SIEMENS

Data sheet

6ES7518-4FP00-0AB0



SIMATIC S7-1500F, CPU 1518F-4 PN/DP, central processing unit with 9 MB work memory for program and 60 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 3rd interface: PROFINET basic services, 4th interface: PROFIBUS, 1 ns bit performance, SIMATIC Memory Card required

General information	
Product type designation	CPU 1518F-4PN/DP
HW functional status	FS11
Firmware version	V3.1
• FW update possible	Yes
Product function	
● I&M data	Yes; I&M0 to I&M3
Isochronous mode	Yes; Distributed and central; with minimum OB 6x cycle of 125 μs (distributed) and 1 ms (central)
• SysLog	Yes
Engineering with	
 STEP 7 TIA Portal configurable/integrated from version 	V19 (FW V3.1); 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	
Rated value (DC)	24 V
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)	1.55 A
Current consumption, max.	1.9 A
Inrush current, max.	1.9 A; Rated value
l²t	0.4 A ² ·s
Power	
Infeed power to the backplane bus	12 W
Power consumption from the backplane bus (balanced)	30 W
Power loss	
Power loss, typ.	24 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes

Work memory	
integrated (for program)	9 Mbyte
integrated (for brogram) integrated (for data)	60 Mbyte
Load memory	
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	52 Obyte
· · ·	Vaa
maintenance-free	Yes
CPU processing times	
for bit operations, typ.	1 ns
for word operations, typ.	2 ns
for fixed point arithmetic, typ.	2 ns
for floating point arithmetic, typ.	6 ns
CPU-blocks	
Number of elements (total)	20 000; 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.	16 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	
Number range	0 65 535
• Size, max.	1 Mbyte
FC	
Number range	0 65 535
• Size, max.	1 Mbyte
OB	
• Size, max.	1 Mbyte
 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 100 µs
 Number of process alarm OBs 	50
 Number of DPV1 alarm OBs 	3
 Number of isochronous mode OBs 	3
 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	2.048
Number Detentivity	2 048
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
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	768 kbyte; In total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 700 KB
Extended retentive data area (incl. timers, counters, flags), max.	20 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
Address area	
Number of IO modules	16 384; 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)	32 kbyte; max. 32 KB via X1; max. 8 KB via X2 or X4
— Outputs (volume)	32 kbyte; max. 32 KB via X1; max. 8 KB via X2 or X4
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	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 links (e.g. IE/PB-Link)
Number of DP masters	
integrated	1
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be
Number of IO Controllers	inserted in total
	2
integratedVia 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	
• 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
• to DP, master	Yes
• to DP, slave	Yes
• in AS, master	Yes
• in AS, slave	Yes
on Ethernet via NTP	Yes
Interfaces	
Number of PROFINET interfaces	3
Number of PROFIBUS interfaces	1
1. Interface	
Interface types	
RJ 45 (Ethernet)	Yes; X1
Number of ports	2
 integrated switch 	Yes
Protocols	

Process P		Voo: IDud
• PROFINET IC Device Yes • Sibility Communication Yes • Open IE communication Yes • Media redundony Yes • Media redundony Yes • Profinet IT IC Communication Yes • Profinet IT of Communication Yes • Of which ID devices with IRT max. 61 • Of which ID devices with IRT max. 61 • Of which ID devices with IRT max. 61 • Of which ID devices with IRT max. 61 • Of which ID devices with IRT max. 71 • Of which ID devices with IRT max. 71 • Of which ID devices with IRT max. 71 • Of which ID devices with IRT max. 71 • Of which ID devices with IRT max. 71 <tr< td=""><td>IP protocol DROFINET IO Constanting</td><td>Yes; IPv4</td></tr<>	IP protocol DROFINET IO Constanting	Yes; IPv4
