6ES7212-1HF40-0XB0

CPU 1212FC, DC/DC/Relay, 8DI/6DO/2AI

Technical data

SIMATIC S7-1200, CPU 1212FC, 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 20.4-28.8V DC, Program/data memory 100 KB

General information	
Product type designation	CPU 1212FC DC/DC/relay
Firmware version	V4.2
Engineering with	
● Programming package	STEP 7 V14 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
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 DC
I²t	0.5 A²·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	Permissible range: 20.4V to 28.8V
Power loss	
Power loss, typ.	9 W
Memory	
Work memory	
● integrated	100 kbyte
● expandable	No
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.	2.5 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.	10 kbyte
Flag	
● Number, 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	
I/O address area	
● Inputs	1 024 byte

● Outputs	1 024 byte
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
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 current	
● for signal "1", typ.	1 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 groups of four
— at "0" to "1", min.	0.2 ms
— at "0" to "1", max.	12.8 ms
for interrupt inputs	
— parameterizable	Yes
Digital outputs	
Number of digital outputs	6
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	
● Number of relay outputs	6
Cable length	
● 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	
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	
● 2-wire sensor	Yes
1. Interface	
Isolated	Yes
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
● RJ 45 (Ethernet)	Yes
● Number of ports	1
● integrated switch	Yes
Protocols	
● PROFINET IO Controller	Yes

● PROFINET IO Device	Yes
● SIMATIC communication	Yes
● Open IE communication	Yes
● Web server	Yes

PROFINET IO Controller

● Transmission rate, max.	100 Mbit/s

Services

— PG/OP communication	Yes
— Isochronous mode	No
— IRT	No
— PROFIenergy	No
— 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
— 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 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
— Isochronous mode	No
— IRT	No
— PROFIenergy	Yes
— Shared device	Yes
— Number of IO Controllers with shared device, max.	2

Protocols

Supports protocol for PROFINET IO	Yes
PROFIBUS	Yes; CM 1243-5 (master) or CM 1242-5 (slave) required
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
● 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

Further protocols

● MODBUS	Yes

Communication functions

S7 communication

● supported	Yes
● as server	Yes
● as client	Yes
● User data per job, max.	See online help (S7 communication, user data size)

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

Integrated Functions

Number of counters	4
Counting frequency (counter) 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 pulse outputs	4

Potential separation

Potential separation digital inputs
● Potential separation digital inputs	500V 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	1

Permissible potential difference
between different circuits	500 V DC between 24 V DC and 5 V DC

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 61000-4-4	Yes
● Interference immunity on signal cables acc. to IEC 61000-4-4	Yes

Interference immunity against voltage surge
● Interference immunity on supply lines acc. to IEC 61000-4-5	Yes

Interference immunity against conducted variable disturbance induced 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

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

Highest safety class achievable in safety mode
● Performance level according to ISO 13849-1	PLe
● SIL acc. to IEC 61508	SIL 3

Ambient conditions

Free fall
● Fall height, max.	0.3 m; five times, in product package

Ambient temperature during operation
● min.	0 °C
● max.	55 °C
● horizontal installation, min.	0 °C
● horizontal installation, max.	55 °C
● vertical installation, min.	0 °C
● vertical installation, max.	45 °C

Ambient temperature during storage/transportation
● min.	-40 °C
● max.	70 °C

Air pressure acc. to IEC 60068-2-13
● Storage/transport, min.	660 hPa
● Storage/transport, max.	1 139 hPa

Altitude during operation relating to sea level
● Installation altitude, min.	-1 000 m
● Installation altitude, max.	2 000 m

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	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

Programming

Programming language
— LAD	Yes; incl. failsafe

— FBD	Yes; incl. failsafe
— SCL	Yes
Know-how protection	
● User program protection/password protection	Yes
● Copy protection	Yes
● Block protection	Yes
Cycle time monitoring	
● adjustable	Yes
Dimensions	
Width	90 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	385 g
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