SIEMENS

Data sheet

6ES7515-2AM01-0AB0



*** Spare part *** SIMATIC S7-1500, CPU 1515-2 PN, central processing unit with work memory 500 KB for program and 3 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 30 ns bit performance, SIMATIC Memory Card required

General information	
Product type designation	CPU 1515-2 PN
HW functional status	FS03
Firmware version	V2.9
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes; Distributed and central; with minimum OB 6x cycle of 500 μ s (distributed) and 1 ms (central)
Engineering with	
 STEP 7 TIA Portal configurable/integrated from version 	V17 (FW V2.9) / V13 (FW V1.5) or higher
Configuration control	
via dataset	Yes
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
Repeat rate, min.	1/s
Input current	
Current consumption (rated value)	0.8 A
Inrush current, max.	2.4 A; Rated value
l²t	0.02 A ² ·s
Power	
Infeed power to the backplane bus	12 W
Power consumption from the backplane bus (balanced)	6.2 W
Power loss	
Power loss, typ.	6.3 W
Memory	
Number of slots for SIMATIC memory card	1

SIMATIC momony pard required	Von
SIMATIC memory card required	Yes
Work memory	50011.1
• integrated (for program)	500 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	192 110
	0.000, Planks (OD, ED, EC, DD) and UDTs
Number of elements (total)	8 000; Blocks (OB, FB, FC, DB) and UDTs
DB	
Number range	1 60 999; subdivided into: number range that can be used by the user: 1 59 999, and number range of DBs created via SFC 86: 60 000 60 999
• Size, max.	3 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	
Number range	0 65 535
• Size, max.	500 kbyte
FC	·
Number range	0 65 535
• Size, max.	500 kbyte
OB	
• Size, max.	500 kbyte
Number of free cycle OBs	100
Number of time alarm OBs	20
	20
Number of delay alarm OBs	
Number of cyclic interrupt OBs	20; With minimum OB 3x cycle of 500 μs
Number of process alarm OBs	50
Number of DPV1 alarm OBs	3
 Number of isochronous mode OBs 	2
 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
	2 070
Retentivity	Vac
— 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
ata 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
Extended retentive data area (incl. timers, counters, flags), max.	3 Mbyte; When using PS 6 0W 24/48/60 V DC HF
Flag	
• Size, 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
ddress 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
ardware configuration	
Number of distributed IO systems	64; A distributed I/O system is characterized not only by the integration of distributed I/O via PROFINET or PROFIBUS communication modules, but also by the connection of I/O via AS-i master modules or
ALL CDD (links (e.g. IE/PB-Link)
Number of DP masters	O. A resolution of O.O.M. (OD. (DDOCIDIO DDOCINET Ethorisat)
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Number of IO Controllers	
• integrated	2
• 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
me 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

1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
Number of ports	2
integrated switch	Yes
Protocols	165
IP protocol	Yes; IPv4
PROFINET IO Controller	Yes
PROFINET IO Controller PROFINET IO Device	Yes
SIMATIC communication	Yes
Open IE communication	Yes; Optionally also encrypted
Web server Media redundancy	Yes
Media redundancy PROFINET IO Controller	Yes
Services	Ves
— PG/OP communication	Yes
Isochronous mode Direct data evaluance	Yes Paguirament: IDT and isosphanous mode (MDDD entined)
— Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
— IRT	Yes
— PROFlenergy	Yes; per user program
— Prioritized startup	Yes; Max. 32 PROFINET devices
— Number of connectable IO Devices, max.	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, 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	8; in total across all interfaces
simultaneously activated/deactivated, max.	o, in total across all interfaces
 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	$250~\mu s$ 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	V
— PG/OP communication	Yes
— Isochronous mode	No
— IRT	Yes
— PROFlenergy	Yes; per user program
— Shared device	Yes
 Number of IO Controllers with shared device, 	4
max.	Vac: par user program
activation/deactivation of I-devices Asset management record	Yes; per user program
Asset management record Interface	Yes; per user program
2. Interface	