• SMATIC communication Yes • Wob seture Yes • Wob seture Yes • Mode redundancy Yes PERSINE TO Constrained Yes • Order data exchange Yes • Provide data exchange Yes • Or which IO devices with IRT, max. Bit • Or which IO devices with IRT, max. Bit • Or which IO devices with IRT, max. Bit • Or which IO devices with IRT, max. Bit • Or which IO devices with IRT max Bit • Or which IO devices with IRT max Bit • Or which IO devices with IRT max Bit • Or which IO devices with IRT max Bit • Or which IO devices with IRT max Bit • Or which IO devices Constrate exchange • Or were		
• Open E communication Yes: Optionally also encrypted • Web server Yes • Media redunfancy Yes • Profine TU Communication Yes • Service Yes • Option E data exchange Yes • Option E data exchange Yes • PROFINET TO Communication Yes • PROFINET adults Yes • Profine and yes Yes • Profine adults Yes • Or which 10 devices with IRT, max. 64 • Or which 10 devices with IRT, max. 64 • Or which 10 devices with IRT, max. 61 • Or which 10 devices with IRT, max. 61 • Or which 10 devices with IRT, max. 61 • Or which 10 devices with IRT, max. 61 • Or which 10 devices with IRT, max. 61 • Or which 10 devices met communication 10 or devices. 61 • Or which 10 devices met communication 11 or devices. 61 • Or which 10 devices met communication 11 or devices. 61 • Or which 10 devices met communication 11 or devices. 61 • Or which 10 devices met communication 11 or devices. 61 • Or which 10 devices met communication 11 or devices. 61 • Or which 10 devices met communication 11 or devices. 71 • Or or end cycle of 250		
• Web server Yes • Model revealsday Yes PROFINETIO Controller Services - Direct data exchange Yes, Requirement, IRT and isochronous mode (MEPD optional) - RT Yes - PROFINETIO Controller Yes, Requirement, IRT and isochronous mode (MEPD optional) - RT Yes - PROFINETIO Yes, Services - Workher of connectable IO Devices, max. 64 - Workher of connectable IO Devices for RT, max. 64 - Workher of IO Devices that can be simultaneously 8; In total up to 100 devices, and on the quantity of activate of IO Devices for RT, max. - Workher of IO Devices per tool, max. 512 - Workher of IO Devices per tool, max. 6 - Workher of IO Devices per tool, max. 6 - Updating times 1 - Updating times 1 - Devices per tool, max. 512 - FOOFINET IO controls 1 Update time for IRT 2 - For send cycle of 187.5 µs 187.5 µs - For send cycle of 187.5 µs 250 µs to 4 ms - For send cycle of 200 µs 200 µs to 4 ms </td <td></td> <td></td>		
Modia redundancy Yes PROFINET IO Control Service - Isochtronous mode Yes - Service Yes, Requirement: IRT and isochronous mode (MRPD options) - RT Yes, Provide Status - Profileed Status Yes, Yes, per user program - Provided Status Profileed Status - Provided Status Profileed Status - Of which O alvices man. Profileed Status - Of which O alvices with IRT, max. Profileed Status - Number of connectable IO Devices for RT, max. Profileed Status - Whither of IO Devices for tor, max. Status - Whither of IO Devices per tor, max. Status - Whither of IO Devices per tor, max. Status - Updating times 125 µs - Or send cycle of 152 µs 125 µs - or send cycle of 152 µs 125 µs - or send cycle of 152 µs 125 µs - or send cycle of 152 µs 125 µs - or send cycle of 152 µs 125 µs - or send cycle of 25 µs 25 µs 1475 µs - or send cycle of 162 µs 25 µs 1478 µs - or send c	Open IE communication	Yes; Optionally also encrypted
