

SIMATIC S7-1500R, CPU 1515R-2 PN central processing unit with work memory 500 KB for program and 3 MB for data, 1st interface: PROFINET RT With 2-port switch, 2nd interface: PROFINET, SIMATIC memory card required ***** Special release required. Please contact your Siemens representative



| General information | |
|--|---|
| Product type designation | CPU 1515R-2 PN |
| HW functional status | FS01 |
| Firmware version | V2.8 |
| Product function | |
| • I&M data | Yes; I&M0 to I&M3 |
| • Isochronous mode | No |
| Engineering with | |
| • STEP 7 TIA Portal configurable/integrated from version | V16 (FW V2.8) / V15.1 (FW V2.6) or higher |
| 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 |
| permissible range, lower limit (DC) | 19.2 V |

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| permissible range, upper limit (DC) | 28.8 V |
| Reverse polarity protection | Yes |
| Mains buffering | |
| • Mains/voltage failure stored energy time | 5 ms |
| Input current | |
| Current consumption (rated value) | 0.8 A |
| Inrush current, max. | 2.4 A |
| I^2t | 0.02 A ² ·s |
| Power loss | |
| Power loss, typ. | 6.3 W |
| Memory | |
| Number of slots for SIMATIC memory card | 1 |
| SIMATIC memory card required | Yes |
| Work memory | |
| • integrated (for program) | 500 kbyte |
| • integrated (for data) | 3 Mbyte |
| Load memory | |
| • Plug-in (SIMATIC Memory Card), max. | 32 Gbyte |
| Backup | |
| • maintenance-free | Yes |
| CPU processing times | |
| for bit operations, typ. | 60 ns |
| for word operations, typ. | 72 ns |
| for fixed point arithmetic, typ. | 96 ns |
| for floating point arithmetic, typ. | 384 ns |
| CPU-blocks | |
| Number of elements (total) | 6 000; Blocks (OB, FB, FC, DB) and UDTs |
| DB | |
| • Number range | Number range: 1 to 59 999 |
| • Size, max. | 3 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB |
| FB | |
| • Number range | 0 ... 65 535 |
| • Size, max. | 500 kbyte |
| FC | |
| • Number range | 0 ... 65 535 |
| • Size, max. | 500 kbyte |
| OB | |
| • Size, max. | 500 kbyte |
| • Number of free cycle OBs | 100 |
| • Number of time alarm OBs | 20 |

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| • Number of delay alarm OBs | 20 |
| • Number of cyclic interrupt OBs | 20 |
| • Number of process alarm OBs | 50 |
| • 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

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|--------------------|---------------------------------------|
| 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

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|---|---|
| Retentive data area (incl. timers, counters, flags), max. | 512 kbyte |
| 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 | |
| • per priority class, max. | 64 kbyte; max. 16 KB per block |

Address area

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|-------------------------|---|
| Number of IO modules | 4 096; max. number of modules / submodules |
| 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) | 8 kbyte |
| — Outputs (volume) | 8 kbyte |
| Subprocess images | |
| • Number of subprocess images, max. | 32 |

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| Hardware configuration | |
| Number of distributed IO systems | 1 |
| Number of IO Controllers | |
| • integrated | 1 |

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|---------------------------|---|
| 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 | 16 |
| Clock synchronization | |
| • supported | Yes |
| • on Ethernet via NTP | Yes |

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| Interfaces | |
| Number of PROFINET interfaces | 2 |

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|--------------------------|---|
| 1. Interface | |
| Interface types | |
| • RJ 45 (Ethernet) | Yes; X1 |
| • Number of ports | 2 |
| • integrated switch | Yes |
| Protocols | |
| • IP protocol | Yes; IPv4 |
| • PROFINET IO Controller | Yes |
| • PROFINET IO Device | No |
| • SIMATIC communication | Yes; Only Server |
| • Open IE communication | Yes |
| • Web server | No |
| • Media redundancy | Yes; MRP Automanager according to IEC 62439-2 Edition 2.0 |
| PROFINET IO Controller | |
| Services | |
| — PG/OP communication | Yes |
| — S7 routing | Yes |
| — Isochronous mode | No |

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| — IRT | No |
| — MRP | Yes; Only Manager Auto, max. 50 nodes; only 16 are recommended, however |
| — MRPD | No |
| — PROFinergy | Yes |
| — Number of connectable IO Devices, max. | 64 |
| — 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 RT

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|--------------------------|----------------|
| — for send cycle of 1 ms | 1 ms to 512 ms |
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2. Interface

Interface types

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|---------------------|---------|
| • RJ 45 (Ethernet) | Yes; X2 |
| • Number of ports | 1 |
| • integrated switch | No |

Protocols

| | |
|--------------------------|------------------|
| • IP protocol | Yes; IPv4 |
| • PROFINET IO Controller | No |
| • PROFINET IO Device | No |
| • SIMATIC communication | Yes; Only Server |
| • Open IE communication | Yes |
| • Web server | No |
| • Media redundancy | No |

