



Figure similar

SIMATIC S7-1200 G2: failsafe compact CPU 1212FC DC/DC/RLY; power supply: DC 20.4-28.8 V DC; onboard I/O: 8x DI 24 V DC; 6 DO relay 2 A; memory: program 200 KB data: 500 KB, retentivity: 20 KB

General information	
Product type designation	CPU 1212FC DC/DC/Relay
Firmware version	V4.1
<ul style="list-style-type: none"> <li>FW update possible</li> </ul>	Yes
Product function	
<ul style="list-style-type: none"> <li>I&amp;M data</li> </ul>	Yes; I&M0 to I&M3
<ul style="list-style-type: none"> <li>Isochronous mode</li> </ul>	Yes; For PROFINET only
<ul style="list-style-type: none"> <li>SysLog</li> </ul>	Yes
Engineering with	
<ul style="list-style-type: none"> <li>Programming package</li> </ul>	STEP 7 V21 or higher
Supply voltage	
Rated value (DC)	
<ul style="list-style-type: none"> <li>24 V DC</li> </ul>	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Input current	
Current consumption (rated value)	185 mA; CPU only
Current consumption, max.	765 mA; CPU with all expansion modules
Inrush current, max.	12 A; at 28.8 V DC
$I^2t$	0.5 A <sup>2</sup> ·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	
<ul style="list-style-type: none"> <li>24 V</li> </ul>	Yes; L+ minus 4 V DC min.
<ul style="list-style-type: none"> <li>Short-circuit protection</li> </ul>	Yes
<ul style="list-style-type: none"> <li>Output current, max.</li> </ul>	300 mA
Power loss	
Power loss, typ.	3 W
Storage	
Work memory	
<ul style="list-style-type: none"> <li>Integrated</li> </ul>	700 kbyte
<ul style="list-style-type: none"> <li>integrated (for program)</li> </ul>	200 kbyte
<ul style="list-style-type: none"> <li>integrated (for data)</li> </ul>	500 kbyte

<b>Load memory</b>	
<ul style="list-style-type: none"> <li>• Integrated</li> </ul>	8 Mbyte
<ul style="list-style-type: none"> <li>• Plug-in (SIMATIC Memory Card), max.</li> </ul>	32 Gbyte; with SIMATIC memory card
<b>Backup</b>	
<ul style="list-style-type: none"> <li>• present</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• maintenance-free</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• without battery</li> </ul>	Yes
<b>CPU processing times</b>	
for bit operations, typ.	37 ns; / instruction
for word operations, typ.	30 ns; / instruction
for floating point arithmetic, typ.	74 ns; / instruction
<b>CPU-blocks</b>	
Number of elements (total)	4 000; Blocks (OB, FB, FC, DB) and UDTs
<b>OB</b>	
<ul style="list-style-type: none"> <li>• Number of free cycle OBs</li> </ul>	100
<ul style="list-style-type: none"> <li>• Number of time alarm OBs</li> </ul>	20
<ul style="list-style-type: none"> <li>• Number of delay alarm OBs</li> </ul>	20
<ul style="list-style-type: none"> <li>• Number of cyclic interrupt OBs</li> </ul>	20; with minimum OB 3x cycle of 1 ms
<ul style="list-style-type: none"> <li>• Number of process alarm OBs</li> </ul>	50
<ul style="list-style-type: none"> <li>• Number of DPV1 alarm OBs</li> </ul>	3
<ul style="list-style-type: none"> <li>• Number of isochronous mode OBs</li> </ul>	1
<ul style="list-style-type: none"> <li>• Number of startup OBs</li> </ul>	100
<ul style="list-style-type: none"> <li>• Number of asynchronous error OBs</li> </ul>	4
<ul style="list-style-type: none"> <li>• Number of synchronous error OBs</li> </ul>	2
<ul style="list-style-type: none"> <li>• Number of diagnostic alarm OBs</li> </ul>	1
<b>Data areas and their retentivity</b>	
Retentive data area (incl. timers, counters, flags), max.	20 kbyte
<b>Flag</b>	
<ul style="list-style-type: none"> <li>• Size, max.</li> </ul>	8 kbyte; Size of bit memory address area
<b>Local data</b>	
<ul style="list-style-type: none"> <li>• per priority class, max.</li> </ul>	64 kbyte; max. 16 KB per block
<b>Address area</b>	
<b>I/O address area</b>	
<ul style="list-style-type: none"> <li>• Inputs</li> </ul>	1 kbyte; All inputs are in the process image
<ul style="list-style-type: none"> <li>• Outputs</li> </ul>	1 kbyte; All outputs are in the process image
<b>Process image</b>	
<ul style="list-style-type: none"> <li>• Inputs, adjustable</li> </ul>	1 kbyte
<ul style="list-style-type: none"> <li>• Outputs, adjustable</li> </ul>	1 kbyte
<b>Hardware configuration</b>	
Number of modules per system, max.	6
<ul style="list-style-type: none"> <li>• number of expansion boards (SB, CB, BB)</li> </ul>	1
<ul style="list-style-type: none"> <li>• number of signal modules (SM)</li> </ul>	6; depends on the number of CMs
<ul style="list-style-type: none"> <li>• number of communications modules (CM)</li> </ul>	3
<b>Time of day</b>	
<b>Clock</b>	
<ul style="list-style-type: none"> <li>• Hardware clock (real-time)</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• Backup time</li> </ul>	480 h; Typical
<ul style="list-style-type: none"> <li>• Deviation per day, max.</li> </ul>	2 s; at 25 °C
<b>Clock synchronization</b>	
<ul style="list-style-type: none"> <li>• on Ethernet via NTP</li> </ul>	Yes
<b>Digital inputs</b>	
Number of digital inputs	8; Integrated
<ul style="list-style-type: none"> <li>• of which inputs usable for technological functions</li> </ul>	8; HSC (High Speed Counting)
Sourcing/sinking input	Yes
<b>Number of simultaneously controllable inputs</b>	
all mounting positions	
— up to 40 °C, max.	8
<b>Input voltage</b>	

