SIEMENS

Data sheet

6ES7212-1HE40-0XB0





SIMATIC S7-1200, CPU 1212C, compact CPU, DC/DC/relay, onboard I/O: 8 DI 24 V DC; 6 DO relay 2 A; 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/relay
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
l²t	0.8 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

GRU processing times for bit operations, typ. for bit operations, typ. for bit operations, typ. for footing point arithmetic, typ. Cyb-blocks Number of blocks (total) Bis, FCs, RBs, counters and timers. The maximum number of addressable blocks (angles from 1 to 6555. There is no restriction, the entire working minory can be used. Streement of blocks (total) Bis, FCs, RBs, counters and timers. The maximum number of addressable blocks (angles from 1 to 6555. There is no restriction, the entire working minory can be used. Streement of the restriction of the counters	without battery	Yes
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for standard inputs — parameterizable — at "0" to "1", min. — at "0" to "1", max. for interrupt inputs — parameterizable parameterizable for technological functions — parameterizable shielded, max. unshielded, max. unshielded, max. pushielded, max. pushielded, max. pushielded, max. for my for technological functions for technological functions — parameterizable Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz KHz Cable length shielded, max. for my for technological functions unshielded, max. for my for technological functions with resistive load, max. with resistive load, max. on lamp load, max. Output delay with resistive load	• for signal "1"	15 V DC at 2.5 mA
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— 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. • unshielded, max. 100 m; 50 m for technological functions 100 m; for technological functions: No 101 Number of digital outputs Number of digital outputs Switching capacity of the outputs • with resistive load, max. 100 on lamp load, max. 2 A 100 on lamp load, max. 2 A 3 0 W with DC, 200 W with AC		12.8 ms
for technological functions — parameterizable Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz kHz Cable length • shielded, max. • unshielded, max. 500 m; 50 m for technological functions • unshielded, max. 300 m; for technological functions: No Digital outputs Number of digital outputs 6; Relays Switching capacity of the outputs • with resistive load, max. • on lamp load, max. 30 W with DC, 200 W with AC Output delay with resistive load	·	
— parameterizable Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz Cable length shielded, max. unshielded, max. ounshielded, max. Digital outputs Number of digital outputs Switching capacity of the outputs with resistive load, max. on lamp load, max. Output delay with resistive load Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 4 @ 30 kHz & 4 @	·	Yes
Cable length • shielded, max. • unshielded, max. • unshielded, max. Soo m; 50 m for technological functions 300 m; for technological functions: No Digital outputs Number of digital outputs Switching capacity of the outputs • with resistive load, max. • on lamp load, max. Output delay with resistive load	·	
 shielded, max. unshielded, max. unshielded, max. 300 m; 50 m for technological functions: No Digital outputs Relays Switching capacity of the outputs with resistive load, max. on lamp load, max. Output delay with resistive load 500 m; 50 m for technological functions: No 6; Relays 2 A 30 W with DC, 200 W with AC Output delay with resistive load		Single phase: 3 @ 100 kHz & 3 @ 30 kHz, differential: 3 @ 80 kHz & 3 @ 30 kHz
 unshielded, max. Digital outputs Number of digital outputs Switching capacity of the outputs with resistive load, max. on lamp load, max. Output delay with resistive load 300 m; for technological functions: No Relays Relays Q A 30 W with DC, 200 W with AC 		
Digital outputs Number of digital outputs Switching capacity of the outputs with resistive load, max. on lamp load, max. Output delay with resistive load Signal outputs 6; Relays 2 A 30 W with DC, 200 W with AC		The state of the s
Number of digital outputs Switching capacity of the outputs with resistive load, max. on lamp load, max. Output delay with resistive load		300 m; for technological functions: No
Switching capacity of the outputs • with resistive load, max. • on lamp load, max. Output delay with resistive load 2 A 30 W with DC, 200 W with AC		
 with resistive load, max. on lamp load, max. Output delay with resistive load 2 A 30 W with DC, 200 W with AC	Number of digital outputs	6; Relays
on lamp load, max. 30 W with DC, 200 W with AC Output delay with resistive load	Switching capacity of the outputs	
Output delay with resistive load	with resistive load, max.	2 A
	on lamp load, max.	30 W with DC, 200 W with AC
- 101 to 141 many	Output delay with resistive load	
• U to 1', max.	• "0" to "1", max.	10 ms; max.
• "1" to "0", max. 10 ms; max.	• "1" to "0", max.	10 ms; max.

