



SIMATIC S7-1500R, CPU 1513R-1PN, central processing unit with 300 KB work memory for program and 1.5 MB for data, 1st interface: PROFINET RT with 2-port switch, SIMATIC Memory Card required

General information	
Product type designation	CPU 1513R-1 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]	3.45 cm
Control elements	
Number of keys	6
Mode selector switch	1
Supply voltage	
Rated value (DC)	24 V
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)	0.7 A
Inrush current, max.	1.9 A; Rated value
I^2t	0.02 A ² ·s
Power loss	
Power loss, typ.	5.7 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) 	300 kbyte
<ul style="list-style-type: none"> integrated (for data) 	1.5 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.	80 ns

for word operations, typ.	96 ns
for fixed point arithmetic, typ.	128 ns
for floating point arithmetic, typ.	512 ns
CPU-blocks	
Number of elements (total)	4 000; Blocks (OB, FB, FC, DB) and UDTs
DB	
<ul style="list-style-type: none"> • Number range • Size, max. 	Number range: 1 to 59 999 1.5 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 ... 65 535 300 kbyte
FC	
<ul style="list-style-type: none"> • Number range • Size, max. 	0 ... 65 535 300 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 	300 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.	128 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	2 048; max. number of modules / submodules
I/O address area	
<ul style="list-style-type: none"> • Inputs • Outputs 	32 kbyte; All inputs are in the process image 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	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
— Isochronous mode	No
— IRT	No
— PROFIenergy	Yes
— Number of connectable IO Devices, max.	64
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.	88
• Number of connections reserved for ES/HMI/web	10
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	No
• S7 communication, as server	Yes
• S7 communication, as client	No
Open IE communication	

<ul style="list-style-type: none"> • TCP/IP <ul style="list-style-type: none"> — Data length, max. 64 kbyte — several passive connections per port, supported Yes • ISO-on-TCP (RFC1006) Yes <ul style="list-style-type: none"> — Data length, max. 64 kbyte • UDP Yes <ul style="list-style-type: none"> — 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	
<ul style="list-style-type: none"> • HTTP No • HTTPS No 	
OPC UA	
<ul style="list-style-type: none"> • OPC UA Client No • OPC UA Server No 	
Further protocols	
<ul style="list-style-type: none"> • MODBUS Yes; MODBUS TCP 	
Isochronous mode	
Equidistance	No
S7 message functions	
Number of login stations for message functions, max.	32
Program alarms	Yes
Number of configurable program messages, max.	5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH
Number of loadable program messages in RUN, max.	2 500
Number of simultaneously active program alarms	
<ul style="list-style-type: none"> • Number of program alarms 300 • Number of alarms for system diagnostics 100 	
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 Yes • Variables Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters • Number of variables, max. <ul style="list-style-type: none"> — of which status variables, max. 200; per job — of which control variables, max. 200; per job 	
Forcing	
<ul style="list-style-type: none"> • Forcing Yes • Forcing, variables Peripheral inputs/outputs • Number of variables, max. 200 	
Diagnostic buffer	
<ul style="list-style-type: none"> • present Yes • Number of entries, max. <ul style="list-style-type: none"> — of which powerfail-proof 500 	
Traces	
<ul style="list-style-type: none"> • Number of configurable Traces 4 • Memory size per trace, max. 512 kbyte 	
Interrupts/diagnostics/status information	
Diagnostics indication LED	
<ul style="list-style-type: none"> • RUN/STOP LED Yes • ERROR LED Yes • MAINT LED Yes • Connection display LINK TX/RX 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. 	0 °C	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
<ul style="list-style-type: none"> • vertical installation, min. • vertical installation, max. 	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		
configuration / programming / header		
Programming language		
— LAD	Yes	
— FBD	Yes	
— STL	Yes	
— SCL	Yes	
— CFC	No	
— GRAPH	Yes	
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	
programming / cycle time monitoring / header		
<ul style="list-style-type: none"> • lower limit • upper limit 	adjustable minimum cycle time adjustable maximum cycle time	
Dimensions		
Width	35 mm	
Height	147 mm	
Depth	129 mm	
Weights		
Weight, approx.	430 g	