Interface types

RJ 45 (Ethernet)

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

Protocols

Number of connections

| | |
|---|-----|
| • Number of connections, max. | 108 |
| • Number of connections reserved for ES/HMI/web | 10 |
| • Number of S7 routing paths | 16 |

Redundancy mode

Media redundancy

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|--------|---|
| — MRP | Yes; Manager Auto is permanently set in TIA. Max. 50 nodes are possible, 16 are recommended |
| — MRPD | No |

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|--|---|
| — Switchover time on line break, typ. | 200 ms; PROFINET MRP |
| — Number of stations in the ring, max. | 50; Only 16 are recommended, however |
| SIMATIC communication | |
| • S7 communication, as server | Yes |
| • S7 communication, as client | No |
| Open IE communication | |
| • TCP/IP | Yes |
| — Data length, max. | 64 kbyte |
| — several passive connections per port, supported | Yes |
| • ISO-on-TCP (RFC1006) | Yes |
| — Data length, max. | 64 kbyte |
| • UDP | Yes |
| — Data length, max. | 2 kbyte; 1 472 bytes for UDP broadcast |
| — UDP multicast | Yes; Max. 5 multicast circuits |
| • DHCP | No |
| • SNMP | Yes |
| • DCP | Yes |
| • LLDP | Yes |
| Web server | |
| • HTTP | No |
| • HTTPS | No |
| OPC UA | |
| • OPC UA Client | No |
| • OPC UA Server | No |
| Further protocols | |
| • MODBUS | Yes; MODBUS TCP |
| Isochronous mode | |
| Equidistance | No |
| S7 message functions | |
| Number of login stations for message functions, max. | 64 |
| Program alarms | Yes |
| Number of configurable program messages, max. | 10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH |
| Number of loadable program messages in RUN, max. | 5 000 |
| Number of simultaneously active program alarms | |
| • Number of program alarms | 800 |
| • Number of alarms for system diagnostics | 200 |
| Test commissioning functions | |
| Joint commission (Team Engineering) | No |

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| Status block | Yes; up to 8 simultaneously | |
| Single step | No | |
| Number of breakpoints | 8; Breakpoints are only supported in RUN-Solo status | |
| Status/control | | |
| <ul style="list-style-type: none"> • Status/control variable • Variables • Number of variables, max. <ul style="list-style-type: none"> — of which status variables, max. — of which control variables, max. | Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 200; per job 200; per job | |
| Forcing | | |
| <ul style="list-style-type: none"> • Forcing • Forcing, variables • Number of variables, max. | Yes Peripheral inputs/outputs 200 | |
| Diagnostic buffer | | |
| <ul style="list-style-type: none"> • present • Number of entries, max. <ul style="list-style-type: none"> — of which powerfail-proof | Yes 3 200 500 | |
| Traces | | |
| <ul style="list-style-type: none"> • Number of configurable Traces • Memory size per trace, max. | 4 512 kbyte | |
| Interrupts/diagnostics/status information | | |
| Diagnostics indication LED | | |
| <ul style="list-style-type: none"> • RUN/STOP LED • ERROR LED • MAINT LED • Connection display LINK TX/RX | Yes Yes Yes Yes | |
| Supported technology objects | | |
| Motion Control | No | |
| Controller | <ul style="list-style-type: none"> • PID_Compact • PID_3Step • PID-Temp | Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature |
| Counting and measuring | Yes | |
| <ul style="list-style-type: none"> • High-speed counter | No | |
| Ambient conditions | | |
| Ambient temperature during operation | | |
| <ul style="list-style-type: none"> • horizontal installation, min. • horizontal installation, max. • vertical installation, min. | 0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C | |

| | |
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| • 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; Restrictions for installation altitudes > 2 000 m, see manual |

Configuration

Programming

| | |
|-----------------------------|-----|
| Programming language | |
| — LAD | Yes |
| — FBD | Yes |
| — STL | Yes |
| — SCL | Yes |
| — CFC | No |
| — GRAPH | Yes |

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| Know-how protection | |
| • User program protection/password protection | Yes |
| • Copy protection | No |
| • Block protection | Yes |

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|---|-----|
| Access protection | |
| • Password for display | Yes |
| • Protection level: Write protection | Yes |
| • Protection level: Read/write protection | Yes |
| • Protection level: Complete protection | Yes |

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| Cycle time monitoring | |
| • lower limit | adjustable minimum cycle time |
| • upper limit | adjustable maximum cycle time |

Dimensions

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|--------|--------|
| Width | 70 mm |
| Height | 147 mm |
| Depth | 129 mm |

Weights

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|-----------------------|------------|
| Weight, approx. | 830 g |
| last modified: | 10/09/2020 |