

6ES7212-1AF40-0XB0

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

Technical data



SIMATIC S7-1200F, CPU 1212 FC, 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 100 KB

| General information | |
|--|---|
| Product type designation | CPU 1212FC DC/DC/DC |
| Firmware version | V4.2 |
| Engineering with | <ul style="list-style-type: none"> Programming package |
| | STEP 7 V14 or higher |
| Supply voltage | |
| Rated value (DC) | Yes |
| <ul style="list-style-type: none"> 24 V DC | |
| permissible range, lower limit (DC) | 20.4 V |
| permissible range, upper limit (DC) | 28.8 V |
| Load voltage L+ | |
| <ul style="list-style-type: none"> Rated value (DC) permissible range, lower limit (DC) permissible range, upper limit (DC) | 24 V 20.4 V 28.8 V |
| Input current | |
| Current consumption (rated value) | 400 mA; Typical |
| Inrush current, max. | 12 A; at 28.8 V DC |
| I _t | 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 | <ul style="list-style-type: none"> 24 V |
| | Permissible range: 20.4V to 28.8V |
| Power loss | |
| Power loss, typ. | 9 W |
| Memory | |
| Work memory | <ul style="list-style-type: none"> integrated expandable |
| | 100 kbyte No |
| Load memory | <ul style="list-style-type: none"> integrated Plug-in (SIMATIC Memory Card), max. |
| | 2 Mbyte with SIMATIC memory card |
| Backup | <ul style="list-style-type: none"> present maintenance-free without battery |
| | Yes Yes Yes |
| CPU processing times | |
| for bit operations, typ. | 0.08 µs; / instruction |
| for word operations, typ. | 1.7 µs; / instruction |
| for floating point arithmetic, typ. | 2.5 µs; / instruction |
| CPU-blocks | |
| Number of blocks (total) | DBs, FCs, FBs, counters and timers. The maximum number of addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used |
| OB | <ul style="list-style-type: none"> Number, max. |
| | 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"> Number, max. |
| | 4 kbyte; Size of bit memory address area |
| Local data | <ul style="list-style-type: none"> per priority class, max. |
| | 16 kbyte; Priority class 1 (program cycle): 16 KB, priority class 2 to 26: 6 KB |
| Address area | |
| I/O address area | <ul style="list-style-type: none"> Inputs |
| | 1 024 byte |

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| • Outputs | 1 024 byte |
| Process image | |
| • Inputs, adjustable | 1 kbyte |
| • Outputs, adjustable | 1 kbyte |
| Hardware configuration | |
| Number of modules per system, max. | 3 comm. modules, 1 signal board, 2 signal modules |
| Time of day | |
| Clock | |
| • Hardware clock (real-time) | Yes |
| • Backup time | 480 h; Typical |
| • Deviation per day, max. | 60 s/month at 25 °C |
| Digital inputs | |
| Number of digital inputs | 8; Integrated |
| • of which inputs usable for technological functions | 6; HSC (High Speed Counting) |
| Source/sink input | Yes |
| Number of simultaneously controllable inputs | |
| all mounting positions | |
| — up to 40 °C, max. | 8 |
| Input voltage | |
| • Rated value (DC) | 24 V |
| • for signal "0" | 5 V DC at 1 mA |
| • for signal "1" | 15 V DC at 2.5 mA |
| Input current | |
| • for signal "1", typ. | 1 mA |
| Input delay (for rated value of input voltage) | |
| for standard inputs | |
| — parameterizable | 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four |
| — at "0" to "1", min. | 0.2 ms |
| — at "0" to "1", max. | 12.8 ms |
| for interrupt inputs | |
| — parameterizable | Yes |
| for technological functions | |
| — parameterizable | Single phase: 3 @ 100 kHz & 1 @ 30 kHz, differential: 3 @ 80 kHz & 1 @ 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 |
| Short-circuit protection | No; to be provided externally |
| 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 | |
| • Resolution with overrange (bit including sign), max. | 10 bit |
| • Integration time, parameterizable | Yes |
| • Conversion time (per channel) | 625 µs |
| Encoder | |

