

\*\*\*Spare part\*\*\* SIMATIC S7-1500F, CPU 1515F-2 PN, Central processing unit with work memory 750 KB for Program and 3 MB for data, 1st interface, PROFINET IRT with 2-port switch, 2nd interface, Ethernet, 30 ns bit performance, SIMATIC Memory Card required



General information	
Product type designation	CPU 1515F-2 PN
HW functional status	FS01
Firmware version	V1.8
Engineering with	
<ul style="list-style-type: none"> <li>STEP 7 TIA Portal configurable/integrated as of version</li> </ul>	V13 SP1 Update 4
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
<b>Input current</b>	
Current consumption (rated value)	0.8 A
Inrush current, max.	2.4 A; Rated value
<b>Power</b>	
Infeed power to the backplane bus	12 W
Power consumption from the backplane bus (balanced)	6.2 W
<b>Power loss</b>	
Power loss, typ.	6.3 W
<b>Memory</b>	
SIMATIC memory card required	Yes
<b>Work memory</b>	
• integrated (for program)	750 kbyte
• integrated (for data)	3 Mbyte
<b>Load memory</b>	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
<b>Backup</b>	
• maintenance-free	Yes
<b>CPU processing times</b>	
for bit operations, typ.	30 ns
for word operations, typ.	36 ns
for fixed point arithmetic, typ.	48 ns
for floating point arithmetic, typ.	192 ns
<b>CPU-blocks</b>	
Number of elements (total)	6 000; Blocks (OB, FB, FC, DB) and UDTs
<b>DB</b>	
• Number, max.	6 000; Number range: 1 to 65535
• Size, max.	3 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB
<b>FB</b>	
• Number, max.	5 998; Number range: 1 to 65535
• Size, max.	500 kbyte
<b>FC</b>	
• Number, max.	5 999; Number range: 1 to 65535
• Size, max.	500 kbyte
<b>OB</b>	
• 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 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; Up to 8 possible for F-blocks

### Counters, timers and their retentivity

<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.	512 kbyte; In total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 472 KB
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<b>Flag</b>	
• Number, max.	16 kbyte
• Number of clock memories	8; 8 clock memory bits, grouped into one clock memory byte

<b>Data blocks</b>	
• Retentivity adjustable	Yes
• Retentivity preset	No

<b>Local data</b>	
• per priority class, max.	64 kbyte; max. 16 KB per block

### Address area

Number of IO modules	8 192; max. number of modules / submodules
<b>I/O address area</b>	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
<b>per integrated IO subsystem</b>	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
<b>per CM/CP</b>	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
<b>Subprocess images</b>	
• Number of subprocess images, max.	32
<b>Hardware configuration</b>	
Number of distributed IO systems	20
<b>Number of DP masters</b>	
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
<b>Number of IO Controllers</b>	
• integrated	1
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
<b>Rack</b>	
• Modules per rack, max.	32; CPU + 31 modules
• Number of lines, max.	1
<b>PtP CM</b>	
• Number of PtP CMs	the number of connectable PtP CMs is only limited by the number of available slots
<b>Time of day</b>	
<b>Clock</b>	
• Type	Hardware clock
• Backup time	6 wk; At 40 °C ambient temperature, typically
• Deviation per day, max.	10 s; Typ.: 2 s
<b>Operating hours counter</b>	
• Number	16
<b>Clock synchronization</b>	
• supported	Yes
• in AS, master	Yes
• in AS, slave	Yes
• on Ethernet via NTP	Yes
<b>Interfaces</b>	
Number of PROFINET interfaces	2

## 1. Interface

Interface types	
• Number of ports	2
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes; X1

  

Functionality	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	Yes

## 2. Interface

Interface types	
• Number of ports	1
• integrated switch	No
• RJ 45 (Ethernet)	Yes; X2

  

Functionality	
• PROFINET IO Controller	No
• PROFINET IO Device	No
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes

## 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.	192; via integrated interfaces of the CPU and connected CPs / CMs
• Number of connections reserved for ES/HMI/web	10
• Number of connections via integrated interfaces	108
• Number of S7 routing paths	16

  

