SIEMENS

Data sheet

6ES7513-1AL02-0AB0



SIMATIC S7-1500, CPU 1513-1 PN, CENTRAL PROCESSING UNIT WITH WORKING MEMORY 300 KB FOR PROGRAM AND 1.5 MB FOR DATA, 1. INTERFACE: PROFINET IRT WITH 2 PORT SWITCH, 40 NS BIT-PERFORMANCE, SIMATIC MEMORY CARD NECESSARY

General information	
Product type designation	CPU 1513-1 PN
HW functional status	FS01
Firmware version	V2.5
Engineering with	
 STEP 7 TIA Portal configurable/integrated as of version 	V15
Configuration control	
via dataset	Yes
Display	
Screen diagonal [cm]	3.45 cm
Control elements	
Number of keys	8
Mode buttons	2
Supply voltage	
Type of supply voltage	24 V DC
permissible range, lower limit (DC)	19.2 V

permissue anyle, duple minit(CC) 200 V Reverse polarity protection Yes Mains buffering 5 ms • Repeat rate, min. 15 Input current Current consumption (rated value) 0.7 A Current consumption, max. 0.95 A Invust current, max. 1.9 A: Rated value Pr 0.02 A*s Power 1 Infed power to the backplane bus 10 W Power consumption from the backplane bus 5.5 W Power consumption from the backplane bus 5.5 W Power loss 5.7 W Power loss, typ. 5.7 W Memory 1 Number of slots for SIMATIC memory card 1 Number of slots for SIMATIC memory card 1 • Integrated (for program) 300 kbyte • Integrated (for data) 1.5 Mbyte Load memory 1 • Plug-in (SIMATIC Memory Card), max. 32 Gbyte Backup 7 • maintenance-free Yes CPU processing times 40 ns for biord operations, typ. 40 ns for biord operatio	permissible range, upper limit (DC)	28.8 V
Mains buffering 6 ms • Repeat rate, min. 1/s Input consumption (rated value) 0.7 A Current consumption, max. 0.95 A Inrush current, max. 1.9 A; Rated value Power 10 W Power consumption from the backplane bus 10 W Power consumption from the backplane bus 10 W Power consumption from the backplane bus 5.5 W Power loss. 5.7 W Power loss. 900 M Power loss. 7.7 W Power loss. 9.7 W Power loss. typ. 5.7 W Mumber of slots for SIMATIC memory card 1 SIMATIC memory card required Yes Work memory 100 kbyte • integrated (for program) 300 kbyte • integrated (for data) 1.5 Mbyte Load memory 200 kbyte • maintenance-free Yes CPU processing times 6 r ks for row of operations, typ. 40 ns for row of operations, typ. 40 rs for row of operations, typ.		
• Mains/voltage failure stored energy time 5 ms • Repeat rate, min. 1/s Input current 0.7 A Current consumption (rated value) 0.7 A Current consumption, max. 0.95 A Inrush current, max. 1.9 A; Rated value P 0.02 A*s Power 0.02 A*s Power on the backplane bus 0.W Power onsumption from the backplane bus 5.5 W Power loss 5.7 W Power loss 5.7 W Power of slots for SIMATIC memory card 1 Number of slots for SIMATIC memory card 1 Number of slots for SIMATIC memory card Yes Vork memory 1 • integrated (for program) 300 kbyte • integrated (for program) 300 kbyte • integrated (for data) 1.5 Mbyte Load memory 32 Gbyte Backup 48 ns for word operations, typ. 40 ns for word operations, typ. 40 ns for fracting point arithmetic, typ. 64 ns for fracting point arithmetic, typ. 64 ns for fracting point arithmetic, typ. 2000; Blocks (OE, FB, FC, DB) and UDTs DB 160 999; subdivided into: number range that can be used by the user: 159 990, and number rang		165
• Repeat rate, min. 1/s Function of the problem of th	-	5 ms
Input current Input current Input consumption (rated value) 0.7 A Current consumption, max. 0.95 A Inrush current, max. 1.9 A; Rated value Pt 0.02 A*s Power Infeed power to the backplane bus 10 W Power consumption from the backplane bus 10 W S.5 W Power loss 5.5 W S.5 W Power loss 5.7 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Vork memory Yes Yes • Integrated (for program) 300 kbyte SiMATIC memory card required • Integrated (for data) 1.5 Mbyte Load memory • Plug-in (SIMATIC Memory Card), max. 32 Gbyte Backup • maintenance-free Yes CPU processing times for for dor operations, typ. 40 ns Gr as Go ns CPU processing times 64 ns Gr as Go ns CPU-block 2000; Blocks (OB, FB, FC, DB) and UDTs DB • Number of elements (total) 2 000; Blocks (OB, FB, FC, DB) and number range of DBs created via S		
