

SIPLUS S7-1200 CPU 1212C DC/DC/DC T1 RAIL -25 ... +55°C T1 with 70°C for 10 min with conformal coating based on 6ES7212-1AE40-0XB0 . 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: 20.4-28.8V DC Program/data memory 50 KB



### General information

Product type designation	CPU 1212C DC/DC/DC
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### Supply voltage

Rated value (DC)	Yes
<ul style="list-style-type: none"> <li>• 24 V DC</li> </ul>	
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes

### Load voltage L+

<ul style="list-style-type: none"> <li>• Rated value (DC)</li> </ul>	24 V
<ul style="list-style-type: none"> <li>• permissible range, lower limit (DC)</li> </ul>	20.4 V
<ul style="list-style-type: none"> <li>• permissible range, upper limit (DC)</li> </ul>	28.8 V

### Input current

Current consumption (rated value)	400 mA; Typical
Inrush current, max.	12 A; at 28.8 V DC

### Output current

for backplane bus (5 V DC), max.	890 mA; Max. 5 V DC for SM and CM
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Encoder supply	
24 V encoder supply	
<ul style="list-style-type: none"> <li>• 24 V</li> </ul>	Permissible range: 20.4V to 28.8V
Power loss	
Power loss, typ.	9 W
Memory	
Work memory	
<ul style="list-style-type: none"> <li>• integrated</li> </ul>	50 kbyte
<ul style="list-style-type: none"> <li>• expandable</li> </ul>	No
Load memory	
<ul style="list-style-type: none"> <li>• integrated</li> </ul>	1 Mbyte
<ul style="list-style-type: none"> <li>• Plug-in (SIMATIC Memory Card), max.</li> </ul>	2 Gbyte; with SIMATIC memory card
Backup	
<ul style="list-style-type: none"> <li>• present</li> </ul>	Yes; maintenance-free
<ul style="list-style-type: none"> <li>• without battery</li> </ul>	Yes
CPU processing times	
for bit operations, typ.	0.085 µs; / Operation
for word operations, typ.	1.7 µs; / Operation
for floating point arithmetic, typ.	2.3 µs; / Operation
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	
<ul style="list-style-type: none"> <li>• Number, max.</li> </ul>	Limited only by RAM for code
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	10 kbyte
Flag	
<ul style="list-style-type: none"> <li>• Number, max.</li> </ul>	4 kbyte; Size of bit memory address area
Address area	
I/O address area	
<ul style="list-style-type: none"> <li>• Inputs</li> </ul>	1 024 byte
<ul style="list-style-type: none"> <li>• Outputs</li> </ul>	1 024 byte
Process image	
<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
Hardware configuration	
Number of modules per system, max.	3 comm. modules, 1 signal board, 2 signal modules

Time of day	
<b>Clock</b>	
• 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
<b>Number of simultaneously controllable inputs</b>	
all mounting positions	
— up to 40 °C, max.	8
<b>Input voltage</b>	
• Rated value (DC)	24 V
• for signal "0"	5 V DC at 1 mA
• for signal "1"	15 V DC at 2.5 mA
<b>Input current</b>	
• for signal "1", typ.	1 mA
<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 ms
for interrupt inputs	
— parameterizable	Yes
for technological functions	
— parameterizable	Single phase: 3 @ 100 kHz & 1 @ 30 kHz, differential: 3 @ 80 kHz & 1 @ 30 kHz
<b>Cable length</b>	
• 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)
<b>Switching capacity of the outputs</b>	
• with resistive load, max.	0.5 A
• on lamp load, max.	5 W
<b>Output voltage</b>	
• for signal "0", max.	0.1 V; with 10 kOhm load

• for signal "1", min.	20 V
<b>Output current</b>	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.1 mA
<b>Output delay with resistive load</b>	
• "0" to "1", max.	1 $\mu$ s
• "1" to "0", max.	3 $\mu$ s
<b>Switching frequency</b>	
• of the pulse outputs, with resistive load, max.	100 kHz
<b>Relay outputs</b>	
• Number of relay outputs	0
<b>Cable length</b>	
• shielded, max.	500 m
• unshielded, max.	150 m
<b>Analog inputs</b>	
Number of analog inputs	2
<b>Input ranges</b>	
• Voltage	Yes
<b>Input ranges (rated values), voltages</b>	
• 0 to +10 V	Yes
— Input resistance (0 to 10 V)	$\geq 100$ k ohms
<b>Cable length</b>	
• shielded, max.	100 m; twisted and shielded
<b>Analog outputs</b>	
Number of analog outputs	0
<b>Analog value generation for the inputs</b>	
<b>Integration and conversion time/resolution per channel</b>	
• Resolution with overrange (bit including sign), max.	10 bit
• Integration time, parameterizable	Yes
• Conversion time (per channel)	625 $\mu$ s
<b>Encoder</b>	
<b>Connectable encoders</b>	
• 2-wire sensor	Yes
<b>1. Interface</b>	
Interface type	PROFINET
Physics	Ethernet
Isolated	Yes
automatic detection of transmission rate	Yes
Autonegotiation	Yes

