SIEMENS

Data sheet

6ES7212-1BE40-0XB0



SIMATIC S7-1200, CPU 1212C, compact CPU, AC/DC/relay, onboard I/O: 8 DI 24 V DC; 6 DO relay 2 A; 2 AI 0-10 V DC, Power supply: AC 85-264 V AC at 47-63 Hz, Program/data memory 75 KB

General information	
Product type designation	CPU 1212C AC/DC/relay
Firmware version	V4.5
Engineering with	
 Programming package 	STEP 7 V17 or higher
Supply voltage	
Rated value (AC)	
• 120 V AC	Yes
• 230 V AC	Yes
permissible range, lower limit (AC)	85 V
permissible range, upper limit (AC)	264 V
Line frequency	
 permissible range, lower limit 	47 Hz
 permissible range, upper limit 	63 Hz
Input current	
Current consumption (rated value)	80 mA at 120 V AC; 40 mA at 240 V AC
Current consumption, max.	240 mA at 120 V AC; 120 mA at 240 V AC
Inrush current, max.	20 A; at 264 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	20.4 to 28.8V
Power loss	
Power loss, typ.	11 W
Memory	
Work memory	
• integrated	75 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.	2.3 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
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 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	0. 1 1 0.0 400 11. 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
— 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; Relays
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.
	10 ms; max. 10 ms; max.

Nicoshan of valous autouts	
Number of relay outputs	6
Number of operating cycles, max. Only largette.	mechanically 10 million, at rated load voltage 100 000
Cable length	F00
• shielded, max.	500 m
• unshielded, max.	150 m
Analog inputs	
Number of analog inputs	2
Input ranges	v.
• Voltage	Yes
Input ranges (rated values), voltages	V
• 0 to +10 V	Yes
— Input resistance (0 to 10 V)	≥100k ohms
Cable length • shielded, max.	100 m; twisted and shielded
·	100 III, twisted and shielded
Analog outputs	
Number of analog outputs	0
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	40 1:4
 Resolution with overrange (bit including sign), max. 	10 bit
Integration time, parameterizable	Yes
Conversion time (per channel)	625 µs
Encoder	
Connectable encoders	Voc
• 2-wire sensor	Yes
1. Interface	
Interface type	PROFINET
Isolated	Yes
automatic detection of transmission rate	Yes
Autoregotiation	Yes
Autocrossing	Yes
Interface types • RJ 45 (Ethernet)	Yes
Number of ports	1
integrated switch	No
Protocols	140
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
— Prioritized startup	Yes
 Number of IO devices with prioritized startup, 	16
max.	
Number of connectable IO Devices, max.	16
 Number of connectable IO Devices for RT, 	16
max. — of which in line, max.	16
Or which in line, max. Activation/deactivation of IO Devices	Yes
— Activation/deactivation of IO Devices — Number of IO Devices that can be	8
simultaneously activated/deactivated, max.	
— 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; encryption with TLS V1.3 pre-selected
Isochronous mode	No
— ISOCITIONOUS MODE — IRT	No
— PROFlenergy	Yes
Shared device	Yes
Number of IO Controllers with shared device,	2
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
Protocols (Ethernet)	103, ON 1240-2 required
• TCP/IP	Yes
• DHCP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Redundancy mode	1 03
-	
Media redundancy — MRP	No
— MRPD	
— MRPD SIMATIC communication	No
	Ves
S7 routing Open IE communication	Yes
·	V
TCP/IP Pate largette reserve	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	N.
• 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. 	50
— Sampling interval, min.	100 ms
— Publishing interval, min.	200 ms
Number of server methods, max.	20
 Number of monitored items, max. 	1 000
 Number of server interfaces, max. 	2
 Number of nodes for user-defined server interfaces, max. 	2 000
Further protocols	
• MODBUS	Yes
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)
- oos data per job, max.	555 S.IIII TIOP (57 COMMUNICATION , GOOT GALA 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 	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 	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 61000-4-4 	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 disturbanc	
Interference immunity against high-frequency radiation acc. to IEC 61000-4-6	Yes
Emission of radio interference acc. to EN 55 011	V 0
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
KC approval	Yes
Marine approval	Yes
	res
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.	660 hPa
Storage/transport, max.	1 080 hPa
Altitude during operation relating to sea level	1 000 HF a
Installation altitude, min.	-1 000 m
Installation altitude, max. Polative hypridity	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Relative humidity	OF 0/ , no condensation
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 / header	
configuration / programming / header	
Programming language	
— LAD	Yes
— FBD	Yes
— SCL	Yes
Know-how protection	100
User program protection/password protection	Yes
Copy protection	Yes
	Yes
Block protection Access protection	1 53
Access protection	Voc
protection of confidential configuration data	Yes
Protection level: Write protection	Yes
Protection level: Read/write protection	Yes
Protection level: Complete protection	Yes
programming / cycle time monitoring / header	
adjustable	Yes

