SIEMENS

Data sheet

6ES7212-1AE40-0XB0



SIMATIC S7-1200, CPU 1212C, compact CPU, DC/DC/DC, onboard I/O: 8 DI 24 V DC; 6 DO 24 V DC; 2 AI 0-10 V DC, power supply: DC 20.4-28.8 V DC, program/data memory 100 KB

Figure similar

General information	
Product type designation	CPU 1212C DC/DC/DC
Firmware version	V4.6
Engineering with	
 Programming package 	STEP 7 V18 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 A ² ·s
Output current	
for backplane bus (5 V DC), max.	1 000 mA; Max. 5 V DC for SM and CM
Encoder supply	
24 V encoder supply	
• 24 V	L+ minus 4 V DC min.
Power loss	
Power loss, typ.	9 W
Memory	
Work memory	
integrated	100 kbyte
Load memory	
• integrated	2 Mbyte
 Plug-in (SIMATIC Memory Card), max. 	with SIMATIC memory card
Backup	
• present	Yes
• maintenance-free	Yes
without battery	Yes
CPU processing times	
for bit operations, typ.	0.08 µs; / instruction

for word appretians, type	1.7 vo. / instruction
for word operations, typ.	1.7 μs; / instruction
for floating point arithmetic, typ.	2.3 μs; / instruction
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), max.	14 kbyte
Flag	,
• Size, max.	4 kbyte; Size of bit memory address area
Local data	They to, called the throntony duditions and
per priority class, max.	16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2 to 26: 6 KB
Address area	To hayto, Friend, Glace F (program dysto). To hay, priority stade 2 to 20. o ha
Process image	
	1 khyto
Inputs, adjustable Outputs, adjustable	1 kbyte
Outputs, adjustable	1 kbyte
Hardware configuration	
Number of modules per system, max.	3 comm. modules, 1 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 	6; 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
para	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 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
	- W
Output voltage • for signal "0", max.	0.1 V: with 10 kOhm load
	0.1 V; with 10 kOhm load
• for signal "1", min.	20 V