Autocrossing	Yes
<b>Protocols</b>	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• Open IE communication	Yes
• Web server	Yes
<b>PROFINET IO Controller</b>	
• Transmission rate, max.	100 Mbit/s
<b>Services</b>	
— Number of connectable IO Devices, max.	16
<b>PROFINET IO Device</b>	
<b>Services</b>	
— Shared device	Yes
— Number of IO Controllers with shared device, max.	2
<b>Protocols</b>	
Supports protocol for PROFINET IO	Yes
PROFIBUS	Yes; CM 1243-5 required
AS-Interface	Yes
<b>Protocols (Ethernet)</b>	
• TCP/IP	Yes
<b>Open IE communication</b>	
• TCP/IP	Yes
• ISO-on-TCP (RFC1006)	Yes
• UDP	Yes
<b>Web server</b>	
• supported	Yes
• User-defined websites	Yes
<b>Further protocols</b>	
• MODBUS	Yes
<b>Communication functions</b>	
<b>S7 communication</b>	
• supported	Yes
• as server	Yes
• as client	Yes
<b>Number of connections</b>	
• overall	16; dynamically
<b>Test commissioning functions</b>	
<b>Status/control</b>	
• Status/control variable	Yes

• Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
<b>Forcing</b>	
• Forcing	Yes
<b>Diagnostic buffer</b>	
• present	Yes
<b>Traces</b>	
• Number of configurable Traces	2; Up to 512 KB of data per trace are possible
<b>Integrated Functions</b>	
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	4; With integrated DO
PID controller	Yes
Number of alarm inputs	4
Number of pulse outputs	4
Limit frequency (pulse)	100 kHz
<b>Potential separation</b>	
<b>Potential separation digital inputs</b>	
• Potential separation digital inputs	500V AC for 1 minute
• between the channels, in groups of	1
<b>Potential separation digital outputs</b>	
• Potential separation digital outputs	Yes
• between the channels	No
• between the channels, in groups of	1
<b>Isolation</b>	
Isolation tested with	According to EN 50155 (routine test)
<b>EMC</b>	
<b>Interference immunity against discharge of static electricity</b>	
• 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
<b>Interference immunity to cable-borne interference</b>	
• Interference immunity on supply lines acc. to IEC 61000-4-4	Yes
• Interference immunity on signal cables acc. to IEC 61000-4-4	Yes
<b>Interference immunity against voltage surge</b>	

<ul style="list-style-type: none"> <li>• Interference immunity on supply lines acc. to IEC 61000-4-5</li> </ul>	Yes
<b>Interference immunity against conducted variable disturbance induced by high-frequency fields</b>	
<ul style="list-style-type: none"> <li>• Interference immunity against high-frequency radiation acc. to IEC 61000-4-6</li> </ul>	Yes
<b>Emission of radio interference acc. to EN 55 011</b>	
<ul style="list-style-type: none"> <li>• Limit class A, for use in industrial areas</li> </ul>	Yes; Group 1
<ul style="list-style-type: none"> <li>• Limit class B, for use in residential areas</li> </ul>	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>	
<b>Railway application</b>	
<ul style="list-style-type: none"> <li>• EN 50121-3-2</li> </ul>	Yes; EMC for rail vehicles
<ul style="list-style-type: none"> <li>• EN 50121-4</li> </ul>	Yes; EMC for signal and telecommunications systems
<ul style="list-style-type: none"> <li>• EN 50124-1</li> </ul>	Yes; Railway applications - overvoltage category OV2; pollution degree PD2; rated surge voltage UNi = 0.5 kV; UNm = 24 V DC
<ul style="list-style-type: none"> <li>• EN 50125-1</li> </ul>	Yes; Rail vehicles - see ambient conditions
<ul style="list-style-type: none"> <li>• EN 50125-2</li> </ul>	Yes; Stationary electrical equipment - see ambient conditions
<ul style="list-style-type: none"> <li>• EN 50125-3</li> </ul>	Yes; Signal and telecommunications systems - see ambient conditions; vibrations and shocks: Application point outside of tracks (1 m to 3 m away from track)
<ul style="list-style-type: none"> <li>• EN 50155</li> </ul>	Yes; Rail vehicles - temperature class T1, horizontal mounting position, salt spray Class ST2
<ul style="list-style-type: none"> <li>• EN 61373</li> </ul>	Yes; Rail vehicles - vibrations and shocks: Category 1 Class A/B
<ul style="list-style-type: none"> <li>• Fire protection acc. to EN 45545-2</li> </ul>	Yes; Rail vehicles - verification on request

