# SIEMENS

SIPLUS S7-300 CPU 315-2DP -25 ... +60°C with conformal coating ACCORDING EN50155 T1 KAT 1 KL A based on 6ES7315-2AH14-0AB0 . CPU WITH MPI INTERFACE INTEGRATED 24 V DC POWER SUPPLY 256 KBYTE WORKING MEMORY 2. INTERFACE DP-MASTER/SLAVE MICRO MEMORY CARD NECESSARY

Figure similar

| General information | |
|---|---|
| Product function | |
| • Isochronous mode | Yes |
| Engineering with | |
| • Programming package | STEP 7 V5.5 + SP1 or higher or STEP 7 V5.2 + SP1 or higher with HSP 218 |

| Supply voltage | |
|---|---|
| Rated value (DC) | |
| • 24 V DC | Yes; A power supply according to EN 50155 shall be used |
| 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 |

| Input current | |
|---|---|
| Current consumption (rated value) | 850 mA |

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| | |
|---|---|
| Current consumption (in no-load operation), typ. | 150 mA |
| Inrush current, typ. | 3.5 A |
| I²t | 1 A²·s |

## Power loss

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

## Memory

### Work memory

| | |
|---|---|
| • integrated | 256 kbyte |
| • expandable | No |
| • Size of retentive memory for retentive data blocks | 128 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. | 0.09 µs |
| for fixed point arithmetic, typ. | 0.12 µs |
| for floating point arithmetic, typ. | 0.45 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. | 1 024; Number range: 1 to 16000 |
| • Size, max. | 64 kbyte |

### FB

| | |
|---|---|
| • Number, max. | 1 024; Number range: 0 to 7999 |
| • Size, max. | 64 kbyte |

### FC

| | |
|---|---|
| • Number, max. | 1 024; 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 |

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| | |
|---|---|
| • 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 | 256 |
| Retentivity | |
| — adjustable | Yes |
| — lower limit | 0 |
| — upper limit | 255 |
| — 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 | 256 |
| Retentivity | |
| — adjustable | Yes |
| — lower limit | 0 |
| — upper limit | 255 |
| — 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

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| | |
|---|---|
| retentive data area in total | all, 128 KB max. |
| **Flag** | |
| • Number, max. | 2 048 byte |
| • Retentivity available | Yes; MB 0 to MB 2 047 |
| • 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 kbyte; Max. 2 KB per block |

| Address area | |
|---|---|
| **I/O address area** | |
| • Inputs | 2 048 byte |
| • Outputs | 2 048 byte |
| of which distributed | |
| — Inputs | 2 048 byte |
| — Outputs | 2 048 byte |
| **Process image** | |
| • Inputs | 2 048 byte |
| • Outputs | 2 048 byte |
| • Inputs, adjustable | 2 048 byte |
| • Outputs, adjustable | 2 048 byte |
| • Inputs, default | 128 byte |
| • Outputs, default | 128 byte |
| **Subprocess images** | |
| • Number of subprocess images, max. | 1 |
| **Digital channels** | |
| • Inputs | 16 384 |
| — of which central | 1 024 |
| • Outputs | 16 384 |
| — of which central | 1 024 |
| **Analog channels** | |
| • Inputs | 1 024 |
| — of which central | 256 |
| • Outputs | 1 024 |
| — of which central | 256 |

| Hardware configuration | |
|---|---|
| Number of expansion units, max. | 3 |
| **Number of DP masters** | |
| • integrated | 1 |

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| | |
|---|---|
| • 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 | 1 |
| • Number/Number range | 0 |
| • 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 | 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 |

## Interfaces

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

| 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 |
| **Protocols** | |
| • MPI | Yes |
| • PROFIBUS DP master | No |
| • PROFIBUS DP slave | No |
| • Point-to-point connection | No |
| **MPI** | |
| • Transmission rate, max. | 187.5 kbit/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 |
| — S7 communication, as server | Yes |

| 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 |
| • Point-to-point connection | No |
| **PROFIBUS DP master** | |
| • Number of connections, max. | 16 |
| • Transmission rate, max. | 12 Mbit/s |
| • Number of DP slaves, max. | 124; Per station |
| **Services** | |
| — PG/OP communication | Yes |
| — Routing | Yes |

