

SIMATIC ET 200SP Open Controllers, CPU 1515SP PC. 4 GB RAM, 30 GB CFAST with WES 7 E 32 bit pre-installed, with S7-1500 software controller CPU 1505SP F pre-installed, Interfaces: 1x slot CFAST, 1x slot SD/MMC, 1x connection for ET 200SP bus adapter PROFINET 1x 10/100/1000 Mbit/s Ethernet, 3x USB, 1x DVI-I graphics card connection, Documentation on DVD, Restore DVD



Figure similar

General information	
Product type designation	CPU 1515SP PC
HW functional status	FS06
Firmware version	V2.1
Engineering with	
<ul style="list-style-type: none"> STEP 7 TIA Portal configurable/integrated from version 	V14 SP1
Installed software	
<ul style="list-style-type: none"> Visualization Control 	No S7-1500 Software Controller CPU 1505SP V2.1
Configuration control	
via dataset	Yes
Control elements	
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)	1.5 A; Full processor load, incl. ET 200SP modules and using USB
Current consumption (in no-load operation), typ.	0.6 A
Inrush current, max.	4.7 A; Rated value
Power	
Active power input, max.	36 W; incl. ET 200SP modules and using USB
Infeed power to the backplane bus	8.75 W
Power loss	
Power loss, typ.	15 W; without ET 200SP modules and without using USB
Processor	
Processor type	Dual-Core 1 GHz, AMD G Series APU T40E
Memory	
Type of memory	DDR3-SDRAM
Main memory	4 GB RAM
CFast memory card	Yes; 30 GB flash memory
SIMATIC memory card required	No
Work memory	
<ul style="list-style-type: none"> integrated (for program) integrated (for data) integrated (for CPU function library of CPU Runtime) 	1 Mbyte 5 Mbyte 10 Mbyte
Load memory	
<ul style="list-style-type: none"> integrated (on PC mass storage) 	320 Mbyte
Backup	
<ul style="list-style-type: none"> with UPS with non-volatile memory 	Yes; all memory areas declared retentive Yes
CPU processing times	
for bit operations, typ.	10 ns
for word operations, typ.	12 ns
for fixed point arithmetic, typ.	16 ns
for floating point arithmetic, typ.	64 ns
CPU-blocks	
Number of elements (total)	6 000; In addition to blocks such as DBs, FBs and FCs, UDTs, global constants, etc. are also regarded as elements

DB	
• Number, max.	5 999; Number range: 1 to 65535
• Size, max.	5 Mbyte
FB	
• Number, max.	5 998; Number range: 1 to 65535
• Size, max.	512 kbyte
FC	
• Number, max.	5 999; Number range: 1 to 65535
• Size, max.	512 kbyte
OB	
• Size, max.	1 048 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 DPV1 alarm OBs	3
• Number of isochronous mode OBs	1
• Number of technology synchronous alarm OBs	2
• 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. 410 kbyte; For storage in NVRAM; for storage in mass storage 5 242 020 bytes

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

Address area

Number of IO modules 8 192

I/O address area

- Inputs 32 kbyte; All inputs are in the process image
- Outputs 32 kbyte; All outputs are in the process image

of which per assigned PC interface

- Inputs (volume) 8 kbyte
- Outputs (volume) 8 kbyte

Subprocess images

- Number of subprocess images, max. 32

Hardware configuration

Integrated power supply Yes

Number of distributed IO systems 20

Number of DP masters

- Via CM 1

Rack

- Modules per rack, max. 64; CPU 1515SP PC + 64 modules + server module
- Number of lines, max. 1

PtP CM

- Number of PtP CMs the number of connectable PtP CMs is only limited by the number of available slots

Time of day

Clock

- Type Hardware clock
- Hardware clock (real-time) Yes; Resolution: 1 s
- Backup time 6 wk; At 40 °C ambient temperature, typically
- Deviation per day, max. 10 s; Typ.: 2 s

