SIEMENS

Datasheet

6ES7212-1HE40-0XB0



SIMATIC S7-1200, CPU 1212C, COMPACT CPU, DC/DC/RLY, ONBOARD I/O: 8 DI 24V DC; 6 DO RELAY 2A; 2 AI 0 - 10V DC, POWER SUPPLY: DC 20.4 - 28.8 V DC, PROGRAM/DATA MEMORY: 50 KB

Display	
with display	No
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
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; Typical
Inrush current, max.	12 A; at 28.8 V
Encoder supply	
24 V encoder supply	
• 24 V	Permissible range: 20.4V to 28.8V
Output current	
Current output to backplane bus (DC 5 V), max.	1 000 mA; Max. 5 V DC for SM and CM
Power losses	
Power loss, typ.	9 W
Memory	
Type of memory	EEPROM

Vork memory Integrated expandable Load memory Integrated Pluy-in (SIMATIC Memory Card), max. Backup present eyes; maintenance-free without battery CPU processing times for bit operations, typ. for word operations, typ. for forbating point arithmetic, typ. CPU-blocks Number of blocks (total) Number, max. Limited only by RAM for code Inputs Outputs Output		··
Integrated expandable No Load memory Integrated Plug-in (SIMATIC Memory Card), max. Present exit without battery Present For bit operations, typ. For word operations, typ. For word operations, typ. Deblocks Number of blocks (total) Back (total) Number of blocks (total) Back	Usable memory for user data	75 kbyte
expandable Load memory Integrated Integrated Plug-in (SIMATIC Memory Card), max. Backup Present Ves: maintenance-free Ves Processing times for bit operations, typ. 1.7 µs; / Operation CPU-blocks Number of blocks (total) DBs, FCs, FBs, counters and timers. The maximum number of addressable blocks ranges from 1 to 6535. 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 in total (incl. times, counters, flags), max. Flag Number, max. 4 kbyte; Size of bit memory address area I/O putus, adjustable 1 kbyte 1 tbyte Hardware configuration Number of modules per system, max. 3 comm. modules, 1 signal board, 2 signal modules Firme of day Clock Hardware clock (real-time clock) Peeviation per day, max. # 60 s/month at 25 °C Hardware clock (real-time clock) Peeviation per day, max. # 8 ackup time Process image Process image Hardware clock (real-time clock) Peeviation per day, max. # 60 s/month at 25 °C Hardware clock (real-time clock) Peeviation per day, max. # 60 s/month at 25 °C Hardware clock (real-time clock) Peeviation per day, max. # 60 s/month at 25 °C Hardware clock (real-time clock) Peeviation per day, max. # 60 s/month at 25 °C Hardware clock (real-time clock) Peeviation per day, max. # 60 s/month at 25 °C Hardware clock (real-time clock) Peeviation per day, max. # 60 s/month at 25 °C Hardware clock (real-time clock) Peeviation per day, max. # 60 s/month at 25 °C Hardware clock (real-time clock) Peeviation per day, max. # 60 s/month at 25 °C Hardware clock (real-time clock) Peeviation per day, max. # 60 s/month at 25 °C Hardware clock (real-time clock) Peeviation per day, max.		
Load memory Integrated Plug-in (SIMATIC Memory Card), max. Present P	Integrated	
Integrated Plug-in (SIMATIC Memory Card), max. Backup	expandable	No
Plug-in (SIMATIC Memory Card), max. 2 Gbyte; with SIMATIC memory card Present Present Present Pres; maintenance-free Pres ONUMBER OF bit operations, typ. ONUMBER OF locks (total) Polytholocks Number of blocks (total) Polytholocks Number, max. 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 Bata areas and their retentivity Pretentive data area in total (incl. times, counters, flags), max. Flag Number, max. 4 kbyte: Size of bit memory address area Address area Pouputs Outputs Outputs Process image Inputs, adjustable Outputs, adjust	Load memory	
Backup • present • without battery Pess maintenance-free Yes CPU processing times for bit operations, typ.	Integrated	1 Mbyte
Present Pyes Pyes Yes; maintenance-free Yes CPU processing times for bit operations, typ. for word operations, typ. for floating point arithmetic, typ. DBs, FCs, FBs, counters and timers. The maximum number of addressable blocks (total) BBs, 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 in total (incl. times, counters, flags), max. Flag Number, max. 4 kbyte; Size of bit memory address area I/O address area	 Plug-in (SIMATIC Memory Card), max. 	2 Gbyte; with SIMATIC memory card
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Number of modules per system, max. 3 comm. modules, 1 signal board, 2 signal modules Time of day Clock Hardware clock (real-time clock) Deviation per day, max. Backup time 3 comm. modules, 1 signal board, 2 signal modules Yes +/- 60 s/month at 25 °C 480 h; Typical	Outputs, adjustable	1 kbyte
Clock • Hardware clock (real-time clock) • Deviation per day, max. • Backup time Yes +/- 60 s/month at 25 °C 480 h; Typical	Hardware configuration	
Clock • Hardware clock (real-time clock) • Deviation per day, max. • Backup time Yes +/- 60 s/month at 25 °C 480 h; Typical	Number of modules per system, max.	3 comm. modules, 1 signal board, 2 signal modules
 Hardware clock (real-time clock) Deviation per day, max. Backup time Yes +/- 60 s/month at 25 °C 480 h; Typical 	Time of day	
 Deviation per day, max. Backup time +/- 60 s/month at 25 °C 480 h; Typical 		
Backup time 480 h; Typical	 Hardware clock (real-time clock) 	Yes
	 Deviation per day, max. 	+/- 60 s/month at 25 °C
Digital inputs	Backup time	480 h; Typical
	Digital inputs	

