

*** SPARE PART*** SIMATIC S7-300, CPU 312C COMPACT CPU WITH MPI, 10 DI/6 DO, 2 FAST COUNTERS (10 KHZ), INTEGRATED 24V DC POWER SUPPLY, 32 KBYTE WORKING MEMORY, FRONT CONNECTOR (1 X 40PIN) AND MICRO MEMORY CARD REQUIRED



Figure similar

| General information | |
|---|---|
| Hardware product version | 01 |
| Firmware version | V2.6 |
| Engineering with | |
| <ul style="list-style-type: none"> Programming package | STEP 7 V5.3 SP2 or higher with HW update |
| Supply voltage | |
| Rated value (DC) | |
| <ul style="list-style-type: none"> 24 V DC | Yes |
| permissible range, lower limit (DC) | 20.4 V |
| permissible range, upper limit (DC) | 28.8 V |
| external protection for power supply lines (recommendation) | Miniature circuit breaker, type C; min. 2 A; miniature circuit breaker type B, min. 4 A |
| Load voltage L+ | |
| <ul style="list-style-type: none"> Rated value (DC) | 24 V |
| <ul style="list-style-type: none"> permissible range, lower limit (DC) | 20.4 V |
| <ul style="list-style-type: none"> permissible range, upper limit (DC) | 28.8 V |
| Digital inputs | |

| | |
|---|---|
| Load voltage L+ | |
| — Rated value (DC) | 24 V |
| — Reverse polarity protection | Yes |
| Digital outputs | |
| Load voltage L+ | |
| — Rated value (DC) | 24 V |
| — Reverse polarity protection | No |
| Input current | |
| Current consumption (rated value) | 500 mA |
| Current consumption (in no-load operation), typ. | 60 mA |
| Inrush current, typ. | 11 A |
| I ² t | 0.7 A ² ·s |
| Digital outputs | |
| • from load voltage L+, max. | 50 mA |
| Power loss | |
| Power loss, typ. | 6 W |
| Memory | |
| Work memory | |
| • integrated | 32 kbyte |
| • expandable | No |
| Load memory | |
| • Plug-in (MMC) | Yes |
| • Plug-in (MMC), max. | 4 Mbyte |
| • Data management on MMC (after last programming), min. | 10 y |
| Backup | |
| • present | Yes; Guaranteed by MMC (maintenance-free) |
| • without battery | Yes; Program and data |
| CPU processing times | |
| for bit operations, typ. | 0.2 μs |
| for bit operations, max. | 0.4 μs |
| for word operations, typ. | 0.4 μs |
| for fixed point arithmetic, typ. | 5 μs |
| for floating point arithmetic, typ. | 6 μs |
| CPU-blocks | |
| Number of blocks (total) | 1 024; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used. |
| DB | |
| • Number, max. | 511; Number range: 1 to 511 |
| • Size, max. | 16 kbyte |
| FB | |

| | |
|---|--|
| • Number, max. | 1 024; Number range: 0 to 2047 |
| • Size, max. | 16 kbyte |
| FC | |
| • Number, max. | 1 024; Number range: 0 to 2047 |
| • Size, max. | 16 kbyte |
| OB | |
| • Number, max. | see instruction list |
| • Size, max. | 16 kbyte |
| • Number of free cycle OBs | 1; OB 1 |
| • Number of time alarm OBs | 1; OB 10 |
| • Number of delay alarm OBs | 1; OB 20 |
| • Number of cyclic interrupt OBs | 1; OB 35 |
| • Number of process alarm OBs | 1; OB 40 |
| • Number of startup OBs | 1; OB 100 |
| • Number of asynchronous error OBs | 4; OB 80, 82, 85, 87 |
| • Number of synchronous error OBs | 2; OB 121, 122 |
| Nesting depth | |
| • per priority class | 8 |
| • additional within an error OB | 4 |
| Counters, timers and their retentivity | |
| S7 counter | |
| • Number | 128 |
| of which retentive without battery | |
| — can be set | Yes |
| — lower limit | 0 |
| — upper limit | 127 |
| — preset | 8 |
| Retentivity | |
| — adjustable | Yes |
| — lower limit | 0 |
| — upper limit | 127 |
| — preset | 8 |
| Counting range | |
| — lower limit | 0 |
| — upper limit | 999 |
| IEC counter | |
| • present | Yes |
| • Type | SFB |
| • Number | Unlimited (limited only by RAM capacity) |
| S7 times | |
| • Number | 128 |

