SIEMENS

## Data sheet 6ES7315-2EH14-0AB0

***spare part*** SIMATIC S7-300 CPU 315-2 PN/DP, central processing unit with 384 KB work memory, 1st interface MPI/DP 12 Mbps, 2nd interface Ethernet PROFINET, with 2-port switch, Micro Memory Card required

| | |
|---|---|
| **General information** | |
| Product type designation | CPU 315-2 PN/DP |
| HW functional status | 01 |
| Firmware version | V3.2 |
| Product function | |
| ● Isochronous mode | Yes; Via PROFIBUS DP or PROFINET interface |
| Engineering with | |
| ● Programming package | STEP 7 V5.5 or higher |
| **Supply voltage** | |
| Rated value (DC) | 24 V |
| 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. |
| 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 $A^2 \cdot s$ |
| **Power loss** | |
| Power loss, typ. | 4.65 W |
| **Memory** | |
| Work memory | |
| ● integrated | 384 kbyte |
| ● expandable | No |
| Load memory | |
| ● Plug-in (MMC) | Yes |
| ● Plug-in (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. | 0.05 µs |
| for word operations, typ. | 0.09 µs |
| for fixed point arithmetic, typ. | 0.12 µs |


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| 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 | |
| ● 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 (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 | 256 |
| Retentivity | |
| — adjustable | Yes |
| — 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 | 256 |
| Retentivity | |
| — adjustable | Yes |
| — 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 (incl. timers, counters, flags), max. | 128 kbyte |
| Flag | |
| ● Size, max. | 2 048 byte |
| ● Retentivity available | Yes; MB 0 to MB 2 047 |


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| ● 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 | 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; With PROFINET IO, the length of the user data is limited to 1600 bytes |
| 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 |
| ● 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 | the clock continues at the time of day it had when power was switched off |
| 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 |


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| Clock synchronization | |
| ● supported | Yes |
| ● to MPI, master | Yes |
| ● on MPI, device | Yes |
| ● to DP, master | Yes; With DP slave only slave clock |
| ● on DP, device | Yes |
| ● in AS, master | Yes |
| ● in AS, device | Yes |
| ● on Ethernet via NTP | Yes; As client |
| **Digital inputs** | |
| Number of digital inputs | 0 |
| **Digital outputs** | |
| Number of digital outputs | 0 |
| **Analog inputs** | |
| Number of analog inputs | 0 |
| **Interfaces** | |
| Number of PROFINET interfaces | 1; 2 ports (switch) RJ45 |
| Number of RS 485 interfaces | 1; Combined MPI / PROFIBUS DP |
| Number of RS 422 interfaces | 0 |
| **1. Interface** | |
| Interface type | Integrated RS 485 interface |
| Isolated | Yes |
| Interface types | |
| ● RS 485 | Yes |
| ● Output current of the interface, max. | 200 mA |
| Protocols | |
| ● MPI | Yes |
| ● PROFIBUS DP master | Yes |
| ● PROFIBUS DP device | 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 |
| PROFIBUS DP master | |
| ● Transmission rate, max. | 12 Mbit/s |
| ● max. number of DP devices | 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; isochronous mode can only be used alternatively on PROFIBUS DP or PROFINET IO |
| — SYNC/FREEZE | Yes |
| — activation/deactivation of DP devices | Yes |
| — max. number of DP devices that can be activated/deactivated at the same time | 8 |
| — Direct data exchange (slave-to-slave | Yes; as subscriber |


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| communication) | |
| — DPV1 | Yes |
| Address area | |
| — Inputs, max. | 2 kbyte |
| — Outputs, max. | 2 kbyte |
| User data per DP device | |
| — Inputs, max. | 244 byte |
| — Outputs, max. | 244 byte |
| PROFIBUS DP device | |
| ● 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 |
| **2. Interface** | |
| Interface type | PROFINET |
| Isolated | Yes |
| automatic detection of transmission rate | Yes; 10/100 Mbit/s |
| Autonegotiation | Yes |
| Autocrossing | Yes |
| Change of IP address at runtime, supported | Yes |
| Interface types | |
| ● RJ 45 (Ethernet) | Yes |
| ● Number of ports | 2 |
| ● integrated switch | Yes |
| Protocols | |
| ● MPI | No |
| ● PROFINET IO Controller | Yes; Also simultaneously with IO-Device functionality |
| ● PROFINET IO Device | Yes; Also simultaneously with IO Controller functionality |
| ● PROFINET CBA | Yes |
| ● PROFIBUS DP master | No |
| ● PROFIBUS DP device | No |
| ● Open IE communication | Yes; Via TCP/IP, ISO on TCP, and UDP |
| ● Web server | Yes |
| ● Media redundancy | Yes |
| 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: 14, max. number of instances: 32 |
| — Isochronous mode | Yes; OB 61; isochronous mode can only be used alternatively on PROFIBUS DP or PROFINET IO |
| — IRT | Yes |
| — Shared device | Yes |
| — Prioritized startup | Yes |