PROFINET ID Controls Services - Direct date exchange Yes, Requirement: IRT and isochronous mode (MRPD optional) - IRT Yes - PROFINET ID Controls Yes, Per user program - PROFINET ID Overses 512 (In bita), up to 1 000 distributed VD devices can be connected via AS4, PROFINET - Of which ID devices with IRT, max. 54 - Of which ID devices that can be simultaneously activated for devices per tool, max. 512 - of which ID devices per tool, max. 512 - of which ID devices per tool, max. 512 - Of which ID devices per tool, max. 512 - Updating times 61 - Updating times 8 - Updating times 1 - FROFINET Security Class 1 Update time for IRT - - for send cycle of 187.5 µs 1.95 µs - for send cycle of 187.5 µs 1.95 µs - for send cycle of 187.5 µs 1.000000000000000000000000000000000000	Web server	Yes
Services - Incontranues model Yes - Direct data exchange Yes, Requirement: IRT and isochronous mode (MRPD optional) - IRT Yes - PROFIlenergy Yes; per user program - Number of connectable ID Devices, max. FROFILENT devices - Of which ID devices for RT, max. 61 - Of which ID devices for RT, max. 512 - Of which ID Devices for RT, max. 512 - Of which ID Devices for RT, max. 512 - Of which ID Devices for RT, max. 512 - Wumber of ID Devices for RT max. 512 - Wumber of ID Devices per tool, max. 8 - Updating times 107 - To reard cycle of 125 µs 125 µs - FROFINET Security Class 1 - For send cycle of 125 µs 125 µs - For send cycle of 125 µs 125 µs - For send cycle of 126 µs 250 µs to 4 ms - For send cycle of 126 µs 250 µs to 4 ms - For send cycle of 126 µs 250 µs to 58 ms - For send cycle of 20 µs 250 µs to 128 ms - For send cycle of 20 µs 250 µs to 128 m	Media redundancy	Yes
	PROFINET IO Controller	
- Diect data exchange Yes: Requirement: IRT and isochronous mode (MRPD optional) - IRT Yes: per user program - PROFIenergy Yes: per user program - Number of connectable IO Devices, max: PROFIENT devices - Or which IO devices with IRT, max 64 - Number of connectable IO Devices for RT, max. 512 - Number of Connectable IO Devices for RT, max. 512 - Number of IO Devices that can be simultaneously 8, in total across all interfaces - Updating times 8 - Updating times 1 - PROFINET Security Class 1 - Frager Interfaces 1 - Frager Interfaces 1 - Frager Interfaces 1 - Orisend cycle of 135 µs 1 25 µs - For send cycle of 135 µs 1 25 µs - For send cycle of 135 µs 1 25 µs - For send cycle of 135 µs 1 25 µs - For send cycle of 135 µs 1 25 µs - For send cycle of 135 µs 1 25 µs - For send cycle of 135 µs 1 25 µs - For send cycle of 250 µs 250 µs to 4 ms - For send cycle of 250 µs 250 µs to 4 ms - For send cycle of 250 µs 250 µs to 3 ms - For send cycle of 135 µs 1 ms to 16 ms - For send cycle of 250 µs	Services	
	— Isochronous mode	Yes
 PROFlenergy Ves. per user program Prioritized stratup Prioritized stratup Prioritized stratup Ves. Max. 32 PROFINET devices Number of connectable IO Devices, max. Of which IO devices with IRT, max. Of which IO devices with IRT, max. Of which In the max. S12 of which In the max. S12 Number of Connectable IO Devices for RT, max. In total across all interfaces Number of IO Devices per tool, max. Number of IO Devices per tool, max. Number of IO Devices per tool, max. In total across all interfaces In total across all interfaces In total across all interfaces PROFINET Security Class PROFINET Security Class PROFINET Security Class PROFINET Security Class In total across all interfaces In so of 8 ms For send cycle of 125 µs For send cycle of 125 µs For send cycle of 125 µs For send cycle of 126 µs S00 µs to 8 ms For send cycle of 126 µs S00 µs to 8 ms For send cycle of 20 µs S00 µs to 8 ms For send cycle of 250 µs S00 µs to 12 ms For send cycle of 250 µs S00 µs to 12 ms For send cycle of 250 µs S00 µs to 12 ms For send cycle of 250 µs S00 µs to 250 ms S00 µs to 250 ms S00 µs to 250 µs For send cycle of 250 µs S00 µs to 250 ms For send cycle of 250 µs S00 µs to 250 ms For send cycle of 250 µs S00 µs to 250 ms For send cycle of 250 µs S00 µs to 250 ms For send cycle of 250 µs Sond divice PROFINET IO Device	— Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
