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 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	
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
Fime 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	200 3/110/10/10/20 0
Number of digital inputs	8; Integrated
of which inputs usable for technological functions Source/sink input	6; HSC (High Speed Counting) Yes
Number of simultaneously controllable inputs	165
all mounting positions	
— up to 40 °C, max.	8
Input voltage	0
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)	13 V DC at 2.3 IIIA
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
— рагантетендаріе	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
Output voltage	
• for signal "0", max.	0.1 V; with 10 kOhm load
• for signal "1", min.	20 V
-	

• for signal **I* rated value*		
Count delay with resistive load		0.5 A
• "1" to "1" max.	for signal "0" residual current, max.	0.1 mA
• "I' to "O", max. * Sunctions of gray outputs. • of the pulse outputs, with resistive load, max. * Number of relay outputs • Sheleford, max. • unshelded, max. • unshelded, max. • To "Ordage Number of analog inputs	Output delay with resistive load	
Sententing Requency of the pube outputs, with resistive load, max Relay subtate Number of rotary outputs O Cable length o shaleted, max. So 00 m o shaleted, max. ISD m Analog inputs Puber of analog reputs o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Input ranges (rated values), voltages o to +10 V Yes o shaleted, max. Into fine or the input range (rit including aign), max. o to the input range (rit including aign), max. o to the input range (rit including aign), max. o to the input range (rit including aign), max. o to the input range (rit including aign), max. o to the input range (rit including aign), max. o to the input range (rit including aign), max. o to better the input range (rit including aign), max. o to better the input range (rit including aign), max. o to better the input range (rit including aign), max. o to better the input range (rit including aign), max. o to better the input range (rit including aign), max. o to better the input range (rit including aign), max. o to better the input range (rit including aign), max. o to better the input range (rit including aign), max. o to the input range (rit including aign), max. o to the input range (rit including aign), max. o to the input range (rit including aign), max. o to the input ranges (rit including aign), max. o to the input ranges (rit including aign), max. o to	• "0" to "1", max.	1 µs
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Relay supuls Number of retry outputs Number of retry outputs Number of ranks Number of	Switching frequency	
A lumber of relay outputs	of the pulse outputs, with resistive load, max.	100 kHz
A lumber of relay outputs	Relay outputs	
Cable length • shielded, max. • unshielded, max. • unshielded, max. • unshielded, max. • unshielded, max. Number of analog inputs • Vottage vottage Yes	·	0
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Number of analog inputs Input ranges Yes		130 111
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● Transmission rate, max. Services — PG/OP communication — Isochronous mode — IRT — PROFlenergy — Prioritized startup — Number of IO devices with prioritized startup, max. — Number of connectable IO Devices, max. — Number of connectable IO Devices for RT, max. 100 Mbit/s Yes; encryption with TLS V1.3 pre-selected No No No 16 16	Interface Interface type Isolated 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	PROFINET Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Ye
Services - PG/OP communication - Isochronous mode - IRT - PROFlenergy - Prioritized startup - Number of IO devices with prioritized startup, max Number of connectable IO Devices, max Number of connectable IO Devices for RT, max. 16	Interface Interface type Isolated 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 Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Ye
 — PG/OP communication — Isochronous mode — IRT — PROFlenergy — Prioritized startup — Number of IO devices with prioritized startup, max. — Number of connectable IO Devices, max. — Number of connectable IO Devices for RT, max. 16 	Interface Interface type Isolated 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	PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Ye
 — Isochronous mode — IRT — PROFlenergy — Prioritized startup — Number of IO devices with prioritized startup, max. — Number of connectable IO Devices, max. — Number of connectable IO Devices for RT, max. 16 	Interface Interface type Isolated 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.	PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Ye
 — IRT — PROFlenergy — Prioritized startup — Number of IO devices with prioritized startup, max. — Number of connectable IO Devices, max. — Number of connectable IO Devices for RT, max. 16 	Interface Interface type Isolated 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	PROFINET Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes No Mbit/s
 — PROFlenergy — Prioritized startup — Number of IO devices with prioritized startup, max. — Number of connectable IO Devices, max. — Number of connectable IO Devices for RT, max. 16 	Interface Interface type Isolated 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 — PG/OP communication	PROFINET Yes Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
 — Prioritized startup — Number of IO devices with prioritized startup, max. — Number of connectable IO Devices, max. — Number of connectable IO Devices for RT, max. 16 	Interface Interface type Isolated 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 — PG/OP communication — Isochronous mode	PROFINET Yes Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
 Number of IO devices with prioritized startup, max. Number of connectable IO Devices, max. Number of connectable IO Devices for RT, max. 	Interface Interface type Isolated 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 — PG/OP communication — Isochronous mode — IRT	PROFINET Yes Yes Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
 Number of connectable IO Devices, max. Number of connectable IO Devices for RT, max. 16 	Interface Interface type Isolated 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 — PG/OP communication — Isochronous mode — IRT — PROFIenergy	PROFINET Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes; Optionally also encrypted Yes No 100 Mbit/s Yes; encryption with TLS V1.3 pre-selected No No
— Number of connectable IO Devices for RT, max.	Interface Interface type Isolated 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 — PG/OP communication — Isochronous mode — IRT — PROFIenergy — Prioritized startup	PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Ye
	Interface Interface type Isolated 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 — PG/OP communication — Isochronous mode — IRT — PROFIenergy — Prioritized startup — Number of IO devices with prioritized startup, max.	PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Ye
— of which in line, max.	Interface Interface type Isolated 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 — PG/OP communication — Isochronous mode — IRT — PROFlenergy — Prioritized startup — Number of IO devices with prioritized startup, max. — Number of connectable IO Devices, max.	PROFINET Yes Yes Yes Yes Yes Yes Yes Yes Ye
	Interface type Isolated 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 PG/OP communication Isochronous mode IRT PROFIenergy Prioritized startup Number of IO devices with prioritized startup, max. Number of connectable IO Devices, max.	PROFINET Yes Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye

 Activation/deactivation of IO Devices 	Yes
 Number of IO Devices that can be simultaneously 	8
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; encryption with TLS V1.3 pre-selected
— Isochronous mode	No
— IRT	No
— PROFlenergy	Yes
— Shared device	Yes
	2
Number of IO Controllers with shared device, max. Protocols	2
	Ver
Supports protocol for PROFINET IO	Yes
PROFISATE	No
PROFIBUS	Yes; CM 1243-5 (master) or CM 1242-5 (slave) required
OPC UA	Yes; OPC UA Server
AS-Interface	Yes; CM 1243-2 required
Protocols (Ethernet)	
• TCP/IP	Yes
• DHCP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Redundancy mode	
Media redundancy	
— MRP	No
— MRPD	No
SIMATIC communication	
S7 routing	Yes
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
OPC UA	
Runtime license required	Yes; "Basic" license required
OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required
Application authentication	
— Application authentication	Available security policies: None, 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 methods, max. Number of monitored items, recommended max.	1 000
Number of server interfaces, max.	2
 Number of nodes for user-defined server interfaces, max. 	2 000
Further protocols	
MODBUS	Yes
communication functions / header	
S7 communication	

• 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	O O man first times a line was don't manifest and
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	00.00
• 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	
Operation, max.	95 %; no condensation
Vibrations	oo 70, no condendation
Vibration resistance during operation acc. to IEC 60068-	2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail
2-6	
Operation, tested according to IEC 60068-2-6	Yes
Shock testing	
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
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: 11/7/2023 🖸