Current consumption (rated value) 0.7 A Current consumption, max. 0.95 A Inrush current, max. 1.9 A; Rated value Pt 0.02 A*s Power 0.02 A*s Power of the backplane bus 10 W Power ot the backplane bus 10 W Power ots 5.5 W Power loss, typ. 5.7 W Memory Ves Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes Verk memory 1.5 Mbyte Integrated (for program) 300 kbyte • integrated (for program) 300 kbyte • integrated (for data) 1.5 Mbyte Load memory - • Plug-in (SIMATIC Memory Card), max. 32 Gbyte Backup - • maintenance-free Yes CPU processing times 40 ns for fixed point arithmetic, typ. 40 ns for fixed point arithmetic, typ. 256 ns CPU-blocks 2000; Blocks (OB, FE, FC, DB) and UDTs DB - • Number range 1 60 999; subdivided into: number range that can be used by the user: 1 59 990, and number range of DBs created via SFC 8: 60 000 60 999 • Size, max. 1.5 Mbyte; For non-optimized block accesses, the max. size of th	• Repeat rate, min.	1/5
Current consumption, max. 0.95 A Inrush current, max. 1.9 A; Rated value It 0.02 A*s Power 10 W Power consumption from the backplane bus 5.5 W Power loss 5.5 W Power loss 5.7 W Memory 5.7 W Number of slots for SIMATIC memory card 1 Number of slots for SIMATIC memory card 1.5 Mbyte Integrated (for program) 300 kbyte integrated (for program) 32 Gbyte Backup 5 Tor bit operations, typ. 40 ns for vord operations, typ. 40 ns for fixed point arithmetic, typ. 256 ns CPU blocks 2000; Blocks (OB, FB, FC, DB) and UDTs DB 1 60 999; subdivided into: number range of DBs created via SFC 8: 6: 00 00 60 999 Number range 1 60 999; subdivided into: number range of DBs created via SFC 8: 6: 00 00	Input current	
Inrush current, max. 1.9 A; Rated value IPt 0.02 A*s Power 10 W Power consumption from the backplane bus 5.5 W Power consumption from the backplane bus 5.5 W Power consumption from the backplane bus 5.5 W Power loss 5.7 W Power loss, typ. 5.7 W Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes Work memory 0.00 kbyte • integrated (for program) 300 kbyte • integrated (for program) 32 Gbyte Backup 1 • Plug-in (SIMATIC Memory Card), max. 32 Gbyte Backup 1 • naintenance-free Yes CPU processing times 40 ns for bid operations, typ. 40 ns for fixed point arithmetic, typ. 256 ns CPU-blocks 2000; Blocks (OB, FB, FC, DB) and UDTs DB 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 B: 61000 60 999 • Size, max. 1.5 Mbyte; For non-optimized block accesses, the max. size of the big big 64 KB <td>Current consumption (rated value)</td> <td>0.7 A</td>	Current consumption (rated value)	0.7 A
Pt 0.02 A*s Power 10 W Power consumption from the backplane bus (balanced) 10 W Power consumption from the backplane bus (balanced) 5.5 W Power loss 5.7 W Power loss, typ. 5.7 W Memory 1 Number of slots for SIMATIC memory card 1 • integrated (for program) 300 kbyte • integrated (for data) 1.5 Mbyte Load memory - • Plug-in (SIMATIC Memory Card), max. 32 Gbyte Backup - • maintenance-free Yes CPU processing times - for fixed point arithmetic, typ. 40 ns for word operations, typ. 44 ns for fixed point arithmetic, typ. 256 ns CPU-blocks - Number of elements (total) 2000; Blocks (OB, FB, FC, DB) and UDTs DB - Number range that can be used by the user; 1 59 999, and number range of DBs created via SFC 86 60 00 60 99 • Size, max. 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB	Current consumption, max.	0.95 A
