# SIEMENS

***Spare part*** SIMATIC S7-300 CPU 317-2 PN/DP, Central processing unit with 1 MB work memory, 1st interface MPI/DP 12 Mbit/s, 2nd interface Ethernet PROFINET, Micro Memory Card required



Figure similar

| General information | |
|---|---|
| HW functional status | 01 |
| Firmware version | V2.6 |
| Engineering with | |
| • Programming package | STEP 7 V5.4 SP2 |

| 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 |
| external protection for power supply lines (recommendation) | 2 A min. |

| Input current | |
|---|---|
| Current consumption (rated value) | 650 mA |
| Current consumption (in no-load operation), typ. | 100 mA |
| Inrush current, typ. | 2.5 A |
| I²t | 1 A²·s |

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| Power loss | |
|---|---|
| Power loss, typ. | 3.5 W |

| Memory | |
|---|---|
| **Work memory** | |
| • integrated | 1 Mbyte; For program and data |
| • expandable | No |
| • Size of retentive memory for retentive data blocks | 256 kbyte |
| **Load memory** | |
| • Plug-in (MMC) | Yes |
| • Plug-in (MMC), max. | 8 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. | 0.05 µs |
| for word operations, typ. | 0.2 µs |
| for fixed point arithmetic, typ. | 0.2 µs |
| for floating point arithmetic, typ. | 1 µs |

| CPU-blocks | |
|---|---|
| Number of blocks (total) | 2 048; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used. |
| **DB** | |
| • Number, max. | 2 047; Number band: 1 to 2047 |
| • Size, max. | 64 kbyte |
| **FB** | |
| • Number, max. | 2 048; Number range: 0 to 2047 |
| • Size, max. | 64 kbyte |
| **FC** | |
| • Number, max. | 2 048; Number range: 0 to 2047 |
| • Size, max. | 64 kbyte |
| **OB** | |
| • Size, max. | 64 kbyte |
| • Number of free cycle OBs | 1; OB 1 |
| • Number of time alarm OBs | 1; OB 10 |
| • Number of delay alarm OBs | 2; OB 20, 21 |
| • Number of cyclic interrupt OBs | 4; OB 32, 33, 34, 35 |
| • Number of process alarm OBs | 1; OB 40 |
| • Number of DPV1 alarm OBs | 3; OB 55, 56, 57 |

| | |
|---|---|
| • Number of isochronous mode OBs | 1; OB 61 |
| • Number of startup OBs | 1; OB 100 |
| • Number of asynchronous error OBs | 6; OB 80, 82, 83, 85, 86, 87 |
| • Number of synchronous error OBs | 2; OB 121, 122 |
| **Nesting depth** | |
| • per priority class | 16 |
| • additional within an error OB | 4 |

## Counters, timers and their retentivity

| | |
|---|---|
| **S7 counter** | |
| • Number | 512 |
| Retentivity | |
| — adjustable | Yes |
| — lower limit | 0 |
| — upper limit | 511 |
| — preset | Z 0 to Z 7 |
| Counting range | |
| — can be set | Yes |
| — lower limit | 0 |
| — upper limit | 999 |
| **IEC counter** | |
| • Number | Unlimited (limited only by RAM capacity) |
| **S7 times** | |
| • Number | 512 |
| Retentivity | |
| — adjustable | Yes |
| — lower limit | 0 |
| — upper limit | 511 |
| — 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, max. 256 KB |
| **Flag** | |
| • Number, max. | 4 096 byte |
| • Retentivity available | Yes; From MB 0 to MB 4095 |
| • Retentivity preset | MB 0 to MB 15 |

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| | |
|---|---|
| • Number of clock memories | 8; 1 memory byte |
| **Data blocks** | |
| • Retentivity adjustable | Yes; via non-retain property on DB |
| • Retentivity preset | Yes |
| **Local data** | |
| • per priority class, max. | 1 024 byte |

