SIEMENS

Data sheet

6ES7212-1AE40-0XB0

SIMATIC S7-1200, CPU 1212C, COMPACT CPU, DC/DC/DC, ONBOARD I/O: 8 DI 24V DC; 6 DO 24 V DC; 2 AI 0 - 10V DC, POWER SUPPLY: DC 20.4 - 28.8 V DC, PROGRAM/DATA





General information	
Product type designation	CPU 1212C DC/DC/DC
Firmware version	V4.2
Engineering with	
Programming package	STEP 7 V14 or higher
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Load voltage L+	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
• permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption (rated value)	400 mA; CPU only
Current consumption, max.	1 200 mA; CPU with all expansion modules

Inrush current, max.	12 A; at 28.8 V DC
l²t	0.5 A²·s
Output current for backplane bus (5 V DC), max.	1 000 mA; Max. 5 V DC for SM and CM
Tot backplatte bus (5 v bc), max.	1 000 IIIA, IMAX. 3 V DC IOI SIM AND CIM
Encoder supply	
24 V encoder supply	
• 24 V	L+ minus 4 V DC min.
Power loss	
Power loss, typ.	9 W
Momory	
Memory Work memory	
• integrated	75 kbyte
• expandable	No
Load memory	
• integrated	2 Mbyte
Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card
Backup	
• present	Yes
maintenance-free	Yes
without battery	Yes
0011	
CPU processing times for bit operations, typ.	0.085 μs; / instruction
for word operations, typ.	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction
	2.0 po, / moducation
CPU-blocks	
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
OB	•
Number, max.	Limited only by RAM for code
Data areas and their retentivity Retentive data area (incl. timers, counters, flags),	10 khyte
max.	10 kbyte
Flag	
Number, max.	4 kbyte; Size of bit memory address area
Local data	
• per priority class, max.	16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2
	to 26: 6 KB
Address area	
Process image	

● Inputs, adjustable	1 kbyte
Outputs, adjustable	1 kbyte
Hardware configuration Number of modules per system, max.	3 comm. modules, 1 signal board, 2 signal modules
Number of modules per system, max.	3 comm. modules, i signal board, 2 signal modules
Time of day	
Clock	
 Hardware clock (real-time) 	Yes
Backup time	480 h; Typical
Deviation per day, max.	+/- 60 s/month at 25 °C
Digital inputs	
Number of digital inputs	8; Integrated
 of which inputs usable for technological functions 	4; HSC (High Speed Counting)
Source/sink input	Yes
Number of simultaneously controllable inputs	
all mounting positions	
— up to 40 °C, max.	8
Input voltage	
Rated value (DC)	24 V
● for signal "0"	5 V DC at 1 mA
• for signal "1"	15 V DC at 2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— 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
— at "0" to "1", min.	0.2 ms
— at "0" to "1", max.	12.8 ms
for interrupt inputs	
— parameterizable	Yes
for counter/technological functions	
— parameterizable	Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz
Cable length	
• shielded, max.	500 m; 50 m for technological functions
• unshielded, max.	300 m; For technological functions: No
Digital outputs	
Number of digital outputs	6
of which high-speed outputs	4; 100 kHz Pulse Train Output
Limitation of inductive shutdown voltage to	L+ (-48 V)
Switching capacity of the outputs	
• with resistive load, max.	0.5 A

• on lamp load, max.	5 W
Output voltage	
• for signal "0", max.	0.1 V; with 10 kOhm load
• for signal "1", min.	20 V
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.1 mA
Output delay with resistive load	
• "0" to "1", max.	1 μs
• "1" to "0", max.	5 μs
Switching frequency	
• of the pulse outputs, with resistive load, max.	100 kHz
Cable length	
• shielded, max.	500 m
• unshielded, max.	150 m
Analog inputs	
Analog inputs Number of analog inputs	2
Input ranges	_
• Voltage	Yes
Input ranges (rated values), voltages	
• 0 to +10 V	Yes
Input resistance (0 to 10 V)	≥100k ohms
Cable length	
• shielded, max.	100 m; twisted and shielded
Analog outputs Number of analog outputs	0
Number of analog outputs	O
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
 Resolution with overrange (bit including sign), 	10 bit
max.	
 Integration time, parameterizable 	Yes
 Conversion time (per channel) 	625 μs
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
1. Interface	
Interface type	PROFINET
Physics	Ethernet
Isolated	Yes
automatic detection of transmission rate	Yes