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- Number of connectable IO Devices, max. F12. In total, up 1o 100 distributed I/O devices can be connected via AS-I, PCOFIBUS or PROFINET - Of which ID devices with IRT, max. E4 - Number of Connectable IO Devices for RT, max. 512 - Number of IO Devices that can be simultaneously activited/deactivated, max. 8 - Number of IO Devices per tool, max. 8 - Updating times 8 - Updating times 10 - PROFINET Security Class 1 - for send cycle of 125 µs 125 µs - for send cycle of 125 µs 125 µs - for send cycle of 125 µs 1275 µs - for send cycle of 125 µs 1275 µs - for send cycle of 125 µs 1275 µs - for send cycle of 125 µs 1275 µs - for send cycle of 125 µs 1275 µs - for send cycle of 125 µs 250 µs to 4 ms - for send cycle of 175 µs 250 µs to 4 ms - for send cycle of 178 4ms to 45 ms - for send cycle of 178 4ms to 45 ms - for send cycle of 178 2ms to 32 ms - for send cycle of 178 2ms to 32 ms - for send cycle of 178 2ms to 32 ms - for send cycle of 178 2ms to 32 ms - for send cycle of 178 2ms to 32 ms - for send cycle of 178 2ms t	— PROFlenergy	Yes; per user program
PROFINET 64 - Number of connectable IO Devices for RT, max. 512 - of which in line, max. 512 - Number of IO Devices that can be simultaneously activate/deactivated, max. 8 - Number of IO Devices per tool, max. 8 - Updating times 8 - PROFINET Security Class 1 - For send cycle of 125 µs 125 µs - for send cycle of 125 µs 125 µs - for send cycle of 125 µs 125 µs - for send cycle of 125 µs 250 µs to 4 ms - for send cycle of 125 µs 250 µs to 4 ms - for send cycle of 125 µs 200 µs to 8 ms - for send cycle of 125 µs 200 µs to 8 ms - for send cycle of 125 µs 200 µs to 8 ms - for send cycle of 125 µs 200 µs to 8 ms - for send cycle of 125 µs 200 µs to 8 ms - for send cycle of 125 µs 200 µs to 8 ms - for send cycle of 178 4 ms to 64 ms - for send cycle of 178 2 ms to 32 ms - for send cycle of 125 µs 500 µs to 128 ms - for send cycle of 500 µs 500 µs to 128 ms - for send cycle of 500 µs 500 µs to 128 ms - for send cycle of 500 µs 500 µs to 128 ms - for send cycle of 500 µs 500 µs to 128 ms - for send	— Prioritized startup	Yes; Max. 32 PROFINET devices
	- Number of connectable IO Devices, max.	
- of which in line, max. 512 - Number of 10 Devices that can be simultaneously activate/dedeat/water, max. 8 - Number of 10 Devices per tool, max. 8 - Updating times 8 - Update time also depends on communication share set for PROFINET 10, on the number of 10 devices, and on the quantity of configured user data - PROFINET Security Class 1 - for send cycle of 125 µs 125 µs - for send cycle of 126 µs 250 µs to 4 ms - for send cycle of 126 µs 520 µs to 4 ms - for send cycle of 126 µs 500 µs to 8 ms - for send cycle of 2ms 250 µs to 4 ms - for send cycle of 2ms 250 µs to 4 ms - for send cycle of 2ms 250 µs to 4 ms - for send cycle of 2ms 250 µs to 128 ms - for send cycle of 2ms 250 µs to 128 ms - for send cycle of 20 µs 250 µs to 128 ms - for send cycle of 20 µs 250 µs to 128 ms - for send cycle of 20 µs 250 µs to 128 ms - for send cycle of 20 µs 250 µs to 128 ms - for send cycle of 20 µs 250 µs to 128 ms - for send cycle of 20 µs 250 µs to 128 ms - for send cycle of 280 µs 250 µs to 128 ms - for send cycle of 280 µs 2ms to 512 ms - for send cycle of 27ms 2ms to 512 ms	— Of which IO devices with IRT, max.	64
- of which in line, max. 512 - Number of 10 Devices that can be simultaneously activate/dedeat/water, max. 8 - Number of 10 Devices per tool, max. 8 - Updating times 8 - Update time also depends on communication share set for PROFINET 10, on the number of 10 devices, and on the quantity of configured user data - PROFINET Security Class 1 - for send cycle of 125 µs 125 µs - for send cycle of 126 µs 250 µs to 4 ms - for send cycle of 126 µs 520 µs to 4 ms - for send cycle of 126 µs 500 µs to 8 ms - for send cycle of 2ms 250 µs to 4 ms - for send cycle of 2ms 250 µs to 4 ms - for send cycle of 2ms 250 µs to 4 ms - for send cycle of 2ms 250 µs to 128 ms - for send cycle of 2ms 250 µs to 128 ms - for send cycle of 20 µs 250 µs to 128 ms - for send cycle of 20 µs 250 µs to 128 ms - for send cycle of 20 µs 250 µs to 128 ms - for send cycle of 20 µs 250 µs to 128 ms - for send cycle of 20 µs 250 µs to 128 ms - for send cycle of 20 µs 250 µs to 128 ms - for send cycle of 280 µs 250 µs to 128 ms - for send cycle of 280 µs 2ms to 512 ms - for send cycle of 27ms 2ms to 512 ms		512
