# SIEMENS

SIMATIC S7-300, CPU 317-2 DP, Central processing unit with 1 MB work memory, 1st interface MPI/DP 12 Mbit/s, 2nd interface DP master/slave Micro Memory Card required



| General information | |
|---|---|
| HW functional status | 01 |
| Firmware version | V3.3 |
| Engineering with | |
| • Programming package | STEP 7 as of V5.5 + SP1 or STEP 7 V5.2 + SP1 or higher with HSP 202 |

| Supply voltage | |
|---|---|
| Rated value (DC) | |
| • 24 V DC | Yes |
| permissible range, lower limit (DC) | 19.2 V |
| permissible range, upper limit (DC) | 28.8 V |
| external protection for power supply lines (recommendation) | 2 A min. |
| Mains buffering | |
| • Mains/voltage failure stored energy time | 5 ms |
| • Repeat rate, min. | 1 s |

| Input current | |
|---|---|
| Current consumption (rated value) | 870 mA |

| | |
|---|---|
| Current consumption (in no-load operation), typ. | 120 mA |
| Inrush current, typ. | 4 A |
| I²t | 1 A²·s |

## Power loss

| | |
|---|---|
| Power loss, typ. | 4.5 W |

## Memory

### Work memory

| | |
|---|---|
| • integrated | 1 024 kbyte |
| • 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. | 0.025 µs |
| for word operations, typ. | 0.03 µs |
| for fixed point arithmetic, typ. | 0.04 µs |
| for floating point arithmetic, typ. | 0.16 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. | 2 048; Number range: 1 to 16000 |
| • Size, max. | 64 kbyte |

### FB

| | |
|---|---|
| • Number, max. | 2 048; Number range: 0 to 7999 |
| • Size, max. | 64 kbyte |

### FC

| | |
|---|---|
| • Number, max. | 2 048; Number range: 0 to 7999 |
| • Size, max. | 64 kbyte |

### OB

| | |
|---|---|
| • Description | see instruction list |
| • 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 | 5; OB 80, 82, 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 | |
| — lower limit | 0 |
| — upper limit | 999 |
| **IEC counter** | |
| • present | Yes |
| • Type | SFB |
| • 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** | |

08/16/2019

| | |
|---|---|
| retentive data area in total | All, max. 256 KB |

| Flag | |
|---|---|
| • Number, max. | 4 096 byte |
| • Retentivity available | Yes; From MB 0 to MB 4 095 |
| • Retentivity preset | MB 0 to MB 15 |
| • 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. | 32 768 byte; Max. 2048 bytes per block |

## 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 | 8 192 byte |
| • Outputs | 8 192 byte |
| • Inputs, adjustable | 8 192 byte |
| • Outputs, adjustable | 8 192 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 | 2 |

| | |
|---|---|
| • 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; Typ.: 2 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) |
| • Granularity | 1 h |
| • 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 | No |

## Digital inputs

| | |
|---|---|
| Number of digital inputs | 0 |

## Digital outputs

| | |
|---|---|
| Number of digital outputs | 0 |

## Analog inputs

| | |
|---|---|
| Number of analog inputs | 0 |

## Analog outputs

| | |
|---|---|
| Number of analog outputs | 0 |

08/16/2019

| Interfaces | |
|---|---|
| Number of industrial Ethernet interfaces | 0 |
| Number of PROFINET interfaces | 0 |
| Number of RS 485 interfaces | 2; Combined MPI / PROFIBUS DP and PROFIBUS DP |
| Number of RS 422 interfaces | 0 |

| 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 |
| **Protocols** | |
| • MPI | Yes |
| • PROFIBUS DP master | Yes |
| • PROFIBUS DP slave | Yes; A DP slave at both interfaces simultaneously is not possible |
| • Point-to-point connection | No |
| **MPI** | |
| • Transmission rate, max. | 12 Mbit/s |
| **Services** | |
| — PG/OP communication | Yes |
| — Routing | Yes |
| — Global data communication | Yes |
| — S7 basic communication | Yes |
| — S7 communication | Yes; Only server, configured on one side |
| — S7 communication, as client | No; but via CP and loadable FB |
| — S7 communication, as server | Yes |
| **PROFIBUS 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; Only server, configured on one side |
| — S7 communication, as client | No |
| — S7 communication, as server | Yes |
| — Equidistance | Yes |
| — Isochronous mode | No |
| — SYNC/FREEZE | Yes |
| — Activation/deactivation of DP slaves | Yes |