Power Infeed power to the backplane bus 10 W Power consumption from the backplane bus 5.5 W Power loss 5.7 W Power loss, typ. 5.7 W Memory Yes Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes Work memory 300 kbyte • integrated (for program) 300 kbyte • integrated (for data) 1.5 Mbyte Load memory • • Plug-in (SIMATIC Memory Card), max. 32 Gbyte Backup • • maintenance-free Yes CPU processing times • for bit operations, typ. 40 ns for word operations, typ. 40 ns for facting point arithmetic, typ. 64 ns for floating point arithmetic, typ. 55 ns CPU-blocks 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 B: 60 000 60 999 • Size, max. 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 44 KB	Inrush current, max.	1.9 A; Rated value
Infeed power to the backplane bus 10 W Power consumption from the backplane bus 5.5 W Power loss 5.7 W Power loss, typ. 5.7 W Memory 1 Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes Work memory 900 kbyte • integrated (for program) 300 kbyte • integrated (for data) 1.5 Mbyte Load memory 92 Gbyte Backup 92 Gbyte Plug-in (SIMATIC Memory Card), max. 32 Gbyte Backup 92 Gbyte For bit operations, typ. 40 ns for bit operations, typ. 40 ns for fixed point arithmetic, typ. 64 ns for fixed point arithmetic, typ. 64 ns for flot operations, typ. 2000; Blocks (OB, FB, FC, DB) and UDTs DB 1 60 999; subdivided into: number range of DBs created via SFC 86: 60000 60 999 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB	l²t	0.02 A ² ·s
Power consumption from the backplane bus (balanced) 5.5 W Power loss 5.7 W Power loss, typ. 5.7 W Memory 1 Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes Work memory 300 kbyte • integrated (for program) 300 kbyte • integrated (for data) 1.5 Mbyte Load memory 32 Gbyte Backup Ves • maintenance-free Yes CPU processing times 40 ns for bit operations, typ. 40 ns for fixed point arithmetic, typ. 26 ns CPU-blocks 2000; Blocks (OB, FB, FC, DB) and UDTs DB I 60 999; subdivided into: number range of DBs created via SFC 86 : 60 : 60 : 60 : 999 • Number range 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB	Power	
(balanced) 2 Power loss 5.7 W Power loss, typ. 5.7 W Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes Work memory 300 kbyte • integrated (for program) 300 kbyte • integrated (for data) 1.5 Mbyte Load memory 32 Gbyte • maintenance-free Yes • maintenance-free Yes for bit operations, typ. 40 ns for word operations, typ. 44 ns for fixed point arithmetic, typ. 64 ns for floating point arithmetic, typ. 256 ns CPU-blocks 1 Number of elements (total) 2 000; Blocks (OB, FB, FC, DB) and UDTs DB 1 1 • Number range 1 1 • Number range 1 1 • Size, max. 1 1 FB E 1	Infeed power to the backplane bus	10 W
Power loss, typ. 5.7 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes Work memory 300 kbyte • integrated (for program) 300 kbyte • integrated (for data) 1.5 Mbyte Load memory • Plug-in (SIMATIC Memory Card), max. 32 Gbyte Backup • maintenance-free Yes CPU processing times • for bit operations, typ. 40 ns for bit operations, typ. 40 ns • for fixed point arithmetic, typ. for fixed point arithmetic, typ. 56 ns • CPU-blocks CPU-blocks 2 000; 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 85: 60 000 60 999 • Size, max. 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB		5.5 W
