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 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 0/110/10/10/20 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 "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
Relay outputs	100 10.12
Number of relay outputs	0
Cable length	
	500 m
• 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
Analog outputs	,
	0
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	
Connectable encoders • 2-wire sensor	Yes
• 2-wire sensor	Yes
• 2-wire sensor 1. Interface	
2-wire sensor 1. Interface Interface type	PROFINET
2-wire sensor 1. Interface Interface type Isolated	PROFINET Yes
2-wire sensor 1. Interface Interface type Isolated automatic detection of transmission rate	PROFINET Yes Yes
2-wire sensor 1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation	PROFINET Yes Yes Yes
2-wire sensor 1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing	PROFINET Yes Yes
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2-wire sensor 1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types RJ 45 (Ethernet)	PROFINET Yes Yes Yes Yes Yes
2-wire sensor 1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types RJ 45 (Ethernet) Number of ports	PROFINET Yes Yes Yes Yes Yes 1
2-wire sensor 1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types R J 45 (Ethernet) Number of ports integrated switch	PROFINET Yes Yes Yes Yes Yes 1
2-wire sensor 1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols	PROFINET Yes Yes Yes Yes Yes No
2-wire sensor 1. 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 Yes Yes Yes Yes 1 No
2-wire sensor 1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types R J 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication	PROFINET Yes Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes
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2-wire sensor 1. 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
2-wire sensor 1. 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 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
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1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types	PROFINET Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types	PROFINET Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types	PROFINET Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye

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activised/disactivated, max. — Updating time PROFINET IO Device Services - PGOP communication - Isochronous mode - No - PROFIEIR IN No - PROFIEIR IN No - PROFIEIR IN No - PROFIEIR IN No - Shared device - Number of IO Controllers with shared device, max. PROFIEIR IN No - PROFINET IO - No - No - PROFIEIR IN No - No - PROFIEIR IN No - PROFIEIR IN No - No - PROFIEIR IN No - No	Activation/deactivation of IO Devices	Yes
### Process of the update time also depends on the communication components after PRPORINET IO, on the number of IO devices and the quantity of configured user date. ### PROCED Communication ### PRO		8
Services	— Updating time	component set for PROFINET IO, on the number of IO devices and the quantity
Services	PROFINITIO D. :	of configured user data.
Isochronous mode IRT PROFilerity Shared device Number of IO Controllers with shared device, max. Protocols Supports protocol of PROFINET IO PROFitsafe PROFITS		V
- PROFilenergy - Shared device - Shared device, max. 2 Protocols Supports protocol for PROFINET IO Yes PROFilade No PROFILAGE Yes, CM 1243-5 (master) or CM 1242-5 (slave) required PROFilade Yes, CM 1243-5 (master) or CM 1242-5 (slave) required PROFilade Yes, CM 1243-5 (master) or CM 1242-5 (slave) required PROFILAGE Yes, CM 1243-12-5 (master) or CM 1242-5 (slave) required PROFILAGE Yes, CM 1243-12-5 (master) or CM 1242-5 (slave) required PROFILAGE Yes, CM 1243-12-5 (master) or CM 1242-5 (slave) required PROFILAGE Yes, CM 1243-12-5 (master) or CM 1242-5 (slave) requi		
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PROFisafe No PROFibus Yes: CM 1243-5 (master) or CM 1242-5 (slave) required OPC UA AS-Interface Protocols (Ethernet) **TCP/IP** **TCP/IP** **DHCP** **DHCP** **DHCP** **DHCP** **DHCP** **DHCP** **DHCP** **DHCP** **SMMP** **DCP** **MRPD** **NO **SMRATIC communication **TCP/IP** **STORING** **STORING** **ON** **STORING** OPEN IE communication **TCP/IP** **Data length, max. **aswaral passive connections per port, supported **ISO-on-TCP (RFC1008) **Oata length, max. **UDP** **Data length, max. **UDP** **Data length, max. **UDP** **Data length, max. **UDP** **Data length, max. **1472 byte **Web server **supported **Supported **Supported **User-defined websites **Yes OPC UA **Runtime license required **OPC UA Server **Application suthentication **Number of server interfaces and security policies: None, Basic 126Rsa 15, Basic 256Rsa 15, Basic 256Rsa 15, Basic 256SRsa 15, B		
