# SIEMENS

SIPLUS S7-1500 CPU 1518-4 PN/DP with conformal coating based on 6ES7518-4AP00-0AB0 . Central processing unit with Work memory 3 MB for Program and 10 MB for data, 1st interface, PROFINET IRT with 2-port switch, 2nd interface, Ethernet, 3rd interface, Ethernet, 4th interface, PROFIBUS, 1 ns bit-performance, SIMATIC Memory Card required



Figure similar

| General information | |
| --- | --- |
| Product type designation | CPU 1518-4 PN/DP |
| HW functional status | FS01 |
| Firmware version | V1.5 |
| **Product function** | |
| • Isochronous mode | Yes |
| **Engineering with** | |
| • STEP 7 TIA Portal configurable/integrated from version | V13 |

| Display | |
| --- | --- |
| Screen diagonal [cm] | 6.1 cm |

| Control elements | |
| --- | --- |
| Number of keys | 6 |
| Mode selector switch | 1 |

| Supply voltage | |
| --- | --- |
| Type of supply voltage | 24 V DC |

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| | |
|---|---|
| permissible range, lower limit (DC) | 19.2 V |
| permissible range, upper limit (DC) | 28.8 V |
| Reverse polarity protection | Yes |

## Input current

| | |
|---|---|
| Current consumption (rated value) | 1.55 A |
| Inrush current, max. | 2.4 A; Rated value |
| I²t | 0.45 A²·s |

## Power

| | |
|---|---|
| Infeed power to the backplane bus | 12 W |
| Power consumption from the backplane bus (balanced) | 30 W |

## Power loss

| | |
|---|---|
| Power loss, typ. | 24 W |

## Memory

| | |
|---|---|
| SIMATIC memory card required | Yes |
| Work memory | |
| • integrated (for program) | 3 Mbyte |
| • integrated (for data) | 10 Mbyte |
| Load memory | |
| • Plug-in (SIMATIC Memory Card), max. | 32 Gbyte |
| Backup | |
| • maintenance-free | Yes |

## CPU processing times

| | |
|---|---|
| for bit operations, typ. | 1 ns |
| for word operations, typ. | 2 ns |
| for fixed point arithmetic, typ. | 2 ns |
| for floating point arithmetic, typ. | 6 ns |

## CPU-blocks

| | |
|---|---|
| Number of blocks (total) | 10 000 |
| DB | |
| • Number, max. | 10 000; Number range: 1 to 65535 |
| • Size, max. | 10 Mbyte |
| FB | |
| • Number, max. | 9 998; Number range: 1 to 65535 |
| • Size, max. | 512 kbyte |
| FC | |
| • Number, max. | 9 999; Number range: 1 to 65535 |
| • Size, max. | 512 kbyte |
| OB | |
| • Size, max. | 512 kbyte |

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| | |
|---|---|
| • Number of free cycle OBs | 100 |
| • Number of time alarm OBs | 20 |
| • Number of delay alarm OBs | 20 |
| • Number of cyclic interrupt OBs | 20 |
| • Number of process alarm OBs | 50 |
| • Number of DPV1 alarm OBs | 3 |
| • Number of isochronous mode OBs | 2 |
| • Number of technology synchronous alarm OBs | 2 |
| • Number of startup OBs | 100 |
| • Number of asynchronous error OBs | 4 |
| • Number of synchronous error OBs | 2 |
| • Number of diagnostic alarm OBs | 1 |
| **Nesting depth** | |
| • per priority class | 24 |

| **Counters, timers and their retentivity** | |
|---|---|
| **S7 counter** | |
| • Number | 2 048 |
| Retentivity | |
| — adjustable | Yes |
| **IEC counter** | |
| • Number | Any (only limited by the main memory) |
| Retentivity | |
| — adjustable | Yes |
| **S7 times** | |
| • Number | 2 048 |
| Retentivity | |
| — adjustable | Yes |
| **IEC timer** | |
| • Number | Any (only limited by the main memory) |
| Retentivity | |
| — adjustable | Yes |

| **Data areas and their retentivity** | |
|---|---|
| Retentive data area (incl. timers, counters, flags), max. | 768 kbyte; Available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 700 KB |
| **Flag** | |
| • Number, max. | 16 kbyte |
| • Number of clock memories | 8; 8 clock memory bit, grouped into one clock memory byte |
| **Data blocks** | |
| • Retentivity adjustable | Yes |
| • Retentivity preset | No |
| **Local data** | |

