

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
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 ² ·s

Power loss

Power loss, typ.	6.3 W
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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
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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
- 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	
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.	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	
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
Hardware configuration	
Number of distributed IO systems	1
Number of IO Controllers	
• integrated	1
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
Interfaces	
Number of PROFINET interfaces	2
1. Interface	
Interface types	
• Number of ports	2
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes; X1
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
— 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

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

Interface types	
• Number of ports	1
• integrated switch	No
• RJ 45 (Ethernet)	Yes; X2
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	
— 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
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
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	
<ul style="list-style-type: none"> • High-speed counter 	Yes 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

• 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

Know-how protection	
• User program protection/password protection	Yes
• Copy protection	No
• 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	70 mm
Height	147 mm
Depth	129 mm

Weights

Weight, approx.	830 g
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