Dimensions	
Width	90 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	425 g

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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 20.4-28.8V DC, Program/data memory 75 KB

General information	
Product type designation	CPU 1212C DC/DC/DC
Firmware version	V4.5
Engineering with	
 Programming package 	STEP 7 V17 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	75 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.	2.3 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
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	100
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)	10 Y DO U. Z.O HIM
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
parameterizable	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
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
Output current	
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	
Number of relay outputs	0
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	40 kit
Resolution with overrange (bit including sign), max.	10 bit
Integration time, parameterizable	Yes
Conversion time (per channel)	625 µs
Encoder	
Connectable encoders	
	Yes
Connectable encoders	Yes
Connectable encoders • 2-wire sensor	Yes PROFINET
Connectable encoders • 2-wire sensor 1. Interface	
Connectable encoders • 2-wire sensor 1. Interface Interface type	PROFINET
Connectable encoders • 2-wire sensor 1. Interface Interface type Isolated	PROFINET Yes
Connectable encoders • 2-wire sensor 1. Interface Interface type Isolated automatic detection of transmission rate	PROFINET Yes Yes
Connectable encoders • 2-wire sensor 1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation	PROFINET Yes Yes Yes
Connectable encoders • 2-wire sensor 1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing	PROFINET Yes Yes Yes
Connectable encoders • 2-wire sensor 1. Interface Interface type Isolated automatic detection of transmission rate Autonegotiation Autocrossing Interface types	PROFINET Yes Yes Yes Yes
Connectable encoders • 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
Connectable encoders • 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
Connectable encoders • 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	PROFINET Yes Yes Yes Yes Yes 1
Connectable encoders • 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 Your Market
Connectable encoders • 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 Yes Yes Yes Yes 1 No
Connectable encoders • 2-wire sensor 1. Interface 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	PROFINET Yes Yes Yes Yes Yes Yes Yes Yes 1 No Yes Yes
Connectable encoders • 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	PROFINET Yes Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes
Connectable encoders • 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	PROFINET Yes Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Connectable encoders • 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 Yes Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Connectable encoders • 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	PROFINET Yes Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Connectable encoders • 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.	PROFINET Yes Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Connectable encoders • 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	PROFINET Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Connectable encoders • 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	PROFINET Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
Connectable encoders • 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
Connectable encoders • 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	PROFINET Yes Yes Yes Yes Yes Yes 1 No Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye

B. W	V
— Prioritized startup	Yes
 Number of IO devices with prioritized startup, 	16
max.	40
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 	8
simultaneously activated/deactivated, max.	
— 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; encryption with TLS V1.3 pre-selected
— Isochronous mode	No
— IRT	No
— PROFlenergy	Yes
— Shared device	Yes
Number of IO Controllers with shared device,	2
— Number of 10 Controllers with shared device, max.	4
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
Protocols (Ethernet)	Voc
• 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
 several passive connections per port, 	Yes
supported	
• 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 sessions, max. Number of subscriptions per session, max.	50
— Sampling interval, min.	100 ms
- Camping interval, film.	

