



SIMATIC S7-300 CPU 317-2 PN/DP,
CENTRAL PROCESSING UNIT WITH 1 MB WORKING
MEMORY,
1. INTERFACE MPI/DP 12MBIT/S,
2. INTERFACE ETHERNET PROFINET,
WITH 2 PORT SWITCH,
MICRO MEMORY CARD NECESSARY

General information

| | |
|--------------------------|------|
| Hardware product version | 01 |
| Firmware version | V3.2 |

Engineering with

| | |
|---------------------|-----------------------|
| Programming package | STEP7 V 5.5 or higher |
|---------------------|-----------------------|

Supply voltage

| | |
|--|----------|
| 24 V DC | Yes |
| permissible range, lower limit (DC) | 20.4 V |
| permissible range, upper limit (DC) | 28.8 V |
| External protection for supply cables (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) | 750 mA |
| Current consumption (in no-load operation), typ. | 150 mA |
| Inrush current, typ. | 4 A |
| I^2t | 1 A ² ·s |

Power losses

| | |
|--|---|
| Power loss, typ. | 4.65 W |
| Memory | |
| Work memory | |
| integrated | 1024 kbyte |
| expandable | No |
| Size of retentive memory for retentive data blocks | 256 kbyte |
| Load memory | |
| pluggable (MMC) | Yes |
| pluggable (MMC), max. | 8 Mbyte |
| Data management on MMC (after last programming), min. | 10 a |
| Backup | |
| present | Yes ; Guaranteed by MMC (maintenance-free) |
| without battery | Yes ; Program and data |
| CPU processing times | |
| for bit operations, typ. | 0.025 μ s |
| for word operations, typ. | 0.03 μ s |
| for fixed point arithmetic, typ. | 0.04 μ s |
| for floating point arithmetic, typ. | 0.16 μ s |
| CPU-blocks | |
| Number of blocks (total) | 2048 ; (DBs, FCs, FBs); the maximum number of loadable blocks can be reduced by the MMC used. |
| DB | |
| Number, max. | 2048 ; Number range: 1 to 16000 |
| Size, max. | 64 kbyte |
| FB | |
| Number, max. | 2048 ; Number range: 0 to 7999 |
| Size, max. | 64 kbyte |
| FC | |
| Number, max. | 2048 ; Number range: 0 to 7999 |
| 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 time 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 isochronous mode OBs | 1 ; OB 61 - isochronous mode is possible either on DP or PROFINET IO (not simultaneously) |
| Number of startup OBs | 1 ; OB 100 |
| Number of asynchronous error OBs | 6 ; OB 80, 82, 83, 85, 86, 87 (OB83 only for PROFINET IO) |
| 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 | |
| adjustable | Yes |
| 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 | 9990 s |
| IEC timer | |
| present | Yes |
| Type | SFB |
| Number | Unlimited (limited only by RAM capacity) |
| Data areas and their retentivity | |

| | |
|--|--|
| retentive data area, total | All, max. 256 KB |
| Flag | |
| Number, max. | 4096 byte |
| Retentivity available | Yes ; MB 0 to MB 4095 |
| Retentivity preset | MB 0 to MB 15 |
| Number of clock memories | 8 ; 1 memory byte |
| Data blocks | |
| Number, max. | 2048 ; Number range: 1 to 16000 |
| Size, max. | 64 kbyte |
| Retentivity adjustable | Yes ; via non-retain property on DB |
| Retentivity preset | Yes |
| Local data | |
| per priority class, max. | 32768 byte ; Max. 2048 bytes per block |
| Address area | |
| I/O address area | |
| Inputs | 8192 byte |
| Outputs | 8192 byte |
| of which, distributed | |
| Inputs | 8192 byte |
| Outputs | 8192 byte |
| Process image | |
| Inputs | 8192 byte |
| Outputs | 8192 byte |
| Inputs, adjustable | 8192 byte |
| Outputs, adjustable | 8192 byte |
| Inputs, default | 256 byte |
| Outputs, default | 256 byte |
| Subprocess images | |
| Number of subprocess images, max. | 1 ; With PROFINET IO, the length of the user data is limited to 1600 bytes |
| Digital channels | |
| Inputs | 65536 |
| Outputs | 65536 |
| Inputs, of which central | 1024 |
| Outputs, of which central | 1024 |
| Analog channels | |
| Inputs | 4096 |
| Outputs | 4096 |
| Inputs, of which central | 256 |

