SIEMENS

Data sheet

6ES7517-3FP00-0AB0



SIMATIC S7-1500F, CPU 1517F-3 PN/DP, central processing unit with work memory 3 MB for program and 8 MB for data, 1st interface: PROFINET IRT with 2port switch, 2nd interface: PROFINET RT, 3rd interface: PROFIBUS, 2 ns bit performance, SIMATIC Memory Card required

General information	
Product type designation	CPU 1517F-3 PN/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 250 μs (distributed) and 1 ms (central)
SysLog	Yes
Engineering with	
 STEP 7 TIA Portal configurable/integrated from version 	V19 (FW V3.1); V13 Update 3 (FW V1.6) 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
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) 	3 Mbyte
integrated (for data)	8 Mbyte
Load memory	
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	02 00510
maintenance-free	Yes
CPU processing times	
for bit operations, typ.	2 ns
for word operations, typ.	3 ns
for fixed point arithmetic, typ.	3 ns
for floating point arithmetic, typ.	12 ns
CPU-blocks	
Number of elements (total)	12 000; 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.	8 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	0 05 505
Number range	0 65 535
• Size, max.	1 Mbyte
FC	0 65 525
Number range Size max	0 65 535
• Size, max. OB	1 Mbyte
• Size, max.	1 Mbyte
Number of free cycle OBs	100
-	
Number of time alarm OBs	20
Number of delay alarm OBs	
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	
Number	2 048
Retentivity	
— adjustable	Yes
IEC counter	
Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
S7 times	
Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	
Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
Data areas and their retentivity	
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.	8 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	
	22 khuto: All inputs are in the process image
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 X3
— Outputs (volume)	32 kbyte; Max. 32 KB via X1; max. 8 KB via X2 or X3
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
	inserted in total
Number of IO Controllers	
 integrated 	2
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be
Deale	inserted in total
Rack	
Modules per rack, max.	32; CPU + 31 modules
PtP CM	
Number of PtP CMs	the number of connectable PtP CMs is only limited by the number of available slots
Time of day	51015
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	2
Number of PROFIBUS interfaces	1
1. Interface	
Interface types	Vec: V1
• RJ 45 (Ethernet)	Yes; X1
Number of ports	2
integrated switch	Yes
Protocols	
IP protocol	Yes; IPv4
 PROFINET IO Controller 	Yes

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• Very Control Yes • Media redundanty Yes • Media redundanty Yes • Media redundanty Yes • Direct data exchange Yes, Requirement, IRT and Isochronous mode (MSPD optional) • Direct data exchange Yes, Yes, Yes, Yes, Yes, Yes, Yes, Yes,		
Web server Yes Mode andwalmay Yes PROFINET to Controller		
eVersion Yes PROFINET to Controlues - - Beach toronus mode - - Direct data sexthangs Yes - PROFINET Service - - PROFINET Service Yes - PROFINET Service Yes - PROFINET Service Yes - Provisited Sample Yes - Provisited Sample Yes - Provisited Sample Yes - Provisite of connocatable IO Devices max. 512 Wundter of connocatable IO Devices for PT, max. 512 Wundter of Dovices part tool, max. 8 Wundter of IO Devices part tool, max. 8 PROFINET Security Class 1		
PROFINET IO Controls Yes Services		