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| | |
|---|---|
| • per priority class, max. | 64 kbyte; max. 16 KB per block |

## Address area

| | |
|---|---|
| Number of IO modules | 8 192 |
| **I/O address area** | |
| • Inputs | 32 kbyte; All inputs are in the process image |
| • Outputs | 32 kbyte; All outputs are in the process image |
| **per integrated IO subsystem** | |
| — Inputs (volume) | 16 kbyte; 16 KB via the integrated PROFINET IO interface, 8 KB via the integrated DP interface |
| — Outputs (volume) | 16 kbyte; 16 KB via the integrated PROFINET IO interface, 8 KB via the integrated DP interface |
| **per CM/CP** | |
| — Inputs (volume) | 8 kbyte |
| — Outputs (volume) | 8 kbyte |
| **Subprocess images** | |
| • Number of subprocess images, max. | 32 |

## Hardware configuration

| | |
|---|---|
| Number of distributed IO systems | 10 |
| **Number of DP masters** | |
| • integrated | 1 |
| • Via CM | 8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total |
| **Number of IO Controllers** | |
| • integrated | 1 |
| • Via CM | 8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total |
| **Rack** | |
| • Modules per rack, max. | 32; CPU + 31 modules |
| • Number of lines, max. | 1 |
| **PtP CM** | |
| • Number of PtP CMs | the number of connectable PtP CMs is only limited by the number of available slots |

## Time of day

| | |
|---|---|
| **Clock** | |
| • Type | Hardware clock |
| • Backup time | 6 wk; At 40 °C ambient temperature, typically |
| • Deviation per day, max. | 10 s; Typ.: 2 s |
| **Operating hours counter** | |
| • Number | 8 |
| **Clock synchronization** | |
| • supported | Yes |
| • to DP, master | Yes |

| | |
|---|---|
| • in AS, master | Yes |
| • in AS, slave | Yes |
| • on Ethernet via NTP | Yes |

## Interfaces

| | |
|---|---|
| Number of PROFINET interfaces | 3 |
| Number of PROFIBUS interfaces | 1 |

## 1. Interface

### Interface types

| | |
|---|---|
| • RJ 45 (Ethernet) | Yes |
| • Number of ports | 2 |
| • integrated switch | Yes |

### Protocols

| | |
|---|---|
| • PROFINET IO Controller | Yes |
| • PROFINET IO Device | Yes |
| • SIMATIC communication | Yes |
| • Open IE communication | Yes |
| • Web server | Yes |
| • Media redundancy | Yes |

### PROFINET IO Controller

#### Services

| | |
|---|---|
| — PG/OP communication | Yes |
| — S7 routing | Yes |
| — Isochronous mode | Yes |
| — IRT | Yes |
| — PROFIenergy | Yes |
| — Prioritized startup | Yes; Max. 32 PROFINET devices |
| — Number of connectable IO Devices, max. | 512; In total, up to 1 000 distributed I/O devices can be connected via PROFIBUS or PROFINET |
| — Of which IO devices with IRT, max. | 64 |
| — Number of connectable IO Devices for RT, max. | 256 |
| — of which in line, max. | 256 |
| — Number of IO Devices that can be simultaneously activated/deactivated, max. | 8 |
| — Number of IO Devices per tool, max. | 8 |
| — Updating times | The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data |

#### Update time for IRT

| | |
|---|---|
| — for send cycle of 250 µs | 250 µs to 4 ms |
| — for send cycle of 500 µs | 500 µs to 8 ms |
| — for send cycle of 1 ms | 1 ms to 16 ms |