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| | |
|---|---|
| — 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 | Yes; OB 61 |
| — SYNC/FREEZE | Yes |
| — Activation/deactivation of DP slaves | Yes |
| — Number of DP slaves that can be simultaneously activated/deactivated, max. | 8 |
| — DPV1 | Yes |
| **Address area** | |
| — Inputs, max. | 2 048 byte |
| — Outputs, max. | 2 048 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 at: 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 |
| — 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 |
| **Isochronous mode** | |
| Isochronous operation (application synchronized up to terminal) | Yes |

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| 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. | 180 byte; With PUT/GET |
| • User data per job (of which consistent), max. | 240 byte; as server |
| **S5 compatible communication** | |
| • supported | Yes; via CP and loadable FC |
| **Number of connections** | |
| • overall | 16 |
| • usable for PG communication | 15 |
| — reserved for PG communication | 1 |
| — adjustable for PG communication, min. | 1 |
| — adjustable for PG communication, max. | 15 |
| • usable for OP communication | 15 |
| — reserved for OP communication | 1 |
| — adjustable for OP communication, min. | 1 |
| — adjustable for OP communication, max. | 15 |
| • usable for S7 basic communication | 12 |
| — reserved for S7 basic communication | 0 |
| — adjustable for S7 basic communication, min. | 0 |
| — adjustable for S7 basic communication, max. | 12 |
| **S7 message functions** | |

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| | |
|---|---|
| Number of login stations for message functions, max. | 16; 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. | |
| — adjustable | Yes; From 10 to 499 |
| — preset | 10 |

## Standards, approvals, certificates

| | |
|---|---|
| CE mark | Yes |
| UL approval | Yes; File E239877 |
| RCM (formerly C-TICK) | Yes |
| KC approval | Yes |
| EAC (formerly Gost-R) | Yes |

### Use in hazardous areas

| | |
|---|---|
| • ATEX | Yes |

### Railway application

| | |
|---|---|
| • EN 50155 | Yes; Sections 4, 5 and 12; no further agreements apply; T1, Category 1, Class A/B, EN 50155:2007 |

## Ambient conditions

### Ambient temperature during operation

| | |
|---|---|
| • min. | -25 °C; = Tmin |
| • max. | 60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155 |

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| Ambient temperature during storage/transportation | |
|---|---|
| ● min. | -40 °C |
| ● max. | 70 °C |
| **Altitude during operation relating to sea level** | |
| ● Installation altitude above sea level, max. | 5 000 m |
| ● Ambient air temperature-barometric pressure-altitude | Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m) |
| **Relative humidity** | |
| ● With condensation, tested in accordance with IEC 60068-2-38, max. | 100 %; RH incl. condensation/frost (no commissioning under condensation conditions) |
| **Resistance** | |
| Use in stationary industrial systems | |
| — to biologically active substances according to EN 60721-3-3 | Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request |
| — to chemically active substances according to EN 60721-3-3 | Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * |
| — to mechanically active substances according to EN 60721-3-3 | Yes; Class 3S4 incl. sand, dust, * |
| Use on land craft, rail vehicles and special-purpose vehicles | |
| — to biologically active substances according to EN 60721-3-5 | Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request |
| — to chemically active substances according to EN 60721-3-5 | Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); * |
| — to mechanically active substances according to EN 60721-3-5 | Yes; Class 5S3 incl. sand, dust; * |
| Remark | |
| — Note regarding classification of environmental conditions acc. to EN 60721, EN 60654-4 and ANSI/ISA-71.04 | * The supplied plug covers must remain in place over the unused interfaces during operation! |

| **Configuration** | |
|---|---|
| **Configuration software** | |
| ● STEP 7 | Yes; V5.2 SP1 or higher 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 |

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| | |
|---|---|
| — SCL | Yes |
| — CFC | Yes |
| — GRAPH | Yes |
| — HiGraph® | Yes |
| Know-how protection | |
| • User program protection/password protection | Yes |

## Dimensions

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

## Weights

| | |
|---|---|
| Weight, approx. | 290 g |
| **last modified:** | 10/09/2020 |

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