Services Ves - Direct data exchange Yes - PROFIneragy Yes - PROFIneragy Yes - Number of connectable I/O Devices, max. PROFINET Gences - Of which I/O devices with IRT, max. 64 - Of which I/O devices with IRT, max. 64 - Of which I/O devices with IRT, max. 64 - Of which I/O devices with IRT, max. 64 - Of which I/O devices with IRT, max. 64 - Of which I/O devices with IRT, max. 64 - Wumber of I/O Devices that can be simultaneously activated disclast/bated, max. 61/2 - Number of I/O Devices per tool, max. 7 - For send cycle of I/O Devices per tool, max. 7 - For send cycle of I/O Devices per tool, max. 7 - for send cycle of I/O Devices per tool, max. 7 - for send cycle of I/O Devices per tool, max. 7 - for send cycle of I/O Devices per tool, max. 7 - for send cycle of I/O Devices per tool, max. 7 - for send cycle of I/O Devices per tool, max. 7 - for send cycle of I/O Devices 200 Ja to 4 ms - for send c		Tes
- Isoftwoole mode Yes - Direct data scharage Yes - PROFinency Yes - PROFinency Yes - PROFinency Yes - PROFinency Yes - Protoct data scharage Yes - Protoct data scharage Yes - PROFinency Yes - Protoct data scharage Yes - Protoct data scharage Yes - Number of connectable IO Devices, max. 64 - Number of Dovices per IPT, max. 64 - Number of Dovices per IPT, max. 61 - Number of Dovices per tool, max. 71 - PROFINET Security Class 1 - Updating times 1 - For send cycle of 250 µs 250 µs h 4 ms - For send cycle of 250 µs 250 µs h 4 ms - For send cycle of 250 µs 250 µs h 2 ms - For send cycle of 250 µs 250 µs h 2 ms - For send cycle of 250 µs 250 µs h 2 ms - For send cycle of 250 µs 250 µs h 2 ms - For send cycle of 250 µs 250 µs h 2 ms		
 Direct data sechange Yes, Requirement, IRT and isochronous mode (MRPD optional) Yes, Proviser program PROFInergy Yes, Jer user program Profitzed statup Number of connectable IO Devices, max. Of which IO devices with IRT, max. Or which IO devices with IRT, max. IT that jury 16 100 devices and no metabulation of the profit of the update line also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of confided deviced. PROFINET Socurity Class I me minimum value of the update line also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of confided deviced. Or or ond cycle of 250 µs Or or ond cycle		Vac
 IPT Ves IPROFINET Security Class Number of connectable IO Devices, max. Number of connectable IO Devices, max. Of which IO devices with IRT, max. Number of connectable IO Devices (RT, max. Number of IO Devices (RT, max. IPROFINET devices inta can be simultaneously activated/devices (RT, max. Number of IO Devices (RT, max. Number of IO Device (RT, max. Number of IO Device (RT, max. Number of IO Device (RT, max. Number of ID Device (RT, max. Number of ID Device (RT, max. Number of IO Controllers with shared device, max. Number of IO Controllers (NT		
- PROF lenergy Yes; per user program - Prioritized startup Yes; Max: 32 PROFINET devices - Number of connectable Io Devices, max. B2 - of which IO devices with IRT, max. B4 - of which IO devices the IRT. max. B12 - of which II file, max. B12 - of which II file, max. B12 - of which II file, max. B12 - Number of IO Devices per tool, max. B - Number of IO Devices per tool, max. B - Number of IO Devices per tool, max. B - Updating times B1 - Devices per tool, max. B - Devices per tool, max. B - Devices down of 200 ps 500 µs to 8 ms - for send cycle of 200 µs 500 µs to 8 ms - for send cycle of 200 µs 200 µs to 18 ms - for send cycle of 2 ms 2 ms to 2 ms - for send cycle of 2 ms 2 ms to 2 ms - for send cycle of 2 ms 2 ms to 3 2 ms - for send cycle of 2 ms 2 ms to 3 2 ms - for send cycle of 2 ms 2 ms to 3 2 ms - for send cycle of 3 ms 4 ms to 4 ms - for send cycle of 1 ms 1 ms to 5 1 ms - for send cycle of 1 ms 1 ms to 5 1 ms - for send cycle of 1 ms 1 ms to 5 12 ms <t< td=""><td>-</td><td></td></t<>	-	