<ul style="list-style-type: none"> <li>Rated value (DC)</li> <li>for signal "0"</li> <li>for signal "1"</li> </ul>	<p>24 V</p> <p>5 V DC or 0.5 mA</p> <p>15 V DC at 2.5 mA</p>
<b>Input delay (for rated value of input voltage)</b>	
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 µs
for interrupt inputs	
— Parameterizable	Yes
for technological functions	
— Parameterizable	single phase: 6 HSCs @ 100 kHz & 2 standard @ 30 kHz, quadrature phase: 6 HSCs @ 80 kHz & 2 standard @ 20 kHz
<b>Cable length</b>	
• shielded, max.	500 m; 50 m for technological functions
• unshielded, max.	300 m; for technological functions: No
<b>Digital outputs</b>	
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.
Switching frequency	
• of the pulse outputs, with resistive load, max.	Not recommended
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
<b>Analog inputs</b>	
Number of analog inputs	0
<b>Analog outputs</b>	
Number of analog outputs	0
<b>Encoder</b>	
Connectable encoders	
• 2-wire sensor	Yes
<b>Interfaces</b>	
Number of PROFINET interfaces	1
<b>1. Interface</b>	
Interface type	PROFINET
Isolated	Yes
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
• RJ 45 (Ethernet)	Yes; X1
— Transmission rate, max.	100 Mbit/s
• Number of ports	2
• integrated switch	Yes
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes; Optionally also encrypted

