

SIMATIC S7-1200, CPU 1215C, compact CPU, DC/DC/DC, 2 PROFINET ports, onboard I/O: 14 DI 24 V DC; 10 DO 24 V DC; 0.5A; 2 AI 0-10 V DC, 2 AO 0-20 mA DC, Power supply: DC 20.4-28.8V DC, Program/data memory 125 KB



| General information                   |  |
|---------------------------------------|--|
| Product type designation              | CPU 1215C DC/DC/DC                       |
| Firmware version                      | V4.2                                     |
| Engineering with                      |  |
| • Programming package                 | STEP 7 V14 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)     | 500 mA; CPU only                         |
| Current consumption, max.             | 1 500 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   |
| <b>Output current</b>                                     |   |
| for backplane bus (5 V DC), max.                          | 1 600 mA; Max. 5 V DC for SM and CM   |
| <b>Encoder supply</b>                                     |   |
| 24 V encoder supply                                       |   |
| • 24 V  | L+ minus 4 V DC min.  |
| <b>Power loss</b>   |   |
| Power loss, typ.  | 12 W  |
| <b>Memory</b>   |   |
| Work memory   |   |
| • integrated  | 125 kbyte   |
| • expandable  | No  |
| Load memory   |   |
| • integrated  | 4 Mbyte   |
| • Plug-in (SIMATIC Memory Card), max.                     | with SIMATIC memory card  |
| Backup  |   |
| • present   | Yes   |
| • maintenance-free  | Yes   |
| • without battery   | Yes   |
| <b>CPU processing times</b>                               |   |
| 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   |
| <b>CPU-blocks</b>   |   |
| 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  |
| <b>Data areas and their retentivity</b>                   |   |
| Retentive data area (incl. timers, counters, flags), max. | 10 kbyte  |
| Flag  |   |
| • Number, 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   |
| <b>Address area</b>                                       |   |
| Process image   |   |

- Inputs, adjustable
- Outputs, adjustable

1 kbyte

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.  $\pm 60$  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)
- for signal "0"
- for signal "1"

24 V

5 V DC at 1 mA

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.
- unshielded, max.

500 m; 50 m for technological functions

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                         |
| 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                               | 2                           |
| Output ranges, current                                 |                             |
| • 0 to 20 mA   | Yes                         |
| 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                      |
| Analog value generation for the outputs                |                             |
| Integration and conversion time/resolution per channel |                             |
| • Resolution with overrange (bit including sign), max. | 10 bit                      |

|   |                    |
|---|--------------------|
| <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>Interface types</b>  |                    |
| • Number of ports   | 2                  |
| • integrated switch   | Yes                |
| <b>Protocols</b>  |                    |
| • PROFINET IO Controller  | Yes                |
| • PROFINET IO Device  | Yes                |
| • SIMATIC communication   | Yes                |
| • Open IE communication   | Yes                |
| • Web server  | Yes                |
| • Media redundancy  | Yes; as MRP client |
| <b>PROFINET IO Controller</b>   |                    |
| • Transmission rate, max.   | 100 Mbit/s         |
| <b>Services</b>   |                    |
| — PG/OP communication   | Yes                |
| — S7 routing  | Yes                |
| — Isochronous mode  | No                 |
| — Open IE communication   | Yes                |
| — IRT   | No                 |
| — MRP   | Yes; as MRP client |
| — MRPD  | No                 |
| — PROFINergy  | 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   |
| — S7 routing  | Yes   |
| — Isochronous mode                                  | No  |
| — Open IE communication                             | Yes   |
| — IRT   | No  |
| — MRP   | Yes; as MRP client                                    |
| — MRPD  | No  |
| — PROFINergy  | 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   |
| 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)                   |
| Number of connections                                    |  |
| • overall  | 16; dynamically  |
| 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                                     |  |
| Number of counters                                       | 6  |
| 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 outputs   |
| PID controller   | Yes  |
| Number of alarm inputs                                   | 4  |
| Number of pulse outputs                                  | 4  |
| Limit frequency (pulse)                                  | 100 kHz  |
| Potential separation                                     |  |
| Potential separation digital inputs                      |  |
| • Potential separation digital inputs                    | No   |
| • between the channels, in groups of                     | 1  |
| Potential separation digital outputs                     |  |
| • Potential separation digital outputs                   | Yes  |
| • between the channels                                   | No   |

- between the channels, in groups of

1

## EMC

### Interference immunity against discharge of static electricity

- Interference immunity against discharge of static electricity acc. to IEC 61000-4-2
  - 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 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

### 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 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 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               |   |
| • 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 <sup>2</sup> ) wall mounting, 1 g (m/s <sup>2</sup> ) 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 <sub>2</sub> at RH < 60% without condensation            | SO <sub>2</sub> : < 0.5 ppm; H <sub>2</sub> S: < 0.1 ppm; RH < 60% condensation-free      |
| Configuration   |   |
| Programming   |   |
| 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 level: Write protection                          | Yes   |
| • Protection level: Read/write protection                     | Yes   |
| • Protection level: Complete protection                       | Yes   |
| Cycle time monitoring   |   |
| • adjustable  | Yes   |
| Dimensions  |   |

|        |        |
|--------|--------|
| Width  | 130 mm |
| Height | 100 mm |
| Depth  | 75 mm  |

## Weights

|                 |       |
|-----------------|-------|
| Weight, approx. | 500 g |
|-----------------|-------|

**last modified:** 02/14/2020