| | |
|---|--|
| Outputs, of which central | 256 |
| Hardware configuration | |
| Racks, max. | 4 |
| Modules per rack, max. | 8 |
| Expansion devices, max. | 3 |
| Number of DP masters | |
| integrated | 1 |
| via CP | 4 |
| Number of operable FMs and CPs (recommended) | |
| FM | 8 |
| CP, point-to-point | 8 |
| CP, LAN | 10 |
| Time of day | |
| Clock | |
| Hardware clock (real-time clock) | Yes |
| battery-backed and synchronizable | Yes |
| Deviation per day, max. | 10 s ; Typ.: 2 s |
| Backup time | 6 wk ; At 40 °C ambient temperature |
| 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 hour |
| 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 |
| Interfaces | |
| Number of USB interfaces | 0 |
| Number of parallel interfaces | 0 |

| | |
|---|--|
| Number of 20 mA interfaces (TTY) | 0 |
| Number of RS 232 interfaces | 0 |
| Number of RS 422 interfaces | 0 |
| Number of other interfaces | 1 ; Ethernet, 2-port switch, 2*RJ45 |
| 1st interface | |
| Type of interface | Integrated RS 485 interface |
| Physics | RS 485 |
| Isolated | Yes |
| Power supply to interface (15 to 30 V DC), max. | 200 mA |
| Functionality | |
| MPI | Yes |
| DP master | Yes |
| DP slave | Yes |
| 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 |
| S7 communication, as client | No ; but via CP and loadable FB |
| 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 mode support | Yes |
| Isochronous mode | Yes ; OB 61; isochronous mode can only be used alternatively on PROFIBUS DP or PROFINET IO |
| 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 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 ; Only with active interface |
| Global data communication | No |
| S7 basic communication | No |
| S7 communication | Yes |
| 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 |
| 2nd interface | |
| Type of interface | PROFINET |
| Physics | Ethernet RJ45 |
| Isolated | Yes |
| Integrated switch | Yes |
| Number of ports | 2 |
| Automatic detection of transmission speed | Yes ; 10/100 Mbit/s |
| Autonegotiation | Yes |
| Autocrossing | Yes |
| Change of IP address at runtime, supported | Yes |

| Media redundancy | |
|--|--|
| supported | Yes |
| Switchover time on line break, typically | 200 ms ; PROFINET MRP |
| Number of stations in the ring, max. | 50 |
| Functionality | |
| MPI | No |
| DP master | No |
| DP slave | No |
| PROFINET IO Controller | Yes ; Also simultaneously with IO-Device functionality |
| PROFINET IO Device | Yes ; Also simultaneously with IO Controller functionality |
| PROFINET CBA | Yes |
| Open IE communication | Yes ; Via TCP/IP, ISO on TCP, and UDP |
| Web server | Yes |
| Number of HTTP clients | 5 |
| PROFINET IO Controller | |
| Transmission rate, max. | 100 Mbit/s |
| Number of connectable IO devices, max. | 128 |
| Max. number of connectable IO devices for RT | 128 |
| of which in line, max. | 128 |
| Number of IO devices with IRT and the option "high flexibility" | 128 |
| of which in line, max. | 61 |
| Number of IO Devices with IRT and the option "high performance", max. | 64 |
| of which in line, max. | 64 |
| IRT, supported | Yes |
| Shared device, supported | Yes |
| Prioritized startup supported | Yes |
| Number of IO Devices, max. | 32 |
| Activation/deactivation of IO Devices | Yes |
| Maximum number of IO devices that can be activated/deactivated at the same time. | 8 |
| IO Devices changing during operation (partner ports), supported | Yes |
| Max. number of IO devices per tool | 8 |
| Device replacement without swap medium | Yes |
| Send cycles | 250 μ s, 500 μ s, 1 ms; 2 ms, 4 ms (not in the case of IRT with "high flexibility" option) |
| Updating time | 250 μ s to 512 ms (depending on the operating mode, see Manual "S7-300 CPU 31xC and CPU 31x, Technical Data" for more details) |
| Services | |
| PG/OP communication | Yes |