Relay outputs • Number of relay outputs	
	6
 Number of operating cycles, max. 	mechanically 10 million, at rated load voltage 100 000
Cable length	
shielded, max.	500 m
• unshielded, max.	150 m
nalog 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
nalog outputs	
Number of analog outputs	0
nalog 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
ncoder	
Connectable encoders	
2-wire sensor	Yes
Interface	
Interface type	PROFINET
Isolated	Yes
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
• RJ 45 (Ethernet)	Yes
 Number of ports 	1
integrated switch	No
Protocols	
PROFINET IO Controller	Yes
PROFINET IO Device	Yes
SIMATIC communication	Yes
Open IE communication	Yes; Optionally also encrypted
Web server	Yes
Media redundancy	No
PROFINET IO Controller	
Transmission rate, max.	100 Mbit/s
Services	
— PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
— Isochronous mode	No
— IRT	No
— PROFlenergy	No Was
— Prioritized startup	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
— of which in line, max.	16 V
Activation/deactivation of IO Devices	Yes
 Number of IO Devices that can be simultaneously activated/deactivated, max. 	8
 Updating time 	The minimum value of the update time also depends on the communication

0 1	
Services	V 710 VI
— PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
— Isochronous mode	No
— IRT	No
— PROFlenergy	Yes
 Shared device 	Yes
 Number of IO Controllers with shared device, max. 	2
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIsafe	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
	res, Givi 1245-2 required
Protocols (Ethernet)	V
• 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
• 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 	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
	1 000
Number of monitored items, recommended max.	
Number of server interfaces, max.	2
 Number of nodes for user-defined server interfaces, max. 	2 000
Further protocols	
MODBUS	Yes
	100
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	
Counter	
 Number of counters 	6
Counting frequency, max.	100 kHz
Frequency measurement	Yes
controlled positioning	Yes
Number of position-controlled positioning axes, max.	8
Number of positioning axes via pulse-direction interface	Up to 4 with SB 1222
PID controller	Yes
Number of alarm inputs	4
Potential separation	
Potential separation digital inputs	
 Potential separation digital inputs 	500 V AC for 1 minute
between the channels, in groups of	1
Potential separation digital outputs	
Potential separation digital outputs	Relays
between the channels	No
between the channels, in groups of	2
EMC	
Interference immunity against discharge of static electricity	
 Interference immunity against discharge of static electricity acc. to IEC 61000-4-2 	Yes
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-	Yes
4-4	
 Interference immunity on signal cables acc. to IEC 61000- 	Yes
4-4	
Interference immunity against voltage surge	Vac
 Interference immunity on supply lines acc. to IEC 61000- 4-5 	Yes
Interference immunity against conducted variable disturbance indu	ced 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	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes

FM approval	Yes
RCM (formerly C-TICK)	Yes
	Yes
KC approval	Yes
Marine approval	res
Ecological footprint	Voc
environmental product declaration	Yes
Global warming potential	76.4 kg
— global warming potential, (total) [CO2 eq]	76.4 kg
 global warming potential, (during production) [CO2 eq] 	13.8 kg
global warming potential, (during operation) [CO2	63.4 kg
eq]	
— global warming potential, (after end of life cycle)	-0.885 kg
[CO2 eq] Ambient conditions	
Free fall	
	0.2 m; five times, in product package
Fall height, max. Ambient temperature during energtion.	0.3 m; five times, in product package
Ambient temperature during operation • min.	-20 °C
	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent
• max.	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	
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 60069 2.6	Voc
Operation, tested according to IEC 60068-2-6 Shock testing	Yes
Shock testing a tested according to IEC 60068 2 27	Vec: IEC 68 Part 2 27 half sings strangth of the check 45 a (neak value)
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
Protection level: Write protection Protection level: Read/write protection	Yes
Protection level: Read/write protection Protection level: Complete protection	Yes
+ i Totoction icvoi. Complete protection	160

programming / cycle time monitoring / header	
 adjustable 	Yes
Dimensions	
Width	90 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	385 g

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