<b>Ambient conditions</b>	
<b>Free fall</b>	
<ul style="list-style-type: none"> <li>• Fall height, max.</li> </ul>	0.3 m; five times, in product package
<b>Ambient temperature during operation</b>	
<ul style="list-style-type: none"> <li>• horizontal installation, min.</li> </ul>	-25 °C; = Tmin (incl. condensation/frost)
<ul style="list-style-type: none"> <li>• horizontal installation, max.</li> </ul>	60 °C; Number of simultaneously activated inputs or outputs: 4 or 3 (no adjacent points) at 60 °C horizontal, 8 or 6 at 55 °C horizontal; 70 °C for 10 minutes (T1 acc. to EN 50155)
<b>Ambient temperature during storage/transportation</b>	
<ul style="list-style-type: none"> <li>• min.</li> </ul>	-40 °C
<ul style="list-style-type: none"> <li>• max.</li> </ul>	70 °C
<b>Altitude during operation relating to sea level</b>	
<ul style="list-style-type: none"> <li>• Installation altitude above sea level, max.</li> </ul>	2 000 m
<ul style="list-style-type: none"> <li>• Ambient air temperature-barometric pressure-altitude</li> </ul>	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
<b>Relative humidity</b>	

<ul style="list-style-type: none"> <li>• With condensation, tested in accordance with IEC 60068-2-38, max.</li> </ul>	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
<b>Vibrations</b>	
<ul style="list-style-type: none"> <li>• Vibration resistance during operation acc. to IEC 60068-2-6</li> </ul>	2 g (m/s <sup>2</sup> ) wall mounting, 1 g (m/s <sup>2</sup> ) DIN rail
<ul style="list-style-type: none"> <li>• Operation, tested according to IEC 60068-2-6</li> </ul>	Yes
<b>Shock testing</b>	
<ul style="list-style-type: none"> <li>• tested according to IEC 60068-2-27</li> </ul>	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
<b>Resistance</b>	
<b>Coolants and lubricants</b>	
— Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
<b>Use in stationary industrial systems</b>	
— to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
— to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
— to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; *
<b>Use on land craft, rail vehicles and special-purpose vehicles</b>	
— to biologically active substances according to EN 60721-3-5	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
— to chemically active substances according to EN 60721-3-5	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
— to mechanically active substances according to EN 60721-3-5	Yes; Class 5S3 incl. sand, dust; *
<b>Usage in industrial process technology</b>	
— Against chemically active substances acc. to EN 60654-4	Yes; Class 3 (excluding trichlorethylene)
— Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04	Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil)
<b>Remark</b>	
— Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04	* The supplied plug covers must remain in place over the unused interfaces during operation!
<b>Conformal coating</b>	
<ul style="list-style-type: none"> <li>• Coatings for printed circuit board assemblies acc. to EN 61086</li> </ul>	Yes; Class 2 for high reliability
<ul style="list-style-type: none"> <li>• Protection against fouling acc. to EN 60664-3</li> </ul>	Yes; Type 1 protection
<ul style="list-style-type: none"> <li>• Electronic equipment on rolling stock acc. to EN 50155</li> </ul>	Yes; Class PC2 protective coating acc. to EN 50155:2017
<ul style="list-style-type: none"> <li>• Military testing according to MIL-I-46058C, Amendment 7</li> </ul>	Yes; Discoloration of coating possible during service life



• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A

Yes; Conformal coating, Class A

## Configuration

### Programming

#### Programming language

— LAD	Yes
— FBD	Yes
— SCL	Yes

### Cycle time monitoring

• adjustable	Yes
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## Dimensions

Width	90 mm
Height	100 mm
Depth	75 mm

## Weights

Weight, approx.	370 g
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## Other

Note: for use in railway applications, also observe the product information "SIPLUS extreme RAIL" A5E37661960A, Online Support article 109736776

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