| | |
|--|--|
| of which retentive without battery | |
| — adjustable | Yes |
| — lower limit | 0 |
| — upper limit | 127 |
| Retentivity | |
| — adjustable | Yes |
| — lower limit | 0 |
| — upper limit | 127 |
| — preset | No retentivity |
| Time range | |
| — lower limit | 10 ms |
| — upper limit | 9 990 s |
| IEC timer | |
| • present | Yes |
| • Type | SFB |
| • Number | Unlimited (limited only by RAM capacity) |
| Data areas and their retentivity | |
| retentive data area in total | all |
| Flag | |
| • Number, max. | 128 byte |
| • Retentivity available | Yes; MB 0 to MB 127 |
| • Retentivity preset | MB 0 to MB 15 |
| • Number of clock memories | 8; 1 memory byte |
| Data blocks | |
| • Number, max. | 511; from DB1 to DB511 |
| • Size, max. | 16 kbyte |
| • Retentivity adjustable | Yes; via non-retain property on DB |
| • Retentivity preset | Yes |
| Local data | |
| • per priority class, max. | 256 byte |
| Address area | |
| I/O address area | |
| • Inputs | 1 kbyte |
| • Outputs | 1 kbyte |
| Process image | |
| • Inputs | 128 byte |
| • Outputs | 128 byte |
| Default addresses of the integrated channels | |
| — Digital inputs | 124.0 to 125.1 |
| — Digital outputs | 124.0 to 124.5 |
| Digital channels | |

| | |
|--|---|
| • Inputs | 266 |
| — of which central | 266 |
| • Outputs | 262 |
| — of which central | 262 |
| Analog channels | |
| • Inputs | 64 |
| — of which central | 64 |
| • Outputs | 64 |
| — of which central | 64 |
| Hardware configuration | |
| Number of expansion units, max. | 0 |
| Number of DP masters | |
| • integrated | none |
| • via CP | 4 |
| Number of operable FMs and CPs (recommended) | |
| • FM | 8 |
| • CP, PtP | 8 |
| • CP, LAN | 4 |
| Rack | |
| • Racks, max. | 1 |
| • Modules per rack, max. | 8 |
| Time of day | |
| Clock | |
| • Software clock | Yes |
| • retentive and synchronizable | No |
| • Deviation per day, max. | 15 s |
| Operating hours counter | |
| • Number | 1 |
| • Number/Number range | 0 |
| • Range of values | 0 to 2 ³¹ hours (when using SFC 101) |
| • Granularity | 1 hour |
| • retentive | Yes; Must be restarted at each restart |
| Clock synchronization | |
| • supported | Yes |
| • to MPI, master | Yes |
| • to MPI, slave | Yes |
| • in AS, master | Yes |
| Digital inputs | |
| Number of digital inputs | 10 |
| • of which inputs usable for technological functions | 8 |