- Prioritized simup Yes, Max. 32 PROFINET devices - Number of connectable IO Devices, max. 64 - Number of connectable IO Devices, max. 61 - Number of connectable IO Devices, max. 61 - Number of Dovices that can be simultaneously activated/deactivated, max. 61 - Number of IO Devices per tool, max. 8 - Number of IO Devices per tool, max. 8 - Updating times 8 - Updating times 8 - Updating times 10 - 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 4 ms - for send cycle of 4 ms 4 ms to 4 ms - for send cycle of 250 µs 250 µs to 4 ms - for send cycle of 4 ms 4 ms to 4 ms - for send cycle of 4 ms 4 ms to 4 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 4 ms 4 ms to 4 ms - for send cycle of 1 ms 1 ms to 4 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 1 ms 1 ms to 14 ms		
- Number of connectable IO Devices, max. 512: In tradi. up to 1 000 distinuted IO devices can be connected via AS4. - Of which IO devices will IRT, max. 64 - Number of connectable IO Devices for RT, max. 512 Number of ODevices that can be simultaneously activated devices. 81: In total across all interfaces - Number of IO Devices that can be simultaneously activated devices. 8: In total across all interfaces - Number of IO Devices per tool, max. 8 - Updating times 8: - Dr Sond cycle of 250 µs 520 µs to 4 ms - For sond cycle of 250 µs 520 µs to 4 ms - For sond cycle of 260 µs 520 µs to 4 ms - For sond cycle of 270 µs 520 µs to 4 ms - For sond cycle of 270 µs 220 µs to 4 ms - For sond cycle of 270 µs 220 µs to 128 ms - For sond cycle of 270 µs 220 µs to 128 ms - For sond cycle of 270 µs 220 µs to 128 ms - For sond cycle of 270 µs 220 µs to 128 ms - For sond cycle of 270 µs 220 µs to 128 ms - For sond cycle of 200 µs 250 µs to 128 ms - For sond cycle of 200 µs 250 µs to 128 ms - For sond cycle of 20 µs 250 µs to 128 ms - For sond cycle of 20 µs 250 µs to 128 ms - For sond cycle of 20 µs 250 µs to 128 ms - For		
- Of which ID devices with IRT, max. 64 - Number of connectable ID Devices for RT, max. 512 - Whith In Ible, max. 61 - Number of ID Devices that can be simultaneously activated/deadtrivate, max. 8 - Number of ID Devices per tool, max. 8 - PROFINET Socially Class 1 - PROFINET Socially Class 1 - for send cycle of 20 µs 250 µs to 4 ms - for send cycle of 20 µs 250 µs to 4 ms - for send cycle of 20 µs 250 µs to 6 ms - for send cycle of 20 µs 250 µs to 6 ms - for send cycle of 20 µs 250 µs to 6 ms - for send cycle of 20 µs 250 µs to 6 ms - for send cycle of 20 µs 250 µs to 6 ms - for send cycle of 2 ms 2 ms to 32 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 20 µs 250 µs to 128 ms - for send cycle of 20 µs 250 µs to 128 ms - for send cycle of 2 ms 2 ms to 512 ms - for send cycle of 2 ms 2 ms	•	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i,
- Number of connectable IO Devices for RT, max. 512 - of which in line, max. 512 - Winker of IO Devices that can be simultaneously activated/dedrivated, max. 8 - Number of IO Devices per tool, max. 8 - Updating times 8 - Updating times 10 Devices, and on the quantity of configured user data - PROFINET Security Class 1 - 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 4 ms - for send cycle of 260 µs 250 µs to 8 ms - for send cycle of 278 µs 278 µs to 32 ms - for send cycle of 20 µs 2 ms to 32 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 4 ms 1 ms to 512 ms - for send cycle of 500 µs 250 µs to 128 ms - for send cycle of 4 ms 1 ms to 512 ms - for send cycle of 4 ms 1 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	— Of which IO devices with IRT, max.	