• Web server	Yes
• Media redundancy	Yes
<b>PROFINET IO Controller</b>	
• Transmission rate, max.	100 Mbit/s
<b>Services</b>	
— PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
— Isochronous mode	Yes
— IRT	Yes
— Dynamic Frame Packing (DFP)	Yes
— PROFlenergy	Yes; per user program
— Prioritized startup	Yes
— Number of IO devices with prioritized startup, max.	16
— Number of connectable IO Devices, max.	31
— Of which IO devices with IRT, max.	31
— Number of connectable IO Devices for RT, max.	31
— of which in line, max.	31
— 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.
<b>Update time for IRT</b>	
— for send cycle of 1 ms	1 ms to 16 ms
— for send cycle of 2 ms	2 ms to 32 ms
— for send cycle of 4 ms	4 ms to 64 ms
<b>Update time for RT</b>	
— for send cycle of 1 ms	1 ms to 512 ms
— for send cycle of 2 ms	2 ms to 512 ms
— for send cycle of 4 ms	4 ms to 512 ms
<b>PROFINET IO Device</b>	
<b>Services</b>	
— PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
— Isochronous mode	No
— IRT	Yes
— Dynamic Frame Packing (DFP)	No
— PROFlenergy	Yes; per user program
— Prioritized startup	Yes
— Shared device	Yes
— Number of IO Controllers with shared device, max.	2
— Asset management record	Yes
<b>Protocols</b>	
Supports protocol for PROFINET IO	Yes
PROFIsafe	Yes
PROFIBUS	No
OPC UA	Yes; OPC UA Server
AS-Interface	No
<b>Protocols (Ethernet)</b>	
• TCP/IP	Yes
• DHCP	Yes
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
<b>Number of connections</b>	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
• Number of connections reserved for ES/HMI/web	10
• Number of connections via integrated interfaces	88
• Number of S7 routing paths	16
<b>Redundancy mode</b>	
• PROFINET system redundancy (S2)	No
• PROFINET system redundancy (R1)	No

<b>Media redundancy</b>	
— MRP	Yes; as MRP redundancy manager and/or MRP client
— MRP interconnection, supported	Yes
— MRPD	Yes; Requirement: IRT
— Number of stations in the ring, max.	50
<b>SIMATIC communication</b>	
• PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
• S7 routing	Yes
• S7 communication, as server	Yes
• S7 communication, as client	Yes; only PUT/GET
• User data per job, max.	See online help (S7 communication, user data size)
<b>Open IE communication</b>	
• TCP/IP	Yes
— Data length, max.	64 kbyte
— several passive connections per port, supported	Yes
• ISO-on-TCP (RFC1006)	Yes
— Data length, max.	64 kbyte
• UDP	Yes
— Data length, max.	2 kbyte; 1 472 bytes for UDP broadcast
• DHCP	Yes
• DNS	Yes
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
• encryption	Yes; Optional
<b>Web server</b>	
• supported	Yes
• HTTPS	Yes
• web API	Yes
— Number of sessions, max.	30
— HTTP request body, max.	131 072 byte
• User-defined websites	Yes
<b>OPC UA</b>	
• Runtime license required	Yes; "Basic" license required
• OPC UA Server	Yes; data access (read, write, subscribe), method call, runtime license required
— Application authentication	Yes
— Security policies	available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256, Aes128Sha256RsaOaep, Aes256Sha256RsaPss
— User authentication	"anonymous" or by user name & password
— Number of sessions, max.	10
— Number of subscriptions per session, max.	5
— Sampling interval, min.	100 ms
— Publishing interval, min.	200 ms
— Number of server methods, max.	20
— Number of monitored items, recommended max.	1 000
— Number of server interfaces, max.	2
— Number of nodes for user-defined server interfaces, max.	2 000
<b>Further protocols</b>	
• MODBUS	Yes; MODBUS RTU/TCP
<b>Communication functions</b>	
<b>S7 communication</b>	
• supported	Yes
• as server	Yes
• as client	Yes
• User data per job, max.	See online help (S7 communication, user data size)
<b>Number of connections</b>	
• overall	PG Connections: 4 reserved; HMI Connections: 4 reserved / 82 max; S7 Connections: 78 max; Open User Connections: 78 max; Web Connections: 2 reserved / 80 max; Total Connections: 10 reserved / 88 max