| | |
|---|--|
| integrated channels (DI) | 10 |
| Input characteristic curve in accordance with IEC 61131, type 1 | Yes |
| Number of simultaneously controllable inputs | |
| horizontal installation | |
| — up to 40 °C, max. | 10 |
| — up to 60 °C, max. | 5 |
| vertical installation | |
| — up to 40 °C, max. | 5 |
| Input voltage | |
| • Rated value (DC) | 24 V |
| • for signal "0" | -3 to +5V |
| • for signal "1" | +15 to +30V |
| Input current | |
| • for signal "1", typ. | 9 mA |
| Input delay (for rated value of input voltage) | |
| for standard inputs | |
| — parameterizable | Yes; 0.1 / 0.3 / 3 / 15 ms |
| — Rated value | 3 ms |
| for counter/technological functions | |
| — at "0" to "1", max. | 48 µs |
| Cable length | |
| • shielded, max. | 1 000 m; 100 m for technological functions |
| • unshielded, max. | 600 m; For technological functions: No |
| for technological functions | |
| — shielded, max. | 100 m |
| — unshielded, max. | not allowed |
| Digital outputs | |
| Number of digital outputs | 6 |
| • of which high-speed outputs | 2 |
| integrated channels (DO) | 6 |
| Short-circuit protection | Yes; Clocked electronically |
| • Response threshold, typ. | 1 A |
| Limitation of inductive shutdown voltage to | L+ (-48 V) |
| Controlling a digital input | Yes |
| Switching capacity of the outputs | |
| • on lamp load, max. | 5 W |
| Load resistance range | |
| • lower limit | 48 Ω |
| • upper limit | 4 kΩ |
| Output voltage | |
| • for signal "1", min. | L+ (-0.8 V) |

| Output current | |
|---|-----------------------------|
| • for signal "1" rated value | 500 mA |
| • for signal "1" permissible range, min. | 5 mA |
| • for signal "1" permissible range, max. | 0.6 A |
| • for signal "1" minimum load current | 5 mA |
| • for signal "0" residual current, max. | 0.5 mA |
| Parallel switching of two outputs | |
| • for uprating | No |
| • for redundant control of a load | Yes |
| Switching frequency | |
| • with resistive load, max. | 100 Hz |
| • with inductive load, max. | 0.5 Hz |
| • on lamp load, max. | 100 Hz |
| • of the pulse outputs, with resistive load, max. | 2.5 kHz |
| Total current of the outputs (per group) | |
| horizontal installation | |
| — up to 40 °C, max. | 2 A |
| — up to 60 °C, max. | 1.5 A |
| vertical installation | |
| — up to 40 °C, max. | 1.5 A |
| Cable length | |
| • shielded, max. | 1 000 m |
| • unshielded, max. | 600 m |
| Analog inputs | |
| integrated channels (AI) | none |
| Analog outputs | |
| integrated channels (AO) | none |
| Encoder | |
| Connectable encoders | |
| • 2-wire sensor | Yes |
| — permissible quiescent current (2-wire sensor), max. | 1.5 mA |
| Interfaces | |
| Number of industrial Ethernet interfaces | 0 |
| Number of RS 485 interfaces | 1; MPI |
| Number of RS 422 interfaces | 0 |
| MPI | |
| • Cable length, max. | 50 m; without repeater |
| 1. Interface | |
| Interface type | Integrated RS 485 interface |

| | |
|---|--|
| Physics | RS 485 |
| Isolated | No |
| Power supply to interface (15 to 30 V DC), max. | 200 mA |
| Functionality | |
| • MPI | Yes |
| • PROFIBUS DP master | No |
| • PROFIBUS DP slave | No |
| • Point-to-point connection | No |
| MPI | |
| • Number of connections | 6 |
| • Transmission rate, max. | 187.5 kbit/s |
| Services | |
| — PG/OP communication | Yes |
| — Routing | No |
| — Global data communication | Yes |
| — S7 basic communication | Yes |
| — S7 communication | Yes |
| — S7 communication, as client | No |
| — S7 communication, as server | Yes |
| Communication functions | |
| PG/OP communication | Yes |
| Global data communication | |
| • supported | Yes |
| • Number of GD loops, max. | 4 |
| • Number of GD packets, max. | 4 |
| • Number of GD packets, transmitter, max. | 4 |
| • Number of GD packets, receiver, max. | 4 |
| • Size of GD packets, max. | 22 byte |
| • Size of GD packet (of which consistent), max. | 22 byte |
| S7 basic communication | |
| • supported | Yes |
| • User data per job, max. | 76 byte |
| • User data per job (of which consistent), max. | 76 byte; 76 bytes (with X_SEND or X_RCV); 64 bytes (with X_PUT or X_GET as server) |
| S7 communication | |
| • supported | Yes |
| • as server | Yes |
| • as client | Yes; Via CP and loadable FB |
| • User data per job, max. | 180 byte; With PUT/GET |
| • User data per job (of which consistent), max. | 64 byte |
| S5 compatible communication | |

