6ES7516-3FN00-0AB0





Spare part SIMATIC S7-1500F, CPU 1516F-3 PN/DP, Central processing unit with work memory 1.5 MB for program and 5 MB for data, 1st interface, PROFINET IRT with 2-port switch, 2nd interface, ETHERNET, 3rd interface, PROFIBUS, 10 ns bit performance, SIMATIC Memory Card required

General information	
Product type designation	CPU 1516F-3 PN/DP
HW functional status	FS01
Firmware version	V1.8
Product function	
Isochronous mode	Yes; With minimum OB 6x cycle of 375 µs
Engineering with	
 STEP 7 TIA Portal configurable/integrated from version 	V13 SP1 Update 4
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)	0.85 A
Inrush current, max.	2.4 A; Rated value
Power	
Infeed power to the backplane bus	12 W
Power consumption from the backplane bus (balanced)	6.7 W
Power loss	
Power loss, typ.	7 W
Memory	
SIMATIC memory card required	Yes
Work memory	
• integrated (for program)	1.5 Mbyte
• integrated (for data)	5 Mbyte
Load memory	
 Plug-in (SIMATIC Memory Card), max. 	32 Gbyte
Backup	
• maintenance-free	Yes
CPU processing times	
for bit operations, typ.	10 ns
for word operations, typ.	12 ns

for fixed point arithmetic, typ.	16 ns
for floating point arithmetic, typ.	64 ns
PU-blocks	
Number of elements (total)	6 000; 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.	5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB
FB	
Number range	0 65 535
• Size, max.	512 kbyte
FC	
Number range	0 65 535
• Size, max.	512 kbyte
ОВ	
Size, max.	512 kbyte
Number of free cycle OBs	100
Number of time alarm OBs	20
Number of delay alarm OBs	20
Number of cyclic interrupt OBs	20
Number of process alarm OBs	50
Number of DPV1 alarm OBs	3
Number of isochronous mode OBs	2
Number of technology synchronous alarm OBs	2
Number of startup OBs	100
Number of asynchronous error OBs	4
Number of synchronous error OBs	2
Number of diagnostic alarm OBs	1
Nesting depth	
per priority class	24; Up to 8 possible for F-blocks
counters, timers and their retentivity	2.1, 6.5 to 6 possible ion 1 blooks
S7 counter	
Number	2 048
Retentivity	2010
— adjustable	Yes
IEC counter	
Number	Any (only limited by the main memory)
Retentivity	Tilly (Only limited by the main memory)
— adjustable	Yes
S7 times	160
Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	
• Number	Any (only limited by the main memory)
Retentivity	Tary (only littleed by the main memory)
— adjustable	Yes
ata areas and their retentivity	160
	512 khyte: In total: available retentive memory for hit memories, timese
Retentive data area (incl. timers, counters, flags), max.	512 kbyte; In total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 472 KB
Flag	
• Size, max.	16 kbyte
Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	, , , , , , , , , , , , , , , , , , , ,
	Yes
• Retentivity adjustable	- *
Retentivity adjustable Retentivity preset	No
Retentivity preset	No
Retentivity preset Local data	
Retentivity preset Local data per priority class, max.	No 64 kbyte; max. 16 KB per block
Retentivity preset Local data	

per integrated ID subsystem - Imputs (volume)		
per integrated IO subsystem	•	32 kbyte; All inputs are in the process image
- Inputs (volume) - Outputs (volume) - Outputs (volume) - Outputs (volume) - Inputs (volume) - Outputs (volume) - Outputs (volume) - Outputs (volume) - B ktyte Subprocess images - Number of supprocess images, max. 1 Interface of supprocess images, max. 1 Interface of distributed I/O systems Number of distributed I/O systems Number of distributed I/O systems Number of I/O Controllers - Integrated - - Int		32 kbyte; All outputs are in the process image
Per CM/CP Funds (volume) 8 kbyte 8 kby	per integrated IO subsystem	
per CMCP Inputs (volume) Dutputs (volume) Skibyte Dutputs (volume) Skibyte Ski	— Inputs (volume)	8 kbyte
	— Outputs (volume)	8 kbyte
- Outputs (volume) Subprocess images Number of subprocess images, max. Number of subprocess images, max. Interpreted subprocess images, max. Interpreted subtuded to systems Via CM Number of Subtuded to Systems Integrated 1 Interfaces Integrated 5 Integrated 5 Integrated 1 Integrated 5 Integrated 5 Integrated 5 Integrated 5 Integrated 5 Integrated 6 Integrated 1 Integrated 5 Integrated 5 Integrated 6 Integrated 6 Integrated 7 Integrated 7 Integrated 7 Integrated 7 Integrated 7 Integrated 7 Integrated 8 Integrated 8 Integrated 9 Integrated	per CM/CP	
Supprocess images	— Inputs (volume)	8 kbyte
Number of subprocess images, max. Rendware configuration Number of DP masters integrated integrated iva CM Number of IO Controllers integrated iva CM Number of Ines, max. 10 PPP CM Number of PIP CMs Num	— Outputs (volume)	8 kbyte
Number of distributed ID systems 20	Subprocess images	
Number of distributed 10 systems Integrated 1	 Number of subprocess images, max. 	32
Number of DP masters integrated integrat	Hardware configuration	