PROFIBUS PROFIBUS POPC UA Pes, OPC UA Server AS-Interface Protocols (Ethernet) • TCP/IP • TCP/IP • DHCP • No • SMMP • DCP • LLDP Redundancy mode Media redundancy — MRPP MRPD No SIMATIC communication • S7 routing • S7 routing • S7 routing • Data length, max. — several passive connections per port, supported • ISO-on-TCP (RFC1006) — Data length, max. • UDP — Data length, max. • UDP — Data length, max. • UPP • UPP — Data length, max. • UPP — Data length, max. • UPP • UPP — Data length, max. • UPP • UPP — Data length, max. • UPP • U	Supports protocol for PROFINET IO	Yes
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SNMP DCP LLDP Yes LLDP Redundancy mode Media redundancy — MRP — MRP — No — MRP — No SIMATIC communication • S7 routing Open IE communication • TCP/IP — Data length, max. — several passive connections per port, supported • ISO-on-TCP (RFC1006) — Data length, max. — several passive connections per port, supported • ISO-on-TCP (RFC1006) — Data length, max. • UDP — Data length, max. • UDP — Lata length, max. • UDP — Ves — Data length, max. • UPP — Ves — Data length, max. • Ves OPC UA Runtime license required • OPC UA Server — Application authentication — Number of subscriptions per session, max. — Number of subscriptions per session, max. — Number of server methods, max. — Number of server interfaces, max. — Out the table the table that the table the t	• TCP/IP	Yes
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Redundancy mode Media redundancy - MRP No SIMATIC communication • \$7 routing Open IE communication • TCP/IP Data length, max. - several passive connections per port, supported • ISO-on-TCP (RFC1006) Data length, max. • UDP Data length, max. • UDP Data length, max. • USP Data length, max. • Swported • User-defined websites OPC UA • Number of sever interfaces, max. Number of server methods, max. Number of server interfaces, max. Number of nodes for user-defined server interfaces, max. Number of server interfaces, max. Number of nodes for user-defined server interfaces, max. Number of server interfaces, max. Number of server interfaces, max. Number of nodes for user-defined server interfaces, ma	• SNMP	Yes
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Media redundancy	• LLDP	Yes
	Redundancy mode	
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• \$7 routing Open IE communication • TCP/IP — Data length, max. — several passive connections per port, supported • ISO-on-TCP (RFC1006) — Data length, max. • UDP — Ves • supported • User-defined websites OPCUA • Runtime license required • OPC UA Server — Application authentication — Application authentication — Number of sessions, max. — Number of sessions, max. — Number of subscriptions per session, max. — Publishing interval, min. — Publishing interval, min. — Publishing interval, min. — Number of server methods, max. — Number of server interfaces, max. — Number of server interfaces, max. — Number of nonitored items, recommended max. — Number of nodes for user-defined server interfaces, max. Further protocols • MODBUS • MODBUS Open IE communication Yes Nes **Route in the face is skibyte Yes Yes **Yes **Yes **Yes **Passic" license required Yes; "Basic" license required **Yes; "Basic" license required **Yes **OPC UA **OPC UA **Passic license required **Yes **Jes **Yes **Jes **Jes	SIMATIC communication	
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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 - Number of nodes for user-defined server interfaces, max. 2 - Whither protocols • MODBUS Yes communication functions / header		
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Further protocols • MODBUS communication functions / header		2 000
MODBUS Yes communication functions / header		
communication functions / header	·	Vac
		Tes
S7 communication		
	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	Voc
, , , , , ,	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 dearly and large
• 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 🖸