated	8; Integrated	8; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
Source/sink input	Yes	Yes	Yes
<b>Number of simultaneously controllable inputs</b>			
<b>all mounting positions</b>			
— up to 40 °C, max.	8	8	8
<b>Input voltage</b>			
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	5 V DC at 1 mA	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	15 V DC at 2.5 mA
<b>Input delay (for rated value of input voltage)</b>			
<b>for standard inputs</b>			
— parameterizable	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	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	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
— at "0" to "1", min.	0.2 ms	0.2 ms	0.2 ms
— at "0" to "1", max.	12.8 ms	12.8 ms	12.8 ms
<b>for interrupt inputs</b>			
— parameterizable	Yes	Yes	Yes
<b>for technological functions</b>			
— parameterizable	Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz	Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz	Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz
<b>Cable length</b>			
• shielded, max.	500 m; 50 m for technological functions	500 m; 50 m for technological functions	500 m; 50 m for technological functions
• unshielded, max.	300 m; for technological functions: No	300 m; for technological functions: No	300 m; for technological functions: No
<b>Digital outputs</b>			
Number of digital outputs	6	6; Relays	6; Relays
• of which high-speed outputs	4; 100 kHz Pulse Train Output		
Limitation of inductive shutdown voltage to	L+ (-48 V)		
<b>Switching capacity of the outputs</b>			
• with resistive load, max.	0.5 A	2 A	2 A
• on lamp load, max.	5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
<b>Output voltage</b>			
• for signal "0", max.	0.1 V; with 10 kOhm load		
• for signal "1", min.	20 V		
<b>Output current</b>			
• for signal "1" rated value	0.5 A		
• for signal "0" residual current, max.	0.1 mA		
<b>Output delay with resistive load</b>			
• "0" to "1", max.	1 µs	10 ms; max.	10 ms; max.
• "1" to "0", max.	5 µs	10 ms; max.	10 ms; max.
<b>Switching frequency</b>			
• of the pulse outputs, with resistive load, max.	100 kHz		
<b>Relay outputs</b>			
• Number of relay outputs	0	6	6
• Number of operating cycles, max.		mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000
<b>Cable length</b>			

Article number	6ES7212-1AE40-0XB0 CPU 1212C, DC/DC/DC, 8DI/6DO/2AI	6ES7212-1BE40-0XB0 CPU 1212C, AC/DC/Relay, 8DI/6DO/2AI	6ES7212-1HE40-0XB0 CPU 1212C, DC/DC/Relay, 8DI/6DO/2AI
• shielded, max.	500 m	500 m	500 m
• unshielded, max.	150 m	150 m	150 m
<b>Analog inputs</b>			
Number of analog inputs	2	2	2
<b>Input ranges</b>			
• Voltage	Yes	Yes	Yes
<b>Input ranges (rated values), voltages</b>			
• 0 to +10 V	Yes	Yes	Yes
— Input resistance (0 to 10 V)	≥100k ohms	≥100k ohms	≥100k ohms
<b>Cable length</b>			
• shielded, max.	100 m; twisted and shielded	100 m; twisted and shielded	100 m; twisted and shielded
<b>Analog outputs</b>			
Number of analog outputs	0	0	0
<b>Analog value generation for the inputs</b>			
<b>Integration and conversion time/resolution per channel</b>			
• Resolution with overrange (bit including sign), max.	10 bit	10 bit	10 bit
• Integration time, parameterizable	Yes	Yes	Yes
• Conversion time (per channel)	625 µs	625 µs	625 µs
<b>Encoder</b>			
<b>Connectable encoders</b>			
• 2-wire sensor	Yes	Yes	Yes
<b>1. Interface</b>			
Interface type	PROFINET	PROFINET	PROFINET
Isolated	Yes	Yes	Yes
automatic detection of transmission rate	Yes	Yes	Yes
Autonegotiation	Yes	Yes	Yes
Autocrossing	Yes	Yes	Yes
<b>Interface types</b>			
• RJ 45 (Ethernet)	Yes	Yes	Yes
• Number of ports	1	1	1
• integrated switch	No	No	No
<b>Protocols</b>			
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes; Optionally also encrypted	Yes; Optionally also encrypted	Yes; Optionally also encrypted
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No
<b>PROFINET IO Controller</b>			
• Transmission rate, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s
<b>Services</b>			
— PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
— Isochronous mode	No	No	No
— IRT	No	No	No
— PROFlenergy	No	No	No
— Prioritized startup	Yes	Yes	Yes
— Number of IO devices with prioritized startup, max.	16	16	16
— Number of connectable IO Devices, max.	16	16	16
— Number of connectable IO Devices for RT, max.	16	16	16
— of which in line, max.	16	16	16
— Activation/deactivation of IO Devices	Yes	Yes	Yes
— Number of IO Devices that can be simultaneously activated/deactivated, max.	8	8	8
— Updating time	The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.	The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.	The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data.