- of which in line, max. 512 - Number of IO Devices per tool, max. 8 - Updating times 7 - Updating times 8 - PROFINET IO Devices per tool, max. 8 - PROFINET Security Class 1 - PROFINET Security Class 20 jus to 4 ms - for send cycle of 250 jus 250 jus to 4 ms - for send cycle of 250 jus 500 jus to 8 ms - for send cycle of 1 ms 1 ms to 16 ms - for send cycle of 2 ms 2 ms to 2 ms - for send cycle of 2 ms 2 ms to 2 ms - for send cycle of 1 ms 1 ms to 16 ms - for send cycle of 2 ms 2 ms to 2 ms - for send cycle of 1 ms 1 ms to 16 ms - for send cycle of 2 ms 2 ms to 2 ms - for send cycle of 1 ms 1 ms to 18 ms - for send cycle of 2 ms 2 ms to 2 ms - for send cycle of 1 ms 1 ms to 51 ms - for send cycle of 1 ms 1 ms to 51 ms - for send cycle of 4 ms 4 ms to 51 ms - for send cycle of 4 ms 4 ms to 51 ms - for send cycle of 4 ms 4 ms to 51 ms - for send cycle of 4 ms 1 ms to 51 ms - for send cycle of 4 ms 1 ms to 51 ms - for send cycle of 4 ms Yes; per user program		512
Number of IO Devices that can be simultaneously activited/deactivited n.max. 8		512
	- Number of IO Devices that can be simultaneously	8; in total across all interfaces
Bet for PROFINET IO, on the number of IO devices, and on the quantity of configured user data PROFINET Security Class 1 Update time for IRT - - for send cycle of 520 µs 550 µs to 4 ms - for send cycle of 520 µs 500 µs to 8 ms - for send cycle of 1 ms 1 ms to 16 ms - for send cycle of 1 ms 2 ms to 32 ms - for send cycle of 4 ms 4 ms to 64 ms - for send cycle of 250 µs 250 µs to 12 ms - for send cycle of 250 µs 250 µs to 24 ms - for send cycle of 250 µs 250 µs to 28 ms - for send cycle of 250 µs 250 µs to 128 ms - for send cycle of 250 µs 250 µs to 128 ms - for send cycle of 250 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 ms 250 µs to 128 ms - for send cycle of 20 µs 500 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 - schornous mode No - RAT Yes <tr< td=""><td>- Number of IO Devices per tool, max.</td><td>8</td></tr<>	- Number of IO Devices per tool, max.	8
Update time for IRT - for send cycle of 250 µs 250 µs to 4 ms - for send cycle of 1 ms 1 ms to 16 ms - for send cycle of 1 ms 1 ms to 16 ms - for send cycle of 1 ms 1 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 Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs 3 0 for send cycle of 250 µs 250 µs to 128 ms - for send cycle of 1 ms 1 ms to 512 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 - 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 4 ms 4 ms to 512 ms - for send cycle of 4 ms 4 ms to 512 ms - Bochronous mode No - Number of 10 Controllers with shared device, max.	— Updating times	set for PROFINET IO, on the number of IO devices, and on the quantity of
- 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 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 - for send cycle of 250 µs 250 µs to 128 ms - for send cycle of 250 µs 250 µs to 128 ms - for send cycle of 250 µs 250 µs to 128 ms - for send cycle of 250 µs 500 µs to 256 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 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 - sectoronus mode No - RAT Yes - extortonideactivation of -devices Yes: per user program - Asset management	— PROFINET Security Class	1
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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 msUpdate time - set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs 3000 for send cycle of 250 µs250 µs to 128 ms for send cycle of 1 ms500 µs to 266 ms for send cycle of 2 ms2 ms to 512 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 1 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 2 ms2 ms to 512 ms for send cycle of 1 ms4 ms to 512 ms for send cycle of 2 ms2 ms to 512 ms for send cycle of 2 ms4 ms to 512 ms for send cycle of 2 ms4 ms to 512 ms for send cycle of 2 ms5 ms for send cycle of 2 ms5 ms for send cycle of 2 ms5 ms for send cycle of 2 ms4 ms to 512 ms for send cycle of 2 ms5 ms inter comparison7 ms inter comparison7 ms inter comparison7 ms inter comparison		
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 for send cycle of 4 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 1 ms thor send cycle of 1 ms thor send cycle of 1 ms for send cycle of 2 ms for send cycle of 2 ms for send cycle of 2 ms for send cycle of 4 ms thor send cycle of 4 ms <lith 4="" cycle="" for="" li="" ms<="" of="" send=""> <</lith>		