S7 message functions	
Number of login stations for message functions, max.	32
number of subscriptions, max.	250
number of tags/attributes for subscriptions, max.	2 000
Program alarms	Yes
Number of configurable program messages, max.	5 000
Number of loadable program messages in RUN, max.	2 500
Number of simultaneously active program alarms	
• Number of program alarms	600
• Number of alarms for system diagnostics	100
• Number of alarms for motion technology objects	160
Test commissioning functions	
Status block	Yes; Up to 8 simultaneously (in total across all ES clients)
Single step	No
Profiling	Yes
Status/control	
• Status/control variable	Yes
• Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
• Number of variables, max.	
— of which status variables, max.	200; per job
— of which control variables, max.	200; per job
Forcing	
• Forcing	Yes
• Forcing, variables	Peripheral inputs/outputs
• Number of variables, max.	200
Diagnostic buffer	
• present	Yes
• Number of entries, max.	500
— of which powerfail-proof	100
Traces	
• Number of configurable Traces	4
• Memory size per trace, max.	512 kbyte
Interrupts/diagnostics/status information	
Diagnostics indication LED	
• RUN/STOP LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
Supported technology objects	
Motion Control	Yes
• Number of available Motion Control resources for technology objects	800
• Required Motion Control resources	
— per speed-controlled axis	40
— per positioning axis	80
— per synchronous axis	160
— per external encoder	80
— per output cam	20
— per cam track	160
— per probe	40
• Number of available Extended Motion Control resources for technology objects	40
• Required Extended Motion Control resources	
— per cam (1 000 points and 50 segments)	2
— for each set of kinematics	30
• kinematics functions	
— kinematics with up to 4 interpolating axes	Yes
— kinematics with 5 or more interpolating axes	No
— user-defined kinematics	No
— SIMATIC Safe Kinematics	No

<ul style="list-style-type: none"> <li>Positioning axis <ul style="list-style-type: none"> <li>Number of positioning axes at motion control cycle of 4 ms (typical value)</li> <li>Number of positioning axes at motion control cycle of 8 ms (typical value)</li> </ul> </li> </ul>	10
10	
<b>Integrated Functions</b>	
Counter	Yes
<ul style="list-style-type: none"> <li>Number of counters</li> <li>Counting frequency, max.</li> </ul>	8 100 kHz; Ia.0 to Ia.5: 100 kHz (80 kHz in quadrature mode), Ia.6 to Ia.7: 30 kHz (20 kHz in quadrature mode)
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	8; individually assigned to CPU and Signal Board
Limit frequency (pulse)	100 kHz
<b>Potential separation</b>	
Potential separation digital inputs	
<ul style="list-style-type: none"> <li>Potential separation digital inputs</li> <li>between the channels</li> <li>Number of potential groups</li> </ul>	Yes; field side to logic: 707 V DC (type test) No 1
Potential separation digital outputs	
<ul style="list-style-type: none"> <li>Potential separation digital outputs</li> <li>between the channels</li> <li>Number of potential groups</li> </ul>	Relays No 1
<b>EMC</b>	
Interference immunity against discharge of static electricity	
<ul style="list-style-type: none"> <li>Interference immunity against discharge of static electricity acc. to IEC 61000-4-2 <ul style="list-style-type: none"> <li>Test voltage at air discharge</li> <li>Test voltage at contact discharge</li> </ul> </li> </ul>	Yes 8 kV 6 kV
Interference immunity to cable-borne interference	
<ul style="list-style-type: none"> <li>Interference immunity on supply lines acc. to IEC 61000-4-4</li> <li>Interference immunity on signal cables acc. to IEC 61000-4-4</li> </ul>	Yes Yes
Interference immunity against voltage surge	
<ul style="list-style-type: none"> <li>Interference immunity on supply lines acc. to IEC 61000-4-5</li> </ul>	Yes
Interference immunity against conducted variable disturbance induced by high-frequency fields	
<ul style="list-style-type: none"> <li>Interference immunity against high-frequency radiation acc. to IEC 61000-4-6</li> </ul>	Yes
Emission of radio interference acc. to EN 55 011	
<ul style="list-style-type: none"> <li>Limit class A, for use in industrial areas</li> <li>Limit class B, for use in residential areas</li> </ul>	Yes; Group 1 Yes; When appropriate measures are used to ensure compliance with the limits for Class B according to EN 55011
<b>Degree and class of protection</b>	
IP degree of protection	IP20
<b>Standards, approvals, certificates</b>	
Siemens Eco Profile (SEP)	Siemens EcoTech
CE mark	Yes
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	Yes
KC approval	Yes
Marine approval	Yes
Ecological footprint	
<ul style="list-style-type: none"> <li>environmental product declaration</li> </ul>	Yes; type 2 acc. to ISO 14021
Global warming potential	