<b>PROFINET IO Device</b>			
<b>Services</b>			
— PG/OP communication	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected	Yes; encryption with TLS V1.3 pre-selected
— Isochronous mode	No	No	No
— IRT	No	No	No
— PROFlenergy	Yes	Yes	Yes

Article number	6ES7212-1AE40-0XB0 CPU 1212C, DC/DC/DC, 8DI/6DO/2AI	6ES7212-1BE40-0XB0 CPU 1212C, AC/DC/Relay, 8DI/6DO/2AI	6ES7212-1HE40-0XB0 CPU 1212C, DC/DC/Relay, 8DI/6DO/2AI
— Shared device	Yes	Yes	Yes
— Number of IO Controllers with shared device, max.	2	2	2
<b>Protocols</b>			
Supports protocol for PROFINET IO	Yes	Yes	Yes
PROFIsafe	No	No	No
PROFIBUS	Yes; CM 1243-5 (master) or CM 1242-5 (slave) required	Yes; CM 1243-5 (master) or CM 1242-5 (slave) required	Yes; CM 1243-5 (master) or CM 1242-5 (slave) required
OPC UA	Yes; OPC UA Server	Yes; OPC UA Server	Yes; OPC UA Server
AS-Interface	Yes; CM 1243-2 required	Yes; CM 1243-2 required	Yes; CM 1243-2 required
<b>Protocols (Ethernet)</b>			
• TCP/IP	Yes	Yes	Yes
• DHCP	No	No	No
• SNMP	Yes	Yes	Yes
• DCP	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes
<b>Redundancy mode</b>			
<b>Media redundancy</b>			
— MRP	No	No	No
— MRPD	No	No	No
<b>SIMATIC communication</b>			
• S7 routing	Yes	Yes	Yes
<b>Open IE communication</b>			
• TCP/IP	Yes	Yes	Yes
— Data length, max.	8 kbyte	8 kbyte	8 kbyte
— several passive connections per port, supported	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes
— Data length, max.	8 kbyte	8 kbyte	8 kbyte
• UDP	Yes	Yes	Yes
— Data length, max.	1 472 byte	1 472 byte	1 472 byte
<b>Web server</b>			
• supported	Yes	Yes	Yes
• User-defined websites	Yes	Yes	Yes
<b>OPC UA</b>			
• Runtime license required	Yes; "Basic" license required	Yes; "Basic" license required	Yes; "Basic" license required
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required	Yes; data access (read, write, subscribe), method call, runtime license required
— Application authentication	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— User authentication	"anonymous" or by user name & password	"anonymous" or by user name & password	"anonymous" or by user name & password
— Number of sessions, max.	10	10	10
— Number of subscriptions per session, max.	5	5	5
— Sampling interval, min.	100 ms	100 ms	100 ms
— Publishing interval, min.	200 ms	200 ms	200 ms
— Number of server methods, max.	20	20	20
— number of monitored items, recommended max.	1 000	1 000	1 000
— Number of server interfaces, max.	2	2	2
— Number of nodes for user-defined server interfaces, max.	2 000	2 000	2 000
<b>Further protocols</b>			
• MODBUS	Yes	Yes	Yes
<b>communication functions / header</b>			
<b>S7 communication</b>			
• supported	Yes	Yes	Yes
• as server	Yes	Yes	Yes
• as client	Yes	Yes	Yes
• User data per job, max.	See online help (S7 communication, user data size)	See online help (S7 communication, user data size)	See online help (S7 communication, user data size)
<b>Number of connections</b>			
• overall	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved /	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved /	PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; S7 Connections: 8 reserved / 14 max; Open User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 30 max; OPC UA Connections: 0 reserved /

Article number	6ES7212-1AE40-0XB0	6ES7212-1BE40-0XB0	6ES7212-1HE40-0XB0
	CPU 1212C, DC/DC/DC, 8DI/6DO/2AI	CPU 1212C, AC/DC/Relay, 8DI/6DO/2AI	CPU 1212C, DC/DC/Relay, 8DI/6DO/2AI
	10 max; Total Connections: 34 reserved / 64 max	10 max; Total Connections: 34 reserved / 64 max	10 max; Total Connections: 34 reserved / 64 max
<b>Test commissioning functions</b>			
<b>Status/control</b>			
• Status/control variable	Yes	Yes	Yes
• Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
<b>Forcing</b>			
• Forcing	Yes	Yes	Yes
<b>Diagnostic buffer</b>			
• present	Yes	Yes	Yes
<b>Traces</b>			
• Number of configurable Traces	2	2	2
• Memory size per trace, max.	512 kbyte	512 kbyte	512 kbyte
<b>Interrupts/diagnostics/status information</b>			
<b>Diagnostics indication LED</b>			
• RUN/STOP LED	Yes	Yes	Yes
• ERROR LED	Yes	Yes	Yes
• MAINT LED	Yes	Yes	Yes
<b>Integrated Functions</b>			
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	4; With integrated outputs	Up to 4 with SB 1222	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		
<b>Potential separation</b>			
<b>Potential separation digital inputs</b>			