PROFINET IO Controller	
Services	
— PG/OP communication	Yes

— S7 routing	Yes
— Isochronous mode	Yes
— Open IE communication	Yes
— IRT	Yes
— PROFINET energy	Yes
— Prioritized startup	Yes; Max. 32 PROFINET devices
— Number of connectable IO Devices, max.	256; In total, up to 512 distributed I/O devices can be connected via PROFIBUS or PROFINET
— Of which IO devices with IRT, max.	64
— Number of connectable IO Devices for RT, max.	256
— of which in line, max.	256
— Number of IO Devices that can be simultaneously activated/deactivated, max.	8
— 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
<b>Redundancy mode</b>	
— MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
<b>Update time for IRT</b>	
— for send cycle of 250 µs	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 µs of the isochronous OB is decisive
— 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)
<b>Update time for RT</b>	
— for send cycle of 250 µs	250 µs to 128 ms
— 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
<b>PROFINET IO Device</b>	
<b>Services</b>	
— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	No
— Open IE communication	Yes

— IRT	Yes
— PROFINergy	Yes
— Shared device	Yes
— Number of IO Controllers with shared device, max.	4
<b>Redundancy mode</b>	
— MRP	Yes
<b>SIMATIC communication</b>	
• S7 communication, as server	Yes
• S7 communication, as client	Yes
• User data per job, max.	See online help (S7 communication, user data size)
<b>Open IE communication</b>	
• 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.	1 472 byte
• DHCP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
<b>Web server</b>	
• HTTP	Yes; Standard and user-defined pages
• HTTPS	Yes; Standard and user-defined pages
<b>Further protocols</b>	
• MODBUS	Yes; MODBUS TCP
<b>Media redundancy</b>	
• Switchover time on line break, typ.	200 ms
• Number of stations in the ring, max.	50
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes
Equidistance	Yes
<b>S7 message functions</b>	
Number of login stations for message functions, max.	32
Program alarms	Yes
Number of configurable program alarms	10 000
Number of simultaneously active program alarms	

• Number of program alarms	600
• 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 (in total across all ES clients)
Single step	No

<b>Status/control</b>	
• Status/control variable	Yes
• Variables	Inputs, outputs, memory bits, DB, times, counters
• Number of variables, max.	
— of which status variables, max.	200; per job
— of which control variables, max.	200; per job

<b>Forcing</b>	
• Forcing, variables	Inputs, outputs
• Number of variables, max.	200

<b>Diagnostic buffer</b>	
• present	Yes
• Number of entries, max.	3 200
— of which powerfail-proof	500

<b>Traces</b>	
• Number of configurable Traces	4; Up to 512 KB of data per trace are possible

### Interrupts/diagnostics/status information

<b>Diagnostics indication LED</b>	
• RUN/STOP LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• Connection display LINK TX/RX	Yes

### Supported technology objects

<b>Motion Control</b>	
• Speed-controlled axis	Yes
— Number of speed-controlled axes, max.	30; Requirement: There must be no other motion technology objects created
• Positioning axis	
— Number of positioning axes, max.	30; Requirement: There must be no other motion technology objects created
• Synchronized axes (relative gear synchronization)	
— Number of axes, max.	15; Requirement: There must be no other motion technology objects created

<ul style="list-style-type: none"> <li>External encoders <ul style="list-style-type: none"> <li>Number of external encoders, max.</li> </ul> </li> </ul>	30; Requirement: There must be no other motion technology objects created
<b>Controller</b> <ul style="list-style-type: none"> <li>PID_Compact</li> <li>PID_3Step</li> <li>PID-Temp</li> </ul>	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves Yes; PID controller with integrated optimization for temperature
<b>Counting and measuring</b> <ul style="list-style-type: none"> <li>High-speed counter</li> </ul>	Yes

## Ambient conditions

<b>Ambient temperature during operation</b>	
<ul style="list-style-type: none"> <li>horizontal installation, min.</li> <li>horizontal installation, max.</li> <li>vertical installation, min.</li> <li>vertical installation, max.</li> </ul>	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

## Configuration

<b>Programming</b>	
<b>Programming language</b>	
<ul style="list-style-type: none"> <li>LAD</li> <li>FBD</li> <li>STL</li> <li>SCL</li> <li>GRAPH</li> </ul>	Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes
<b>Know-how protection</b>	
<ul style="list-style-type: none"> <li>User program protection/password protection</li> <li>Copy protection</li> <li>Block protection</li> </ul>	Yes Yes Yes
<b>Access protection</b>	
<ul style="list-style-type: none"> <li>Password for display</li> <li>Protection level: Write protection</li> <li>Protection level: Read/write protection</li> <li>Protection level: Complete protection</li> </ul>	Yes Yes Yes Yes
<b>Cycle time monitoring</b>	
<ul style="list-style-type: none"> <li>lower limit</li> <li>upper limit</li> </ul>	adjustable minimum cycle time adjustable maximum cycle time

## Dimensions

Width	70 mm
Height	147 mm
Depth	129 mm

## Weights

Weight, approx.

830 g

**last modified:**

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