Power loss, typ. 5.7 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes Work memory 300 kbyte • integrated (for program) 300 kbyte • integrated (for data) 1.5 Mbyte Load memory • Plug-in (SIMATIC Memory Card), max. 32 Gbyte Backup • maintenance-free Yes CPU processing times • for bit operations, typ. 40 ns for bit operations, typ. 40 ns • for fixed point arithmetic, typ. for fixed point arithmetic, typ. 56 ns • CPU-blocks CPU-blocks 2 000; 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 85: 60 000 60 999 • Size, max. 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB	Power loss	
Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes Work memory • integrated (for program) 300 kbyte • integrated (for data) 1.5 Mbyte Load memory • 9 lug-in (SIMATIC Memory Card), max. Backup • 32 Gbyte • maintenance-free Yes CPU processing times • for bit operations, typ. 40 ns for fixed point arithmetic, typ. 64 ns for for foating point arithmetic, typ. 256 ns CPU blocks 2000; Blocks (OB, FB, FC, DB) and UDTs DB 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. 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB		5.7 W
Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes Work memory • integrated (for program) 300 kbyte • integrated (for data) 1.5 Mbyte Load memory • 9 lug-in (SIMATIC Memory Card), max. Backup • 32 Gbyte • maintenance-free Yes CPU processing times • for bit operations, typ. 40 ns for fixed point arithmetic, typ. 64 ns for for foating point arithmetic, typ. 256 ns CPU blocks 2000; Blocks (OB, FB, FC, DB) and UDTs DB 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. 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB	Momory	
SIMATIC memory card required Yes Work memory 300 kbyte • integrated (for program) 300 kbyte • integrated (for data) 1.5 Mbyte Load memory 32 Gbyte Backup 7 • maintenance-free Yes CPU processing times 40 ns for bit operations, typ. 40 ns for kord operations, typ. 64 ns for fixed point arithmetic, typ. 64 ns for doting point arithmetic, typ. 256 ns CPU-blocks Number of elements (total) 2 000; Blocks (OB, FB, FC, DB) and UDTs DB 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. 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB		1
Work memory integrated (for program) integrated (for data) 1.5 Mbyte Load memory Plug-in (SIMATIC Memory Card), max. 32 Gbyte Backup maintenance-free Yes CPU processing times for bit operations, typ. 40 ns for fixed point arithmetic, typ. 64 ns for floating point arithmetic, typ. 256 ns CPU-blocks Number of elements (total) 2 000; Blocks (OB, FB, FC, DB) and UDTs DB • Number range 1 60 999; subdivided into: number range of DBs created via SFC 86: 60 000 60 999 Size, max. Size, max. FB Size 4 KB Size 5 K		
• integrated (for program)300 kbyte• integrated (for data)1.5 MbyteLoad memory32 Gbyte• Plug-in (SIMATIC Memory Card), max.32 GbyteBackup*• maintenance-freeYesCPU processing timesfor bit operations, typ.40 nsfor diperations, typ.48 nsfor fixed point arithmetic, typ.64 nsfor floating point arithmetic, typ.256 nsCPU-blocksNumber of elements (total)2 000; Blocks (OB, FB, FC, DB) and UDTsDB• Number range1 60 999; subdivided into: number range of DBs created via SFC 86: 60 000 60 999• Size, max.1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KBFB	- · ·	
• integrated (for data)1.5 MbyteLoad memory32 Gbyte• Plug-in (SIMATIC Memory Card), max.32 GbyteBackupYes• maintenance-freeYesCPU processing times40 nsfor bit operations, typ.40 nsfor word operations, typ.44 nsfor floating point arithmetic, typ.64 nsfor floating point arithmetic, typ.256 nsCPU-blocksNumber of elements (total)2 000; Blocks (OB, FB, FC, DB) and UDTsDB1 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.1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KBFB	·	300 kbyte
Load memory32 Gbyte• Plug-in (SIMATIC Memory Card), max.32 GbyteBackup*********************************		