integrated via CM via CM s. A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total Number of IO Controllers integrated via CM s. A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total Reack Modules per rack, max. 32; CPU + 31 modules Number of lines, max. 1 PIP CM Number of IPP CMs the number of Connectable PIP CMs is only limited by the number of available slots Time of day Clock Type Backup time Several of with a day of a connectable PIP CMs is only limited by the number of available slots Time of day Clock Type Backup time Several of with a day of a connectable PIP CMs is only limited by the number of available slots Time of day Clock Time of day Clock Type Backup time Several of a day of a connectable PIP CMs is only limited by the number of available slots Time of day Clock Type Backup time Several of a day of a connectable PIP CMs is only limited by the number of available slots Time of day Clock Time of day Clock Type Backup time Several of a day of a connectable PIP CMs is only limited by the number of available slots Time of day Clock Type Backup time of connectable PIP CMs is only limited by the number of available slots Time of day Clock Time of day Clock Type Backup time of connectable PIP CMs is only limited by the number of available slots Time of day Clock Time of day Clock Type Backup time of connectable PIP CMs is only limited by the number of available slots Time of day Clock Time of day Clock Time of day Clock Type Backup time of connectable PIP CMs is only limited by the number of available slots Time of day Clock Time of day	Number of distributed IO systems	20
Via CM 8: A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total Number of 10 Controllers Integrated 1	Number of DP masters	
inserted in total Number of I/O Controllers infegrated infegrated inserted in total 8. A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total Rack Modules per rack, max. Number of lines, max. Number of IPP CMs Number of PIP CMs Time of day Clock Type Backup time Backup time Number Num	integrated	1
integrated iva CM inserted in total Rack Modules per rack, max. Number of lines, max. Number of PtP CMs integrated in total humber of PtP CMs Number of PtP CMs integrated integrated in total humber of PtP CMs integrated integrated in total humber of PtP CMs integrated integrated in total humber of PtP CMs humber of PtP CMs humber of PtP CMs integrated integrated in total humber of PtP CMs humber of PtP CMs hardware clock integrated integrater integrature, typically clock integrated integrature, typically integrated integrater integrature, typically integrated integrater integrated integrater integrater integrater integrater integrater integrated integrater integrated integrater inte	• Via CM	
Via CM	Number of IO Controllers	
Inserted in total	• integrated	1
Modules per rack, max. Number of lines, max. Number of lines, max. Number of PtP CMs Number of Adv Clock Time of day Clock Number of Adv Number of PtP CMs is only limited by the number of available sicks Number of Adv Number of PtP CMs Number of PtP CMs is only limited by the number of available sicks Number of PtP CMs Number of P	• Via CM	
Number of lines, max. PIP CM Number of PIP CMs the number of connectable PIP CMs is only limited by the number of availab slots Time of day Clock Time of day Clock Type Backup time Plandware clock Number Plandware clock Number Numb	Rack	
PIP CM Number of PIP CMs the number of connectable PIP CMs is only limited by the number of available slots Time of dsy Clock Type Backup time Pevaluation per day, max. Operating hours counter Number Number Number Number Tock synchronization supported No P, master Na S, device No Ethernet via NTP Interfaces Number of PROFINET interfaces Number of PROFINET interfaces Number of PROFINES interfaces Number of PROFINET interfaces Number of PROFINET interfaces PROFINET interface Interface types PROFINET IO Controller Number of ports SiMATIC communication Pess PROFINET IO Controller	Modules per rack, max.	32; CPU + 31 modules
Number of PIP CMs siths unimber of connectable PIP CMs is only limited by the number of availabsisits Time of day Clock Type Backup time Sackup ti	 Number of lines, max. 	1
Itime of day Clock Type Backup time Deviation per day, max. Operating hours counter Number Clock synchronization Supported In AS, master In AS, device In AS, device In AS, device Interfaces Number of PROFINET interfaces Number of PROFIREU sinterfaces Interface (types RJ 45 (Ethernet) Interface (syles Interface dayles	PtP CM	
Clock	Number of PtP CMs	the number of connectable PtP CMs is only limited by the number of available slots
Clock	Time of day	
Backup time Deviation per day, max. Operating hours counter Number Number Number Supported	Clock	
Backup time Deviation per day, max. Operating hours counter Number Number 16 Clock synchronization supported No To PP, master No Assater Number Numbe	• Type	Hardware clock
