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, cize of all monthly dual obstation
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 khuto
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 **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 "Ottage 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 both o range range (rated values), voltages o	• "0" to "1", max.	1 µs
e of the pulse outputs, with resistive load, max. Number of refety outputs Number of refety outputs Number of refety outputs Number of refety outputs Number of maked, max. So 00 m So 00	• "1" to "0", max.	5 μs
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
* shielded, max.		
- unshielded, max Number of analog inputs - Votage - Votage - Ves - Input resistance (0 to 10 V) - Zobic length - whelded, max - Votage - whelded, max - Votage - Ves - Votage - Votage - Ves - Votage - Ves - Votage - Ves - Votage - Ves		500 m
Number of analog inputs 2 1 1 1 1 1 1 1 1 1		
Number of analog inputs Input ranges Yes		130 111
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Evoltage Ves		2
Input ranges (rated values), voltages • 0 to +10 V Yes — Input resistance (0 to 10 V) ≥ ±100k ohms Cable length • shielded, max. Analog outputs Number of analog outputs Number of analog outputs Resolution with overrange (bit including sign), max. Integration and conversion time/resolution per channel • Resolution with overrange (bit including sign), max. Integration inter, parameterizable • Conversion time (per channel) • Conversion time (per channel) • Ze-wire sensor • Ze-wire sensor • Ze-wire sensor • Ze-wire sensor • Yes Interface type Interface type Interface type Isolated • Yes Autocrossing • Yes Autocrossing • Yes Interface types • RI 45 (Ethernet) • Number of ports • Number of ports • PROFINET IC Controller • PROFINET IC Communication • PROFINET IC Communication • Yes • SIMATIC communication • Yes • Media redundancy • No • PROFINET IC Controller • Transmission rate, max. Services - PGICP communication • Yes: encryption with TLS V1.3 pre-selected • IRT • No • PROFinergy • Proficited startup • Proficited startup • Profice on the profit of the profit in the profit i		V
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- Input resistance (0 to 10 V) Cable length		.,
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• Integration time, parameterizable	Integration and conversion time/resolution per channel	
• Integration time, parameterizable	 Resolution with overrange (bit including sign), max. 	10 bit
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### 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.
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- 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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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 Popal leangth, max. — several passive connections per port, supported • ISO-on-TCP (RFC1006) — Data length, max. • UDP — Data length, max. • UDP — Data length, max. • UDP — Data length, max. • Web server • supported • No Supported • No Ves OPC UA • Runtime license required • OPC UA Server — Application authentication — Number of sessions, max. — Number of sessions, max. — Number of sessions, max. — Number of server interfaces, max. — Number of server interfaces, max. — Number of notes for user-defined server interfaces, max. — Number of notes for user-defined server interfaces, max. — Number of notes for user-defined server interfaces, max. — Number of notes for user-defined server interfaces, max. — Number of user-defined server interfaces, max. — Number of once for user-defined server interfaces, max. — Number of notes for user-defined server interfaces, max. — Number of once for user-defined server interfaces, max. — Number of once for user-defined server interfaces, max. — Number of once for user-defined server interfaces, max. — Number of once for user-defined server interfaces, max. — Number of once for user-defined server interfaces, max. — Number of once for user-defined server interfaces, max. — Number of once for user-defined server interfaces, max. — Number of once for user-defined server interfaces, max. — Number of once for user-defined server interfaces, max. — Number of once for user-defined server interfaces, max. — Number of once for user-defined server interfaces, max. — Number of once for user-defined server interfaces, max. — Number of once for user-defined server interfaces, max. — Number of serv	Supports protocol for PROFINET IO	Yes
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Ves 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. Publishing of server methods, 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 Sampling interval, min. 200 ms		Vee
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		
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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
	Yes
FM approval	
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. Storage/transport, may	660 hPa
Storage/transport, max. Altitude during people in relating to one level.	1 080 hPa
Altitude during operation relating to sea level	4 000
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	
Vibration resistance during operation acc. to IEC 60068- 2-6	2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail
Operation, tested according to IEC 60068-2-6 Observations	Yes
Shock testing	V 150 00 B 10 071 K
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	000 .05
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
Protection level: Read/write protection	Yes
·	
Protection level: Complete protection programming / cycle time monitoring / boader.	Yes
programming / cycle time monitoring / header	Voc
adjustable	Yes
Dimensions	

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

last modified: 3/12/2024 🖸