Autocrossing Yes Interface types • Number of ports 1 • integrated switch No Functionality • PROFINET IO Controller Yes • PROFINET IO Device Yes • SiMATIC communication Yes • SiMATIC communication Yes • Web server Yes • Media redundancy No PROFINET IO Controller • Transmission rate, max. 100 Mbit/s Services - PC/OP communication Yes - Simatic startup Yes - Isochronous mode No - Open IE communication Yes - IRT No - MRPD No - PROFInergy No - PROFilergy Yes - Number of IO devices with prioritized startup, max. 16 - Number of connectable IO Devices, max. 16 - Number of connectable IO Devices for RT, max. 16 - Activation/deactivation of IO Devices Yes - Number of IO Devices that can be simultaneously activated/deactivated, max. 17 - Updating time The minimum value of the update time also depends on the communication components et for PROFINET IO, on the number of IO devices and the quantity of configured user data. PROFINET IO Device Services - PC/OP communication Yes - Sorvicus Yes - Sorvicus Yes - Sorvicus Yes - PROFINET IO Device Yes - PROFINET IO Device Yes - PC/OP communication Yes - PC/OP communication Yes - PC/OP communication Yes - PC/OP communication Yes - Open IE communication Yes	Autonegotiation	Yes
Interface types • Number of ports • integrated switch Finctionality • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Web server • Media redundancy • Media redundancy • PROFINET IO Controller • Transmission rate, max. Services - PG/OP communication - S7 routing - Isochronous mode - Open IE communication - Yes - IRT - MRP - MRP - MRPD - PROFINET - Profitized startup - Profitized startup - Profitized startup - Number of IO devices with prioritized startup, max. - Number of connectable IO Devices, max Of which in line, max Of which in line, max Of which in line, max Updating time PROFINET IO Device Services - PG/OP communication - S7 routing - Transmission rate, max 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. PROFINET IO Device Services - PG/OP communication - S7 routing - Isochronous mode - Services - PG/OP communication - S7 routing - Isochronous mode - Yes - No.		
Number of ports Integrated switch No Functionality PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication PS or voting Integrated switch No PROFINET IO Controller Profinet in ine, max. No PROFINET IO Controller Transmission rate, max. Integrated switch PGO communication Yes PGO PROFINET IO Controller Transmission rate, max. Integrated switch PGO communication PS routing No PS routing No PROFINET IO communication PS routing No No No No PROFINET IO Controller PROFINET IO Controller PROFINET IO Controller PROFINET IO Controller Transmission rate, max. No PROFINET IO Controller The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices PROFINET IO Device PROFINET IO Device PROFINET IO Device Services PROFINET IO Device Services PROFINET IO Device Services PROFINET IO Device Services PROFINET IO Device PROFINET IO Device PROFINET IO Device Services PROFINET IO Device PROFINET IO Device PROFINET IO Device ID		
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PROFINET IO Controller PROFINET IO Device SIMATIC communication Yes Open IE communication Yes Media redundancy No PROFINET IO Controller Transmission rate, max. 100 Mbit/s Services PG/OP communication Yes No PROFINET IO Controller Transmission rate, max. 100 Mbit/s Services PG/OP communication Yes Sorvices PG/OP communication Yes Isochronous mode No Open IE communication Yes IRT No MRP No MRP No PROFlenergy No PROFlenergy No Prioritized startup No No Prioritized startup Nax. Number of IO devices with prioritized startup, max. Number of Connectable IO Devices, max. Number of Openices that can be simultaneously activated/deactivated, max. Updating time PROFINET IO Device Services PROFO Communication Yes Services PROFO PROFO Communication Yes Services		
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Open IE communication Web server No Media redundancy No PROFINET IO Controller Transmission rate, max. Services		Yes