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| | |
|---|---|
| — for send cycle of 2 ms | 2 ms to 32 ms |
| — for send cycle of 4 ms | 4 ms to 64 ms |
| — With IRT and parameterization of "odd" send cycles | Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs) |
| Update time for RT | |
| — for send cycle of 250 µs | 250 µs to 128 ms |
| — for send cycle of 500 µs | 500 µs to 256 ms |
| — for send cycle of 1 ms | 1 ms to 512 ms |
| — for send cycle of 2 ms | 2 ms to 512 ms |
| — for send cycle of 4 ms | 4 ms to 512 ms |
| **PROFINET IO Device** | |
| Services | |
| — PG/OP communication | Yes |
| — S7 routing | Yes |
| — Isochronous mode | No |
| — IRT | Yes |
| — PROFIenergy | Yes |
| — Shared device | Yes |
| — Number of IO Controllers with shared device, max. | 4 |
| **2. Interface** | |
| Interface types | |
| • RJ 45 (Ethernet) | Yes |
| • Number of ports | 1 |
| • integrated switch | No |
| Protocols | |
| • PROFINET IO Controller | No |
| • PROFINET IO Device | No |
| • SIMATIC communication | Yes |
| • Open IE communication | Yes |
| • Web server | Yes |
| **3. Interface** | |
| Interface types | |
| • RJ 45 (Ethernet) | Yes |
| • Number of ports | 1 |
| • integrated switch | No |
| Protocols | |
| • PROFINET IO Controller | No |
| • PROFINET IO Device | No |
| • SIMATIC communication | Yes |
| • Open IE communication | Yes |

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| | |
|---|---|
| ● Web server | Yes |

## 4. Interface

### Interface types

| | |
|---|---|
| ● RS 485 | Yes |
| ● Number of ports | 1 |

### Protocols

| | |
|---|---|
| ● PROFIBUS DP master | Yes |
| ● PROFIBUS DP slave | No |
| ● SIMATIC communication | Yes |

## Interface types

### RJ 45 (Ethernet)

| | |
|---|---|
| ● 100 Mbps | Yes |
| ● Autonegotiation | Yes |
| ● Autocrossing | Yes |
| ● Industrial Ethernet status LED | Yes |

### RS 485

| | |
|---|---|
| ● Transmission rate, max. | 12 Mbit/s |

## Protocols

### Number of connections

| | |
|---|---|
| ● Number of connections, max. | 384; via integrated interfaces of the CPU and connected CPs / CMs |
| ● Number of connections reserved for ES/HMI/web | 10 |
| ● Number of connections via integrated interfaces | 192 |
| ● Number of S7 routing paths | 64; in total, only 16 S7-Routing connections are supported via PROFIBUS |

### Redundancy mode

#### Media redundancy

| | |
|---|---|
| — MRP | Yes; as MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50 |
| — Switchover time on line break, typ. | 200 ms |
| — Number of stations in the ring, max. | 50 |

### SIMATIC communication

| | |
|---|---|
| ● S7 communication, as server | Yes |
| ● S7 communication, as client | Yes |
| ● User data per job, max. | See online help (S7 communication, user data size) |

### Open IE communication

| | |
|---|---|
| ● TCP/IP | Yes |
| — Data length, max. | 64 kbyte |
| — several passive connections per port, supported | Yes |

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| | |
|---|---|
| • ISO-on-TCP (RFC1006) | Yes |
| — Data length, max. | 64 kbyte |
| • UDP | Yes |
| — Data length, max. | 1 472 byte |
| • DHCP | No |
| • SNMP | Yes |
| • DCP | Yes |
| • LLDP | Yes |
| **Web server** | |
| • HTTP | Yes; Standard and user-defined pages |
| • HTTPS | Yes; Standard and user-defined pages |
| **PROFIBUS DP master** | |
| • Number of connections, max. | 48; for the integrated PROFIBUS DP interface |
| Services | |
| — PG/OP communication | Yes |
| — S7 routing | Yes |
| — Isochronous mode | Yes |
| — Equidistance | Yes |
| — Number of DP slaves | 125; In total, up to 1 000 distributed I/O devices can be connected via PROFIBUS or PROFINET |
| — Activation/deactivation of DP slaves | Yes |
| **Further protocols** | |
| • MODBUS | Yes; MODBUS TCP |

| **Isochronous mode** | |
|---|---|
| Equidistance | Yes |

| **S7 message functions** | |
|---|---|
| Number of login stations for message functions, max. | 32 |
| Program alarms | Yes |
| Number of configurable program messages, max. | 10 000 |
| Number of simultaneously active program alarms | 1 000 |

| **Test commissioning functions** | |
|---|---|
| Status block | Yes; Up to 16 simultaneously |
| Single step | No |
| Status/control | |
| • Status/control variable | Yes |
| • Variables | Inputs, outputs, memory bits, DB, times, counters |
| • Number of variables, max. | |
| — of which status variables, max. | 200; per job |
| — of which control variables, max. | 200; per job |
| Forcing | |
| • Forcing, variables | Inputs, outputs |

| | |
|---|---|
| • Number of variables, max. | 200 |
| **Diagnostic buffer** | |
| • present | Yes |
| • Number of entries, max. | 3 200 |
| — of which powerfail-proof | 1 000 |
| **Traces** | |
| • Number of configurable Traces | 8 |

