

SIMATIC ET 200SP Open Controllers, CPU 1515SP PC. 4 GB RAM, 30 GB CFAST with WES 7 P 64 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	FS05
Firmware version	V2.1
Engineering with	
<ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated as of version</li> </ul>	V14 SP1
Installed software	
<ul style="list-style-type: none"> <li>Visualization</li> <li>Control</li> </ul>	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
<b>Mains buffering</b>	
<ul style="list-style-type: none"> <li>Mains/voltage failure stored energy time</li> </ul>	5 ms
<b>Input current</b>	
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
<b>Power</b>	
Active power input, max.	36 W; incl. ET 200SP modules and using USB
Infeed power to the backplane bus	8.75 W
<b>Power loss</b>	
Power loss, typ.	15 W; without ET 200SP modules and without using USB
<b>Processor</b>	
Processor type	Dual-Core 1 GHz, AMD G Series APU T40E
<b>Memory</b>	
Type of memory	DDR3-SDRAM
Main memory	4 GB RAM
CFast memory card	Yes; 30 GB flash memory
SIMATIC memory card required	No
<b>Work memory</b>	
<ul style="list-style-type: none"> <li>integrated (for program)</li> <li>integrated (for data)</li> <li>integrated (for CPU function library of CPU Runtime)</li> </ul>	1 Mbyte 5 Mbyte 10 Mbyte
<b>Load memory</b>	
<ul style="list-style-type: none"> <li>integrated (on PC mass storage)</li> </ul>	320 Mbyte
<b>Backup</b>	
<ul style="list-style-type: none"> <li>with UPS</li> <li>with non-volatile memory</li> </ul>	Yes; all memory areas declared retentive Yes
<b>CPU processing times</b>	
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
<b>CPU-blocks</b>	
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

<b>DB</b>	
• Number, max.	5 999; Number range: 1 to 65535
• Size, max.	5 Mbyte
<b>FB</b>	
• Number, max.	5 998; Number range: 1 to 65535
• Size, max.	512 kbyte
<b>FC</b>	
• Number, max.	5 999; Number range: 1 to 65535
• Size, max.	512 kbyte
<b>OB</b>	
• 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
<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

## 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

### Local data

- per priority class, max. 64 kbyte; max. 16 KB per block

## 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

- to DP, master
- on Ethernet via NTP
- on Windows clock, slave

No  
Yes  
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

## Interface types

- Number of ports
- integrated switch
- RJ 45 (Ethernet)
  - Transmission rate, max.
  - Industrial Ethernet status LED
- BusAdapter (PROFINET)

2  
Yes  
Yes; Via BusAdapter BA 2x RJ45  
100 Mbit/s  
Yes  
Yes; Applicable BusAdapter: BA 2x RJ45, BA 2x FC

## Protocols

- Number of connections via this interface
- PROFINET IO Controller
- PROFINET IO Device
- SIMATIC communication
- Open IE communication
- Web server

88  
Yes  
Yes  
Yes  
Yes  
Yes

## PROFINET IO Controller

### Services

- Isochronous mode
- shortest clock pulse
- IRT
- MRP
- MRPD
- Prioritized startup
- Number of connectable IO Devices, max.

Yes  
500 µs  
Yes  
Yes  
Yes  
Yes; Max. 32 PROFINET devices  
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)
  - Transmission rate, max. 1 000 Mbit/s
  - Industrial Ethernet status LED No

### 3. Interface

Interface type	PROFIBUS with CM DP
Interface types	
• RS 485	Yes
Protocols	
• Number of connections via this interface	44
• 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
PROFIBUS DP slave	
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
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

<ul style="list-style-type: none"> <li>• UDP <ul style="list-style-type: none"> <li>— Data length, max.</li> </ul> </li> <li>• SNMP</li> <li>• DCP</li> <li>• LLDP</li> </ul>	<p>Yes</p> <p>1 472 kbyte</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>
<b>Web server</b>	
<ul style="list-style-type: none"> <li>• HTTP</li> <li>• HTTPS</li> </ul>	<p>Yes; Via Windows and PROFINET interface</p> <p>Yes; Only via PROFINET interface</p>
<b>OPC UA</b>	
<ul style="list-style-type: none"> <li>• OPC UA server <ul style="list-style-type: none"> <li>— Application authentication</li> <li>— Security policies</li> <li>— User authentication</li> </ul> </li> </ul>	<p>Yes; Data access (read, write, subscribe), runtime license required</p> <p>Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</p> <p>Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</p> <p>Yes; "anonymous" or by user name &amp; password</p>
<b>Further protocols</b>	
<ul style="list-style-type: none"> <li>• MODBUS</li> </ul>	<p>Yes; MODBUS TCP</p>
<b>Media redundancy</b>	
<ul style="list-style-type: none"> <li>• Switchover time on line break, typ.</li> <li>• Number of stations in the ring, max.</li> </ul>	<p>200 ms</p> <p>50</p>
<b>S7 message functions</b>	
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 <ul style="list-style-type: none"> <li>• Number of program alarms</li> <li>• Number of alarms for system diagnostics</li> <li>• Number of alarms for motion technology objects</li> </ul>	<p>1 000</p> <p>200</p> <p>160</p>
<b>Test commissioning functions</b>	
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
<b>Status/control</b>	
<ul style="list-style-type: none"> <li>• Status/control variable</li> <li>• Variables</li> <li>• Number of variables, max. <ul style="list-style-type: none"> <li>— of which status variables, max.</li> <li>— of which control variables, max.</li> </ul> </li> </ul>	<p>Yes</p> <p>Inputs, outputs, memory bits, DB, times, counters</p> <p>200</p> <p>200</p>
<b>Forcing</b>	