Media redundancy No PROFINET IO Controller Transmission rate, max. 100 Mbit/s Services — PG/OP communication — S7 routing — Isochronous mode — Open IE communication — IRT — MRP — MRP — MRPD — PGOFlenergy — Prioritized startup — Prioritized startup — Number of IO devices with prioritized startup, max. — Number of connectable IO Devices, max. — of which in line, max. — of which in line, max. — Updating time PROFINET IO Device Services PG/OP communication Yes — S7 routing — Isochronous mode No		Yes
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PROFINET IO Controller		No
• Transmission rate, max. Services - PG/OP communication Yes - S7 routing Yes - Isochronous mode No - Open IE communication Yes - IRT No - MRP No - MRPD No - PROFINET IO Device - Number of IO devices suit at an be simultaneously activated/deactivated, max Updating time - PROFINET IO Device Services - PG/OP communication Yes - S7 routing - So routing - S7 routing - S6 Rose - PG/OP communication S Pess - Number of IO Devices Max - S7 routing - S7 routing - S0 Rose - S6 Rose - PG/OP communication S Pess - S6 Rose - PG/OP communication S Pess - S6 Rose - S6 Rose - PG/OP communication Yes - S7 routing - S7	-	
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- PG/OP communication Yes - S7 routing Yes - Isochronous mode No - Open IE communication Yes - IRT No - MRP No - MRPD No - PROFINET IO Devices - Number of Configured user data. PROFINET IO Devices Services - PG/OP communication - S7 routing - S6 Services - None - S7 routing - PROFINET IO Devices mode - No - S7 routing - Propendation - Yes - None - S7 routing - Propendation - Yes - None - S7 routing - S7 routing - S6 routing - S7 routing - S6 Routing - S7 routing - S6 Routing - S7		
- S7 routing Yes - Isochronous mode No - Open IE communication Yes - IRT No - MRP No - MRPP No - PROFINET IO Device Services - Open IE communication Yes No - Open IE communication No - Yes No - IRT No No - MRPD No No - PROFINET IO Device - S7 routing No - Prioritized startup Yes - Number of IO devices with prioritized 16 - ST nouting Yes - Number of connectable IO Devices, max. 16 - Number of connectable IO Devices for RT, max of which in line, max. 16 - Activation/deactivation of IO Devices Yes - Number of IO Devices that can be simultaneously activated/deactivated, max 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. PROFINET IO Device - Services - PG/OP communication Yes - S7 routing Yes - Isochronous mode No		Yes
- Isochronous mode - Open IE communication - IRT - MRP - MRP - MRPD - No - PROFlenergy - Prioritized startup - Prioritized startup - Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Number of connectable IO Devices for RT, max of which in line, max of which in line, max of which in line, max Activation/deactivation of IO Devices - Number of IO Devices that can be simultaneously activated/deactivated, max 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. PROFINET IO Device - Services - PG/OP communication - S7 routing - Isochronous mode - No		Yes
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- MRPD - PROFlenergy - Prioritized startup - Prioritized startup - Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Number of connectable IO Devices for RT, max Number of connectable IO Devices for RT, max of which in line, max of which in line, max Activation/deactivation of IO Devices - Number of IO Devices that can be simultaneously activated/deactivated, max 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. PROFINET IO Device - Services - PG/OP communication - S7 routing - Isochronous mode - No		No
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simultaneously activated/deactivated, max. — 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. PROFINET IO Device Services — PG/OP communication — S7 routing — Isochronous mode No	 Activation/deactivation of IO Devices 	Yes
communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data. PROFINET IO Device Services - PG/OP communication - S7 routing - Isochronous mode Yes No		8
Services PG/OP communication Yes S7 routing Yes Isochronous mode No	— Updating time	communication component set for PROFINET IO, on the number
 — PG/OP communication — S7 routing — Isochronous mode Yes No 	PROFINET IO Device	
— S7 routing— Isochronous modeNo	Services	
— Isochronous mode No	— PG/OP communication	Yes
	— S7 routing	Yes
— Open IE communication Yes	— Isochronous mode	No
	 Open IE communication 	Yes