## Address area

| | |
|---|---|
| **I/O address area** | |
| • Inputs | 8 192 byte |
| • Outputs | 8 192 byte |
| of which distributed | |
| — Inputs | 8 192 byte |
| — Outputs | 8 192 byte |
| **Process image** | |
| • Inputs | 2 048 byte |
| • Outputs | 2 048 byte |
| • Inputs, adjustable | 2 048 byte |
| • Outputs, adjustable | 2 048 byte |
| • Inputs, default | 256 byte |
| • Outputs, default | 256 byte |
| **Subprocess images** | |
| • Number of subprocess images, max. | 1 |
| **Digital channels** | |
| • Inputs | 65 536 |
| — of which central | 1 024 |
| • Outputs | 65 536 |
| — of which central | 1 024 |
| **Analog channels** | |
| • Inputs | 4 096 |
| — of which central | 256 |
| • Outputs | 4 096 |
| — of which central | 256 |

## Hardware configuration

| | |
|---|---|
| Number of expansion units, max. | 3 |
| **Number of DP masters** | |
| • integrated | 1 |
| • via CP | 4 |
| **Number of operable FMs and CPs (recommended)** | |
| • FM | 8 |
| • CP, PtP | 8 |
| • CP, LAN | 10 |

| Rack | |
|---|---|
| • Racks, max. | 4 |
| • Modules per rack, max. | 8 |

| Time of day | |
|---|---|
| **Clock** | |
| • Hardware clock (real-time) | Yes |
| • retentive and synchronizable | Yes |
| • Backup time | 6 wk; At 40 °C ambient temperature |
| • Deviation per day, max. | 10 s |
| • Behavior of the clock following POWER-ON | Clock continues running after POWER OFF |
| • Behavior of the clock following expiry of backup period | Clock continues to run with the time at which the power failure occurred |
| **Operating hours counter** | |
| • Number | 4 |
| • Number/Number range | 0 to 3 |
| • Range of values | 0 to 2^31 hours (when using SFC 101) |
| • retentive | Yes; Must be restarted at each restart |
| **Clock synchronization** | |
| • supported | Yes |
| • to MPI, master | Yes |
| • to MPI, slave | Yes |
| • to DP, master | Yes; With DP slave only slave clock |
| • to DP, slave | Yes |
| • in AS, master | Yes |
| • in AS, slave | Yes |
| • on Ethernet via NTP | Yes; As client |

| Digital inputs | |
|---|---|
| integrated channels (DI) | 0 |

| Digital outputs | |
|---|---|
| integrated channels (DO) | 0 |

| Analog inputs | |
|---|---|
| integrated channels (AI) | 0 |

| Analog outputs | |
|---|---|
| integrated channels (AO) | 0 |

| Interfaces | |
|---|---|
| Number of industrial Ethernet interfaces | 1 |
| Number of PROFINET interfaces | 1 |
| Number of RS 485 interfaces | 2 |
| Number of RS 422 interfaces | 0 |

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| 1. Interface | |
|---|---|
| Interface type | Integrated RS 485 interface |
| Physics | RS 485 |
| Isolated | Yes |
| Power supply to interface (15 to 30 V DC), max. | 200 mA |
| **Functionality** | |
| • MPI | Yes |
| • PROFIBUS DP master | Yes |
| • PROFIBUS DP slave | Yes |
| • Point-to-point connection | No |
| **MPI** | |
| • Number of connections | 32 |
| • Transmission rate, max. | 12 Mbit/s |
| **Services** | |
| — PG/OP communication | Yes |
| — Routing | Yes |
| — Global data communication | Yes |
| — S7 basic communication | Yes |
| — S7 communication | Yes |
| — S7 communication, as client | No |
| — S7 communication, as server | Yes |
| **DP master** | |
| • Transmission rate, max. | 12 Mbit/s |
| • Number of DP slaves, max. | 124 |
| **Services** | |
| — PG/OP communication | Yes |
| — Routing | Yes |
| — Global data communication | No |
| — S7 basic communication | Yes; I blocks only |
| — S7 communication | Yes |
| — S7 communication, as client | No |
| — S7 communication, as server | Yes |
| — Equidistance | Yes |
| — Isochronous mode | Yes; OB 61 |
| — SYNC/FREEZE | Yes |
| — Activation/deactivation of DP slaves | Yes |
| — Number of DP slaves that can be simultaneously activated/deactivated, max. | 4 |
| — DPV1 | Yes |
| **Address area** | |
| — Inputs, max. | 8 kbyte |
| — Outputs, max. | 8 kbyte |