Deviation per day, max. Operating hours counter Number Number Supported		6 wk; At 40 °C ambient temperature, typically
Operating hours counter 16 Clock synchronization 16 • supported Yes • to DP, master Yes • in AS, master Yes • in AS, device Yes • on Ethernet via NTP Yes Interfaces Number of PROFINET interfaces 2 Number of PROFIBUS interfaces 1 1. Interface 1 Interface types • • RJ 45 (Ethernet) Yes; X1 • Number of ports 2 • integrated switch Yes Protocols 2 • integrated switch Yes PROFINET IO Controller Yes • PROFINET IO Device Yes • SIMATIC communication Yes • Web server Yes • Media redundancy Yes PROFINET IO Controller Services — — PG/OP communication Yes — Isochronous mode Yes	•	
● Number 16 Clock synchronization ● supported Yes ● to DP, master Yes ● in AS, master Yes ● in AS, device Yes ● on Ethernet via NTP Yes Interfaces Number of PROFIBUS interfaces 2 Number of PROFIBUS interfaces 1 1. Interface Interface types ● RJ 45 (Ethernet) Yes; X1 ● Number of ports 2 ● integrated switch Yes PROFINET IO Controller Yes ● PROFINET IO Controller Yes ● SIMATIC communication Yes ● Open IE communication Yes ● Web server Yes ● Media redundancy Yes PROFINET IO Controller Services — PG/OP communication Yes — PG/OP communication Yes — Isochronous mode Yes		
		16
	Clock synchronization	
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in AS, master in AS, device in AS, device ves on Ethernet via NTP Yes Interfaces Number of PROFINET interfaces Number of PROFIBUS interfaces 1 Interface Interface types RJ 45 (Ethernet) Number of ports integrated switch PROFINET IO Controller PROFINET IO Controller PROFINET IO Device SIMATIC communication Web server Media redundancy PROFINET IO Controller Wes PROFINET IO Controller Wes PROFINET IO Communication Yes PROFINET IO Communication Yes PROFINET IO Communication Yes PROFINET IO Controller Services — PG/OP communication Yes PROFINET IO Controller Services — PG/OP communication Yes	• to DP, master	Yes
• in AS, device • on Ethernet via NTP	 in AS, master 	Yes
Interfaces Number of PROFINET interfaces 2 Number of PROFIBUS interfaces 1 Interface Interface Interface types RJ 45 (Ethernet) Yes; X1 Number of ports 2 integrated switch Yes Protocols PROFINET IO Controller Yes SIMATIC communication Yes Open IE communication Yes Media redundancy Yes PROFINET IO Controller Services PROFINET IO Controller Yes PROFINET IO Controller Yes SIMATIC communication Yes Open IE communication Yes Services PROFINET IO Controller Services PROFINET IO Controller		
Number of PROFINET interfaces 2 Number of PROFIBUS interfaces 1 1. Interface Interface types • RJ 45 (Ethernet) Yes; X1 • Number of ports 2 • integrated switch Yes Protocols • PROFINET IO Controller Yes • PROFINET IO Device Yes • SIMATIC communication Yes • Open IE communication Yes • Web server Yes • Media redundancy Yes PROFINET IO Controller Services — PG/OP communication Yes — Isochronous mode Yes		Yes
Number of PROFINET interfaces 2 Number of PROFIBUS interfaces 1 1. Interface Interface types • RJ 45 (Ethernet) Yes; X1 • Number of ports 2 • integrated switch Yes Protocols • PROFINET IO Controller Yes • PROFINET IO Device Yes • SIMATIC communication Yes • Open IE communication Yes • Web server Yes • Media redundancy Yes PROFINET IO Controller Services — PG/OP communication Yes — Isochronous mode Yes		
Number of PROFIBUS interfaces 1 1. Interface Interface types • RJ 45 (Ethernet) Yes; X1 • Number of ports 2 • integrated switch Yes Protocols • PROFINET IO Controller Yes • PROFINET IO Device Yes • SIMATIC communication Yes • Open IE communication Yes • Web server Yes • Media redundancy Yes PROFINET IO Controller Services — PG/OP communication Yes — Isochronous mode 1		2
Interface types Protocols PROFINET IO Device SIMATIC communication Web server Web server Media redundancy PROFINET IO Controller Services PROFINET IO Controller Yes PROFINET IO Communication Yes SIMATIC communication Yes Web server PROFINET IO Controller Yes Yes Yes Yes SIMATIC communication Yes Yes Yes Yes Nedia redundancy Yes PROFINET IO Controller Services PROFINET IO Controller Services PROFINET IO Communication Yes Yes		
Interface types RJ 45 (Ethernet) Number of ports Number of ports Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server Media redundancy PROFINET IO Controller Yes Media redundancy Pes PROFINET IO Controller Yes PROFINET IO Controller Yes PROFINET IO Controller Yes PROFINET IO Controller Services PROFINET IO Controller Yes PROFINET IO Controller		
 RJ 45 (Ethernet) Number of ports integrated switch Yes Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server Media redundancy PROFINET IO Controller Services PG/OP communication Yes PG/OP communication Yes Yes Media redundancy Yes PROFINET IO Controller Services PG/OP communication Yes Yes Yes Yes Yes PG/OP communication Yes Isochronous mode Yes 		