## Interrupts/diagnostics/status information

| | |
|---|---|
| **Diagnostics indication LED** | |
| • RUN/STOP LED | Yes |
| • ERROR LED | Yes |
| • MAINT LED | Yes |
| • Connection display LINK TX/RX | Yes |

## Supported technology objects

| | |
|---|---|
| Motion Control | Yes |
| • Speed-controlled axis | |
| — Number of speed-controlled axes, max. | 128; Up to 128 axes in total (speed-controlled, positioning axis, external encoders) are supported |
| • Positioning axis | |
| — Number of positioning axes, max. | 128; Up to 128 axes in total (speed-controlled, positioning axis, external encoders) are supported |
| • External encoders | |
| — Number of external encoders, max. | 128; Up to 128 axes in total (speed-controlled, positioning axis, external encoders) are supported |
| Controller | |
| • PID_Compact | Yes; Universal PID controller with integrated optimization |
| • PID_3Step | Yes; PID controller with integrated optimization for valves |
| Counting and measuring | |
| • High-speed counter | Yes |

## Ambient conditions

| | |
|---|---|
| **Ambient temperature during operation** | |
| • horizontal installation, min. | 0 °C; = Tmin (incl. condensation/frost) |
| • horizontal installation, max. | 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off |
| • vertical installation, min. | 0 °C; = Tmin |
| • vertical installation, max. | 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off |
| **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 |

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| | |
|---|---|
| • 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** | |
| **Coolants and lubricants** | |
| — Resistant to commercially available coolants and lubricants | Yes; Incl. diesel and oil droplets in the air |
| **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 ships/at sea** | |
| — to biologically active substances according to EN 60721-3-6 | Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request |
| — to chemically active substances according to EN 60721-3-6 | Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); * |
| — to mechanically active substances according to EN 60721-3-6 | Yes; Class 6S3 incl. sand, dust; * |
| **Usage in industrial process technology** | |
| — Against chemically active substances acc. to EN 60654-4 | Yes; Class 3 (excluding trichlorethylene) |
| — Environmental conditions for process, measuring and control systems acc. to ANSI/ISA-71.04 | Yes; Level GX group A/B (excluding trichlorethylene; harmful gas concentrations up to the limits of EN 60721-3-3 class 3C4 permissible); level LC3 (salt spray) and level LB3 (oil) |
| **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! |
| **Conformal coating** | |
| • Coatings for printed circuit board assemblies acc. to EN 61086 | Yes; Class 2 for high reliability |
| • Protection against fouling acc. to EN 60664-3 | Yes; Type 1 protection |
| • Military testing according to MIL-I-46058C, Amendment 7 | Yes; Discoloration of coating possible during service life |
| • Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A | Yes; Conformal coating, Class A |

| **Configuration** | |
|---|---|

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| Programming | |
|---|---|
| Programming language | |
| — LAD | Yes |
| — FBD | Yes |
| — STL | Yes |
| — SCL | Yes |
| — GRAPH | Yes |
| **Know-how protection** | |
| ● User program protection/password protection | Yes |
| ● Copy protection | Yes |
| ● Block protection | Yes |
| **Access protection** | |
| ● Password for display | Yes |
| ● Protection level: Write protection | Yes |
| ● Protection level: Read/write protection | Yes |
| ● Protection level: Complete protection | Yes |
| **Cycle time monitoring** | |
| ● lower limit | adjustable minimum cycle time |
| ● upper limit | adjustable maximum cycle time |

| Dimensions | |
|---|---|
| Width | 175 mm |
| Height | 147 mm |
| Depth | 129 mm |

| Weights | |
|---|---|
| Weight, approx. | 1 988 g |
| **last modified:** | 10/09/2020 |

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