Interface types	N No.
• RJ 45 (Ethernet)	Yes; X2
Number of ports	1
integrated switch	No
Protocols	
IP protocol	Yes; IPv4
PROFINET IO Controller	Yes
 PROFINET IO Device 	Yes
 SIMATIC communication 	Yes
 Open IE communication 	Yes; Optionally also encrypted
 Web server 	Yes
Media redundancy	No
PROFINET IO Controller	
Services	
— PG/OP communication	Yes
— Isochronous mode	No
 Direct data exchange 	No
— IRT	No
— PROFlenergy	Yes; per user program
Prioritized startup	No
Number of connectable IO Devices, max.	32; In total, up to 1 000 distributed I/O devices can be connected via
Number of connectable IO Devices for RT,	AS-i, PROFIBUS or PROFINET
max.	52
— of which in line, max.	32
Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
-	8
Number of IO Devices per tool, max. Undating times.	
— 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 RT	
— for send cycle of 1 ms	1 ms to 512 ms
PROFINET IO Device	
Services	
— PG/OP communication	Yes
 Isochronous mode 	No
— IRT	No
— PROFlenergy	Yes; per user program
Prioritized startup	No
Shared device	Yes
Number of IO Controllers with shared device,	4
max.	
 activation/deactivation of I-devices 	Yes; per user program
 Asset management record 	Yes; per user program
Interface types	
RJ 45 (Ethernet)	
• 100 Mbps	Yes
Autonegotiation	Yes
Autorossing	Yes
Industrial Ethernet status LED	Yes
Protocols	
Number of connections	400 visite to analytic form of the ODU
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
Redundancy mode	
 H-Sync forwarding 	Yes

Media redundancy	
Media redundancy	only via 1st interface (X1)
— MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client
 MRP interconnection, supported 	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
— MRPD	Yes; Requirement: IRT
 Switchover time on line break, typ. 	200 ms; For MRP, bumpless for MRPD
Number of stations in the ring, max.	50
SIMATIC communication	
PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
S7 routing	Yes
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.	2 kbyte; 1 472 bytes for UDP broadcast
— UDP multicast	Yes; Max. 5 multicast circuits
• DHCP	Yes
• DNS	Yes
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Encryption	Yes; Optional
Web server	
• HTTP	Yes; Standard and user pages
• HTTPS	Yes; Standard and user pages
OPC UA	
Runtime license required	Yes; "Medium" license required
OPC UA Client	Yes
 Application authentication 	Yes
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— User authentication	"anonymous" or by user name & password
 Number of connections, max. 	10
— Number of nodes of the client interfaces, max.	2 000
 Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max. 	300
Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.	20
Number of elements for one call of OPC_UA_MethodGetHandleList, max.	100
 Number of simultaneous calls of the client instructions per connection (except OPC_UA_ReadList,OPC_UA_WriteList,OPC_UA_M max. 	1
Number of simultaneous calls of the client	5
instructions OPC_UA_ReadList,OPC_UA_WriteList and OPC_UA_MethodCall, max.	
instructions OPC_UA_ReadList,OPC_UA_WriteList and	5 000
instructions OPC_UA_ReadList,OPC_UA_WriteList and OPC_UA_MethodCall, max.	5 000 100

OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
— Application authentication— Security policies	Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15,
— occurry politics	Basic256Sha256
 User authentication 	"anonymous" or by user name & password
 — GDS support (certificate management) 	Yes
— Number of sessions, max.	48
 Number of accessible variables, max. 	100 000
 Number of registerable nodes, max. 	20 000
 Number of subscriptions per session, max. 	20
 — Sampling interval, min. 	100 ms
— Publishing interval, min.	200 ms
Number of server methods, max.	50
Number of inputs/outputs per server method,	20
max.	20
 Number of monitored items, max. 	2 000; for 1 s sampling interval and 1 s send interval
 Number of server interfaces, max. 	10 of each "Server interfaces" / "Companion specification" type and 20
	of the type "Reference namespace"
 Number of nodes for user-defined server 	5 000
interfaces, max.	
 Alarms and Conditions 	Yes
 Number of program alarms 	200
Number of alarms for system diagnostics	100
Further protocols	
MODBUS	Yes; MODBUS TCP
Isochronous mode	
Equidistance	Yes
·	165
S7 message functions	
Number of login stations for message functions, max.	64
Program alarms	Yes
Number of configurable program messages, max.	10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH
Number of loadable program messages in RUN, max.	
	block, ProDiag or GRAPH
Number of loadable program messages in RUN, max.	block, ProDiag or GRAPH
Number of loadable program messages in RUN, max. Number of simultaneously active program alarms	block, ProDiag or GRAPH 5 000
Number of loadable program messages in RUN, max. Number of simultaneously active program alarms • Number of program alarms	block, ProDiag or GRAPH 5 000
Number of loadable program messages in RUN, max. Number of simultaneously active program alarms Number of program alarms Number of alarms for system diagnostics	block, ProDiag or GRAPH 5 000 800 200
Number of loadable program messages in RUN, max. Number of simultaneously active program alarms Number of program alarms Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions	block, ProDiag or GRAPH 5 000 800 200 160
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Number of loadable program messages in RUN, max. Number of simultaneously active program alarms Number of program alarms Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block	block, ProDiag or GRAPH 5 000 800 200 160 Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients)
Number of loadable program messages in RUN, max. Number of simultaneously active program alarms Number of program alarms Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step	block, ProDiag or GRAPH 5 000 800 200 160 Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No
Number of loadable program messages in RUN, max. Number of simultaneously active program alarms Number of program alarms Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints	block, ProDiag or GRAPH 5 000 800 200 160 Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients)
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Number of loadable program messages in RUN, max. Number of simultaneously active program alarms Number of program alarms Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Single step Number of breakpoints Status/control Status/control Variables Number of variables, max. of which status variables, max. of which control variables, max.	block, ProDiag or GRAPH 5 000 800 200 160 Yes; Parallel online access possible for up to 8 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No 8 Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
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Diagnostics indication LED RUNSTOP LED RUNSTOP LED RERR LED RERRA	Interrupts/diagnostics/status information	
RUNNSTOP LED ERROR LED Connection display LINK TX/RX Supported Exchanlogy objects Motion Control Number of available Motion Control resources for technology objects affects the cycle time the PLC program; selection guide via the TIA Selection Tool Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per synchronous axis — per positioning axis — per synchronous axis — per output tam — per cam track — per probe Positioning axis — Number of positioning axes at motion control cycle of 4 ms (typical value) — Number of positioning axes at motion control cycle of 6 ms (typical value) PUD Compact PID Compact PID Compact PID Compact PID Temp Counting and measuring — High-speed counter Ambient conditions Ambient temperature during operation • horizontal installation, min. • horizontal installation, min. • horizontal installation, min. • vertical installation, min. • vertical installation reax. Ambient temperature during storage/transportation • min. • vertical installation relating to sea level • installation attitude above sea level, max. Antient temperature during storage/transportation • min. • max. 70 °C Altitude during operation relating to sea level • installation attitude above sea level, max. Configuration Programming Programming language — LAD — FBD — FBD — STL — SCL — GRAPH — Yes Know-how protection • Luser program protection/password protection • Copy protection • User program protection/password protection • Copy protection • User program protection/password protection • Copy protection • Luser program protection/password protection • Copy protection • User program protection/password protection • Ve		
ERROR LED MAINT LED Connection display LINK TX/RX Yes Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources Per speed-controlled axis Per speed-controlled axis Per external encoder Per output cam Per controlled axis Per external encoder Per output cam Per cam track Per per comption of the speed of the s		Yes
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- SCL Yes - GRAPH Yes Know-how protection • User program protection/password protection • Copy protection Yes • Block protection Yes Access protection		
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◆ Block protection Yes Access protection		
Access protection		
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• protection of contidential contiguration data	·	· ·
	protection of confidential configuration data	Yes
Password for display Yes		
Protection level: Write protection Yes	 Protection level: Write protection 	Yes

Protection level: Read/write protection	Yes
Protection level: Complete protection	Yes
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

last modified: 5/12/2021 🖸