



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

General information	
Product type designation	CPU 1515R-2 PN
HW functional status	FS01
Firmware version	V2.9
Product function	
<ul style="list-style-type: none"> I&M data 	Yes; I&M0 to I&M3
<ul style="list-style-type: none"> Isochronous mode 	No
Engineering with	
<ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated from version 	V17 (FW V2.9) / V16 (FW V2.8) / V15.1 (FW V2.6)
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	
<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> integrated (for program) 	500 kbyte
<ul style="list-style-type: none"> integrated (for data) 	3 Mbyte
Load memory	
<ul style="list-style-type: none"> Plug-in (SIMATIC Memory Card), max. 	32 Gbyte
Backup	
<ul style="list-style-type: none"> 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)	8 000; Blocks (OB, FB, FC, DB) and UDTs
DB	
<ul style="list-style-type: none"> • Number range • Size, max. 	Number range: 1 to 59 999 3 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB
FB	
<ul style="list-style-type: none"> • Number range • Size, max. 	0 ... 65 535 500 kbyte
FC	
<ul style="list-style-type: none"> • Number range • Size, max. 	0 ... 65 535 500 kbyte
OB	
<ul style="list-style-type: none"> • Size, max. • Number of free cycle OBs • Number of time alarm OBs • Number of delay alarm OBs • Number of cyclic interrupt OBs • Number of process alarm OBs • Number of startup OBs • Number of asynchronous error OBs • Number of synchronous error OBs • Number of diagnostic alarm OBs 	500 kbyte 100 20 20 20 50 100 4 2 1
Nesting depth	
<ul style="list-style-type: none"> • per priority class 	24
Counters, timers and their retentivity	
S7 counter	
<ul style="list-style-type: none"> • Number 	2 048
Retentivity	
— adjustable	Yes
IEC counter	
<ul style="list-style-type: none"> • Number 	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
S7 times	
<ul style="list-style-type: none"> • Number 	2 048
Retentivity	
— adjustable	Yes
IEC timer	
<ul style="list-style-type: none"> • 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	
<ul style="list-style-type: none"> • Size, max. • Number of clock memories 	16 kbyte 8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	
<ul style="list-style-type: none"> • Retentivity adjustable • Retentivity preset 	Yes No
Local data	
<ul style="list-style-type: none"> • 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	
<ul style="list-style-type: none"> • Inputs 	32 kbyte; All inputs are in the process image

<ul style="list-style-type: none"> • Outputs 	32 kbyte; All outputs are in the process image
per integrated IO subsystem	
<ul style="list-style-type: none"> — Inputs (volume) 	8 kbyte
<ul style="list-style-type: none"> — Outputs (volume) 	8 kbyte
Subprocess images	
<ul style="list-style-type: none"> • Number of subprocess images, max. 	32
Hardware configuration	
Number of distributed IO systems	1
Number of IO Controllers	
<ul style="list-style-type: none"> • integrated 	1
Time of day	
Clock	
<ul style="list-style-type: none"> • Type 	Hardware clock
<ul style="list-style-type: none"> • Backup time 	6 wk; At 40 °C ambient temperature, typically
<ul style="list-style-type: none"> • Deviation per day, max. 	10 s; Typ.: 2 s
Operating hours counter	
<ul style="list-style-type: none"> • Number 	16
Clock synchronization	
<ul style="list-style-type: none"> • supported 	Yes
<ul style="list-style-type: none"> • on Ethernet via NTP 	Yes
Interfaces	
Number of PROFINET interfaces	2
1. Interface	
Interface types	
<ul style="list-style-type: none"> • RJ 45 (Ethernet) 	Yes; X1
<ul style="list-style-type: none"> • Number of ports 	2
<ul style="list-style-type: none"> • integrated switch 	Yes
Protocols	
<ul style="list-style-type: none"> • IP protocol 	Yes; IPv4
<ul style="list-style-type: none"> • PROFINET IO Controller 	Yes
<ul style="list-style-type: none"> • PROFINET IO Device 	No
<ul style="list-style-type: none"> • SIMATIC communication 	Yes; Only Server
<ul style="list-style-type: none"> • Open IE communication 	Yes
<ul style="list-style-type: none"> • Web server 	No
<ul style="list-style-type: none"> • Media redundancy 	Yes
PROFINET IO Controller	
Services	
<ul style="list-style-type: none"> — PG/OP communication 	Yes
<ul style="list-style-type: none"> — Isochronous mode 	No
<ul style="list-style-type: none"> — IRT 	No
<ul style="list-style-type: none"> — PROFIenergy 	Yes
<ul style="list-style-type: none"> — Number of connectable IO Devices, max. 	64
<ul style="list-style-type: none"> — 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	
<ul style="list-style-type: none"> — for send cycle of 1 ms 	1 ms to 512 ms
2. Interface	
Interface types	
<ul style="list-style-type: none"> • RJ 45 (Ethernet) 	Yes; X2
<ul style="list-style-type: none"> • Number of ports 	1
<ul style="list-style-type: none"> • integrated switch 	No
Protocols	
<ul style="list-style-type: none"> • IP protocol 	Yes; IPv4
<ul style="list-style-type: none"> • PROFINET IO Controller 	No
<ul style="list-style-type: none"> • PROFINET IO Device 	No
<ul style="list-style-type: none"> • SIMATIC communication 	Yes; Only Server
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<ul style="list-style-type: none"> • Web server 	No
<ul style="list-style-type: none"> • Media redundancy 	No

Interface types	
RJ 45 (Ethernet)	
• 100 Mbps	Yes
• Autonegotiation	Yes
• Autocrossing	Yes
• Industrial Ethernet status LED	Yes
Protocols	
PROFIsafe	No
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; MRP Automanager according to IEC 62439-2 Edition 2.0
— MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
— 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	
• PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
• S7 routing	Yes
• 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
• DNS	Yes
• 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	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. • vertical installation, max. 	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	
Ambient temperature during storage/transportation		
<ul style="list-style-type: none"> • min. • max. 	-40 °C 70 °C	
Altitude during operation relating to sea level		
<ul style="list-style-type: none"> • Installation altitude above sea level, max. 	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	
configuration / header		
Know-how protection		
<ul style="list-style-type: none"> • User program protection/password protection • Copy protection • Block protection 	Yes No Yes	
Access protection		
<ul style="list-style-type: none"> • protection of confidential configuration data • Password for display • Protection level: Write protection • Protection level: Read/write protection • Protection level: Complete protection 	Yes Yes Yes Yes Yes	
Dimensions		
Width	70 mm	

Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	830 g
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