- Publishing interval, min. 200 ns Number of server methods, max. 1000 Number of monitored items, max. 1000 Number of new interfaces, max. 200 Number of new interfaces, max. Number of new		
- Number of monitored items, max Number of saver 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 NCORUS - NOTE of the defined server interfaces, max NCORUS - Notes for the defined server interfaces and the defined server interface of static electricity and the defined server interface of static electricity and the definition of static electricit	— Publishing interval, min.	200 ms
- Number of nodes for user-defined server interfaces, max. Futher profacols - MODBUS - MODBUS - MODBUS - MODBUS - Sy communication functions / header 57 communication - Sy cas server - User data per job, max. Number of connections - Overral - Overral - PG Connections: 4 reserved / 1 max; HMI Connections: 12 reserved / 1 max; Web Connections: 12 reserved / 1 max; Web Connections: 2 reserved / 16 max; CPC UA Connections: 7 reserved / 10 max; Total Connections: 34 reserved / 14 max; Web Connections: 34 reserved / 16 max - Overral - Status/control variable - Status/control variable - Variables - Forcing - Forcing - Forcing - Forcing - Procesent - Ves - Number of configurable Traces - Number of postinon (ED) - REARCR LED - REARCR LED - Number of conters - Number of postinoning aves, max. - Number of postinoning aves via pulse-direction interface - Number of postinoning aves in pulse-direction interface - PID controller - Number of postinoning aves in pulse-direction interface - PID controller - Number of postinoning aves, max. - Number of postinoning aves in pulse-direction interface - PID controller - Number of postinoning aves in pulse-direction interface - PID controller - Number of postinoning aves in pulse-direction interface - PID controller - Number of postinoning aves in pulse-direction interface - PID controller - Number of postinoning aves in pulse-direction interface - PID controller - Number of postinoning aves in pulse-direction interface - PID controller - Number of postinoning aves in pulse-direction interface - PID controller - Postinal separation d		
interfaces, max. Futher protocols • MODEUS • MODEUS • Secommunication • Supported • Jas Server • Secomine help (\$7 communication, user data size) • Supported • Secomine help (\$7 communication, user data size) • Supported • Secomine help (\$7 communication, user data size) • Was • Secomine help (\$7 communication, user data size) • Was • Secomine help (\$7 communication, user data size) • Was • Secomine help (\$7 communication, user data size) • Was • Secomine help (\$7 communication, user data size) • Was • Secomine help (\$7 communication, user data size) • Was • Secomine help (\$7 communication, user data size) • Was • Secomine help (\$7 communication, user data size) • Was • Secomine help (\$7 communication, user data size) • Was • Secomine help (\$7 communication, user data size) • Was • Secomine help (\$7 communication, user data size) • Was • Secomine help (\$7 communication, user data size) • Was • Oreall • PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 6 max • Tesserved / 14 max; Was • Connections: 9 reserved / 14 max; HMI Connections: 34 reserved / 6 max • Status/control • Status/control variable • Variable • Variable • Variable • Variable • Variable • Present • Yes • Present • Yes • Mumber of configurable Traces • Very • Mumber of configurable Traces • Was • Manner of positioning aves, max. • 100 kHz • Frequency measurement • Ves • Mumber of positioning aves, max. • Number of positioning aves, max. • Number of positioning aves, max. • Number of positioning aves, max. • Predential separation • Potential separation • Potential separation digital coutust • Potential separation digital outputs • Determine minumity against discharge of static electricity • Interference im		_
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MODBUS Ves communication functions / header 7 communication • supported • supported • sa server • sa client • User data per job, max • overall	·	
communication functions / header 37 communication 37 communication 37 communication 38 server 48 server 49 server 48 server 49 server 48 server 49 server 40 server	·	Vos
S7 communication • supported • as server • as client • 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; Web Connections: 2 reserved / 18 max; S7 connections: 8 reserved / 14 max; Web Connections: 2 reserved / 18 max; Den User Connections: 8 reserved / 14 max; Web Connections: 2 reserved / 19 max; DPC UA Connections: 0 reserved / 10 max; DPC UA Connectio		165
