

SIPLUS S7-1500 CPU 1515R-2 PN -40...+70 °C With conformal coating Based on 6ES7515-2RM00-0AB0 . Central processing unit with work memory 500 KB for program and 3 MB for data, 1st interface: PROFINET With 2-port switch 2nd interface: PROFINET RT, SIMATIC Memory Card required \*\*\*\*\*  
Special sales release required



Figure similar

| General information                        |                |
|--|----------------|
| Product type designation                   | CPU 1515R-2 PN |
| 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         |
| 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 <sup>2</sup> ·s  |
| <b>Power loss</b>                       |   |
| Power loss, typ.                        | 6.3 W   |
| <b>Memory</b>                           |   |
| Number of slots for SIMATIC memory card | 1   |
| SIMATIC memory card required            | Yes   |
| <b>Work memory</b>                      |   |
| • integrated (for program)              | 500 kbyte   |
| • integrated (for data)                 | 3 Mbyte   |
| <b>Load memory</b>                      |   |
| • Plug-in (SIMATIC Memory Card), max.   | 32 Gbyte  |
| <b>Backup</b>                           |   |
| • maintenance-free                      | Yes   |
| <b>CPU processing times</b>             |   |
| 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  |
| <b>CPU-blocks</b>                       |   |
| Number of elements (total)              | 6 000; Blocks (OB, FB, FC, DB) and UDTs                                     |
| <b>DB</b>                               |   |
| • 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 |
| <b>FB</b>                               |   |
| • Number range                          | 0 ... 65 535  |
| • Size, max.                            | 500 kbyte   |
| <b>FC</b>                               |   |
| • Number range                          | 0 ... 65 535  |
| • Size, max.                            | 500 kbyte   |
| <b>OB</b>                               |   |
| • Size, max.                            | 500 kbyte   |
| • 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 startup OBs                 | 100   |
| • Number of asynchronous error OBs      | 4   |
| • Number of synchronous error OBs       | 2   |

|   |   |
|---|---|
| • Number of diagnostic alarm OBs                          | 1   |
| <b>Nesting depth</b>                                      |   |
| • per priority class                                      | 24  |
| <b>Counters, timers and their retentivity</b>             |   |
| <b>S7 counter</b>   |   |
| • Number  | 2 048   |
| <b>Retentivity</b>  |   |
| — adjustable  | Yes   |
| <b>IEC counter</b>  |   |
| • Number  | Any (only limited by the main memory)                     |
| <b>Retentivity</b>  |   |
| — adjustable  | Yes   |
| <b>S7 times</b>   |   |
| • Number  | 2 048   |
| <b>Retentivity</b>  |   |
| — adjustable  | Yes   |
| <b>IEC timer</b>  |   |
| • Number  | Any (only limited by the main memory)                     |
| <b>Retentivity</b>  |   |
| — adjustable  | Yes   |
| <b>Data areas and their retentivity</b>                   |   |
| Retentive data area (incl. timers, counters, flags), max. | 512 kbyte   |
| <b>Flag</b>   |   |
| • Number, max.  | 16 kbyte  |
| • Number of clock memories                                | 8; 8 clock memory bit, grouped into one clock memory byte |
| <b>Data blocks</b>  |   |
| • Retentivity adjustable                                  | Yes   |
| • Retentivity preset                                      | No  |
| <b>Local data</b>   |   |
| • per priority class, max.                                | 64 kbyte; max. 16 KB per block                            |
| <b>Address area</b>                                       |   |
| Number of IO modules                                      | 4 096; max. number of modules / submodules                |
| <b>I/O address area</b>                                   |   |
| • Inputs  | 32 kbyte; All inputs are in the process image             |
| • Outputs   | 32 kbyte; All outputs are in the process image            |
| <b>per integrated IO subsystem</b>                        |   |
| — Inputs (volume)   | 8 kbyte   |
| — Outputs (volume)  | 8 kbyte   |
| <b>Subprocess images</b>                                  |   |
| • Number of subprocess images, max.                       | 32  |

| Hardware configuration                   |   |
|--|---|
| Number of IO Controllers                 |   |
| • integrated                             | 1   |
| Time of day                              |   |
| 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   |
| • in AS, master                          | No  |
| • in AS, slave                           | No  |
| • on Ethernet via NTP                    | Yes   |
| Interfaces                               |   |
| Number of PROFINET interfaces            |   |
|  | 1   |
| 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   |
| PROFINET IO Controller                   |   |
| Services                                 |   |
| — PG/OP communication                    | Yes   |
| — S7 routing                             | No  |
| — Isochronous mode                       | No  |
| — IRT                                    | No  |
| — MRP                                    | Yes; Only Manager Auto, max. 50 nodes; only 16 are recommended, however |
| — MRPD                                   | No  |
| — PROFlenergy                            | 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