• Potential separation digital inputs	No	500V AC for 1 minute	500V AC for 1 minute
• between the channels, in groups of	1	1	1
<b>Potential separation digital outputs</b>			
• Potential separation digital outputs	Yes	Relays	Relays
• between the channels	No	No	No
• between the channels, in groups of	1	2	2
<b>EMC</b>			
<b>Interference immunity against discharge of static electricity</b>			
• Interference immunity against discharge of static electricity acc. to IEC 61000-4-2	Yes	Yes	Yes
— Test voltage at air discharge	8 kV	8 kV	8 kV
— Test voltage at contact discharge	6 kV	6 kV	6 kV
<b>Interference immunity to cable-borne interference</b>			
• Interference immunity on supply lines acc. to IEC 61000-4-4	Yes	Yes	Yes
• Interference immunity on signal cables acc. to IEC 61000-4-4	Yes	Yes	Yes
<b>Interference immunity against voltage surge</b>			
• Interference immunity on supply lines acc. to IEC 61000-4-5	Yes	Yes	Yes
<b>Interference immunity against conducted variable disturbance induced by high-frequency fields</b>			
• Interference immunity against high-frequency radiation acc. to IEC 61000-4-6	Yes	Yes	Yes
<b>Emission of radio interference acc. to EN 55 011</b>			
• Limit class A, for use in industrial areas	Yes; Group 1	Yes; Group 1	Yes; Group 1
• Limit class B, for use in residential areas	Yes; When appropriate measures are used to ensure compliance with the limits for Class B according to EN 55011	Yes; When appropriate measures are used to ensure compliance with the limits for Class B according to EN 55011	Yes; When appropriate measures are used to ensure compliance with the limits for Class B according to EN 55011
<b>Degree and class of protection</b>			
IP degree of protection	IP20	IP20	IP20
<b>Standards, approvals, certificates</b>			
CE mark	Yes	Yes	Yes
UL approval	Yes	Yes	Yes
cULus	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes	Yes
KC approval	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes

Article number	6ES7212-1AE40-0XB0 CPU 1212C, DC/DC/DC, 8DI/6DO/2AI	6ES7212-1BE40-0XB0 CPU 1212C, AC/DC/Relay, 8DI/6DO/2AI	6ES7212-1HE40-0XB0 CPU 1212C, DC/DC/Relay, 8DI/6DO/2AI
<b>Ambient conditions</b>			
<b>Free fall</b>			
• 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
<b>Ambient temperature during operation</b>			
• 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
• horizontal installation, min.	-20 °C	-20 °C	-20 °C
• horizontal installation, max.	60 °C	60 °C	60 °C
• vertical installation, min.	-20 °C	-20 °C	-20 °C
• vertical installation, max.	50 °C	50 °C	50 °C
<b>Ambient temperature during storage/transportation</b>			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>			
• Operation, min.	795 hPa	795 hPa	795 hPa
• Operation, max.	1 080 hPa	1 080 hPa	1 080 hPa
• Storage/transport, min.	660 hPa	660 hPa	660 hPa
• Storage/transport, max.	1 080 hPa	1 080 hPa	1 080 hPa
<b>Altitude during operation relating to sea level</b>			
• Installation altitude, min.	-1 000 m	-1 000 m	-1 000 m
• Installation altitude, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Relative humidity</b>			
• Operation, max.	95 %; no condensation	95 %; no condensation	95 %; no condensation
<b>Vibrations</b>			
• Vibration resistance during operation acc. to IEC 60068-2-6	2 g (m/s <sup>2</sup> ) wall mounting, 1 g (m/s <sup>2</sup> ) DIN rail	2 g (m/s <sup>2</sup> ) wall mounting, 1 g (m/s <sup>2</sup> ) DIN rail	2 g (m/s <sup>2</sup> ) wall mounting, 1 g (m/s <sup>2</sup> ) DIN rail
• Operation, tested according to IEC 60068-2-6	Yes	Yes	Yes
<b>Shock testing</b>			
• tested according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
<b>Pollutant concentrations</b>			
• SO <sub>2</sub> 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
<b>configuration / header</b>			
<b>configuration / programming / header</b>			
<b>Programming language</b>			
— LAD	Yes	Yes	Yes
— FBD	Yes	Yes	Yes
— SCL	Yes	Yes	Yes
<b>Know-how protection</b>			
• User program protection/password protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
<b>Access protection</b>			
• protection of confidential configuration data	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
<b>programming / cycle time monitoring / header</b>			
• adjustable	Yes	Yes	Yes
<b>Dimensions</b>			
Width	90 mm	90 mm	90 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
<b>Weights</b>			
Weight, approx.	370 g	425 g	385 g