# SIEMENS

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

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

| General information | |
|---|---|
| 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 |
| I²t | 1 A²·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 |
| for floating point arithmetic, typ. | 0.45 µs |
| **CPU-blocks** | |

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| | |
|---|---|
| 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 |
| — lower limit | 0 |
| — upper limit | 255 |
| — 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 |
| — 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**

| | |
|---|---|
| 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 |
| ● 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 |

### 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 |

## 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 | 1; 2 ports (switch) RJ45 |
| 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 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 |
| 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 |
| — 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 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. | 2 kbyte |
| — Outputs, max. | 2 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 |
| — 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 slave | 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 |
| — 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 |
| — 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 / header** | |

| | |
|---|---|
| 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 |
| **communication functions / PROFINET CBA (with set target communication load) / header** | |
| ● Setpoint for the CPU communication load | 50 % |
| ● number of remote connection partners / with PROFINET CBA | 32 |
| ● number of technological functions / with PROFINET CBA / for master or slave | 30 |
| ● number of connections / with PROFINET CBA / for master or slave / total | 1 000 |
| ● data volume / of the input variables / with PROFINET CBA / for master or slave | 4 000 byte |
| ● data volume / of the output variables / with PROFINET CBA / for master or slave | 4 000 byte |
| ● number of internal and PROFIBUS interconnections / with PROFINET CBA / maximum | 500 |
| ● data volume / of internal and PROFIBUS interconnections / with PROFINET CBA / for master or slave | 4 000 byte |
| ● data volume / with PROFINET CBA / per connection / maximum | 1 400 byte |
| **performance data / PROFINET CBA / remote interconnection / with acyclic transfer / header** | |
| — update time / of the remote interconnections / in the case of acyclic transmission / with PROFINET CBA | 500 ms |
| — number of remote connections to input variables / in the case of acyclic transmission / with PROFINET CBA / maximum | 100 |
| — number of remote connections to output variables / in the case of acyclic transmission / with PROFINET CBA / maximum | 100 |
| — data volume / as user data for remote interconnections with input variables / in the case of acyclic transmission / with PROFINET CBA | 2 000 byte |
| — data volume / as user data for remote interconnections with output variables / in the case of acyclic transmission / with PROFINET CBA | 2 000 byte |
| — data volume / as user data for remote interconnections / in the case of acyclic transmission / with PROFINET CBA / per connection / maximum | 1 400 byte |
| **performance data / PROFINET CBA / remote interconnection / with cyclic transfer / header** | |
| — update time / of the remote interconnections / with cyclical transfer / with PROFINET CBA | 10 ms |
| — number of remote connections to input variables / with PROFINET CBA / with cyclic transfer / maximum | 200 |

| | |
|---|---|
| — number of remote connections to output variables / with cyclical transfer / with PROFINET CBA / maximum | 200 |
| — data volume / as user data for remote interconnections with input variables / with cyclical transfer / with PROFINET CBA / maximum | 2 000 byte |
| — data volume / as user data for remote interconnections with output variables / with cyclical transfer / with PROFINET CBA / maximum | 2 000 byte |
| — data volume / as user data for remote interconnections / with cyclical transfer / with PROFINET CBA / per connection / maximum | 450 byte |
| **performance data / PROFINET CBA / HMI variables via PROFINET / acyclic / header** | |
| — number of connectable HMI stations / for HMI variables / in the case of acyclic transmission / with PROFINET CBA | 3; 2x PN OPC/1x iMap |
| — update time / of the HMI variables / in the case of acyclic transmission / with PROFINET CBA | 500 ms |
| — number of HMI variables / in the case of acyclic transmission / with PROFINET CBA / maximum | 200 |
| — data volume / as user data for HMI variables / in the case of acyclic transmission / with PROFINET CBA / maximum | 2 000 byte |
| **performance data / PROFINET CBA / PROFIBUS proxy functionality / header** | |
| — product function / with PROFINET CBA / PROFIBUS proxy functionality | Yes |
| — number of coupled PROFIBUS devices / with PROFIBUS functionality | 16 |
| — data volume / with PROFIBUS proxy functionality / with PROFINET CBA / per connection / maximum | 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 |
| ● max. | | 60 °C |

## configuration / header

| | | |
|---|---|---|
| **Configuration software** | | |
| ● STEP 7 | | Yes; V5.5 or higher |
| **configuration / programming / header** | | |
| ● 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 |

| | |
|---|---|
| **last modified:** | 4/1/2022 |