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Image: Section of Section o	- Number of IO Devices per tool, max.	8
Update time for IRT 125 µs — for send cycle of 125 µs 125 µs — for send cycle of 250 µs 250 µs to 4 ms — for send cycle of 500 µs 500 µs to 8 ms — for send cycle of 2 ms 1 ms to 16 ms — for send cycle of 4 ms 4 ms to 84 ms — for send cycle of 4 ms 4 ms to 84 ms — for send cycle of 500 µs 200 µs to 8 ms — for send cycle of 4 ms 4 ms to 84 ms — With IRT and parameterization of "odd" send cycles 205 µs to 128 ms — for send cycle of 500 µs 250 µs to 128 ms — for send cycle of 500 µs 500 µs to 256 ms — for send cycle of 100 µs 250 µs to 128 ms — for send cycle of 100 µs 250 µs to 512 ms — for send cycle of 4 ms 4 ms to 512 ms — for send cycle of 4 ms 4 ms to 512 ms — for send cycle of 4 ms 4 ms to 512 ms — for send cycle of 4 ms 4 ms to 512 ms — for send cycle of 4 ms 4 ms to 512 ms — for send cycle of 100 µs Yes; per user program — schortonous mode No — IRT Yes; per user program — Staret device Yes; per user prog	— Updating times	set for PROFINET IO, on the number of IO devices, and on the quantity of
- for send cycle of 125 μs 125 μs - for send cycle of 187.5 μs 187.5 μs - for send cycle of 500 μs 500 μs to 4 ms - for send cycle of 500 μs 00 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 16 ms - for send cycle of 4 ms 4 ms to 64 ms - for send cycle of 2 ms 2 ms to 32 ms - for send cycle of 4 ms 4 ms to 64 ms - for send cycle of 500 μs 500 μs to 128 ms - for send cycle of 500 μs 500 μs to 526 ms - for send cycle of 2 ms 2 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 - for send cycle of 4 ms 4 ms to 512 ms - for send cycle of 4 ms 4 ms to 512 ms - for send cycle of 4 ms 4 ms to 512 ms - for send cycle of 4 ms 4 ms to 512 ms - for send cycle of 4 ms 4 ms to 512 ms - for send cycle of 10 idevice Yes; Yes Services - - lochronous mode No - sativation/deactivation of 1-devices Yes; per user program - Asset management record Yes; per user program - Asset management recor	- PROFINET Security Class	1
- for send cycle of 187.5 µs 187.5 µs - for send cycle of 250 µs 250 µs to 4 ms - for send cycle of 1 ms 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 22 ms - for send cycle of 4 ms 4 ms to 64 ms - for send cycle of 500 µs 250 µs to 128 ms - for send cycle of 550 µs 250 µs to 128 ms - for send cycle of 500 µs 500 µs to 256 ms - for send cycle of 2 ms 2 ms to 512 ms - for send cycle of 1 ms 1 ms to 512 ms - for send cycle of 1 ms 4 ms to 512 ms - for send cycle of 1 ms 4 ms to 512 ms - for send cycle of 1 ms 4 ms to 512 ms - for send cycle of 4 ms 4 ms to 512 ms - for send cycle of 4 ms 4 ms to 512 ms - for send cycle of 4 ms 4 ms to 512 ms - services Yes; per user program - extration/deactivation of I-devices Yes; per user program - Asset management record Yes; per user program - Asset management record Yes; Xes (Xes (Xes (Xes (Xes (Xes (Xes (Xes	Update time for IRT	