| | |
|---|---|
| User data per DP slave | |
| — Inputs, max. | 244 byte |
| — Outputs, max. | 244 byte |
| **DP slave** | |
| • Transmission rate, max. | 12 Mbit/s |
| • automatic baud rate search | Yes; only with passive interface |
| • Address area, max. | 32 |
| • User data per address area, max. | 32 byte |
| Services | |
| — PG/OP communication | Yes |
| — Routing | Yes; with interface active |
| — Global data communication | No |
| — S7 basic communication | No |
| — S7 communication | Yes |
| — S7 communication, as client | No |
| — S7 communication, as server | Yes |
| — Direct data exchange (slave-to-slave communication) | Yes |
| — DPV1 | No |
| Transfer memory | |
| — Inputs | 244 byte |
| — Outputs | 244 byte |
| **2. Interface** | |
| Interface type | PROFINET |
| Physics | Ethernet RJ45 |
| Isolated | Yes |
| Power supply to interface (15 to 30 V DC), max. | 0 mA |
| automatic detection of transmission rate | Yes; 10/100 Mbit/s |
| **Functionality** | |
| • MPI | No |
| • PROFINET IO Controller | Yes |
| • PROFINET IO Device | No |
| • PROFINET CBA | Yes |
| • PROFIBUS DP master | No |
| • PROFIBUS DP slave | No |
| • Open IE communication | Yes; Via TCP/IP, ISO on TCP, and UDP |
| • Web server | Yes |
| • Point-to-point connection | No |
| **PROFINET IO Controller** | |
| • Transmission rate, max. | 100 Mbit/s |
| Services | |

| | |
|---|---|
| — PG/OP communication | Yes |
| — Routing | Yes |
| — S7 communication | Yes; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 |
| — Open IE communication | Yes; Via TCP/IP, ISO on TCP, and UDP |
| — Number of connectable IO Devices, max. | 128 |
| — Send cycles | 1 ms |
| — Updating time | 1 to 512 ms (minimum value depends on communication share set for PROFINET I/O, on the number of I/O devices, and on the volume of configured user data) |
| **Address area** | |
| — Inputs, max. | 8 kbyte |
| — Outputs, max. | 8 kbyte |
| — User data consistency, max. | 254 byte |
| **PROFINET CBA** | |
| • acyclic transmission | Yes |
| • cyclic transmission | Yes |

## Protocols

### Open IE communication

| | |
|---|---|
| • TCP/IP | Yes; via integrated PROFINET interface and loadable FBs |
| — Data length for connection type 01H, max. | 1 460 byte |
| — Data length for connection type 11H, max. | 8 192 byte |
| • ISO-on-TCP (RFC1006) | Yes; via integrated PROFINET interface and loadable FBs |
| — Data length, max. | 8 192 byte |
| • UDP | Yes; via integrated PROFINET interface and loadable FBs |
| — Number of connections, max. | 8 |
| — Data length, max. | 1 472 byte |

