# SIEMENS

SIPLUS S7-300 CPU314 -25 ... +60 DEGREES C WITH
CONFORMAL COATING ACCORDING EN50155 BASED ON
6ES7314-1AG14-0AB0 . CPU WITH MPI INTERFACE,
INTEGRATED 24V DC POWER SUPPLY, 128 KBYTE WORKING
MEMORY, MICRO MEMORY CARD NECESSARY

Figure similar

| General information | |
|---|---|
| Hardware product version | 01 |
| Firmware version | V3.3 |
| 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 |
| 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) | 650 mA |
| Current consumption (in no-load operation), typ. | 140 mA |
| Inrush current, typ. | 3.5 A |
| I²t | 1 A²·s |

## Power loss

| | |
|---|---|
| Power loss, typ. | 4 W |

## Memory

### Work memory

| | |
|---|---|
| • integrated | 128 kbyte |
| • expandable | No |
| • Size of retentive memory for retentive data blocks | 64 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. | 0.06 µs |
| for word operations, typ. | 0.12 µs |
| for fixed point arithmetic, typ. | 0.16 µs |
| for floating point arithmetic, typ. | 0.59 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 |
| • 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 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 | 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** | |
| — can be set | Yes |
| — 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, max. 64 KB |
| **Flag** | |
| • Number, max. | 256 byte |
| • Retentivity available | Yes; MB 0 to MB 255 |
| • Retentivity preset | MB 0 to MB 15 |
| • Number of clock memories | 8; 1 memory byte |
| **Data blocks** | |
| • Number, max. | 1 024; 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. | 32 kbyte; Max. 2 KB per block |

| **Address area** | |
|---|---|
| **I/O address area** | |
| • Inputs | 1 024 byte |
| • Outputs | 1 024 byte |
| **Process image** | |
| • Inputs | 1 024 byte |
| • Outputs | 1 024 byte |
| • Inputs, adjustable | 1 024 byte |
| • Outputs, adjustable | 1 024 byte |
| • Inputs, default | 128 byte |
| • Outputs, default | 128 byte |
| **Digital channels** | |
| • Inputs | 1 024 |
| — of which central | 1 024 |
| • Outputs | 1 024 |
| — of which central | 1 024 |
| **Analog channels** | |
| • Inputs | 256 |
| — of which central | 256 |
| • Outputs | 256 |
| — of which central | 256 |

| **Hardware configuration** | |
|---|---|
| Number of expansion units, max. | 3 |
| **Number of DP masters** | |
| • integrated | 0 |
| • 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 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 |
| • 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

| | |
|---|---|
| Number of industrial Ethernet interfaces | 0 |
| Number of RS 485 interfaces | 1; MPI |
| 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 |
| **Functionality** | |
| ● 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 | No |
| — 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 |
| **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 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 | 12 |
| • usable for PG communication | 11 |
| — reserved for PG communication | 1 |
| — adjustable for PG communication, min. | 1 |
| — adjustable for PG communication, max. | 11 |
| • usable for OP communication | 11 |
| — reserved for OP communication | 1 |
| — adjustable for OP communication, min. | 1 |
| — adjustable for OP communication, max. | 11 |
| • usable for S7 basic communication | 8 |
| — reserved for S7 basic communication | 0 |
| — adjustable for S7 basic communication, min. | 0 |
| — adjustable for S7 basic communication, max. | 8 |

| S7 message functions | |
|---|---|
| Number of login stations for message functions, max. | 12; 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 |

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| | |
|---|---|
| • Number of entries readable in RUN, max. | |
| — can be set | Yes; From 10 to 499 |
| — preset | 10 |

| Standards, approvals, certificates | |
|---|---|
| CE mark | Yes |
| UL approval | Yes |
| FM approval | Yes |
| RCM (formerly C-TICK) | Yes |
| KC approval | Yes |
| EAC (formerly Gost-R) | Yes |
| Railway application | |
| • EN 50155 | Yes; T1 Category 1 Class A/B horizontal mounting position |
| Use in hazardous areas | |
| • ATEX | Yes |

| 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 |
| Ambient temperature during storage/transportation | |
| • min. | -40 °C |
| • max. | 70 °C |
| Extended ambient conditions | |
| Relative humidity | |
| — With condensation, tested in accordance with IEC 60068-2-38, max. | 100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation |
| Resistance | |
| — against biologically active substances / conformity with EN 60721-3-3 | Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request |
| — against chemically active substances / conformity with EN 60721-3-3 | Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation! |
| — against mechanically active substances / conformity with EN 60721-3-3 | Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on 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 |
| — 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. | 280 g |

| **last modified:** | 05/31/2017 |
|---|---|