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for send cycle of 500 µs500 µs to 8 ms for send cycle of 1 ms1 ms to 16 ms for send cycle of 2 ms2 ms to 32 ms for send cycle of 4 ms4 ms to 64 ms With IRT and parameterization of "odd" send cyclesUpdate time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs 3 a 75 µs)Update time for RT for send cycle of 500 µs250 µs to 128 ms for send cycle of 500 µs500 µs to 256 ms for send cycle of 1 ms1 ms to 512 ms for send cycle of 2 ms2 ms to 512 ms for send cycle of 2 ms2 ms to 512 ms for send cycle of 4 ms4 ms to 512 ms for send cycle of 4 msYes; per user program for send cycle of 4 msYes; per user program for send cycle of 4 msYes; per user program for send cycle of 4 msYes; per user program for send cycle of 4 msYes; per user program for send cycle of 4 msYes; per user program for send cycle of 4 msYes; per user program for send cycle of 4 msYes; per user program activation/deactivation of 1-devicesYes; per user program Shared deviceYes; per user program Asset management recordYes; per user program Asset management recordYes; per user program Asset management recordYes; X2- Number of ports1- Number of ports1- Number of ports1- Number of ports1- Number of ports </td <td>— for send cycle of 187.5 μs</td> <td>187.5 µs</td>	— for send cycle of 187.5 μs	187.5 µs
for send cycle of 1 ms1 ms to 16 ms for send cycle of 2 ms2 ms to 32 ms for send cycle of 4 ms4 ms to 64 ms for send cycle of 4 ms4 ms to 64 ms for send cycle of 250 µs250 µs to 128 ms for send cycle of 250 µs250 µs to 128 ms for send cycle of 1 ms250 µs to 256 ms for send cycle of 1 ms1 ms to 512 ms for send cycle of 2 ms2 ms to 512 ms for send cycle of 2 ms2 ms to 512 ms for send cycle of 4 ms4 ms to 512 ms for send cycle of 4 ms2 ms to 512 ms for send cycle of 4 ms2 ms to 512 ms for send cycle of 4 ms4 ms to 512 ms for send cycle of 4 ms4 ms to 512 ms for send cycle of 4 ms4 ms to 512 ms for send cycle of 4 ms4 ms to 512 ms elsochronous modeNo IRTYes; Minimum send cycle of 250 µs PROFINET IO DeviceYes; per user program Shared deviceYes; per user program Shared deviceYes; per user program Asset management recordYes; per user program PROFINET Security ClassSNMP Configuration and DCP Read Only2- Interface types	— for send cycle of 250 µs	250 µs to 4 ms
- for send cycle of 2 ms2 ms to 32 ms- for send cycle of 4 ms4 ms to 64 ms- With IRT and parameterization of "odd" send cyclesUpdate time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs3 375 µs)Update time for RT for send cycle of 250 µs250 µs to 128 ms- for send cycle of 500 µs500 µs to 256 ms- for send cycle of 1 ms1 ms to 512 ms- for send cycle of 4 ms4 ms to 512 ms- for send cycle of 4 ms4 ms to 512 ms- for send cycle of 4 ms4 ms to 512 ms- for send cycle of 4 ms4 ms to 512 ms- for send cycle of 4 ms4 ms to 512 ms- for send cycle of 4 ms4 ms to 512 ms- for send cycle of 4 ms4 ms to 512 ms- for send cycle of 1 ms512 ms- for send cycle of 4 ms4 ms to 512 ms- for send cycle of 4 ms4 ms to 512 ms- for send cycle of 4 ms4 ms to 512 ms- for send cycle of 10 Controllers with shared device, max.1- activation/deactivation of 1-devicesYes; per user program- Shared deviceYes; per user program- Asset management recordYes; per user program- Asset management recordYes; X2• Number of ports1- Number of ports1- integrated switchNo• NoNoProtocolsYes; IPv4• PROFINET IO ControllerYes; Pry4	— for send cycle of 500 μs	500 µs to 8 ms
- for send cycle of 4 ms4 ms to 64 ms- With IRT and parameterization of "odd" send cyclesUpdate 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 µs250 µs to 128 ms- for send cycle of 1 ms500 µs to 256 ms- for send cycle of 1 ms1 ms to 512 ms- for send cycle of 2 ns2 ms to 512 ms- for send cycle of 4 ms4 ms to 512 ms- for send cycle of 4 ms4 ms to 512 ms- for send cycle of 4 ms4 ms to 512 ms- for send cycle of 4 ms4 ms to 512 ms- for send cycle of 4 ms4 ms to 512 ms- FROFINET IO Device	— for send cycle of 1 ms	1 ms to 16 ms
	— for send cycle of 2 ms	2 ms to 32 ms
With the second seco	— for send cycle of 4 ms	4 ms to 64 ms