• Plug-in (SIMATIC Memory Card), max. 32 Gbyte Backup Yes • maintenance-free Yes CPU processing times 40 ns for bit operations, typ. 40 ns for fixed point arithmetic, typ. 64 ns for floating point arithmetic, typ. 64 ns CPU-blocks 256 ns Number of elements (total) 2 000; Blocks (OB, FB, FC, DB) and UDTs DB 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. 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB		
Backup Yes • maintenance-free Yes CPU processing times 40 ns for bit operations, typ. 40 ns for word operations, typ. 48 ns for fixed point arithmetic, typ. 64 ns for floating point arithmetic, typ. 256 ns CPU-blocks 2000; Blocks (OB, FB, FC, DB) and UDTs DB 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. 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB		22 Chuta
• maintenance-freeYesCPU processing timesfor bit operations, typ.40 nsfor word operations, typ.48 nsfor fixed point arithmetic, typ.64 nsfor floating point arithmetic, typ.256 nsCPU-blocksNumber of elements (total)2 000; Blocks (OB, FB, FC, DB) and UDTsDB1 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• Number range1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KBFB		52 Obyte
CPU processing times for bit operations, typ. 40 ns for word operations, typ. 48 ns for fixed point arithmetic, typ. 64 ns for floating point arithmetic, typ. 256 ns CPU-blocks Number of elements (total) 2 000; Blocks (OB, FB, FC, DB) and UDTs DB 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 • Nize, max. 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB		Vez
for bit operations, typ. 40 ns for word operations, typ. 48 ns for fixed point arithmetic, typ. 64 ns for floating point arithmetic, typ. 256 ns CPU-blocks 2000; Blocks (OB, FB, FC, DB) and UDTs DB 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 • Nize, max. 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB	• maintenance-free	Yes
for word operations, typ.48 nsfor fixed point arithmetic, typ.64 nsfor floating point arithmetic, typ.256 nsCPU-blocksNumber of elements (total)DB2 000; Blocks (OB, FB, FC, DB) and UDTsDB1 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.1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KBFB	CPU processing times	
for fixed point arithmetic, typ.64 nsfor floating point arithmetic, typ.256 nsCPU-blocksNumber of elements (total)2 000; Blocks (OB, FB, FC, DB) and UDTsDB-• Number range1 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.1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KBFB	for bit operations, typ.	40 ns
for floating point arithmetic, typ.256 nsCPU-blocksNumber of elements (total)2 000; Blocks (OB, FB, FC, DB) and UDTsDB1 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.1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KBFB	for word operations, typ.	48 ns
CPU-blocks Number of elements (total) 2 000; Blocks (OB, FB, FC, DB) and UDTs DB 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. 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB	for fixed point arithmetic, typ.	64 ns
Number of elements (total) 2 000; Blocks (OB, FB, FC, DB) and UDTs DB 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. 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB	for floating point arithmetic, typ.	256 ns
Number of elements (total) 2 000; Blocks (OB, FB, FC, DB) and UDTs DB 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. 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB	CPU-blocks	
• 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. 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB FB FB		2 000; Blocks (OB, FB, FC, DB) and UDTs
 b Size, max. c Siz	DB	
DB is 64 KB	Number range	the user: 1 59 999, and number range of DBs created via SFC
	• Size, max.	