<ul style="list-style-type: none"> <li>• Forcing</li> <li>• Forcing, variables</li> <li>• Number of variables, max.</li> </ul>	<p>Yes</p> <p>Inputs, outputs</p> <p>200</p>
<b>Diagnostic buffer</b>	
<ul style="list-style-type: none"> <li>• present</li> <li>• Number of entries, max. <ul style="list-style-type: none"> <li>— of which powerfail-proof</li> </ul> </li> </ul>	<p>Yes</p> <p>1 000</p> <p>300</p>
<b>Traces</b>	
<ul style="list-style-type: none"> <li>• Number of configurable Traces</li> <li>• Memory size per trace, max.</li> </ul>	<p>4</p> <p>512 kbyte</p>
<b>Interrupts/diagnostics/status information</b>	
<b>Diagnostics indication LED</b>	
<ul style="list-style-type: none"> <li>• RUN/STOP LED</li> <li>• ERROR LED</li> <li>• MAINT LED</li> </ul>	<p>Yes</p> <p>Yes</p> <p>Yes</p>
<b>Supported technology objects</b>	
<b>Motion Control</b>	
<ul style="list-style-type: none"> <li>• Number of available Motion Control resources for technology objects (except cam disks)</li> <li>• Required Motion Control resources <ul style="list-style-type: none"> <li>— per speed-controlled axis</li> <li>— per positioning axis</li> <li>— per synchronous axis</li> <li>— per external encoder</li> <li>— per output cam</li> <li>— per cam track</li> <li>— per probe</li> </ul> </li> <li>• Positioning axis <ul style="list-style-type: none"> <li>— Number of positioning axes at motion control cycle of 4 ms (typical value)</li> <li>— Number of positioning axes at motion control cycle of 8 ms (typical value)</li> </ul> </li> </ul>	<p>Yes</p> <p>2 400</p> <p>40; per axis</p> <p>80; per axis</p> <p>160; per axis</p> <p>80; per external encoder</p> <p>20; per cam</p> <p>160; per cam track</p> <p>40; per probe</p> <p>5</p> <p>12</p>
<b>Controller</b>	
<ul style="list-style-type: none"> <li>• PID_Compact</li> <li>• PID_3Step</li> <li>• PID-Temp</li> </ul>	<p>Yes; Universal PID controller with integrated optimization</p> <p>Yes; PID controller with integrated optimization for valves</p> <p>Yes; PID controller with integrated optimization for temperature</p>
<b>Counting and measuring</b>	
<ul style="list-style-type: none"> <li>• High-speed counter</li> </ul>	<p>Yes</p>
<b>Standards, approvals, certificates</b>	
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   |
| • 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 |
| • horizontal installation, min. | 0 °C   |
| • horizontal installation, max. | 60 °C  |
| • vertical installation, min.   | 0 °C   |
| • vertical installation, max.   | 50 °C; With max. 32 ET 200SP modules and 3x 100 mA USB load  |

### Ambient temperature during storage/transportation

- |        |        |
|--------|--------|
| • min. | -40 °C |
| • max. | 70 °C  |

### Vibrations

- |  |     |
|--|-----|
| • Operation, tested according to IEC 60068-2-6 | Yes |
| • Transport, tested acc. to IEC 60068-2-6      | Yes |

### Shock testing

- |  |     |
|--|-----|
| • tested according to IEC 60068-2-6                | Yes |
| • tested according to IEC 60068-2-27               | Yes |
| • tested according to IEC 60068-2-29               | Yes |
| • Storage/transport, tested acc. to IEC 60068-2-27 | Yes |

## Operating systems

pre-installed operating system	Windows Embedded Standard 7 P 64-bit
--------------------------------	--------------------------------------

## 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                             | Yes |
| • Block protection                            | Yes |

### Access protection

• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
<b>Cycle time monitoring</b>	
• lower limit	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time
<b>Open Development interfaces</b>	
• Size of ODK SO file, max.	3.8 Mbyte
<b>Peripherals/Options</b>	
Peripherals	
• SD card	Optionally for additional mass storage
<b>Dimensions</b>	
Width	160 mm
Height	117 mm
Depth	75 mm
<b>Weights</b>	
Weight, approx.	0.83 kg
<b>last modified:</b>	08/24/2019