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 226 ms for send cycle of 100 µs 500 µs to 256 ms for send cycle of 2 ms 1 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 0 ps Yes for send cycle of 0 ms 1 ms to 512 ms for send cycle of 4 ms 4 ms to 512 ms for send cycle of 0 ps Yes for send cycle of 0 ms 4 ms to 512 ms for send cycle of 0 ps Yes for send cycle of 0 ps Yes liRT Yes PROFInerry Yes Number of 10 Controllers with shared device, max. 4 activation/deactivation of 1-devices Yes; per user program Asset management record Yes; yes user program PROFINET Security Class SNMP Configuration and DCP Read Only 2. Interface Interface types • IN dots No • PROFINET 10 Controller Yes		
Update time for RT 250 µs to 128 ms - for send cycle of 250 µs 250 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 - 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 4 ms 4 ms to 512 ms - for send cycle of 4 ms 4 ms to 512 ms PROFINET IO Device Yes - IRT Yes - PROFIenergy Yes; per user program - Shared device Yes; per user program - Asset management record Yes; per user program - Asset management record Yes; Yes • RAJ 45 (Ethernet) Yes; X2 • Number of ports 1 • Interface types 1 • RAJ 45 (Ethernet) Yes; Yes • PROFINET IO Controller Yes • PROFINET IO Controller Yes • PROFINET IO Controller Yes • IProtocol Yes; Protonally also encrypted	-	
Update time for RT - for send cycle of 250 µs 250 µs to 128 ms - for send cycle of 1 ms 500 µs to 256 ms - for send cycle of 1 ms 1 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 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 4 ms Yes - lRT Yes - pROFINET IO Controllers with shared device, max 4 - activation/deactivation of Ldevices Yes; per user program - Asset management record Yes; per user program - Asset management record Yes; X2 • Number of pots 1	 With IRT and parameterization of "odd" send cycles 	
- 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 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 msPROFINET ID Device-Services IRTYes;- PROFIenergyYes; per user program- Shared deviceYes- Number of IO Controllers with shared device, max.4- activation/deactivation of I-devicesYes; per user program- Asset management recordYes; per user program- Asset management recordYes; X2• Interface types-Interface types-• PROFINET Security ClassSNMP Configuration and DCP Read Only• ProtocolYes; X2• Number of ports1• integrate switchNo• ProtocolYes; IPv4• PROFINET IO ControllerYes• IP protocolYes; Optionally also encrypted• PROFINET IO DeviceYes• SIMATIC communicationYes• Web serverYes; Optionally also encrypted• Web serverYes• Media redundancyNo	Update time for RT	
- 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 5 Services - - Isochronous mode No - IRT Yes - PROFIenergy Yes; per user program - 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 - Asset management record Yes; per user program - PROFINET Security Class SNMP Configuration and DCP Read Only 2 Interface Interface types • RJ 45 (Ethernet) Yes; X2 • Number of ports 1 • integrated switch No • PROFINET IO Controller Yes • PROFINET IO Controller Yes • PROFINET IO Device Yes • SIMATIC communication Yes • SIMATIC communication Yes • Web server Yes • Media redundancy No	— for send cycle of 250 μs	250 µs to 128 ms
- for send cycle of 2 ms2 ms to 512 ms- for send cycle of 4 ms4 ms to 512 msPROFINET IO DeviceServices Isochronous modeNo- IRTYes- PROFIenergyYes; per user program- Shared deviceYes- Number of IO Controllers with shared device, max.4- activation/deactivation of I-devicesYes; per user program- Asset management recordYes; per user program- PROFINET Security ClassSNMP Configuration and DCP Read OnlyProtecterInterface types- R14 5 (Ethernet)Yes; X2• Number of ports1- integrated switchNoProtocolProtocols- PROFINET IO DeviceYes; IPv4• PROFINET IO DeviceYes• SIMATIC communicationYes; Optionally also encrypted• Open IE communicationYes; Optionally also encrypted• Wedi aredundancyNo	— for send cycle of 500 μs	500 µs to 256 ms