Supported Sis server Sis See online help (S7 communication, user data size) Number of connections See online help (S7 communication, user data size) 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; Vpc Connections: 34 reserved / 64 max S7 connections: 8 reserved / 10 max; DRU MC Connections: 37 reserved / 64 max Test commissioning functions Status/control variable Status/control variable Status/control variable Status/control variable Status/control variable Server Status/control variable Server Server Server Server Server Server Status/control variable Server Server Status/control variable Server Status/control Status/control Server Status/control Status/control Server Status/control Status/contr		
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User data per job, max. See online help (\$7 communication, user data size)		
Number of connections • overall • overall PG Connections: 4 reserved / 4 max; HMI Connections: 12 reserved / 18 max; 79 connections: 8 reserved / 14 max; 70 connections: 9 reserved / 14 max; 70 connections: 9 reserved / 16 max; 70 connections: 34 reserved / 64 max Test commissioning functions Status/control variable • Status/control variable • Ves • Variables Forcing • Forcing • Forcing • Forcing • Forcing • Present • RUNNSTOP LED • RUNNSTOP LED • RANNSTOP LED • RANNSTOP LED • RANNSTOP LED • CANNSTOP LED		
PG Connections: 4 reserved / 4 max; HM Connections: 12 reserved / 18 max; FD connections: 8 reserved / 14 max; FD connections: 9 reserved / 14 max; FD connections: 2 reserved / 13 max; OPC UA Connections: 0 reserved / 14 max; Verb Connections: 24 reserved / 64 max Test commissioning functions Status/control Status/control Status/control variable Ves Variables Procting Procting Procting Procting Procting Prosent Pres Traces Number of configurable Traces Number of position-controlled positioning axes, max. Number of position-controlled positioning axes, max. Number of positioning axes via pulse-direction interface PID controller Number of positioning axes via pulse-direction interface Potential separation digital inputs No No No No No No No No No N		Gee Offiline Help (G7 Communication, user data size)
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Forcing For	Status/control	
Forcing • Forcing • Forcing • Forcing • Forcing • Present Yes Traces • Number of configurable Traces • RUN/STOP LED • RUN/STOP	 Status/control variable 	Yes
Piccing 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 position-controlled positioning axes, max. 8 Number of position-controlled positioning axes via pulse-direction interface 4; With integrated outputs PID controller Yes Number of palse outputs 4 Number of pulse outputs 4 Number of pulse outputs 4 Limit frequency (pulse) 700 kHz Potential separation digital inputs • Potential separation digital inputs • Detential separation digital outputs • Potential separation digital outputs • between the channels, in groups of 1 EMC Interference immunity against discharge of static electricity • Interference immunity against discharge of static electricity	Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
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• RUN/STOP LED • ERROR LED • MAINT LED Integrated Functions Counter • Number of counters • Counting frequency, max. Frequency measurement Yes Ountiled positioning Number of position-controlled positioning axes, max. Number of positioning axes via pulse-direction interface PID controller Number of alarm inputs Aumber of alarm inputs Limit frequency (pulse) Potential separation digital inputs • Potential separation digital inputs • Potential separation digital outputs Potential separation digital outputs • Determination of the frequency (pulse) Interference immunity against discharge of static electricity • Interference immunity against discharge of static electricity		
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Interference immunity against discharge of static electricity ● Interference immunity against discharge of static electricity acc. to IEC 61000-4-2 Yes		
Interference immunity against discharge of static electricity acc. to IEC 61000-4-2 Yes		
— Test voltage at air discharge 8 kV	Interference immunity against discharge of static	Yes
	Test voltage at air discharge	8 kV