| | |
|---|-----------------------------|
| • supported | Yes; via CP and loadable FC |
| Number of connections | |
| • overall | 6 |
| • usable for PG communication | 5 |
| — reserved for PG communication | 1 |
| — adjustable for PG communication, min. | 1 |
| — adjustable for PG communication, max. | 5 |
| • usable for OP communication | 5 |
| — reserved for OP communication | 1 |
| — adjustable for OP communication, min. | 1 |
| — adjustable for OP communication, max. | 5 |
| • usable for S7 basic communication | 2 |
| — reserved for S7 basic communication | 0 |
| — adjustable for S7 basic communication, min. | 0 |
| — adjustable for S7 basic communication, max. | 2 |
| • usable for routing | No |

| | |
|--|---|
| S7 message functions | |
| Number of login stations for message functions, max. | 6; Depending on the configured connections for PG/OP and S7 basic communication |
| Process diagnostic messages | Yes |
| simultaneously active Alarm-S blocks, max. | 20 |

| | |
|-------------------------------------|-----|
| Test commissioning functions | |
| Status block | Yes |
| Single step | Yes |
| Number of breakpoints | 2 |

| | |
|------------------------------------|---|
| Status/control | |
| • Status/control variable | Yes |
| • Variables | Inputs, outputs, memory bits, DB, times, counters |
| • Number of variables, max. | 30 |
| — of which status variables, max. | 30 |
| — of which control variables, max. | 14 |

| | |
|-----------------------------|-----------------|
| Forcing | |
| • Forcing | Yes |
| • Forcing, variables | Inputs, outputs |
| • Number of variables, max. | 10 |

| | |
|---------------------------|-----|
| Diagnostic buffer | |
| • present | Yes |
| • Number of entries, max. | 100 |

Interrupts/diagnostics/status information

| Diagnostics indication LED | |
|---|-----|
| • Status indicator digital input (green) | Yes |
| • Status indicator digital output (green) | Yes |

Integrated Functions

| | |
|--|---|
| Number of counters | 2; 2 channels (see "Technological Functions" manual) |
| Counting frequency (counter) max. | 10 kHz |
| Frequency measurement | Yes |
| Number of frequency meters | 2; 2 channels up to max. 10 kHz (see "Technological Functions" manual) |
| controlled positioning | No |
| integrated function blocks (closed-loop control) | No |
| PID controller | No |
| Number of pulse outputs | 2; 2 channels pulse width modulation up to 2.5 kHz (see Manual "Technological Functions") |
| Limit frequency (pulse) | 2.5 kHz |

Potential separation

| Potential separation digital inputs | |
|--|-----|
| • Potential separation digital inputs | Yes |
| • between the channels | No |
| • between the channels and backplane bus | Yes |
| Potential separation digital outputs | |
| • Potential separation digital outputs | Yes |
| • between the channels | No |
| • between the channels and backplane bus | Yes |

Permissible potential difference

| | |
|----------------------------|-----------------|
| between different circuits | 75 V DC/60 V AC |
|----------------------------|-----------------|

Isolation

| | |
|-----------------------|----------|
| Isolation tested with | 600 V DC |
|-----------------------|----------|

Configuration

| Configuration software | |
|--------------------------------|------------------------------|
| • STEP 7 | Yes; V5.3 SP2 with HW update |
| Programming | |
| • Command set | see instruction list |
| • Nesting levels | 8 |
| • System functions (SFC) | see instruction list |
| • System function blocks (SFB) | see instruction list |
| Programming language | |
| — LAD | Yes |
| — FBD | Yes |
| — STL | Yes |

- SCL Yes
- GRAPH Yes
- HiGraph® Yes

Know-how protection

- User program protection/password protection Yes

Dimensions

| | |
|--------|--------|
| Width | 80 mm |
| Height | 125 mm |
| Depth | 130 mm |

Weights

| | |
|-----------------|-------|
| Weight, approx. | 409 g |
|-----------------|-------|

last modified: 03/23/2017