for send cycle of 4 ms 4 ms to 512 ms PROFINET IO Device Services Isochronous mode No IRT Yes PROFIenergy Yes; per user program Shared device Yes Number of IO Controllers with shared device, max. 4 activation/deactivation of 1-devices Yes; per user program PROFINET Security Class SIMP Configuration and DCP Read Only Interface types RI 45 (Ethernet) Yes; X2 RR 45 (Ethernet) Yes; X2 Number of ports 1 IP protocol Yes; IPV4 - -	— for send cycle of 1 ms	1 ms to 512 ms
PROFINET IO Device Services - Isochronous mode No - IRT Yes - PROFInergy Yes; per user program - 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 2. Interface Interface types • RJ 45 (Ethernet) Yes; X2 • Number of ports 1 • integrated switch No Protocols Yes; IPv4 • PROFINET IO Device Yes • SIMATIC communication Yes; Optionally also encrypted • Web server Yes • Media redundancy No	— for send cycle of 2 ms	2 ms to 512 ms
Services – Isochronous mode No – IRT Yes – PROFlenergy Yes; per user program – 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 – Asset management record Yes; per user program – PROFINET Security Class SNMP Configuration and DCP Read Only 2. Interface types • RJ 45 (Ethernet) Yes; X2 • Number of ports 1 • integrated switch No PROFINET IO Controller • IP protocol Yes; IPv4 • PROFINET IO Controller Yes • IP protocol Yes • SIMATIC communication Yes • Open IE communication Yes; Optionally also encrypted • Web server Yes • Media redundancy No	— for send cycle of 4 ms	4 ms to 512 ms
- IRTYes- PROFlenergyYes; per user program- Shared deviceYes- Number of IO Controllers with shared device, max.4- activation/deactivation of I-devicesYes; per user program- Asset management recordYes; per user program- PROFINET Security ClassSIMIP Configuration and DCP Read Only2. InterfaceInterface types• RJ 45 (Ethernet)Yes; X2• Number of ports1• integrated switchNoProtocols• PROFINET IO Controller• PROFINET IO ControllerYes; Ves• SIMATIC communicationYes; Optionally also encrypted• Open IE communicationYes; Optionally also encrypted• Web serverYes• Media redundancyNo		
PROFlenergyYes; per user program Shared deviceYes Number of IO Controllers with shared device, max.4 activation/deactivation of I-devicesYes; per user program 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• PROFINET IO Controller• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes• Open IE communicationYes; Optionally also encrypted• Web serverYes• Media redundancyNo		
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Number of IO Controllers with shared device, max.4 activation/deactivation of I-devicesYes; per user program 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• SIMATIC communicationYes• Open IE communicationYes; Optionally also encrypted• Web serverYes• Media redundancyNo		
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Asset management record PROFINET Security ClassYes; per user program SNMP Configuration and DCP Read Only2. InterfaceInterface types• RJ 45 (Ethernet)Yes; X2• Number of ports1• integrated switchNoProtocols• IP protocolYes; IPv4• PROFINET IO ControllerYes• PROFINET IO ControllerYes• SIMATIC communicationYes• Open IE communicationYes; Optionally also encrypted• Web serverYes• Media redundancyNo		
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 • PROFINET IO Device Yes • SIMATIC communication Yes • Open IE communication Yes; Optionally also encrypted • Web server Yes • Media redundancy No		
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Interface types • RJ 45 (Ethernet) Yes; X2 • Number of ports 1 • integrated switch No Protocols Yes; IPv4 • PROFINET IO Controller Yes • SIMATIC communication Yes • Open IE communication Yes; Optionally also encrypted • Web server Yes • Media redundancy No		
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• integrated switchNoProtocols• IP protocolYes; IPv4• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes• Open IE communicationYes; Optionally also encrypted• Web serverYes• Media redundancyNo		
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	-	
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• PROFINET IO ControllerYes• PROFINET IO DeviceYes• SIMATIC communicationYes• Open IE communicationYes; Optionally also encrypted• Web serverYes• Media redundancyNo		Yes; IPv4
• PROFINET IO DeviceYes• SIMATIC communicationYes• Open IE communicationYes; Optionally also encrypted• Web serverYes• Media redundancyNo	-	