for signal "1" rated value	
Total Signal Traced 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
Relay outputs	100 111 12
Number of relay outputs	0
	0
Cable length	500
• shielded, max.	500 m
• unshielded, max.	150 m
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
,	100 m, twisted and silicided
Analog outputs	
Number of analog outputs	0
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
 Resolution with overrange (bit including sign), max. 	10 bit
 Integration time, parameterizable 	Yes
 Conversion time (per channel) 	625 µs
Encoder	
Connectable encoders	
2-wire sensor	Yes
1. Interface	
	PROFINET
Interface type	PROFINEI
	V
Isolated	Yes
automatic detection of transmission rate	Yes
automatic detection of transmission rate Autonegotiation	
automatic detection of transmission rate Autonegotiation Autocrossing	Yes
automatic detection of transmission rate Autonegotiation	Yes Yes
automatic detection of transmission rate Autonegotiation Autocrossing	Yes Yes
automatic detection of transmission rate Autonegotiation Autocrossing Interface types	Yes Yes Yes
automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet)	Yes Yes Yes
automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports	Yes Yes Yes Yes 1
automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols	Yes Yes Yes Yes No
automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller	Yes Yes Yes Yes Yes Yes Yes
automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device	Yes Yes Yes Yes Yes Yes Yes Yes Ye
automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication	Yes Yes Yes Yes Yes Yes Yes Yes Ye
automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication	Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes; Optionally also encrypted
automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server	Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes; Optionally also encrypted Yes
automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server • Media redundancy	Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes; Optionally also encrypted
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automatic detection of transmission rate Autonegotiation Autocrossing Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication • Web server • Media redundancy PROFINET IO Controller • Transmission rate, max. Services	Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes No 100 Mbit/s
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Number of 10 Devices that can be airrultaneously activated dearwheet, max. Updating time Updating time	 Activation/deactivation of IO Devices 	Yes
Updating time	 Number of IO Devices that can be simultaneously 	8
component set for PROFINET IO, on the number of IO devices and the quantity of configured user data. PROFIDE Communication - PGIOP communication - Instrument and No - IRT No - PROFIdenerty Ves Shared device Ves Shared device Ves Number of IO Controlers with shared device, max. Protocols Supports protocol for PROFINET IO Yes. PROFIDERS Yes. CM 1243-5 (master) or CM 1242-6 (slave) required OPC UA Yes. CPL UA Server - No STOPP - DATE of Controlers with shared device, max. Protocols (Ethernet) - TCPAP - DATE of Controlers with shared device, max. Protocols (Ethernet) - TCPAP - DATE of Controlers with shared device, max STOPP Ves NO STOPP Ves NO STOPP Ves Controlers Ves STOPP Ves Controlers Ves STOPP No STOPP N		
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- IRT - PROFlenergy Yes - Protocols - Number of IC Controllers with shared device, max. 2 Protocols - Number of IC Controllers with shared device, max. 2 Protocols - Supports protocol for PROFINET IO Yes - No PROFISHS		
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PROFIBUS Yes; CM 1243-5 (master) or CM 1242-5 (slave) required		
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Redundancy mode Media redundancy	• SNMP	Yes
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• \$7 routing Yes Open IE communication • TCP/IP Yes — Data length, max. 8 kbyte • ISO-on-TCP (RFC1006) Yes • Data length, max. 8 kbyte • ISO-on-TCP (RFC1006) Yes — Data length, max. 1472 byte Web server • supported Yes • User-defined websites Yes OPC UA • Runtime license required Yes; "Basic" license required • OPC UA Server Yes; data access (read, write, subscribe), method call, runtime license required • OPC ua Server Application authentication Basic128Rsa15, Basic256Rsa15, Basic256Sha256 — User authentication "anonymous" or by user name & password — Number of sessions, max. 10 — Number of subscriptions per session, max. 5 — Sampling interval, min. 100 ms — Publishing interval, min. 200 ms — Number of server methods, max. 20 — Number of server interfaces, max. 21 — Number of server interfaces, max. 22 — Number of nonitored items, recommended max. 20 — Number of server interfaces, max. 22 — Number of nodes for user-defined server interfaces, max. 22 — Number of nodes for user-defined server interfaces, max. 22 — Number of nodes for user-defined server interfaces, max. 22 — Number of nodes for user-defined server interfaces, max. 22 — Number of nodes for user-defined server interfaces, max. 22 — Number of nodes for user-defined server interfaces, max. 25 • MODBUS Yes communication functions / header	— MRPD	No
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- Data length, max. ■ UDP - Data length, max. 1 472 byte Web server ■ supported ■ User-defined websites OPC UA ■ Runtime license required ■ OPC UA Server - Application authentication - Number of sessions, max. - Number of server interfaces, max. - Number of server methods, max. - Number of server interfaces, max. - Number of nodes for user-defined server interfaces, max. - Number of nodes for user-defined server interfaces, max. - Sumpling interval, min. - Number of server interfaces, max. - Number of nodes for user-defined server interfaces, max. - Number protocols ■ MODBUS Yes communication functions / header	several passive connections per port, supported	Yes
UDP Data length, max. 1 472 byte Web server supported Subscribing websites OPC UA Runtime license required OPC UA Server Application authentication Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 User authentication Number of sessions, max. Number of subscriptions per session, max. Number of subscriptions per session, max. Number of server methods, max. Number of server methods, max. Number of server methods, max. Number of server interfaces, max. Number of nodes for user-defined server interfaces, max. Further protocols MODBUS Yes Yes Yes Yes Yes Yes Yes Ye	• ISO-on-TCP (RFC1006)	Yes
UDP Data length, max. 1 472 byte Web server supported Subscribing websites OPC UA Runtime license required OPC UA Server Application authentication Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 User authentication Number of sessions, max. Number of subscriptions per session, max. Number of subscriptions per session, max. Number of server methods, max. Number of server methods, max. Number of server methods, max. Number of server interfaces, max. Number of nodes for user-defined server interfaces, max. Further protocols MODBUS Yes Yes Yes Yes Yes Yes Yes Ye	— Data length, max.	8 kbyte
— Data length, max. Web server ● supported ● User-defined websites OPC UA ● Runtime license required ● OPC UA Server — Application authentication Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 — User authentication — Number of sessions, max. — Number of subscriptions per session, max. — Sampling interval, min. — Publishing interval, min. — Number of server methods, max. — Number of server methods, max. — Number of server interfaces, max. — Number of nonitored items, recommended max. — Number of server interfaces, max. — Number of nodes for user-defined server interfaces, max. Further protocols ● MODBUS Yes Yes Yes Yes Yes Yes Yes 1 472 byte Yes 1 672 1	-	
## Supported		
Supported User-defined websites Yes OPC UA Runtime license required OPC UA Server Application authentication Number of sessions, max. Number of server methods, max. Number of server interfaces, max. Number of nodes for user-defined server interfaces, max. Number of nodes for user-defined server interfaces, max. Further protocols MODBUS Yes; "Basic" license required Yes; data access (read, write, subscribe), method call, runtime license required Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 10 "anonymous" or by user name & pass		
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Runtime license required OPC UA Server Application authentication Number of subscriptions per session, max. Publishing interval, min. Number of server methods, max. Number of server methods, max. Number of server methods, max. Number of server interfaces, max. Number of server interfaces, max. Number of nodes for user-defined server interfaces, max. Further protocols MODBUS Yes; "Basic" license required 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 Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 10 mannymous" or by user name & password 10 100 ms 200 ms 200 ms 200 ms 200 ms 300 4000 Further protocols MODBUS Yes		
 Runtime license required OPC UA Server — Application authentication — Application authentication — User authentication — Number of sessions, max. — Number of subscriptions per session, max. — Publishing interval, min. — Number of server methods, max. — Number of server methods, max. — Number of server interfaces, max. — Number of nodes for user-defined server interfaces, max. Further protocols ● MODBUS Yes; "Basic" license required Yes; data access (read, write, subscribe), method call, runtime license required Yes; data access (read, write, subscribe), method call, runtime license required Yes; "Basic" license required 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 Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa15		
OPC UA Server		Yes: "Basic" license required
— Application authentication Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 — User authentication — Number of sessions, max. — Number of subscriptions per session, max. — Sampling interval, min. — Publishing interval, min. — Publishing of server methods, max. — Number of server methods, max. — Number of monitored items, recommended max. — Number of server interfaces, max. — Number of nodes for user-defined server interfaces, max. Further protocols ■ MODBUS Yes Communication functions / header	•	
Basic256Sha256 - User authentication "anonymous" or by user name & password - Number of sessions, max. 10 - Number of subscriptions per session, max. 5 - Sampling interval, min. 100 ms - Publishing interval, min. 200 ms - Number of server methods, max. 20 - Number of monitored items, recommended max. 1 000 - Number of server interfaces, max. 2 - Number of nodes for user-defined server interfaces, max. 2 Further protocols • MODBUS Yes communication functions / header		
 Number of sessions, max. Number of subscriptions per session, max. Sampling interval, min. Publishing interval, min. Number of server methods, max. Number of monitored items, recommended max. Number of server interfaces, max. Number of nodes for user-defined server interfaces, max. Further protocols MODBUS Yes Communication functions / header 100 200 300 Yes	— Application authentication	
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— Number of nodes for user-defined server interfaces, max. Further protocols ■ MODBUS Yes communication functions / header		
max. Further protocols • MODBUS communication functions / header		
Further protocols • MODBUS communication functions / header		2 000
MODBUS Yes communication functions / header		
communication functions / header	·	Yes
OT COMMINICATION		
	O/ Oshimumodion	