Number of digital inputs	8; Integrated
of which, inputs usable for technological	6; HSC (High Speed Counting)
functions	
integrated channels (DI)	8
m/p-reading	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 VDC at 2.5 mA
Input current	
● for signal "1", typ.	1 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— Parameterizable	0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1
	/ 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms
— at "0" to "1", min.	0.1 μs
— at "0" to "1", max.	20 ms
for interrupt inputs	
— Parameterizable	Yes
for counter/technological functions	
— Parameterizable	Single phase: 3 @ 100 kHz & 1 @ 30 kHz, differential: 3 @ 80 kHz & 1 @ 30 kHz
Cable length	
Cable length, shielded, max.	500 m; 50 m for technological functions
 Cable length unshielded, max. 	300 m; For technological functions: No
Digital outputs	
Number of digital outputs	6; Relays
integrated channels (DO)	6
short-circuit protection	No; to be provided externally
Switching capacity of the outputs	
with resistive load, max.	2 A
• on lamp load, max.	30 W with DC, 200 W with AC
Output delay with resistive load	
• "0" to "1", max.	10 ms; max.
• "1" to "0", max.	10 ms; max.
Switching frequency	
• of the pulse outputs, with resistive load, max.	1 Hz
Relay outputs	
Max. number of relay outputs, integrated	6

Number of relay outputs	6
	mechanically 10 million, at rated load voltage 100,000
Number of operating cycles, max. Cable length	mechanically 10 million, at rated load voltage 100,000
Cable length	500 m
Cable length, shielded, max.	
Cable length unshielded, max.	150 m
Analog inputs	
Number of analog inputs	2
Integrated channels (AI)	2; 0 to 10 V
Input ranges	
Voltage	Yes
Input ranges (rated values), voltages	
• 0 to +10 V	Yes
Input resistance (0 to 10 V)	≥100k ohms
Cable length	
Cable length, shielded, max.	100 m; twisted and shielded
Analog outputs	
Number of analog outputs	0
Analog value creation	
Integration and conversion time/resolution per channel	
 Resolution with overrange (bit including sign), 	10 bit
max.	
 Integration time, parameterizable 	Yes
 Conversion time (per channel) 	625 µs
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
1. Interface	
Interface type	PROFINET
Physics	Ethernet
Isolated	Yes
Automatic detection of transmission speed	Yes
Autonegotiation	Yes
Autocrossing	Yes
Functionality	
PROFINET IO Device	Yes
 PROFINET IO Controller 	Yes
PROFINET IO Controller	
Prioritized startup supported	
— Number of IO Devices, max.	16
Communication functions	