Number of ports integrated switch Yes Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Yes Open IE communication Web server Media redundancy PROFINET IO Controller Services — PG/OP communication Yes — Isochronous mode Yes Yes Yes Yes Yes Yes Yes	* *	Ves: X1
 integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server Media redundancy PROFINET IO Controller Services PG/OP communication Yes Yes Media redundancy Yes 	·	
Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server Media redundancy PROFINET IO Controller Services — PG/OP communication Yes — Isochronous mode Yes	·	
 PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server Media redundancy PROFINET IO Controller Services PG/OP communication Yes Yes Yes Psochronous mode Yes 		165
 PROFINET IO Device SIMATIC communication Open IE communication Web server Media redundancy Media redundancy Yes PROFINET IO Controller Services PG/OP communication Isochronous mode Yes 		Von
SIMATIC communication Open IE communication Web server Media redundancy PROFINET IO Controller Services — PG/OP communication — Isochronous mode Yes Yes Yes		
 Open IE communication Web server Media redundancy Yes PROFINET IO Controller Services — PG/OP communication — Isochronous mode Yes 		
● Media redundancy PROFINET IO Controller Services — PG/OP communication — Isochronous mode Yes Yes	•	
PROFINET IO Controller Services — PG/OP communication Yes — Isochronous mode Yes		
Services — PG/OP communication Yes — Isochronous mode Yes		Yes
— PG/OP communication— Isochronous modeYes		
— Isochronous mode Yes		
IRT		
165	— IRT	Yes
— PROFlenergy Yes	— PROFlenergy	Yes
— Prioritized startup Yes; Max. 32 PROFINET devices	 Prioritized startup 	Yes; Max. 32 PROFINET devices

 Number of connectable IO Devices, max. 	256; In total, up to 768 distributed I/O devices can be connected via PROFIBUS
	or PROFINET
Of which IO devices with IRT, max.	64
 Number of connectable IO Devices for RT, max. 	256
— of which in line, max.	256
 Number of IO Devices that can be simultaneously 	8
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	3, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
— for send cycle of 250 μs	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum
tor sorte syste or 200 µs	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
— With IKT and parameterization of odd send cycles	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 500 µs — 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
— Isochronous mode	No
— IRT	Yes
— PROFlenergy	Yes
— Shared device	Yes
 Number of IO Controllers with shared device, max. 	4
2. Interface	
2. Interface Interface types	
	Yes; X2
Interface types • RJ 45 (Ethernet)	Yes; X2
Interface types RJ 45 (Ethernet) Number of ports	1
Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch	
Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols	1 No
Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller	1 No
Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device	No No
Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication	No No No Yes
Interface types • RJ 45 (Ethernet) • Number of ports • integrated switch Protocols • PROFINET IO Controller • PROFINET IO Device • SIMATIC communication • Open IE communication	No No No Yes Yes
Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server	No No No Yes
Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server 3. Interface	No No No Yes Yes
Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server Interface Interface types	No No No Yes Yes
Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server 3. Interface	No No No Yes Yes
Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server Interface Interface types	No No No Yes Yes Yes
Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server Interface Interface types RS 485	No No No Yes Yes Yes
Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server Interface Interface RS 485 Number of ports	No No No Yes Yes Yes
Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server 3. Interface Interface types RS 485 Number of ports Protocols	No No No Yes Yes Yes 1
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Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP device	No No No Yes Yes Yes 1 Yes No
Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP device SIMATIC communication	No No No Yes Yes Yes 1 Yes No
Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server 3. Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP device SIMATIC communication PROFIBUS DP master Number of connections, max.	1 No No No Yes Yes Yes 1 Yes No Yes No Yes
Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server 3. Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP device SIMATIC communication PROFIBUS DP master	1 No No No No Yes Yes Yes 1 Yes No Yes
Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server 3. Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP device SIMATIC communication PROFIBUS DP master Number of connections, max.	No No No Yes Yes Yes Yes 1 Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 768 distributed I/O devices can be connected via PROFIBUS
Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server 3. Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP device SIMATIC communication PROFIBUS DP master Number of connections, max. max. number of DP devices	No No No Yes Yes Yes Yes 1 Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 768 distributed I/O devices can be connected via PROFIBUS
Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server 3. Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP device SIMATIC communication PROFIBUS DP master Number of connections, max. max. number of DP devices Services	No No No Yes Yes Yes Yes 1 Yes No Yes 1 Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 768 distributed I/O devices can be connected via PROFIBUS or PROFINET
Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server Interface Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP device SIMATIC communication PROFIBUS DP master PROFIBUS DP master PROFIBUS DP master SIMATIC communication PROFIBUS DP devices SIMATIC communication PROFIBUS DP devices Services — PG/OP communication — Equidistance	No No No Yes Yes Yes Yes 1 Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 768 distributed I/O devices can be connected via PROFIBUS or PROFINET Yes
Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server 3. Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP device SIMATIC communication PROFIBUS DP master PROFIBUS DP master PROFIBUS DP device SIMATIC communication PROFIBUS DP devices Services — PG/OP communication — Equidistance — Isochronous mode	1 No No No No Yes Yes Yes Yes Yes 1 Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 768 distributed I/O devices can be connected via PROFIBUS or PROFINET Yes Yes Yes Yes
Interface types RJ 45 (Ethernet) Number of ports integrated switch Protocols PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server 3. Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP device SIMATIC communication PROFIBUS DP master PROFIBUS DP master PROFIBUS DP device SIMATIC communication PROFIBUS DP devices Services — PG/OP communication — Equidistance	No No No Yes Yes Yes Yes 1 Yes No Yes 48; for the integrated PROFIBUS DP interface 125; In total, up to 768 distributed I/O devices can be connected via PROFIBUS or PROFINET Yes Yes

DIAF (Fiborosi)	
RJ 45 (Ethernet)	Voc
• 100 Mbps	Yes
Autonegotiation	Yes
Autocrossing	Yes
Industrial Ethernet status LED	Yes
RS 485	
Transmission rate, max.	12 Mbit/s
Protocols	
PROFIsafe	Yes
Number of connections	
 Number of connections, max. 	256; 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 	128
Number of S7 routing paths	16
Redundancy mode	
Media redundancy	
— MRP	Yes; as MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
 Switchover time on line break, typ. 	200 ms
- Switchover time or line break, typ. - Number of stations in the ring, max.	50 ms
— Number of stations in the ring, max. SIMATIC communication	
• S7 routing	Yes
Data record routing	Yes
S7 communication, as server	Yes
S7 communication, as server S7 communication, as client	Yes
User data per job, max.	See online help (S7 communication, user data size)
Open IE communication	See Offinie Help (37 Confindincation, user data size)
• TCP/IP	Yes
— Data length, max.	64 kbyte
several passive connections per port, supported	Yes
• ISO-on-TCP (RFC1006)	Yes
— Data length, max.	64 kbyte
• UDP	Yes
— Data length, max.	1 472 byte
• DHCP	No No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Web server	165
• HTTP	Yes; Standard and user-defined pages
• HTTPS	Yes; Standard and user-defined pages
Further protocols	,
MODBUS	Yes; MODBUS TCP
Isochronous mode	
Equidistance	Yes
S7 message functions	
Number of login stations for message functions, max.	32
Program alarms	Yes
Number of configurable program messages, max.	10 000
Number of simultaneously active program alarms	
Number of program alarms	600
Number of program alarms Number of alarms for system diagnostics	200
Number of alarms for system diagnostics Number of alarms for motion technology objects	160
Test commissioning functions	
Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 8 engineering systems
· · · · · · · · · · · · · · · · · · ·	
Status block	Yes; Up to 8 simultaneously (in total across all ES clients)
Single step	No
Status/control	Vec
Status/control variableVariables	Yes Inputs, outputs, memory bits, DB, times, counters
VariablesNumber of variables, max.	inpute, outpute, memory bits, DD, times, counters
● Number of variables, max.	

