



SIMATIC S7-1200F, CPU 1214 FC, compact CPU, DC/DC/DC, onboard I/O: 14 DI 24 V DC; 10 DO 24 V DC; 2 AI 0-10 V DC, Power supply: DC 20.4-28.8V DC, Program/data memory 125 KB

| General information  |  |
|--|--|
| Product type designation   | CPU 1214FC DC/DC/DC                      |
| Firmware version   | V4.5                                     |
| Engineering with   |  |
| <ul style="list-style-type: none"> <li>Programming package</li> </ul>  | STEP 7 V17 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                                      |
| Load voltage L+  |  |
| <ul style="list-style-type: none"> <li>Rated value (DC)</li> <li>permissible range, lower limit (DC)</li> <li>permissible range, upper limit (DC)</li> </ul> | 24 V<br>20.4 V<br>28.8 V                 |
| Input current  |  |
| Current consumption (rated value)  | 500 mA; CPU only                         |
| Current consumption, max.  | 1 500 mA; CPU with all expansion modules |
| Inrush current, max.   | 12 A; at 28.8 V                          |
| $I^2t$   | 0.5 A <sup>2</sup> ·s                    |
| Output current   |  |
| for backplane bus (5 V DC), max.   | 1 600 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>   | L+ minus 4 V DC min.                     |
| Power loss   |  |
| Power loss, typ.   | 12 W                                     |
| Memory   |  |
| Work memory  |  |
| <ul style="list-style-type: none"> <li>integrated</li> <li>expandable</li> </ul>   | 125 kbyte<br>No                          |
| Load memory  |  |
| <ul style="list-style-type: none"> <li>integrated</li> <li>Plug-in (SIMATIC Memory Card), max.</li> </ul>  | 4 Mbyte<br>with SIMATIC memory card      |
| Backup   |  |
| <ul style="list-style-type: none"> <li>present</li> <li>maintenance-free</li> <li>without battery</li> </ul>   | Yes<br>Yes<br>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.  | 8 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, 8 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                                  | 14; 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.                                       | 14  |
| 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                                 | 10  |
| • 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   |

|  |  |
|--|--|
| <b>Output voltage</b>  |  |
| <ul style="list-style-type: none"> <li>for signal "0", max.</li> <li>for signal "1", min.</li> </ul>   | 0.1 V; with 10 kOhm load<br>20 V                                 |
| <b>Output current</b>  |  |
| <ul style="list-style-type: none"> <li>for signal "1" rated value</li> <li>for signal "0" residual current, max.</li> </ul>  | 0.5 A<br>0.1 mA  |
| <b>Output delay with resistive load</b>  |  |
| <ul style="list-style-type: none"> <li>"0" to "1", max.</li> <li>"1" to "0", max.</li> </ul>   | 1 µs<br>5 µs   |
| <b>Switching frequency</b>   |  |
| <ul style="list-style-type: none"> <li>of the pulse outputs, with resistive load, max.</li> </ul>  | 100 kHz  |
| <b>Relay outputs</b>   |  |
| <ul style="list-style-type: none"> <li>Number of relay outputs</li> </ul>  | 0  |
| <b>Cable length</b>  |  |
| <ul style="list-style-type: none"> <li>shielded, max.</li> <li>unshielded, max.</li> </ul>   | 500 m<br>150 m   |
| <b>Analog inputs</b>   |  |
| Number of analog inputs  | 2  |
| <b>Input ranges</b>  |  |
| <ul style="list-style-type: none"> <li>Voltage</li> </ul>  | Yes  |
| <b>Input ranges (rated values), voltages</b>   |  |
| <ul style="list-style-type: none"> <li>0 to +10 V</li> <li>— Input resistance (0 to 10 V)</li> </ul>   | Yes<br>≥100k ohms  |
| <b>Cable length</b>  |  |
| <ul style="list-style-type: none"> <li>shielded, max.</li> </ul>   | 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>  |  |
| <ul style="list-style-type: none"> <li>Resolution with overrange (bit including sign), max.</li> <li>Integration time, parameterizable</li> <li>Conversion time (per channel)</li> </ul>                         | 10 bit<br>Yes<br>625 µs  |
| <b>Encoder</b>   |  |
| <b>Connectable encoders</b>  |  |
| <ul style="list-style-type: none"> <li>2-wire sensor</li> </ul>  | Yes  |
| <b>1. Interface</b>  |  |
| Interface type   | PROFINET   |
| Isolated   | Yes  |
| automatic detection of transmission rate   | Yes  |
| Autonegotiation  | Yes  |
| Autocrossing   | Yes  |
| <b>Interface types</b>   |  |
| <ul style="list-style-type: none"> <li>RJ 45 (Ethernet)</li> <li>Number of ports</li> <li>integrated switch</li> </ul>   | Yes<br>1<br>No   |
| <b>Protocols</b>   |  |
| <ul style="list-style-type: none"> <li>PROFINET IO Controller</li> <li>PROFINET IO Device</li> <li>SIMATIC communication</li> <li>Open IE communication</li> <li>Web server</li> <li>Media redundancy</li> </ul> | Yes<br>Yes<br>Yes<br>Yes; Optionally also encrypted<br>Yes<br>No |
| <b>PROFINET IO Controller</b>  |  |
| <ul style="list-style-type: none"> <li>Transmission rate, max.</li> </ul>  | 100 Mbit/s   |
| <b>Services</b>  |  |
| <ul style="list-style-type: none"> <li>— PG/OP communication</li> <li>— Isochronous mode</li> <li>— IRT</li> <li>— PROFIenergy</li> </ul>  | Yes; encryption with TLS V1.3 pre-selected<br>No<br>No<br>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; encryption with TLS V1.3 pre-selected |
| — 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   |
| PROFIsafe                         | Yes   |
| 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 |

