SIEMENS

Data sheet 6ES7515-2FM01-0AB0

SIMATIC S7-1500F, CPU 1515F-2 PN, CENTRAL PROCESSING UNIT WITH WORKING MEMORY 750 KB FOR PROGRAM AND 3 MB FOR DATA, 1. INTERFACE: PROFINET IRT WITH 2 PORT SWITCH, 2. INTERFACE: PROFINET RT, 30 NS BIT-PERFORMANCE, SIMATIC MEMORY CARD NECESSARY

Figure similar

General information	
Product type designation	CPU 1515F-2 PN
HW functional status	FS01
Firmware version	V1.8
Engineering with	
● STEP 7 TIA Portal configurable/integrated as of version	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

Input current

Current consumption (rated value)	0.8 A
Inrush current, max.	2.4 A; Rated value
I²t	0.02 A²·s

Power

Power consumption from the backplane bus (balanced)	6.2 W
Infeed power to the backplane bus	12 W

Power loss

Power loss, typ.	6.3 W

Memory

SIMATIC memory card required	Yes
Work memory	
• integrated (for program)	750 kbyte
• integrated (for data)	3 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	
• maintenance-free	Yes

CPU processing times

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

CPU-blocks

Number of elements (total)	6 000; Blocks (OB, FB, FC, DB) and UDTs
DB	
• 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
FB	
• Number, max.	5 998; Number range: 1 to 65535
• Size, max.	500 kbyte
FC	
• Number, max.	5 999; Number range: 1 to 65535
• Size, max.	500 kbyte
OB	

• 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
Nesting depth	
• per priority class	24; Up to 8 possible for F-blocks

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	
Flag	
• Number, max.	16 kbyte
• Number of clock memories	8; 8 clock memory bits, 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; max. number of modules / submodules
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
per integrated IO subsystem	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
per CM/CP	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
Subprocess images	
• Number of subprocess images, max.	32

Hardware configuration	
Number of distributed IO systems	20
Number of DP masters	
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Number of IO Controllers	
• integrated	1
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Rack	
• Modules per rack, max.	32; CPU + 31 modules
• 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
• 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
• in AS, master	Yes
• in AS, slave	Yes
• on Ethernet via NTP	Yes

Interfaces	

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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
— MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
— PROFIenergy	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
Update time for IRT	
— 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)
Update time for RT	
— 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
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	No
— Open IE communication	Yes

— IRT	Yes
— MRP	Yes
— PROFIenergy	Yes
— Shared device	Yes
— Number of IO Controllers with shared device, max.	4

SIMATIC communication	
● S7 communication, as server	Yes
● S7 communication, as client	Yes
● User data per job, max.	See online help (S7 communication, user data size)

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.	1 472 byte
● DHCP	No
● SNMP	Yes
● DCP	Yes
● LLDP	Yes

Web server	
● HTTP	Yes; Standard and user-defined pages
● HTTPS	Yes; Standard and user-defined pages

Further protocols	
● MODBUS	Yes; MODBUS TCP

Media redundancy	
● Switchover time on line break, typ.	200 ms
● Number of stations in the ring, max.	50

Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Equidistance	Yes

S7 message functions	
Number of login stations for message functions, max.	32
Block related messages	Yes
Number of configurable alarms, max.	10 000
Number of simultaneously active alarms in alarm pool	
● Number of reserved user alarms	600

● Number of reserved alarms for system diagnostics	200
● Number of reserved alarms for Motion Control 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
Status/control	
● 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
Forcing	
● Forcing, variables	Inputs, outputs
● Number of variables, max.	200
Diagnostic buffer	
● present	Yes
● Number of entries, max.	3 200
— of which powerfail-proof	500
Traces	
● Number of configurable Traces	4; Up to 512 KB of data per trace are possible

Interrupts/diagnostics/status information	
Diagnostics indication LED	
● RUN/STOP LED	Yes
● ERROR LED	Yes
● MAINT LED	Yes
● Connection display LINK TX/RX	Yes

Supported technology objects	
Motion Control	Yes
● Speed-controlled axis	
— 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

● External encoders	
— Number of external encoders, max.	30; Requirement: There must be no other motion technology objects created
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

Highest safety class achievable in safety mode	
Probability of failure (for service life of 20 years and repair time of 100 hours)	
— Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
— High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09

Ambient conditions

Ambient temperature during operation	
● horizontal installation, min.	0 °C
● horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
● vertical installation, min.	0 °C
● vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off

Configuration

Programming	
Programming language	
— LAD	Yes; incl. failsafe
— FBD	Yes; incl. failsafe
— STL	Yes
— SCL	Yes
— GRAPH	Yes
Know-how protection	
● User program protection	Yes
● Copy protection	Yes
● Block protection	Yes
Access protection	
● Password for display	Yes
● Protection level: Write protection	Yes
● Protection level: Read/write protection	Yes
● Protection level: Complete protection	Yes

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Cycle time monitoring	
• lower limit	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time

Dimensions	
Width	70 mm
Height	147 mm
Depth	129 mm

Weights	
Weight, approx.	830 g

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