— for send cycle of 1 ms

1 ms to 512 ms

## 2. Interface

### Interface types

- |                     |         |
|---------------------|---------|
| • 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  |

#### Redundancy mode

##### Media redundancy

- |  |   |
|--|---|
| — MRP                                  | Yes; Manager Auto is permanently set in TIA. Max. 50 nodes are possible, 16 are recommended |
| — MRPD                                 | No  |
| — 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  |
| <b>Web server</b>                                 |  |
| • HTTP  | No   |
| • HTTPS   | No   |
| <b>OPC UA</b>                                     |  |
| • OPC UA Client                                   | No   |
| • OPC UA Server                                   | No   |
| <b>Further protocols</b>                          |  |
| • MODBUS  | Yes; MODBUS TCP  |
| <b>S7 message functions</b>                       |  |
| Program alarms                                    | No   |
| <b>Test commissioning functions</b>               |  |
| Joint commission (Team Engineering)               | No   |
| Status block                                      | Yes; up to 8 simultaneously  |
| Single step                                       | No   |
| <b>Status/control</b>                             |  |
| • Status/control variable                         | Yes  |
| • Variables                                       | Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters |
| • Number of variables, max.                       |  |
| — of which status variables, max.                 | 200; per job   |
| — of which control variables, max.                | 200; per job   |
| <b>Forcing</b>                                    |  |
| • Forcing, variables                              | Peripheral inputs/outputs  |
| • Number of variables, max.                       | 200  |
| <b>Diagnostic buffer</b>                          |  |
| • present   | Yes  |
| • Number of entries, max.                         | 3 200  |
| — of which powerfail-proof                        | 500  |
| <b>Traces</b>                                     |  |

- Number of configurable Traces 4
- Memory size per trace, max. 512 kbyte

### 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 No

#### Controller

- PID\_Compact No
- PID\_3Step No
- PID-Temp No

#### Counting and measuring

- High-speed counter No

### Ambient conditions

#### Ambient temperature during operation

- horizontal installation, min. -40 °C; = Tmin (incl. condensation/frost); start-up @ -20 °C
- horizontal installation, max. 70 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
- vertical installation, min. -40 °C; = Tmin (incl. condensation/frost); start-up @ -20 °C
- 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

- 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 in bedewed state), horizontal installation

#### 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, *  |
| <b>Use on ships/at sea</b>  |   |
| — to biologically active substances according to EN 60721-3-6   | Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)  |
| — 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; *  |
| <b>Usage in industrial process technology</b>   |   |
| — 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) |
| <b>Remark</b>   |   |
| — 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!  |
| <b>Conformal coating</b>  |   |
| • 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   |
| <b>Configuration</b>  |   |
| <b>Programming</b>  |   |
| <b>Programming language</b>   |   |
| — LAD   | Yes   |
| — FBD   | Yes   |
| — STL   | Yes   |
| — SCL   | Yes   |
| — CFC   | No  |
| — GRAPH   | No  |
| <b>Know-how protection</b>  |   |
| • User program protection/password protection   | Yes   |
| • Copy protection   | No  |
| • Block protection  | Yes   |
| <b>Access protection</b>  |   |



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

### Dimensions

|        |        |
|--------|--------|
| Width  | 105 mm |
| Height | 147 mm |
| Depth  | 129 mm |

### Weights

|                 |         |
|-----------------|---------|
| Weight, approx. | 1 100 g |
|-----------------|---------|

### Other

|       |  |
|-------|--|
| Note: | At temperatures below 0 °C legibility may be restricted and representation of dynamic contents may be slower |
|-------|--|

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