### Web server

| | |
|---|---|
| • Number of HTTP clients | 5 |

## Communication functions

| | |
|---|---|
| PG/OP communication | Yes |
| Data record routing | No |
| **Global data communication** | |
| • supported | Yes |
| • Number of GD loops, max. | 8 |
| • Number of GD packets, max. | 8 |
| • Number of GD packets, transmitter, max. | 8 |
| • Number of GD packets, receiver, max. | 8 |
| • 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 integrated PROFINET interface and loadable FB or via CP and loadable FB |
| • User data per job, max. | See online help of STEP 7 (shared parameters of the SFBs/FBs and of the SFCs/FCs of S7 Communication) |
| **S5 compatible communication** | |
| • supported | Yes; via CP and loadable FC |
| **Web server** | |
| • supported | Yes; only read function |
| **PROFINET CBA (at set setpoint communication load)** | |
| • Setpoint for the CPU communication load | 50 % |
| • Number of remote interconnection partners | 32 |
| • Number of functions, master/slave | 30 |
| • Total of all master/slave connections | 1 000 |
| • Data length of all incoming connections master/slave, max. | 4 000 byte |
| • Data length of all outgoing connections master/slave, max. | 4 000 byte |
| • Number of device-internal and PROFIBUS interconnections | 500 |
| • Data length of device-internal und PROFIBUS interconnections, max. | 4 000 byte |
| • Data length per connection, max. | 1 400 byte |
| **Remote interconnections with acyclic transmission** | |
| — Sampling frequency: Sampling time, min. | 500 ms |
| — Number of incoming interconnections | 100 |
| — Number of outgoing interconnections | 100 |
| — Data length of all incoming interconnections, max. | 2 000 byte |
| — Data length of all outgoing interconnections, max. | 2 000 byte |
| — Data length per connection, max. | 1 400 byte |
| **Remote interconnections with cyclic transmission** | |
| — Transmission frequency: Transmission interval, min. | 10 ms |
| — Number of incoming interconnections | 200 |
| — Number of outgoing interconnections | 200 |

| | |
|---|---|
| — Data length of all incoming interconnections, max. | 2 000 byte |
| — Data length of all outgoing interconnections, max. | 2 000 byte |
| — Data length per connection, max. | 450 byte |
| **HMI variables via PROFINET (acyclic)** | |
| — Number of stations that can log on for HMI variables (PN OPC/iMap) | 3; 2x PN OPC/1x iMap |
| — HMI variable updating | 500 ms |
| — Number of HMI variables | 200 |
| — Data length of all HMI variables, max. | 2 000 byte |
| **PROFIBUS proxy functionality** | |
| — supported | Yes |
| — Number of linked PROFIBUS devices | 16 |
| — Data length per connection, max. | 240 byte; Slave-dependent |
| **Number of connections** | |
| • overall | 32 |
| • usable for PG communication | 31 |
| — reserved for PG communication | 1 |
| — adjustable for PG communication, min. | 1 |
| — adjustable for PG communication, max. | 31 |
| • usable for OP communication | 31 |
| — reserved for OP communication | 1 |
| — adjustable for OP communication, min. | 1 |
| — adjustable for OP communication, max. | 31 |
| • usable for S7 basic communication | 30 |
| — reserved for S7 basic communication | 0 |
| — adjustable for S7 basic communication, min. | 0 |
| — adjustable for S7 basic communication, max. | 30 |
| • usable for S7 communication | 16 |
| — reserved for S7 communication | 0 |
| — adjustable for S7 communication, min. | 0 |
| — adjustable for S7 communication, max. | 16 |
| • total number of instances, max. | 32 |
| • usable for routing | X1 as MPI: max. 10; X1 as DP master: max. 24; X1 as DP slave (active): max. 14; X2 as PROFINET: 24 max. |
| **S7 message functions** | |
| Number of login stations for message functions, max. | 32; Depending on the configured connections for PG/OP and S7 basic communication |
| Process diagnostic messages | Yes |

| | |
|---|---|
| simultaneously active Alarm-S blocks, max. | 60 |

## 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. | 500 |
| — adjustable | No |
| — of which powerfail-proof | 100 |

## Configuration

### Configuration software

| | |
|---|---|
| ● STEP 7 | Yes; V5.4 SP2 or higher |

### 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 |
| — CFC | 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. | 460 g |

| last modified: | 04/19/2018 |
|---|---|