 — for send cycle of 250 µs — for send cycle of 500 µs — for send cycle of 1 ms — for send cycle of 2 ms — for send cycle of 2 ms — for send cycle of 4 ms — for send cycle of 250 µs — for send cycle of 250 µs — FROFIenergy — Shared device — PROFIenergy — Shared device — PROFIenergy — Shared device, max. — activation/deactivation of 1-devices Yes; per user program — Asset management record — PROFINET Security Class SNMP Configuration and DCP Read Only 2. Interface Interface types — RJ 45 (Ethernet) Yes; X2 Number of ports integrated switch No Interface types — IP protocol — IP protocol — IP protocol — PROFINET IO Controller Yes; IPv4 — PROFINET IO Controller Yes 	-	
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- Asset management recordYes; per user program- PROFINET Security ClassSNMP Configuration and DCP Read Only2. InterfaceInterface types• RJ 45 (Ethernet)Yes; X2• Number of ports1• integrated switchNoProtocols• IP protocolYes; IPv4• PROFINET IO ControllerYes		
PROFINET Security Class SNMP Configuration and DCP Read Only 2. Interface Interface types Interface types • RJ 45 (Ethernet) Yes; X2 • Number of ports 1 • integrated switch No Protocols Yes; IPv4 • PROFINET IO Controller Yes		
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Interface types • RJ 45 (Ethernet) Yes; X2 • Number of ports 1 • integrated switch No Protocols IP protocol • IP protocol Yes; IPv4 • PROFINET IO Controller Yes		
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• Number of ports 1 • integrated switch No • Protocols Yes; IPv4 • PROFINET IO Controller Yes	••	Voc: V2
• integrated switch No Protocols • IP protocol Yes; IPv4 • PROFINET IO Controller Yes		
Protocols • IP protocol • PROFINET IO Controller Yes		
IP protocol Yes; IPv4 PROFINET IO Controller Yes		N0
PROFINET IO Controller Yes		
PROFINET IO Device Yes		
SIMATIC communication Yes	SIMATIC communication	Yes

Open IE communication	Yes; Optionally also encrypted
Web server	Yes
Media redundancy	No
PROFINET IO Controller	
Services	
— Isochronous mode	No
— Direct data exchange	No
— IRT	No
- PROFlenergy	Yes; per user program
— Prioritized startup	No
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
 Number of connectable IO Devices for RT, max. 	128
— of which in line, max.	
 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
— PROFINET Security Class	1
Update time for RT	
— for send cycle of 1 ms	1 ms to 512 ms
PROFINET IO Device	
Services	
— Isochronous mode	No
— IRT	No
— PROFlenergy	Yes; per user program
— Prioritized startup	No
— Shared device	Yes
 Number of IO Controllers with shared device, max. 	4
 activation/deactivation of I-devices 	Yes; per user program
 Asset management record 	Yes; per user program
— PROFINET Security Class	SNMP Configuration and DCP Read Only
3. Interface	
Interface types	
RJ 45 (Ethernet)	Yes; X3
Number of ports	1
integrated switch	No
Protocols	
• IP protocol	Yes; IPv4
PROFINET IO Controller	No
PROFINET IO Device	No
SIMATIC communication	Yes
Open IE communication	Yes; Optionally also encrypted
Web server	Yes
4. Interface	
Interface types	
• RS 485	Yes; X4
Number of ports	1
Protocols	
PROFIBUS DP master	Yes
PROFIBUS DP slave	No
SIMATIC communication	Yes
PROFIBUS DP master	
Number of connections, max.	48; for the integrated PROFIBUS DP interface
 Number of DP slaves, max. 	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Services	
- Equidistance	Ves
— Equidistance	Yes
 — Equidistance — Isochronous mode — Activation/deactivation of DP slaves 	Yes Yes

Interface types	
RJ 45 (Ethernet)	
• 100 Mbps	Yes
• 100 Mbps	Yes; Only possible at the X3 interface of the CPU 1518
Autonegotiation	Yes
Autoregoliation Autoregoliation	Yes
Industrial Ethernet status LED	Yes
RS 485	1 65
	12 Mbit/s
Transmission rate, max. Protocols	12 WDIVS
PROFIsafe	Yes; V2.4 / V2.6
Number of connections	204 via istantistatistation of the ODU and assessed at ODs / OMs
Number of connections, max.	384; 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	
Number of S7 routing paths	64; in total, only 16 S7-Routing connections are supported via PROFIBUS
Redundancy mode	N.