S7 communication	
• supported	Yes
• as server	Yes
As client	Yes
Open IE communication	
• TCP/IP	Yes
• ISO-on-TCP (RFC1006)	Yes
• UDP	Yes
Web server	
• supported	Yes
User-defined websites	Yes
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; Up to 512 KB of data per trace are possible
Integrated Functions	
Number of counters	6
Counter frequency (counter) max.	100 kHz
Frequency meter	Yes
controlled positioning	Yes
PID controller	Yes
Number of alarm inputs	4
Galvanic isolation	
Galvanic isolation digital inputs	
 Galvanic isolation digital inputs 	500V AC for 1 minute
• between the channels, in groups of	1
Galvanic isolation digital outputs	
 Galvanic isolation digital outputs 	Relays
• between the channels	No
Permissible potential difference	
between different circuits	500 V DC between 24 V DC and 5 V DC
EMC	
Interference immunity against discharge of static e	

 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 61000-4-4 	Yes
 Interference immunity on signal lines acc. to IEC 61000-4-4 	Yes
Surge immunity	
• on the supply lines acc. to IEC 61000-4-5	Yes
Immunity against conducted interference induced by high	h-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	
Degree of protection to EN 60529	
• IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
FM approval	Yes
Marine approval	
Marine approval	Yes
Ambient conditions	
Free fall	
Free fall • Drop height, max. (in packaging)	0.3 m; five times, in dispatch package
Free fall • Drop height, max. (in packaging) Ambient temperature in operation	
Free fall Drop height, max. (in packaging) Ambient temperature in operation during operating phase, minimum	-20 °C
Free fall	-20 °C 60 °C
Free fall Drop height, max. (in packaging) Ambient temperature in operation during operating phase, minimum max. horizontal installation, min.	-20 °C 60 °C -20 °C
Free fall Drop height, max. (in packaging) Ambient temperature in operation during operating phase, minimum max. horizontal installation, min. horizontal installation, max.	-20 °C 60 °C -20 °C 60 °C
Free fall Drop height, max. (in packaging) Ambient temperature in operation during operating phase, minimum max. horizontal installation, min. horizontal installation, max. vertical installation, min.	-20 °C 60 °C -20 °C 60 °C -20 °C
Free fall Drop height, max. (in packaging) Ambient temperature in operation during operating phase, minimum max. horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max.	-20 °C 60 °C -20 °C 60 °C
Free fall Drop height, max. (in packaging) Ambient temperature in operation during operating phase, minimum max. horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. Storage/transport temperature	-20 °C 60 °C -20 °C 60 °C -20 °C 50 °C
Free fall Drop height, max. (in packaging) Ambient temperature in operation during operating phase, minimum max. horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max.	-20 °C 60 °C -20 °C 60 °C -20 °C

Air proceuro	
Air pressure	705 hD-
Operation, min.	795 hPa
 Operation, max. 	1 080 hPa
 Storage/transport, min. 	660 hPa
 Storage/transport, max. 	1 080 hPa
 Permissible operating height 	-1000 to 2000 m
Relative humidity	
Operation, max.	95 %; no condensation
 Permissible range (without condensation) at 25 	95 %
°C	
Vibrations	
Vibrations	2G wall mounting, 1G DIN rail
 Operation, checked according to IEC 60068-2- 	Yes
6	
Shock test	
checked 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
programming	
Programming language	
— LAD	Yes
— FBD	Yes
— SCL	Yes
Cycle time monitoring	
• can be set	Yes
Dimensions	
Width	90 mm
Height	100 mm
Depth	75 mm
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Weights	
Weight, approx.	385 g
last modified:	05.02.2015