	200
— Test voltage at contact discharge	6 kV
Interference immunity to cable-borne interference	V
 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	Yes
61000-4-5	
Interference immunity against conducted variable disturbance	e 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
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
Ambient conditions	103
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.	660 hPa
	1 080 hPa
Storage/transport, max. Altitude during operation relating to sea level.	1 VOU TIF a
Altitude during operation relating to sea level	1 000 m
Installation altitude, min.	-1 000 m
Installation altitude, max. Politica homoidite.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Relative humidity	05.0/
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 / 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	Yes
programming / cycle time monitoring / header	
adjustable	Yes
Dimensions	
Width	90 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	370 g

4/12/2021

last modified:

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 20.4-28.8V DC, Program/data memory 75 KB

Product type designation CPU 1212C DC/DC/relay Firmware version V4.5 Engineering with Programming package STEP 7 V17 or higher Supply voltage Rated value (DC) 20.4 V permissible range, lower limit (DC) 20.4 V permissible range, upper limit (DC) 20.4 V permissible range, lower limit (DC) 20.4 V permissible range, upper limit (DC) 20.8 8 V Input current Current consumption (rated value) 400 mA; CPU only Current consumption, max. 120 mA; CPU only 12 Qa MA; CPU with all expansion modules Inrush current, max. 12 A; at 28 8 V Ither to be a consumption (rated value) 24 V 0.8 A²-s Output current for backplane bus (5 V DC), max. 1000 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 wintegrated 75 kbyte expandable No Load memory integrated 2 Mbyte expandable No Load memory integrated 2 Mbyte expandable No 1 Myte Plug-in (SIMATIC Memory Card), max. With SIMATIC memory card Backup experiment Yes exit integrated Yes without battery Yes	General information	
Engineering with Programming package Supply voltage Rated value (DC) 24 V DC permissible range, lower limit (DC) 28.8 V Reverse polarity protection Load voltage L+ Rated value (DC) permissible range, lower limit (DC) 28.8 V Reverse polarity protection Yes Load voltage L+ Rated value (DC) permissible range, lower limit (DC) permissible range, lower limit (DC) permissible range, lower limit (DC) permissible range, upper limit (DC) permissible range, lower limit (DC) pe	Product type designation	CPU 1212C DC/DC/relay
● Programming package Supply voltage Rated value (DC) ● 24 V DC permissible range, lower limit (DC) permissible range, upper limit (DC) Load voltage L+ ● Rated value (DC) ● permissible range, lower limit (DC) Permissible range, upper limit (DC) Pers limit (DC) Pesson (NE) Permissible range, upper limit (DC) Permissible range, upper limit (DC) Pers limit (DC) Pers limit (DC) Pers limit (DC) Pers limit (DC) Permissible range, upper limit (DC) Permissible range, upper limit (DC) Permissible range, upper limit (DC) Pers limit (DC) Pers limit (PC) Pers limit (DC) Pers limit (DC) Permissible range, upper limit (D	Firmware version	V4.5
Rated value (DC) • 24 V DC permissible range, lower limit (DC) permissible range, upper limit (DC) Reverse polarity protection Permissible range, upper limit (DC) Reverse polarity protection Permissible range, upper limit (DC) • Reverse polarity protection Permissible range, upper limit (DC) • permissible range, lower limit (DC) • permissible range, upper limit (DC) • 24 V Current consumption (rated value) • 1200 mA; CPU only Current consumption, max. 1 200 mA; CPU with all expansion modules Inrush current, max. 1 2 A; at 28.8 V Pout current for backplane bus (5 V DC), max. 1 000 mA; Max. 5 V DC for SM and CM Encoder supply • 24 V L+ minus 4 V DC min. Power loss Power loss, typ. 9 W Momory • integrated • expandable • cxpandable • cxpandable • cxpandable • cxpandable • cxpandable • cxpandable • cxxy (SIMATIC Memory Card), max. Backup • present • maintenance-free Yes	Engineering with	