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| Connectable encoders | |
| • 2-wire sensor | Yes |
| 1. Interface | |
| Isolated | Yes |
| automatic detection of transmission rate | Yes |
| Autonegotiation | Yes |
| Autocrossing | Yes |
| Interface types | |
| • RJ 45 (Ethernet) | Yes |
| • Number of ports | 1 |
| • integrated switch | Yes |
| Protocols | |
| • PROFINET IO Controller | Yes |
| • PROFINET IO Device | Yes |
| • SIMATIC communication | Yes |
| • Open IE communication | Yes |
| • Web server | Yes |
| PROFINET IO Controller | |
| • Transmission rate, max. | 100 Mbit/s |
| Services | |
| — PG/OP communication | Yes |
| — Isochronous mode | No |
| — IRT | No |
| — PROFIenergy | No |
| — Prioritized startup | Yes |
| — Number of IO devices with prioritized startup, max. | 16 |
| — Number of connectable IO Devices, max. | 16 |
| — Number of connectable IO Devices for RT, max. | 16 |
| — of which in line, max. | 16 |
| — Activation/deactivation of IO Devices | Yes |
| — Number of IO Devices that can be simultaneously activated/deactivated, max. | 8 |
| — Updating time | The minimum value of the update time also depends on the communication component set for PROFINET IO, on the number of IO devices and the quantity of configured user data. |
| PROFINET IO Device | |
| Services | |
| — PG/OP communication | Yes |
| — Isochronous mode | No |
| — IRT | No |
| — PROFIenergy | Yes |
| — Shared device | Yes |
| — Number of IO Controllers with shared device, max. | 2 |
| Protocols | |
| Supports protocol for PROFINET IO | Yes |
| PROFIBUS | Yes; CM 1243-5 (master) or CM 1242-5 (slave) required |
| AS-Interface | Yes; CM 1243-2 required |
| Protocols (Ethernet) | |
| • TCP/IP | Yes |
| • DHCP | No |
| • SNMP | Yes |
| • DCP | Yes |
| • LLDP | Yes |
| Redundancy mode | |
| Media redundancy | |
| — MRP | No |
| — MRPD | No |
| SIMATIC communication | |
| • S7 routing | Yes |
| Open IE communication | |
| • TCP/IP | Yes |
| — Data length, max. | 8 kbyte |
| • ISO-on-TCP (RFC1006) | Yes |
| — Data length, max. | 8 kbyte |
| • UDP | Yes |
| — Data length, max. | 1 472 byte |
| Web server | |
| • supported | Yes |
| • User-defined websites | Yes |
| Further protocols | |
| • MODBUS | Yes |
| Communication functions | |
| S7 communication | |
| • supported | Yes |
| • as server | Yes |
| • as client | Yes |
| • User data per job, max. | See online help (S7 communication, user data size) |
| Test commissioning functions | |