08/16/2019

| | |
|---|---|
| — Number of DP slaves that can be simultaneously activated/deactivated, max. | 8 |
| — Direct data exchange (slave-to-slave communication) | Yes; As subscriber |
| — 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 |
| **PROFIBUS 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; Only with active interface |
| — Global data communication | No |
| — S7 basic communication | No |
| — S7 communication | Yes; Only server, configured on one side |
| — S7 communication, as client | No |
| — S7 communication, as server | Yes; Connection configured on one side only |
| — Direct data exchange (slave-to-slave communication) | Yes |
| — DPV1 | No |
| **Transfer memory** | |
| — Inputs | 244 byte |
| — Outputs | 244 byte |

| **2. Interface** | |
|---|---|
| Interface type | Integrated RS 485 interface |
| Physics | RS 485 |
| Isolated | Yes |
| Power supply to interface (15 to 30 V DC), max. | 200 mA |
| **Protocols** | |
| ● MPI | No |
| ● PROFIBUS DP master | Yes |
| ● PROFIBUS DP slave | Yes; A DP slave at both interfaces simultaneously is not possible |
| ● Point-to-point connection | No |
| **PROFIBUS 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; Only server, configured on one side |
| — S7 communication, as client | No; but via CP and loadable FB |
| — 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. | 8 |
| — Direct data exchange (slave-to-slave communication) | Yes; As subscriber |
| — DPV1 | Yes |
| **Address area** | |
| — Inputs, max. | 8 192 byte |
| — Outputs, max. | 8 192 byte |
| **User data per DP slave** | |
| — Inputs, max. | 244 byte |
| — Outputs, max. | 244 byte |
| **PROFIBUS DP slave** | |
| • GSD file | The latest GSD file is available on the Internet (http://www.siemens.com/profibus-gsd) |
| • 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; Only with active interface |
| — Global data communication | No |
| — S7 basic communication | No |
| — S7 communication | Yes; Only server, configured on one side |
| — S7 communication, as client | No; but via CP and loadable FB |
| — S7 communication, as server | Yes |
| — Direct data exchange (slave-to-slave communication) | Yes |
| — DPV1 | No |

| | |
|---|---|
| Transfer memory | |
| — Inputs | 244 byte |
| — Outputs | 244 byte |

## Communication functions

| | |
|---|---|
| PG/OP communication | Yes |
| Data record routing | Yes |

### 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 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 |

### 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 routing | X1 as a MPI, max. 10; X1 as DP Master max. 24; X1 as DP Slave (active) max. 14; X2 as DP Master max. 24; X2 as DP Slave (active) max. 14 |

## 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. | 300 |

## Test commissioning functions

| | |
|---|---|
| Status block | Yes; Up to 2 simultaneously |
| Single step | Yes |
| Number of breakpoints | 4 |

### 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; Only the last 100 entries are retained |
| • Number of entries readable in RUN, max. | 499 |
| — adjustable | Yes; From 10 to 499 |
| — preset | 10 |

### Service data

| | |
|---|---|
| • can be read out | Yes |

## Ambient conditions

### Ambient temperature during operation

| | |
|---|---|
| • min. | 0 °C |
| • max. | 60 °C |

## Configuration

### Configuration software

08/16/2019

| | |
|---|---|
| • STEP 7 | Yes; STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203 |
| • STEP 7 Lite | No |
| **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 |
| • Block encryption | Yes; With S7 block Privacy |

| Dimensions | |
|---|---|
| Width | 40 mm |
| Height | 125 mm |
| Depth | 130 mm |

| Weights | |
|---|---|
| Weight, approx. | 360 g |
| **last modified:** | 08/15/2019 |