Rated value (DC) • 24 V DC permissible range, lower limit (DC) permissible range, upper limit (DC) Reverse polarity protection Load voltage L+ • Rated value (DC) • permissible range, lower limit (DC) permissible range, upper limit (DC) • permissible range, lower limit (DC) • permissible range, lower limit (DC) • permissible range, lower limit (DC) • permissible range, upper limit (DC) • permissible range, lower limit (DC) • permi	 Programming package 	STEP 7 V17 or higher
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) 28.8 V Input current Current consumption (rated value) 400 mA; CPU only Current consumption, max. 12 A; at 28.8 V Irt 0.8 A²-s Output current for backplane bus (5 V DC), max. 1000 mA; Max. 5 V DC for SM and CM Encoder supply 24 V 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 75 kbyte • expandable Load memory • integrated • expandable Load memory • integrated • expandable Load memory • integrated • Plug-in (SIMATIC Memory Card), max. With SIMATIC memory card Backup • present • present • present • maintenance-free	Supply voltage	
permissible range, lower limit (DC) permissible range, upper limit (DC) Reverse polarity protection Permissible range, upper limit (DC) Reverse polarity protection Permissible range, lower limit (DC) Permissible range, upper limit (DC) Permissibl	Rated value (DC)	
permissible range, upper limit (DC) Reverse polarity protection Load voltage L+ Rated value (DC) permissible range, lower limit (DC) permissible range, upper limit (DC) 28.8 V Input current Current consumption (rated value) Current consumption, max. 1 200 mA; CPU only Current consumption, max. 1 2 A; at 28.8 V Pt 0.8 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 encoder supply 24 V encoder supply Power loss Power loss Power loss, typ. 9 W Memory Work memory integrated perpandable No Load memory integrated plug-in (SIMATIC Memory Card), max. With SIMATIC memory card Backup present yes	• 24 V DC	Yes
Reverse polarity protection Load voltage L+ • Rated value (DC) • permissible range, lower limit (DC) • permissible range, upper limit (DC) • permissible range, upper limit (DC) 28.8 V Input current Current consumption (rated value) Current consumption, max. 1 200 mA; CPU only Current consumption, max. 1 2 A; at 28.8 V IPt 0.8 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 L+ minus 4 V DC min. Power loss Power loss, typ. 9 W Memory Work memory • integrated • expandable No Load memory • integrated • present • yes	permissible range, lower limit (DC)	20.4 V
Load voltage L+ Rated value (DC) permissible range, lower limit (DC) permissible range, upper limit (DC) permissible range, upper limit (DC) 28.8 V Input current Current consumption (rated value) Current consumption, max. 1 200 mA; CPU only Current consumption, max. 1 200 mA; CPU with all expansion modules Inrush current, max. Pt 0.8 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 encoder supply 24 V L+ minus 4 V DC min. Power loss Power loss, typ. 9 W Memory Work memory integrated expandable No Load memory integrated Plug-in (SIMATIC Memory Card), max. Backup present present Yes Yes	permissible range, upper limit (DC)	28.8 V
Rated value (DC) permissible range, lower limit (DC) permissible range, upper limit (DC) 20.4 V permissible range, upper limit (DC) 28.8 V	Reverse polarity protection	Yes
 permissible range, lower limit (DC) 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. Pt 0.8 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 L+ minus 4 V DC min. Power loss Power loss, typ. 9 W Memory work memory integrated expandable No Load memory integrated Plug-in (SIMATIC Memory Card), max. Backup present yes maintenance-free Yes 	Load voltage L+	
permissible range, upper limit (DC) Input current Current consumption (rated value) 400 mA; CPU only Current consumption, max. 1 200 mA; CPU with all expansion modules Inrush current 12 A; at 28.8 V Pt 0.8 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	 Rated value (DC) 	24 V
Input current Current consumption (rated value) Current consumption, max. Inrush current, max. It and an analysis of the second of the seco	 permissible range, lower limit (DC) 	20.4 V
Current consumption (rated value) Current consumption, max. Inrush current, max. Inrush current, max. Inrush current Inru	 permissible range, upper limit (DC) 	28.8 V
Current consumption, max. Inrush current, m	Input current	
Inrush current, max. I²t 0.8 A²·s Output current for backplane bus (5 V DC), max. I 000 mA; Max. 5 V DC for SM and CM Encoder supply 24 V encoder supply • 24 V	Current consumption (rated value)	400 mA; CPU only