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| — Number of IO devices with prioritized startup, max. | 32 |
| — Number of connectable IO Devices, max. | 128 |
| — Of which IO devices with IRT, max. | 64 |
| — of which in line, max. | 64 |
| — Number of IO Devices with IRT and the option "high flexibility" | 128 |
| — of which in line, max. | 61 |
| — Number of connectable IO Devices for RT, max. | 128 |
| — of which in line, max. | 128 |
| — Activation/deactivation of IO Devices | Yes |
| — Number of IO Devices that can be simultaneously activated/deactivated, max. | 8 |
| — IO Devices changing during operation (partner ports), supported | Yes |
| — Number of IO Devices per tool, max. | 8 |
| — Device replacement without swap medium | Yes |
| — Send cycles | 250 µs, 500 µs,1 ms; 2 ms, 4 ms (not in the case of IRT with "high flexibility" option) |
| — Updating time | 250 µs to 512 ms (depending on the operating mode, see Manual "S7-300 CPU 31xC and CPU 31x, technical Data" for more details) |
| Address area | |
| — Inputs, max. | 2 kbyte |
| — Outputs, max. | 2 kbyte |
| — User data consistency, max. | 1 024 byte |
| PROFINET IO Device | |
| Services | |
| — PG/OP communication | Yes |
| — Routing | Yes |
| — S7 communication | Yes; With loadable FBs, max. configurable connections: 14, max. number of instances: 32 |
| — Isochronous mode | No |
| — IRT | Yes |
| — PROFIenergy | Yes; With SFB 73 / 74 prepared for loadable PROFIenergy standard FB for I-Device |
| — Shared device | Yes |
| — Number of IO Controllers with shared device, max. | 2 |
| Transfer memory | |
| — Inputs, max. | 1 440 byte; Per IO Controller with shared device |
| — Outputs, max. | 1 440 byte; Per IO Controller with shared device |
| Submodules | |
| — Number, max. | 64 |
| — User data per submodule, max. | 1 024 byte |
| PROFINET CBA | |
| ● acyclic transmission | Yes |
| ● cyclic transmission | Yes |
| Open IE communication | |
| ● Number of connections, max. | 8 |
| ● 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 |
| **Protocols** | |
| PROFIsafe | No |
| Redundancy mode | |
| Media redundancy | |
| — Switchover time on line break, typ. | 200 ms; PROFINET MRP |
| — Number of stations in the ring, max. | 50 |
| Open IE communication | |
| ● TCP/IP | Yes; via integrated PROFINET interface and loadable FBs |
| — Number of connections, max. | 8 |
| — Data length for connection type 01H, max. | 1 460 byte |
| — Data length for connection type 11H, max. | 32 768 byte |


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| — several passive connections per port, supported | Yes |
| ● ISO-on-TCP (RFC1006) | Yes; via integrated PROFINET interface and loadable FBs |
| — Number of connections, max. | 8 |
| — Data length, max. | 32 768 byte |
| ● UDP | Yes; via integrated PROFINET interface and loadable FBs |
| — Number of connections, max. | 8 |
| — Data length, max. | 1 472 byte |
| Web server | |
| ● supported | Yes |
| ● User-defined websites | Yes |
| ● Number of HTTP clients | 5 |
| **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 |
| PROFINET CBA (at set setpoint communication load) | |
| ● Setpoint for the CPU communication load | 50 % |
| ● Number of remote interconnection partners | 32 |
| ● number of master/device functions | 30 |
| ● total of all master/device connections | 1 000 |
| ● data length of all incoming master/device connections, max. | 4 000 byte |
| ● data length of all outgoing master/device connections, 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 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 |


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| — 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 | 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 | 14 |
| — reserved for S7 basic communication | 0 |
| — adjustable for S7 basic communication, min. | 0 |
| — adjustable for S7 basic communication, max. | 14 |
| ● usable for S7 communication | 14 |
| — reserved for S7 communication | 0 |
| — adjustable for S7 communication, min. | 0 |
| — adjustable for S7 communication, max. | 14 |
| ● 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. | 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. | 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 |


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| ● max. | 60 °C |
| **Configuration** | |
| Configuration software | |
| ● STEP 7 | Yes; V5.5 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 |
| ● Block encryption | Yes; With S7 block Privacy |
| **Dimensions** | |
| Width | 40 mm |
| Height | 125 mm |
| Depth | 130 mm |
| **Weights** | |
| Weight, approx. | 340 g |

**Classifications**

| | Version | Classification |
|---|---|---|
| eClass | 14 | 27-24-22-07 |
| eClass | 12 | 27-24-22-07 |
| eClass | 9.1 | 27-24-22-07 |
| eClass | 9 | 27-24-22-07 |
| eClass | 8 | 27-24-22-07 |
| eClass | 7.1 | 27-24-22-07 |
| eClass | 6 | 27-24-22-07 |
| ETIM | 10 | EC000236 |
| ETIM | 9 | EC000236 |
| ETIM | 8 | EC000236 |
| ETIM | 7 | EC000236 |
| IDEA | 4 | 3565 |
| UNSPSC | 15 | 32-15-17-05 |

**Approvals / Certificates**

**General Product Approval**

Miscellaneous | Manufacturer Declaration | EG-Konf. | UK CA | UL | Miscellaneous

| General Product Approval | | | | EMV | For use in hazardous locations |
|---|---|---|---|---|---|
| RCM | EAC | China RoHS | Manufacturer Declaration | RCM | ATEX |


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| For use in hazardous locations | | | | | |
|---|---|---|---|---|---|
| FM | UL | IECEx | ATEX | Miscellaneous | CCC-Ex |

| Maritime application | | | | | |
|---|---|---|---|---|---|
| ABS | BUREAU VERITAS | DNV | LRS | NK / Nippon Kaiji Kyokai | PRS |

| Maritime application | | other | | Industrial Communication | |
|---|---|---|---|---|---|
| RINA | CCS (China Classification Society) | PROFINET | Profibus | Profibus | PROFINET |

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