Clock synchronization

- supported Yes
- on Windows clock, slave Yes

Interfaces	
Number of industrial Ethernet interfaces	2
Number of PROFINET interfaces	1
Number of PROFIBUS interfaces	1
Number of RS 485 interfaces	1; Via CM DP module
Number of USB interfaces	3; 3x USB 2.0 on the front, 500 mA each - of which 2x 500 mA and 1x 100 mA simultaneously
Number of SD card slots	1
Video interfaces	
• Graphics interface	1x DVI-I

1. Interface

Interface type	PROFINET
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Number of connections	88

Interface types	
• Number of ports	2
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45
— Transmission rate, max.	100 Mbit/s
— Industrial Ethernet status LED	Yes
• BusAdapter (PROFINET)	Yes; Applicable BusAdapter: BA 2x RJ45, BA 2x FC

Protocols	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes

PROFINET IO Controller	
Services	
— Isochronous mode	Yes
— shortest clock pulse	500 µs
— IRT	Yes
— MRP	Yes
— MRPD	Yes
— Prioritized startup	Yes; Max. 32 PROFINET devices
— Number of connectable IO Devices, max.	128
— Of which IO devices with IRT, max.	64
— of which in line, max.	64
— Number of connectable IO Devices for RT, max.	128

— of which in line, max.	128
— Number of IO Devices that can be simultaneously activated/deactivated, max.	8
— IO Devices changing during operation (partner ports), supported	Yes
— Number of IO Devices per tool, max.	8
— 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 IRT

— for send cycle of 500 µs	500 µs to 8 ms
— for send cycle of 1 ms	1 ms to 16 ms
— for send cycle of 2 ms	2 ms to 32 ms
— for send cycle of 4 ms	4 ms to 64 ms
— With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)

Update time for RT

— for send cycle of 500 µs	500 µs to 256 ms
— for send cycle of 1 ms	1 ms to 512 ms
— for send cycle of 2 ms	2 ms to 512 ms
— for send cycle of 4 ms	4 ms to 512 ms

PROFINET IO Device

Services

— Isochronous mode	No
— IRT	Yes
— MRP	Yes
— MRPD	Yes
— Prioritized startup	Yes
— Shared device	Yes
— Number of IO Controllers with shared device, max.	4

2. Interface

Interface type	Integrated Ethernet interface
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes

Interface types

• Number of ports	1
• RJ 45 (Ethernet)	Yes; Integrated
— Transmission rate, max.	1 000 Mbit/s
— Industrial Ethernet status LED	No

3. Interface

Interface type	PROFIBUS with CM DP
Number of connections via this interface	44
Interface types	
• RS 485	Yes
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• Number of DP slaves, max.	125
Services	
— Equidistance	No
— Isochronous mode	No
Interface types	
RS 485	
• Transmission rate, max.	12 Mbit/s
Protocols	
Number of connections	
• Number of connections, max.	88
• Number of connections reserved for ES/HMI/web	10
• Number of S7 routing paths	16
Redundancy mode	
Media redundancy	
— Switchover time on line break, typ.	200 ms
— Number of stations in the ring, max.	50
SIMATIC communication	
• PG/OP communication	Yes
• S7 routing	Yes
• S7 communication, as server	Yes
• S7 communication, as client	Yes
• User data per job, max.	64 kbyte
Open IE communication	
• TCP/IP	Yes
— Data length, max.	64 kbyte
• ISO-on-TCP (RFC1006)	Yes
— Data length, max.	64 kbyte
• UDP	Yes
— Data length, max.	1 472 kbyte
• SNMP	Yes
• DCP	Yes