I²t 0.8 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 L+ minus 4 V DC min. Power loss Power loss, typ. 9 W Memory Work memory • integrated 75 kbyte • expandable No Load memory • integrated 2 Mbyte • Plug-in (SIMATIC Memory Card), max. with SIMATIC memory card Backup • present Yes • maintenance-free Yes	Current consumption, max.	1 200 mA; CPU with all expansion modules
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 9 W Memory 9 W Work memory • integrated 75 kbyte • expandable No Load memory • integrated 2 Mbyte • Plug-in (SIMATIC Memory Card), max. with SIMATIC memory card Backup • present Yes • maintenance-free Yes	Inrush current, max.	12 A; at 28.8 V
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 • expandable No Load memory • integrated • Plug-in (SIMATIC Memory Card), max. Backup • present • maintenance-free Yes	I²t	0.8 A ² ·s
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 expandable No Load memory integrated Plug-in (SIMATIC Memory Card), max. Backup present maintenance-free Yes	Output current	
24 V encoder supply • 24 V L+ minus 4 V DC min. Power loss Power loss, typ. 9 W Memory Work memory • integrated • expandable No Load memory • integrated • Plug-in (SIMATIC Memory Card), max. Backup • present • maintenance-free Yes	for backplane bus (5 V DC), max.	1 000 mA; Max. 5 V DC for SM and CM
L+ minus 4 V DC min. Power loss Power loss, typ. 9 W Memory Work memory integrated expandable No Load memory integrated Plug-in (SIMATIC Memory Card), max. Backup present maintenance-free Yes	Encoder supply	
Power loss Power loss, typ. 9 W Memory Work memory integrated 75 kbyte expandable No Load memory integrated 2 Mbyte Plug-in (SIMATIC Memory Card), max. with SIMATIC memory card Backup present Yes maintenance-free Yes	24 V encoder supply	
Power loss, typ. Memory Work memory integrated expandable No Load memory integrated Plug-in (SIMATIC Memory Card), max. Backup present maintenance-free yes	• 24 V	L+ minus 4 V DC min.
Memory Work memory integrated 75 kbyte expandable No Load memory integrated 2 Mbyte Plug-in (SIMATIC Memory Card), max. with SIMATIC memory card Backup present Yes maintenance-free Yes	Power loss	
Work memory integrated expandable No Load memory integrated Plug-in (SIMATIC Memory Card), max. Backup present maintenance-free Yes	Power loss, typ.	9 W
 integrated expandable No Load memory integrated Plug-in (SIMATIC Memory Card), max. Backup present maintenance-free 75 kbyte No With SIMATIC memory card Yes Yes 	Memory	
 expandable Load memory integrated Plug-in (SIMATIC Memory Card), max. Backup present maintenance-free No With SIMATIC memory card 	Work memory	
Load memory integrated Plug-in (SIMATIC Memory Card), max. with SIMATIC memory card Backup present maintenance-free Yes	integrated	75 kbyte
 integrated Plug-in (SIMATIC Memory Card), max. Backup present maintenance-free Yes 	expandable	No
 Plug-in (SIMATIC Memory Card), max. Backup present maintenance-free Yes Yes 	Load memory	
Backup • present • maintenance-free Yes Yes	integrated	2 Mbyte
 present maintenance-free Yes Yes 	 Plug-in (SIMATIC Memory Card), max. 	with SIMATIC memory card
• maintenance-free Yes	Backup	
	present	Yes
• without battery 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.	2.3 µs; / instruction
CPU-blocks	ps) / members.
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
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	100
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 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; Relays
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.
Relay outputs	io mo, max.
Number of relay outputs	6
Number of relay outputs Number of operating cycles, max.	mechanically 10 million, at rated load voltage 100 000
Cable length	The state of the s
• 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	
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	V
— PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
— Isochronous mode	No
— IRT	No
— PROFlenergy	No Yea
— Prioritized startup	Yes
 Number of IO devices with prioritized startup, max. 	16
Number of connectable IO Devices, max.	16
Number of connectable IO Devices, max. Number of connectable IO Devices for RT,	16
max.	
— of which in line, max.	16
 Activation/deactivation of IO Devices 	Yes
 Number of IO Devices that can be 	8
simultaneously activated/deactivated, max.	