• Open IE communication Yes; Optionally also encrypted • Web server Yes • Media redundancy No		
• Open IE communication Yes; Optionally also encrypted • Web server Yes • Media redundancy No	SIMATIC communication	Yes
Web server Yes Media redundancy No		
	-	
PROFINET IO Controller	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.	128
— Number of IO Devices that can be simultaneously	8; in total across all interfaces
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
- 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	
• RS 485	Yes; X3
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	Yes
— Isochronous mode	Yes
 Activation/deactivation of DP slaves 	Yes
Interface types	
RJ 45 (Ethernet)	
• 100 Mbps	Yes
Autonegotiation	Yes
Autocrossing	Yes
Industrial Ethernet status LED	Yes
RS 485	
• Transmission rate, max.	12 Mbit/s
Protocols	
PROFIsafe	Yes; V2.4 / V2.6
Number of connections	
Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs / CMs
Number of connections reserved for ES/HMI/web	
Number of connections via integrated interfaces	288
Number of S7 routing paths	64; in total, only 16 S7-Routing connections are supported via PROFIBUS
Redundancy mode	
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
 Data record 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; 128 multicast circuits (of which max. 5 via X1)
• DHCP	Yes
• DNS	Yes
SNMP DCP	Yes
• LLDP	Yes
ELDI 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, Basic256Sha256
— User authentication	"anonymous" or by user name & password
— Number of connections, max.	40
 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 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 for session management, per connection, max. 	1
 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 OPC_UA_MethodCall, max. 	100
 — Number of inputs/outputs when calling 	20

OPC 114 MethodCall may	
OPC_UA_MethodCall, max. • 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	"anonymous" or by user name & password
 — GDS support (certificate management) 	Yes
 Number of sessions, max. 	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. 	10 000; 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, 	30 000
max.	
Alarms and Conditions	Yes
 — Number of program alarms 	400
 — Number of alarms for system diagnostics 	200
Further protocols	
MODBUS	Yes; MODBUS TCP
S7 message functions	
Number of login stations for message functions, max.	64
number of subscriptions, max.	750
number of tags/attributes for subscriptions, max.	20 000
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 	2 000
 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	Yes; Up to 16 simultaneously (in total across all ES clients)
Single step	No
Number of breakpoints	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	
• Forcing	Yes; without fail-safe
 Forcing, variables 	peripheral inputs/outputs (without fail-safe)
Number of variables, max.	200
Diagnostic buffer	
present	Yes
 Number of entries, max. 	3 200
— of which powerfail-proof	1 000
Traces	
 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
	program; selection guide via the TIA Selection Tool
 Number of available Motion Control resources for technology objects 	10 240
Required Motion Control resources	
per speed-controlled axis	40
— per positioning axis	80
— per positioning axis — 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	70
of 4 ms (typical value)	
- Number of positioning axes at motion control cycle	128
of 8 ms (typical value)	
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	Pla
Performance level according to ISO 13849-1	PLe SIL 3
SIL acc. to IEC 61508	
Probability of failure (for service life of 20 years and repair time — Low demand mode: PFDavg in accordance with	< 2.00E-05
SIL3	< 2.00L-03
- High demand/continuous mode: PFH in accordance	< 1.00E-09
with SIL3	
Ambient conditions	
Ambient temperature during operation	
horizontal installation, min.	
 horizontal installation, max. 	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
 vertical installation, min. 	0 °C
 vertical installation, max. 	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the
	display is switched off
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.	1 929 g
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