• Number range 0 65 535	FB	
	Number range	0 65 535

• Size, max.	300 kbyte
FC	
Number range	0 65 535
• Size, max.	300 kbyte
OB	
• Size, max.	300 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; 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 	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	
Counters, timers and their retentivity S7 counter	
	2 048
S7 counter	2 048
S7 counter • Number	2 048 Yes
S7 counter • Number Retentivity	
S7 counter • Number Retentivity — adjustable	
S7 counter • Number Retentivity — adjustable IEC counter	Yes
S7 counter • Number Retentivity — adjustable IEC counter • Number	Yes
S7 counter • Number Retentivity — adjustable IEC counter • Number Retentivity	Yes Any (only limited by the main memory)
S7 counter • Number Retentivity — adjustable IEC counter • Number Retentivity — adjustable	Yes Any (only limited by the main memory)
S7 counter • Number Retentivity — adjustable IEC counter • Number Retentivity — adjustable S7 times	Yes Any (only limited by the main memory) Yes
S7 counter • Number Retentivity — adjustable IEC counter • Number Retentivity — adjustable S7 times • Number	Yes Any (only limited by the main memory) Yes
S7 counter • Number Retentivity — adjustable IEC counter • Number Retentivity — adjustable S7 times • Number Retentivity	Yes Any (only limited by the main memory) Yes 2 048
S7 counter • Number Retentivity — adjustable IEC counter • Number Retentivity — adjustable S7 times • Number Retentivity — adjustable S7 times • Number — adjustable	Yes Any (only limited by the main memory) Yes 2 048
S7 counter • Number Retentivity — adjustable IEC counter • Number Retentivity — adjustable S7 times • Number Retentivity — adjustable IEC counter IEC timer	Yes Any (only limited by the main memory) Yes 2 048 Yes
S7 counter • Number Retentivity — adjustable IEC counter • Number Retentivity — adjustable S7 times • Number Retentivity — adjustable IEC timer • Number	Yes Any (only limited by the main memory) Yes 2 048 Yes
S7 counter • Number Retentivity — adjustable IEC counter • Number Retentivity — adjustable S7 times • Number Retentivity — adjustable IEC timer • Number Retentivity — adjustable IEC timer • Number Retentivity	Yes Any (only limited by the main memory) Yes 2 048 Yes Any (only limited by the main memory)
S7 counter • Number Retentivity — adjustable IEC counter • Number Retentivity — adjustable S7 times • Number Retentivity — adjustable IEC times • Number Retentivity — adjustable IEC timer • Number Retentivity — adjustable	Yes Any (only limited by the main memory) Yes 2 048 Yes Any (only limited by the main memory)

Extended retentive data area (incl. timers, counters, flags), max. 1.5 Mbyte; When using PS 60W 24/48/60V DC HF

• Number, max. 16 kbyte • Number of clock memories 8; 8 clock memory bit, grouped into one clock memory byte 2ata blocks	nags), max.	
• Number of clock memories 8: 8 clock memory bit, grouped into one clock memory byte Data blocks • • Retentivity adjustable Yes • Retentivity preset No • coad data • • per priority class, max. 64 kbyte; max. 16 KB per block Colores area 2 048; max. number of modules / submodules • Inputs 32 kbyte; All inputs are in the process image • Outputs 32 kbyte; All outputs 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 • Number of subprocess images, max. 32 ardware configuration 32 (A distributed I/O system is characterized not only by the integration disk (e.g. IE/PB-Link) Number of DP masters 40; A maximum of 6 CMs (PROFINET + PROFIBUS) can be inserted in total Number of IO Controllers 1 • Via CM 6; A maximum of 6 CMs (PROFINET + PROFIBUS) can be inserted in total Rack <	Flag	
Data blocks Yes Retentivity adjustable Yes Retentivity preset No .cocal data 64 kbyte; max. 16 KB per block e per priority class, max. 64 kbyte; max. number of modules / submodules // O address area 2048; max. number of modules / submodules // O address area 2048; max. number of modules / submodules // O address area 20 kbyte; All inputs are in the process image 0 utputs 32 kbyte; All inputs are in the process image 0 utputs (volume) 8 kbyte — Inputs (volume) 8 kbyte — Outputs (volume) 8 kbyte — Outputs (volume) 8 kbyte Outputs (volume) 8 kbyte Supprocess images - • Number of subprocess images, max. 32 ardvare configuration 32; 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 links (e.g. IE/PB-Link) Number of DP masters • Via CM • Via CM 6; A maximum of 6 CMs (PROFINET + PROFIBUS) can be inserted in total Number of IO controllers 1 • integrated 1 <td>• Number, max.</td> <td>16 kbyte</td>	• Number, max.	16 kbyte