— 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; encryption with TLS V1.3 pre-selected
— Isochronous mode	No
— IRT	No
— PROFlenergy	Yes
Shared device	Yes
 Number of IO Controllers with shared device. 	2
max.	
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
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	100
• 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	1 1/2 0/10
• supported	Yes
User-defined websites	Yes
OPC UA	165
Runtime license required	Yes; "Basic" license required
OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license
— Application authentication	required Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
User authentication	"anonymous" or by user name & password
Number of sessions, max.	10
Number of sessions, max. Number of subscriptions per session, max.	50
Sampling interval, min.	100 ms
— Sampling Interval, min. — Publishing interval, min.	200 ms
Number of server methods, max.	20
Number of server metrious, max. Number of monitored items, max.	1 000
Number of monitored items, max. Number of server interfaces, max.	2
Number of server interfaces, max. Number of nodes for user-defined server	
interfaces may	2 000
interfaces, max.	2 000
Further protocols	
Further protocols • MODBUS	2 000 Yes
Further protocols • MODBUS communication functions / header	
Further protocols • MODBUS	

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	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	2
EMC	
Interference immunity against discharge of static electricity • Interference immunity against discharge of static	Yes
electricity acc. to IEC 61000-4-2	163
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	
 Interference immunity against high frequency 	V
Interference immunity against high-frequency radiation acc. to IEC 61000-4-6	Yes
	Yes: Group 1

 Limit class B, for use in residential areas 	Yes; When appropriate measures are used to ensure compliance with
▼ Little Glass D, 101 use ill resluctified dieds	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
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. horizontal installation, max	-20 °C 60 °C
horizontal installation, max. vertical installation, min	
vertical installation, min.	-20 °C
vertical installation, max. Ambient temperature during storage/transportation.	50 °C
Ambient temperature during storage/transportation • min.	-40 °C
	70 °C
max. Air pressure acc. to IEC 60068-2-13	70 C
•	795 hPa
Operation, min. Operation, may	1 080 hPa
Operation, max. Storage/transport, min	660 hPa
Storage/transport, min. Storage/transport, may	1 080 hPa
Storage/transport, max. Altitude during operation relating to sea level	1 000 IIFa
Installation altitude, min.	-1 000 m
Installation altitude, min. Installation altitude, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Relative humidity	5 000 III, Restrictions for installation attitudes > 2 000 III, see manual
	95 %; no condensation
Operation, max. Vibrations	95 %, 110 Condensation
Vibration resistance during operation acc. to IEC	2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail
60068-2-6	
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
 Protection level: Read/write protection 	Yes
Protection level: Complete protection	Yes

Yes
90 mm
100 mm
75 mm
385 g

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