— IRT	No
— MRP	No
— MRPD	No
— PROFlenergy	Yes
— Shared device	Yes
 Number of IO Controllers with shared device, max. 	2

Protocols	
Supports protocol for PROFINET IO	Yes
PROFIBUS	Yes; CM 1243-5 required
AS-Interface	Yes; CM 1243-2 required
Protocols (Ethernet)	
• TCP/IP	Yes
• DHCP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Further protocols	
• MODBUS	Yes

Communication functions		
S7 communication		
• supported	Yes	
• as server	Yes	
• as client	Yes	
 User data per job, max. 	See online help (S7 communication, user data size)	
Open IE communication		
• TCP/IP	Yes	
— Data length, max.	8 kbyte	
 several passive connections per port, supported 	Yes	
• ISO-on-TCP (RFC1006)	Yes	
— Data length, max.	8 kbyte	
• UDP	Yes	
— Data length, max.	1 472 byte	
Web server		
• supported	Yes	
 User-defined websites 	Yes	
Number of connections		

Test commissioning functions Status/control

16; dynamically

overall

Status/control variable	Yes
Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Forcing	osumero.
• Forcing	Yes
Diagnostic buffer	
• present	Yes
Traces	1,00
Number of configurable Traces	2
-	512 kbyte
Memory size per trace, max.	312 kbyte
Interrupts/diagnostics/status information	
Diagnostics indication LED	
RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	Yes
Integrated Functions	
Number of counters	4
Counting frequency (counter) max.	100 kHz
Frequency meter	Yes
controlled positioning	Yes
Number of position-controlled positioning axes, max.	8
Number of positioning axes via pulse-direction interface	4; With integrated outputs
PID controller	Yes
Number of alarm inputs	4
Number of pulse outputs	4
Limit frequency (pulse)	100 kHz
Potential separation	
Potential separation digital inputs	
Potential separation digital inputs	No
between the channels, in groups of	1
Potential separation digital outputs	
Potential separation digital outputs	Yes
between the channels	No
between the channels, in groups of	1
- between the channels, in groups of	
EMC	
Interference immunity against discharge of static electric	·
Interference immunity against discharge of ctatic electricity age, to IEC 61000 4.3.	Yes
static electricity acc. to IEC 61000-4-2	8 kV
— Test voltage at air discharge — Test voltage at contact discharge	6 kV
 Test voltage at contact discharge 	UNV

Interference in a control to the control of the con	
Interference immunity to cable-borne interference	Ver
 Interference immunity on supply lines acc. to IEC 61000-4-4 	Yes
 Interference immunity on signal cables acc. to IEC 61000-4-4 	Yes
Interference immunity against voltage surge	
• on the supply lines acc. to IEC 61000-4-5	Yes
Interference immunity against conducted variable distu	rbance induced by high-frequency fields
 Interference immunity against high-frequency radiation acc. to IEC 61000-4-6 	Yes
Emission of radio interference acc. to EN 55 011	
 Limit class A, for use in industrial areas 	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
Degree and class of protection	
Degree of protection acc. to EN 60529	
● IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	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; 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
 horizontal installation, max. 	60 °C
 vertical installation, min. 	-20 °C
 vertical installation, max. 	50 °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
Storage/transport, min.	660 hPa
Storage/transport, max.	1 080 hPa
permissible operating height	-1000 to 2000 m
Relative humidity	7333 11 2333 11
Operation, max.	95 %; no condensation
Vibrations	
• Vibrations	2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail
Operation, tested according to IEC 60068-2-6	Yes
Shock test	
• 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
Extended ambient conditions	
Pollutant concentrations	
— SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Configuration	
Programming	
Programming language	
— LAD	Yes
— FBD	Yes
— SCL	Yes
Know-how protection	
 User program protection/password protection 	Yes
Copy protection	Yes
Block protection	Yes
Access protection	
Protection level: Write protection	Yes
 Protection level: Read/write protection 	Yes
 Protection level: Complete protection 	Yes
Cycle time monitoring	
• adjustable	Yes
Dimensions	
Width	90 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	370 g
last modified:	05/23/2017