• Retentivity adjustable Yes • Retentivity preset No .cccal data • • per priority class, max. 64 kbyte; max. 16 KB per block .cdtress area • .vNumber of IO modules 2 048; max. number of modules / submodules .vO address area • • Inputs 32 kbyte; All inputs are in the process image • Outputs 32 kbyte; All outputs are in the process image • Outputs (volume) 8 kbyte Inputs (volume) 8 kbyte - Outputs (volume) 8 kbyte • Outputs (volume) 8 kbyte • Number of subprocess images, max. 32 ardware configuration 32; A distributed I/O system is characterized not only by the integration of distributed I/O system is characterized not only by the integration of distributed I/O system is characterized not only by the integrated of 0 Systems • Via CM 6; A maximum of 6 CMs (PROFINET + PROFIBUS) can be inserted in total Number of IO Controllers 1 • Via CM 6; A maximum	 Number of clock memories 	8; 8 clock memory bit, grouped into one clock memory byte
Retentivity preset No .ocal data 64 kbyte; max. 16 KB per block .ocal data 64 kbyte; max. 16 KB per block .ocal data 2 048; max. number of modules / submodules .ocal data 2 048; max. number of modules / submodules .ocal data 2 048; max. number of modules / submodules .ocal data 2 048; max. number of modules / submodules .ocal data 2 048; max. number of modules / submodules .ocal data 32 kbyte; All inputs are in the process image .ocal data 32 kbyte; All outputs are in the process image .ocal data 32 kbyte; All outputs are in the process image .ocal data 8 kbyte .ocal data 32 .outputs (volume) 8 kbyte .outputs (or for subprocess images 32; A distributed I/O sy	Data blocks	
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• per priority class, max. 64 kbyte; max. 16 KB per block	 Retentivity preset 	No
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Inputs (volume) 8 kbyte Outputs (volume) 8 kbyte Subprocess images 32 • Number of subprocess images, max. 32 ardware configuration 32; 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 links (e.g. IE/PB-Link) Number of DP masters 6; A maximum of 6 CMs (PROFINET + PROFIBUS) can be inserted in total Number of IO Controllers 1 • Via CM 6; A maximum of 6 CMs (PROFINET + PROFIBUS) can be inserted in total Rack 1 • Via CM 32; CPU + 31 modules • Number of lines, max. 1 • Number of PtP CMs the number of connectable PtP CMs is only limited by the number of available slots	— Outputs (volume)	8 kbyte
— Outputs (volume) 8 kbyte Subprocess images 32 • Number of subprocess images, max. 32 ardware configuration 32; A distributed I/O system is characterized not only by the integration of distributed I/O system is characterized not only by the integration of 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 links (e.g. IE/PB-Link) Number of DP masters • Via CM • Via CM 6; A maximum of 6 CMs (PROFINET + PROFIBUS) can be inserted in total Number of IO Controllers 1 • Via CM 6; A maximum of 6 CMs (PROFINET + PROFIBUS) can be inserted in total Rack 32; CPU + 31 modules • Number of lines, max. 1 • Number of PtP CMs the number of connectable PtP CMs is only limited by the number of available slots	per CM/CP	
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• Number of subprocess images, max. 32 ardware configuration 32; 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 links (e.g. IE/PB-Link) Number of DP masters 6; A maximum of 6 CMs (PROFINET + PROFIBUS) can be inserted in total Number of IO Controllers 1 • Via CM 6; A maximum of 6 CMs (PROFINET + PROFIBUS) can be inserted in total Number of IO Controllers 1 • Via CM 6; A maximum of 6 CMs (PROFINET + PROFIBUS) can be inserted in total Rack 1 • Via CM 6; CPU + 31 modules • Number of Ines, max. 1 PtP CM 1 • Number of PtP CMs the number of connectable PtP CMs is only limited by the number of available slots	— Outputs (volume)	8 kbyte
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Rack 32; CPU + 31 modules • Modules per rack, max. 32; CPU + 31 modules • Number of lines, max. 1 • PtP CM the number of connectable PtP CMs is only limited by the number of available slots	• integrated	1
Modules per rack, max. Number of lines, max. Number of PtP CMs the number of connectable PtP CMs is only limited by the number of available slots	• Via CM	
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	Rack	
• Number of PtP CMs the number of connectable PtP CMs is only limited by the number of available slots	 Modules per rack, max. 	32; CPU + 31 modules
Number of PtP CMs the number of connectable PtP CMs is only limited by the number of available slots	 Number of lines, max. 	1
of available slots	PtP CM	
	Number of PtP CMs	
	Fime of day	

Clock	
• Туре	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	
Number of PROFINET interfaces	1
1. Interface	
Interface types	
Number of ports	2
 integrated switch 	Yes
• RJ 45 (Ethernet)	Yes; X1
Protocols	
IP protocol	Yes; IPv4
PROFINET IO Controller	Yes
PROFINET IO Device	Yes
 SIMATIC communication 	Yes
Open IE communication	Yes
Web server	Yes
Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
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
— MRPD	Yes; Requirement: IRT
— PROFlenergy	Yes
— Prioritized startup	Yes; Max. 32 PROFINET devices
— Number of connectable IO Devices, max.	128; In total, up to 512 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,	128
max.	120
— of which in line, max.	128
— Number of IO Devices that can be	8; in total across all interfaces
simultaneously activated/deactivated, max.	