| | |
|--|--|
| Routing | Yes |
| S7 communication | Yes ; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 |
| Isochronous mode | Yes ; OB 61; isochronous mode can only be used alternatively on PROFIBUS DP or PROFINET IO |
| Open IE communication | Yes ; Via TCP/IP, ISO on TCP, and UDP |
| Address area | |
| Inputs, max. | 8 kbyte |
| Outputs, max. | 8 kbyte |
| User data consistency, max. | 1024 byte |
| PROFINET IO Device | |
| Services | |
| PG/OP communication | Yes |
| Routing | Yes |
| S7 communication | Yes ; with loadable FBs, max. configurable connections: 16, max. number of instances: 32 |
| Isochronous mode | No |
| Open IE communication | Yes ; Via TCP/IP, ISO on TCP, and UDP |
| IRT, supported | Yes |
| PROFenergy, supported | Yes ; With SFB 73 / 74 prepared for loadable PROFenergy standard FB for I-Device |
| Shared device, supported | Yes |
| Number of IO controllers with shared device, max. | 2 |
| Transfer memory | |
| Inputs, max. | 1440 byte ; Per IO Controller with shared device |
| Outputs, max. | 1440 byte ; Per IO Controller with shared device |
| Submodules | |
| Number, max. | 64 |
| User data per submodule, max. | 1024 byte |
| PROFINET CBA | |
| acyclic transmission | Yes |
| Cyclic transmission | Yes |
| Open IE communication | |
| Open IE communication, supported | Yes |
| Number of connections, max. | 16 |
| Local port numbers used at the system end | 0, 20, 21, 23, 25, 80, 102, 135, 161, 443, 8080, 34962, 34963, 34964, 65532, 65533, 65534, 65535 |
| Keep-alive function, supported | Yes |
| Isochronous mode | |
| Isochronous operation (application synchronized up to terminal) | Yes ; Via PROFIBUS DP or PROFINET interface |

| 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 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 |
| Open IE communication | |
| TCP/IP | Yes ; via integrated PROFINET interface and loadable FBs |
| Number of connections, max. | 16 |
| Data length for connection type 01H, max. | 1460 byte |
| Data length for connection type 11H, max. | 32768 byte |
| Several passive connections per port, supported | Yes |
| ISO-on-TCP (RFC1006) | Yes ; via integrated PROFINET interface and loadable FBs |
| Number of connections, max. | 16 |
| Data length, max. | 32768 byte |
| UDP | Yes ; via integrated PROFINET interface and loadable FBs |
| Number of connections, max. | 16 |
| Data length, max. | 1472 byte |
| Web server | |
| supported | Yes |
| Number of HTTP clients | 5 |

| | |
|--|----------------------------|
| User-defined websites | Yes |
| 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 | 1000 |
| Data length of all incoming connections master/slave, max. | 4000 byte |
| Data length of all outgoing connections master/slave, max. | 4000 byte |
| Number of device-internal and PROFIBUS interconnections | 500 |
| Data length of device-internal und PROFIBUS interconnections, max. | 4000 byte |
| Data length per connection, max. | 1400 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. | 2000 byte |
| Data length of all outgoing interconnections, max. | 2000 byte |
| Data length per connection, max. | 1400 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. | 2000 byte |
| Data length of all outgoing interconnections, max. | 2000 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. | 2000 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 |
| Max. total number of instances | 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. | 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 |
| Force, 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 | |
| Operating temperature | |
| Min. | 0 °C |
| max. | 60 °C |
| Configuration | |
| Configuration software | |
| STEP 7 | Yes ; V5.5 or higher |
| programming | |
| Command set | see instruction list |
| Nesting levels | 8 |
| Programming language | |
| LAD | Yes |
| FBD | Yes |
| STL | Yes |
| SCL | Yes |
| CFC | Yes |
| GRAPH | Yes |
| HiGraph® | Yes |
| Software libraries | |
| System functions (SFC) | see instruction list |
| System function blocks (SFB) | see instruction list |
| 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 |
| Weight | |
| Weight, approx. | 340 g |