##### 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 |

##### 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   |  |
| <ul style="list-style-type: none"> <li>supported</li> <li>as server</li> <li>as client</li> <li>User data per job, max.</li> </ul> | Yes<br>Yes<br>Yes<br>See online help (S7 communication, user data size)  |
| Number of connections  |  |
| <ul style="list-style-type: none"> <li>overall</li> </ul>  | 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   |  |
| <ul style="list-style-type: none"> <li>Status/control variable</li> <li>Variables</li> </ul>                         | Yes<br>inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters |
| Forcing  |  |
| <ul style="list-style-type: none"> <li>Forcing</li> </ul>  | Yes; peripheral inputs/outputs (without fail-safe)   |
| Diagnostic buffer  |  |
| <ul style="list-style-type: none"> <li>present</li> </ul>  | Yes  |
| Traces   |  |
| <ul style="list-style-type: none"> <li>Number of configurable Traces</li> <li>Memory size per trace, max.</li> </ul> | 2<br>512 kbyte   |

**Interrupts/diagnostics/status information**

|  |                   |
|--|-------------------|
| Diagnostics indication LED   |                   |
| <ul style="list-style-type: none"> <li>RUN/STOP LED</li> <li>ERROR LED</li> <li>MAINT LED</li> </ul> | Yes<br>Yes<br>Yes |

**Integrated Functions**

|  |                            |
|--|----------------------------|
| Counter  |                            |
| <ul style="list-style-type: none"> <li>Number of counters</li> <li>Counting frequency, max.</li> </ul> | 6<br>100 kHz               |
| Frequency measurement  |                            |
| controlled positioning   | Yes                        |
| Number of position-controlled positioning axes, max.   | 8                          |
| Number of positioning axes via pulse-direction interface   | 4; With integrated outputs |
| PID controller   |                            |
| 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"> <li>Potential separation digital inputs</li> <li>between the channels, in groups of</li> </ul>                                | No<br>1        |
| Potential separation digital outputs   |                |
| <ul style="list-style-type: none"> <li>Potential separation digital outputs</li> <li>between the channels</li> <li>between the channels, in groups of</li> </ul> | Yes<br>No<br>1 |

**EMC**

|   |                     |
|---|---------------------|
| 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<br>8 kV<br>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<br>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   |
| <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> <li>• Limit class B, for use in residential areas</li> </ul>  | Yes; Group 1<br>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>  |   |
| CE mark  | Yes   |
| UL approval  | Yes   |
| cULus  | Yes   |
| FM approval  | Yes   |
| RCM (formerly C-TICK)  | Yes   |
| KC approval  | Yes   |
| Marine approval  | Yes   |
| <b>Highest safety class achievable in safety mode</b>  |   |
| <ul style="list-style-type: none"> <li>• Performance level according to ISO 13849-1</li> <li>• SIL acc. to IEC 61508</li> </ul>  | PLe<br>SIL 3  |
| <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>• min.</li> <li>• max.</li> <li>• horizontal installation, min.</li> <li>• horizontal installation, max.</li> <li>• vertical installation, min.</li> <li>• vertical installation, max.</li> </ul> | 0 °C<br>55 °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<br>0 °C<br>55 °C<br>0 °C<br>45 °C |
| <b>Ambient temperature during storage/transportation</b>   |   |
| <ul style="list-style-type: none"> <li>• min.</li> <li>• max.</li> </ul>   | -40 °C<br>70 °C   |
| <b>Air pressure acc. to IEC 60068-2-13</b>   |   |
| <ul style="list-style-type: none"> <li>• Operation, min.</li> <li>• Operation, max.</li> <li>• Storage/transport, min.</li> <li>• Storage/transport, max.</li> </ul>   | 795 hPa<br>1 080 hPa<br>660 hPa<br>1 080 hPa  |
| <b>Altitude during operation relating to sea level</b>   |   |
| <ul style="list-style-type: none"> <li>• Installation altitude, min.</li> <li>• Installation altitude, max.</li> </ul>   | -1 000 m<br>5 000 m; Restrictions for installation altitudes > 2 000 m, see manual  |
| <b>Relative humidity</b>   |   |
| <ul style="list-style-type: none"> <li>• Operation, max.</li> </ul>  | 95 %; no condensation   |
| <b>Vibrations</b>  |   |
| <ul style="list-style-type: none"> <li>• Vibration resistance during operation acc. to IEC 60068-2-6</li> <li>• Operation, tested according 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<br>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>Pollutant concentrations</b>  |   |
| <ul style="list-style-type: none"> <li>• SO<sub>2</sub> at RH &lt; 60% without condensation</li> </ul>   | SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free  |
| <b>configuration / header</b>  |   |
| configuration / programming / header   |   |
| Programming language   |   |
| <ul style="list-style-type: none"> <li>— LAD</li> <li>— FBD</li> </ul>   | Yes; incl. failsafe<br>Yes; incl. failsafe  |

|   |  |
|---|--|
| — SCL   | Yes  |
| <b>Know-how protection</b>                          |  |
| • User program protection/password protection       | Yes  |
| • Copy protection                                   | Yes  |
| • 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: Complete protection             | Yes  |
| <b>programming / cycle time monitoring / header</b> |  |
| • cycle monitoring time / adjustable                | Yes  |
| <b>Dimensions</b>                                   |  |
| Width   | 110 mm   |
| Height  | 100 mm   |
| Depth   | 75 mm  |
| <b>Weights</b>                                      |  |
| Weight, approx.                                     | 415 g  |
| <b>last modified:</b>                               | 4/1/2022  |