— 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
— MRPD	Yes; Requirement: IRT
— PROFlenergy	Yes
— Shared device	Yes
 — Number of IO Controllers with shared device, max. 	4
 Asset management record 	Yes; Per user program
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. 	128; 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 	88
 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
— PROFlenergy	Yes
— Prioritized startup	Yes; Max. 32 PROFINET devices
 Number of connectable IO Devices, max. 	128; In total, up to 512 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. 	128
— of which in line, max.	128
 Number of IO Devices that can be simultaneously activated/deactivated, max. 	8; 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
Redundancy mode	
— MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
— MRPD	Yes; Requirement: IRT
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,	Yes
supported	
 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	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Web server	
• HTTP	Yes; Standard and user pages
• HTTPS	Yes; Standard and user pages
OPC UA	
 Runtime license required 	Yes
OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
— Application authentication	Yes
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— User authentication	"anonymous" or by user name & password
— Number of sessions, max.	32
— Number of accessible variables, max.	50 000
— Number of registerable nodes, max.	10 000
— Subscriptions per session, max.	20
— Sampling time, min.	100 ms
— Send time, min.	500 ms
— Number of server methods, max.	20
 — Number of inputs/outputs per server method, max. 	20
— Number of monitored items, max.	1 000; For 1 s sampling interval and 1 s send interval
— Number of server interfaces, max.	10
 — Number of nodes for user-defined server 	1 000
interfaces, max.	
Further protocols	
• MODBUS	Yes; MODBUS TCP
Media redundancy	
• Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
 Number of stations in the ring, max. 	50
Isochronous mode	

Isochronous operation (application synchronized up to terminal)	Yes; With minimum OB 6x cycle of 500 µs
Equidistance	Yes
S7 message functions	
Number of login stations for message functions, max.	32
Program alarms	Yes
Number of configurable program alarms	5 000
Number of simultaneously active program alarms	
 Number of program alarms 	300
 Number of alarms for system diagnostics 	100
 Number of alarms for motion technology objects 	80
Test commissioning functions	
Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 5 engineering systems
Status block	Yes; Up to 8 simultaneously (in total across all ES clients)
Single step	No
Number of breakpoints	8
Status/control	
 Status/control variable 	Yes
• Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
 Number of variables, max. 	
— of which status variables, max.	200; per job
— of which control variables, max.	200; per job
Forcing	
 Forcing, variables 	Peripheral inputs/outputs
 Number of variables, max. 	200
Diagnostic buffer	
• present	Yes
 Number of entries, max. 	1 000
— 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	N
• RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	Yes
STOP ACTIVE LED	Yes
 Connection display LINK TX/RX 	Yes

Supported technology objects	
Motion Control	Yes; Note: The number of axes affects the cycle time of the PLC
	program; selection guide via the TIA Selection Tool or SIZER
Number of available Motion Control resources	800
for technology objects (except cam disks)	
 Required Motion Control resources 	
— per speed-controlled axis	40
— per positioning axis	80
— per synchronous axis	160
— per external encoder	80
— per output cam	20
— per cam track	160
— per probe	40
 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) 	10
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
Ambient conditions	
Ambient temperature during operation	
 horizontal installation, min. 	0°0
 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°0
 vertical installation, max. 	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Configuration	
Programming	
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes

— GRAPH	Yes
Know-how protection	
 User program protection/password 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
Cycle time monitoring	
lower limit	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	405 g
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