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| Status/control | |
| <ul style="list-style-type: none"> • Status/control variable • Variables | <p>Yes</p> <p>Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters</p> |
| Forcing | |
| <ul style="list-style-type: none"> • Forcing | Yes |
| Diagnostic buffer | |
| <ul style="list-style-type: none"> • present | Yes |
| Traces | |
| <ul style="list-style-type: none"> • Number of configurable Traces • Memory size per trace, max. | <p>2</p> <p>512 kbyte</p> |
| Integrated Functions | |
| Number of counters | 4 |
| Counting frequency (counter) max. | 100 kHz |
| Frequency measurement | Yes |
| controlled positioning | Yes |
| Number of position-controlled positioning axes, max. | 8 |
| Number of positioning axes via pulse-direction interface | Up to 4 with SB 1222 |
| PID controller | Yes |
| Number of alarm inputs | 4 |
| Number of pulse outputs | 4 |
| Limit frequency (pulse) | 100 kHz |
| Potential separation | |
| Potential separation digital inputs | |
| <ul style="list-style-type: none"> • Potential separation digital inputs • between the channels, in groups of | <p>500V AC for 1 minute</p> <p>1</p> |
| Potential separation digital outputs | |
| <ul style="list-style-type: none"> • Potential separation digital outputs • between the channels • between the channels, in groups of | <p>Yes</p> <p>No</p> <p>1</p> |
| Permissible potential difference | |
| between different circuits | 500 V DC between 24 V DC and 5 V DC |
| EMC | |
| Interference immunity against discharge of static electricity | |
| <ul style="list-style-type: none"> • Interference immunity against discharge of static electricity acc. to IEC 61000-4-2 <ul style="list-style-type: none"> — Test voltage at air discharge — Test voltage at contact discharge | <p>Yes</p> <p>8 kV</p> <p>6 kV</p> |
| Interference immunity to cable-borne interference | |
| <ul style="list-style-type: none"> • Interference immunity on supply lines acc. to IEC 61000-4-4 • Interference immunity on signal cables acc. to IEC 61000-4-4 | <p>Yes</p> <p>Yes</p> |
| Interference immunity against voltage surge | |
| <ul style="list-style-type: none"> • Interference immunity on supply lines acc. to IEC 61000-4-5 | Yes |
| Interference immunity against conducted variable disturbance induced by high-frequency fields | |
| <ul style="list-style-type: none"> • Interference immunity against high-frequency radiation acc. to IEC 61000-4-6 | Yes |
| Emission of radio interference acc. to EN 55 011 | |
| <ul style="list-style-type: none"> • Limit class A, for use in industrial areas • Limit class B, for use in residential areas | <p>Yes; Group 1</p> <p>Yes; When appropriate measures are used to ensure compliance with the limits for Class B according to EN 55011</p> |
| Standards, approvals, certificates | |
| CE mark | Yes |
| UL approval | Yes |
| cULus | Yes |
| FM approval | Yes |
| RCM (formerly C-TICK) | Yes |
| KC approval | Yes |
| Marine approval | Yes |
| Highest safety class achievable in safety mode | |
| <ul style="list-style-type: none"> • Performance level according to ISO 13849-1 • SIL acc. to IEC 61508 | <p>PLe</p> <p>SIL 3</p> |
| Ambient conditions | |
| Free fall | |
| <ul style="list-style-type: none"> • Fall height, max. | 0.3 m; five times, in product package |
| Ambient temperature during operation | |
| <ul style="list-style-type: none"> • min. • max. • horizontal installation, min. • horizontal installation, max. • vertical installation, min. • vertical installation, max. | <p>0 °C</p> <p>55 °C</p> <p>0 °C</p> <p>55 °C</p> <p>0 °C</p> <p>45 °C</p> |
| Ambient temperature during storage/transportation | |
| <ul style="list-style-type: none"> • min. • max. | <p>-40 °C</p> <p>70 °C</p> |
| Air pressure acc. to IEC 60068-2-13 | |
| <ul style="list-style-type: none"> • Storage/transport, min. • Storage/transport, max. | <p>660 hPa</p> <p>1 139 hPa</p> |
| Altitude during operation relating to sea level | |

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|---|---|
| • Installation altitude, min. | -1 000 m |
| • Installation altitude, max. | 2 000 m |
| Relative humidity | |
| • Operation, max. | 95 %; no condensation |
| Vibrations | |
| • Vibration resistance during operation acc. to IEC 60068-2-6 | 2 g (m/s ²) wall mounting, 1 g (m/s ²) 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 | |
| • SO ₂ at RH < 60% without condensation | SO ₂ : < 0.5 ppm; H ₂ S: < 0.1 ppm; RH < 60% condensation-free |
| Configuration | |
| Programming | |
| Programming language | |
| — LAD | Yes; incl. failsafe |
| — FBD | Yes; incl. failsafe |
| — SCL | Yes |
| Know-how protection | |
| • User program protection/password protection | Yes |
| • Copy protection | Yes |
| • Block protection | Yes |
| Cycle time monitoring | |
| • adjustable | Yes |
| Dimensions | |
| Width | 90 mm |
| Height | 100 mm |
| Depth | 75 mm |
| Weights | |
| Weight, approx. | 370 g |
| last modified: | 2/5/2021 |