• LLDP	Yes
Web server	
• HTTP	Yes; Via Windows and PROFINET interface
• HTTPS	Yes; Only via PROFINET interface
OPC UA	
• OPC UA Server	Data access (read, write, subscribe), runtime license required
— Application authentication	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— User authentication	"anonymous" or by user name & password
Further protocols	
• MODBUS	Yes; MODBUS TCP
S7 message functions	
Number of login stations for message functions, max.	32
Program alarms	Yes
Number of configurable program messages, max.	10 000
Number of simultaneously active program alarms	
• Number of program alarms	1 000
• Number of alarms for system diagnostics	200
• Number of alarms for motion technology objects	160
Test commissioning functions	
Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 8 engineering systems
Status block	Yes; up to 8 simultaneously
Single step	No
Status/control	
• Status/control variable	Yes
• Variables	Inputs, outputs, memory bits, DB, times, counters
• Number of variables, max.	
— of which status variables, max.	200
— of which control variables, max.	200
Forcing	
• Forcing	Yes
• Forcing, variables	Inputs, outputs
• Number of variables, max.	200
Diagnostic buffer	
• present	Yes
• Number of entries, max.	1 000
— of which powerfail-proof	300
Traces	

- 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

Supported technology objects

Motion Control

- Number of available Motion Control resources for technology objects 2 400
- Required Motion Control resources
 - per speed-controlled axis 40; per axis
 - per positioning axis 80; per axis
 - per synchronous axis 160; per axis
 - per external encoder 80; per external encoder
 - per output cam 20; per cam
 - per cam track 160; per cam track
 - per probe 40; per probe
- Positioning axis
 - Number of positioning axes at motion control cycle of 4 ms (typical value) 5
 - Number of positioning axes at motion control cycle of 8 ms (typical value) 12

Controller

- PID_Compact Yes; Universal PID controller with integrated optimization
- PID_3Step Yes; PID controller with integrated optimization for valves
- PID-Temp Yes; PID controller with integrated optimization for temperature

Counting and measuring

- High-speed counter Yes

Standards, approvals, certificates

- CE mark Yes
- CSA approval Yes
- cULus Yes
- FM approval Yes
- RCM (formerly C-TICK) Yes

Ambient conditions

Ambient temperature during operation

- min. 0 °C

<ul style="list-style-type: none"> • max. 	Up to 60 °C with max. 32 ET 200SP modules and 3x 100 mA USB load; up to 55 °C with max. 64 ET 200SP modules and 2x max. 500 mA and 1x max. 100 mA USB load
<ul style="list-style-type: none"> • horizontal installation, min. 	0 °C
<ul style="list-style-type: none"> • horizontal installation, max. 	60 °C
<ul style="list-style-type: none"> • vertical installation, min. 	0 °C
<ul style="list-style-type: none"> • vertical installation, max. 	50 °C; With max. 32 ET 200SP modules and 3x 100 mA USB load
Ambient temperature during storage/transportation	
<ul style="list-style-type: none"> • min. 	-40 °C
<ul style="list-style-type: none"> • max. 	70 °C
Vibrations	
<ul style="list-style-type: none"> • Operation, tested according to IEC 60068-2-6 	Yes
<ul style="list-style-type: none"> • Transport, tested acc. to IEC 60068-2-6 	Yes
Shock testing	
<ul style="list-style-type: none"> • tested according to IEC 60068-2-6 	Yes
<ul style="list-style-type: none"> • tested according to IEC 60068-2-27 	Yes
<ul style="list-style-type: none"> • tested according to IEC 60068-2-29 	Yes
<ul style="list-style-type: none"> • Storage/transport, tested acc. to IEC 60068-2-27 	Yes
Operating systems	
pre-installed operating system	Windows Embedded Standard 7 E 32-bit
Configuration	
Programming	
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 	Yes
<ul style="list-style-type: none"> • Copy protection 	Yes
<ul style="list-style-type: none"> • Block protection 	Yes
Access protection	
<ul style="list-style-type: none"> • Protection level: Write protection 	Yes
<ul style="list-style-type: none"> • Protection level: Read/write protection 	Yes
<ul style="list-style-type: none"> • Protection level: Complete protection 	Yes
Cycle time monitoring	
<ul style="list-style-type: none"> • lower limit 	adjustable minimum cycle time
<ul style="list-style-type: none"> • upper limit 	adjustable maximum cycle time

Open Development interfaces

- Size of ODK SO file, max. 3.8 Mbyte

Peripherals/Options

SD card Optionally for additional mass storage

Dimensions

Width 160 mm

Height 117 mm

Depth 75 mm

Weights

Weight, approx. 0.83 kg

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