• supported	Yes
as server	Yes
• as client	Yes
User data per job, max.	See online help (S7 communication, user data size)
Number of connections	
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 / 10 max; Total Connections: 34 reserved / 64 max
Test commissioning functions	
Status/control	
 Status/control variable 	Yes
Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Forcing	
Forcing	Yes
Diagnostic buffer	
present	Yes
Traces	
 Number of configurable Traces 	2
 Memory size per trace, max. 	512 kbyte
Interrupts/diagnostics/status information	
Diagnostics indication LED	
RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	Yes
Integrated Functions	
Frequency measurement	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
EMC	
Interference immunity against discharge of static electricity	
Interference immunity against discharge of static	Yes
electricity acc. to IEC 61000-4-2	
 Test voltage at air discharge 	8 kV
Test voltage at contact discharge	6 kV
Interference immunity to cable-borne interference	
 Interference immunity on supply lines acc. to IEC 61000- 4-4 	Yes
• Interference immunity on signal cables acc. to IEC 61000-	Yes
4-4 Interference immunity against voltage surge	
Interference infinitivadaliist voitage surge	Voo
, , , , , ,	Yes
 Interference immunity on supply lines acc. to IEC 61000- 4-5 	
• Interference immunity on supply lines acc. to IEC 61000-	ced by high-frequency fields
 Interference immunity on supply lines acc. to IEC 61000- 4-5 Interference immunity against conducted variable disturbance inducted variable disturbance inducted	ced by high-frequency fields Yes
Interference immunity on supply lines acc. to IEC 61000-4-5 Interference immunity against conducted variable disturbance induction Interference immunity against high-frequency radiation acc. to IEC 61000-4-6	
Interference immunity on supply lines acc. to IEC 61000-4-5 Interference immunity against conducted variable disturbance induction. Interference immunity against high-frequency radiation acc. to IEC 61000-4-6 Emission of radio interference acc. to EN 55 011	Yes
Interference immunity on supply lines acc. to IEC 61000-4-5 Interference immunity against conducted variable disturbance induction Interference immunity against high-frequency radiation acc. to IEC 61000-4-6	

Degree and class of protection	
IP degree of protection	IP20
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
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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
Altitude during operation relating to sea level	
Installation altitude, min.	-1 000 m
Installation altitude, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Relative humidity	5 500 HI, Nestrictions for installation dilitades 2 500 HI, see mandal
Operation, max.	95 %; no condensation
Vibrations	95 %, no condensation
	2 a (m/a²) wall magnified 4 a (m/a²) DIN wail
 Vibration resistance during operation acc. to IEC 60068- 2-6 Operation, tested according to IEC 60068-2-6 	2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail Yes
Shock testing	160
tested according to IEC 60068-2-27	Vec: IEC 68. Part 2.27 half eine: strangth of the shock 45 c (pack value)
• tested according to IEC 60006-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
Pollutant concentrations	
SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
configuration / header	
configuration / programming / header	
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 of confidential configuration data	Yes
Protection level: Write protection	Yes
·	Yes
Protection level: Read/write protection Protection level: Complete protection	
Protection level: Complete protection	Yes
programming / cycle time monitoring / header	V
adjustable	Yes
Dimensions	

Width	90 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	370 g

last modified: 3/12/2024 🖸