— global warming potential, (total) [CO2 eq]	61.1 kg
— global warming potential, (during production) [CO2 eq]	12.4 kg
— global warming potential, (during operation) [CO2 eq]	49.2 kg
— global warming potential, (after end of life cycle) [CO2 eq]	-0.63 kg
<b>Highest safety class achievable in safety mode</b>	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
<b>Probability of failure (for service life of 20 years and repair time of 100 hours)</b>	
— Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
— High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 up to an operational altitude of 3 000 m or < 2.00E-09 at an operating altitude greater than 3 000 m up to 5 000 m
<b>Security</b>	
PROFINET Security Class	1
signed firmware update	Yes
Secure Boot	Yes
<b>Ambient conditions</b>	
<b>Free fall</b>	
• Fall height, max.	0.3 m; five times, in product package
<b>Ambient temperature during operation</b>	
• min.	-20 °C; No condensation
• max.	40 °C; 40 °C horizontal or 30 °C vertical at max. voltages and max. specifications
• horizontal installation, min.	-20 °C; No condensation
• horizontal installation, max.	60 °C; at rated voltages, 50 % of max. specification and alternate IO active
• vertical installation, min.	-20 °C; No condensation
• vertical installation, max.	50 °C; at rated voltages, 50 % of max. specification and alternate IO active
<b>Ambient temperature during storage/transportation</b>	
• min.	-40 °C
• max.	70 °C
<b>Air pressure acc. to IEC 60068-2-13</b>	
• Operation, min.	540 hPa
• Operation, max.	1 140 hPa
• Storage/transport, min.	540 hPa
• Storage/transport, max.	1 140 hPa
<b>Altitude during operation relating to sea level</b>	
• Installation altitude, min.	-1 000 m
• Installation altitude, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
<b>Relative humidity</b>	
• Operation, max.	95 %; no condensation
<b>Vibrations</b>	
• Vibration resistance during operation acc. to IEC 60068-2-6	3.5 mm from 5 - 8.4 Hz, 1g from 8.4 - 150 Hz
• Operation, tested according to IEC 60068-2-6	Yes
<b>Shock testing</b>	
• 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
<b>Pollutant concentrations</b>	
• SO2 at RH < 60% without condensation	SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60 % condensation-free
<b>Configuration</b>	
<b>Programming</b>	
<b>Programming language</b>	
— LAD	Yes; incl. failsafe
— FBD	Yes; incl. failsafe
— SCL	Yes
<b>Know-how protection</b>	
• User program protection/password protection	Yes
• Copy protection	No

• Block protection	Yes
<b>Access protection</b>	
• protection of confidential configuration data	Yes
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Write protection for Failsafe	Yes
• Protection level: Complete protection	Yes
• User administration	Yes; device-wide and centralized
• Number of users	100
• Number of groups	100
• Number of roles	50

<b>Cycle time monitoring</b>	
• can be set	Yes

<b>Dimensions</b>	
Width	70 mm
Height	125 mm
Depth	100 mm

<b>Weights</b>	
Weight, approx.	333 g

<b>Classifications</b>			
		<b>Version</b>	<b>Classification</b>
	eClass	16	27-24-22-07
	eClass	14	27-24-22-07
	eClass	12	27-24-22-07
	eClass	9.1	27-24-22-07
	eClass	9	27-24-22-07
	eClass	8	27-24-22-07
	eClass	7.1	27-24-22-07
	eClass	6	27-24-22-07
	ETIM	10	EC000236
	ETIM	9	EC000236
	ETIM	8	EC000236
	ETIM	7	EC000236

**Approvals / Certificates**

**General Product Approval**



**General Product Approval** **EMV**



**For use in hazardous locations** **Functional Safety**



**Functional Safety** **Test Certificates** **Maritime application**

[TUEV](#)



Maritime application



[NK / Nippon Kaiji Kyokai](#)



[KR \(Korean Register of Shipping\)](#)

Environment



Siemens EcoTech



Industrial Communication

[PROFINET](#)

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