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	50
PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
	Yes
S7 routing	Yes
 Data record routing S7 communication, as server 	Yes
	Yes
S7 communication, as client	
User data per job, max. Open IE communication	See online help (S7 communication, user data size)
•	Van
• 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; 128 multicast circuits (of which max. 5 via X1)
	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
• web API	
— Number of sessions, max.	200
— number of simultaneous HTTP calls, max.	4
— HTTP request body, max.	131 072 byte
OPC UA	
Runtime license required	Yes; "Large" license required
OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
— Application authentication	Yes
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sba256
	Basic256Sha256

Loor autheritization	"approximates" or by upor pame ? approximate
User authentication	"anonymous" or by user name & password 40
 Number of connections, max. Number of nodes of the client interfaces, recommended max. 	5 000
 Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_I 	300
max. — Number of elements for one call of	20
OPC_UA_NameSpaceGetIndexList, max. — Number of elements for one call of	100
OPC_UA_MethodGetHandleList, max. — Number of simultaneous calls of the client instructions for session management, per connection,	1
max. — Number of simultaneous calls of the client instructions for data access, per connection, max.	5
— Number of registerable nodes, max.	5 000
— Number of registerable method calls of	100
OPC_UA_MethodCall, max.	
 — Number of inputs/outputs when calling OPC_UA_MethodCall, max. 	20
OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition
	(A&C), Custom Address Space
 Application authentication 	Yes
— Security policies	available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256, Aes128Sha256RsaOaep, Aes256Sha256RsaPss
User authentication CDS support (cortificate management)	"anonymous" or by user name & password
 — GDS support (certificate management) — Number of sessions, max. 	Yes 64
 Number of accessible variables, max. 	200 000
- Number of registerable nodes, max.	50 000
— Number of subscriptions per session, max.	50
— Sampling interval, min.	10 ms
— Publishing interval, min.	10 ms
- Number of server methods, max.	100
 — Number of inputs/outputs per server method, max. 	20
- Number of monitored items, recommended max.	24 000; 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 interfaces, max. 	50 000
Alarms and Conditions	Yes
 Number of program alarms 	400
— Number of alarms for system diagnostics	200
Further protocols • MODBUS	
MODBOS Isochronous mode	Yes; MODBUS TCP
Equidistance	Yes
S7 message functions	
Number of login stations for message functions, max.	64
number of subscriptions, max.	750
number of tags/attributes for subscriptions, max.	50 000
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.	10 000
Number of simultaneously active program alarms	
Number of program alarms	4 000
Number of alarms for system diagnostics	1 000
Number of alarms for motion technology objects	480
Test commissioning functions	
Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 10 engineering systems
Status block Single step	Yes; Up to 16 simultaneously (in total across all ES clients) No
Number of breakpoints	20
Number of preachoning	20

Profiling	No
Status/control	
Status/control variable	Yes; without fail-safe
Variables	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe), times, counters
 Number of variables, max. 	
— of which status variables, max.	200; per job
— of which control variables, max.	200; per job
Forcing	200, per jub
• Forcing	Yes; without fail-safe
Forcing, variables	peripheral inputs/outputs (without fail-safe)
Number of variables, max.	200
Diagnostic buffer	200
	Yes
present	3 200
Number of entries, max.	
— of which powerfail-proof	1 000
Traces	0
Number of configurable Traces	8
Memory size per trace, max.	512 kbyte
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; Note: The number of technology objects affects the cycle time of the PLC
Number of available Motion Control resources for	program; selection guide via the TIA Selection Tool 15 360
technology objects	
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) 	140
 — Number of positioning axes at motion control cycle of 8 ms (typical value) 	192
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	
Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Probability of failure (for service life of 20 years and repair time	e 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
• voluci installation, max.	display is switched off
Ambient temperature during storage/transportation	
● min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
 Installation altitude above sea level, max. 	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
configuration / header	
configuration / programming / header	
Programming language	
— LAD	Yes; incl. failsafe
— FBD	Yes; incl. failsafe
— STL	Yes
— SCL	Yes
— CFC	Yes; either CFC or failsafe functionality
— GRAPH	Yes
Know-how protection	
 User program protection/password protection 	Yes
Copy protection	Yes
Block protection	Yes
Access protection	
 protection of confidential configuration data 	Yes
 Password for display 	Yes
 Protection level: Write protection 	Yes
 Protection level: Read/write protection 	Yes
 Protection level: Write protection for Failsafe 	Yes
 Protection level: Complete protection 	Yes
User administration	Yes; device-wide
programming / cycle time monitoring / header	
lower limit	adjustable minimum cycle time
upper limit	adjustable maximum cycle time
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	2 079 g
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last modified:

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