of which atomic variables, may	2000 man jah
— of which central variables, max.	200; per job
— of which control variables, max.	200; per job
Forcing, variables	Peripheral inputs/outputs
Number of variables, max.	200
Diagnostic buffer	200
• present	Yes
Number of entries, max.	3 200
— of which powerfail-proof	500
Traces	300
Number of configurable Traces	4; Up to 512 KB of data per trace are possible
Interrupts/diagnostics/status information	1, op 10 0.2 1.2 d. data por tideo die possible
Diagnostics indication LED	
RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	Yes
Connection display LINK TX/RX	Yes
Supported technology objects	163
Motion Control	Yes
Speed-controlled axis	160
Number of speed-controlled axes, max.	30; Requirement: There must be no other motion technology objects created
Number of speed-controlled axes, max. Positioning axis	55, requirement. There must be no other motion technology objects created
Positioning axis — Number of positioning axes, max.	30: Requirement: There must be no other motion tookpology objects greated
Number of positioning axes, max. Synchronized axes (relative gear synchronization)	30; Requirement: There must be no other motion technology objects created
	15: Dequirement: There must be no other motion technology chicate created
— Number of axes, max.	15; Requirement: There must be no other motion technology objects created
External encoders	20. Describe mont. There must be no other median technology, abjects exceed
— Number of external encoders, max.	30; Requirement: There must be no other motion technology objects created
Controller	Veg. Universal DID controller with integrated entimization
PID_Compact PID_304aaa	Yes; Universal PID controller with integrated optimization
PID_3Step DID_Tamp	Yes; PID controller with integrated optimization for valves
PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and manageming	
Counting and measuring	Van
High-speed counter	Yes
High-speed counter Ambient conditions	Yes
High-speed counter Ambient conditions Ambient temperature during operation	
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min.	0 °C
High-speed counter Ambient conditions Ambient temperature during operation	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max.	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. • vertical installation, min.	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max.	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. • vertical installation, min.	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max.	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. configuration / header	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. configuration / header configuration / programming / header	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. configuration / header configuration / programming / header Programming language	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. configuration / header configuration / programming / header Programming language — LAD	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off Yes; incl. failsafe
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. configuration / header configuration / programming / header Programming language — LAD — FBD	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off Yes; incl. failsafe Yes; incl. failsafe
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off Yes; incl. failsafe Yes; incl. failsafe Yes
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. configuration / header configuration / programming / header Programming language LAD FBD STL SCL	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off Yes; incl. failsafe Yes; incl. failsafe Yes Yes
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. configuration / header configuration / programming / header Programming language LAD FBD STL SCL GRAPH	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off Yes; incl. failsafe Yes; incl. failsafe Yes Yes
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. configuration / header configuration / programming / header Programming language LAD FBD STL SCL GRAPH Know-how protection User program protection/password protection	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off Yes; incl. failsafe Yes Yes Yes Yes Yes
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off Yes; incl. failsafe Yes Yes Yes Yes Yes Yes
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. configuration / header configuration / programming / header Programming language LAD FBD STL SCL GRAPH Know-how protection User program protection/password protection Copy protection Block protection	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off Yes; incl. failsafe Yes Yes Yes Yes Yes Yes
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. configuration / header configuration / programming / header Programming language LAD FBD STL SCL GRAPH Know-how protection User program protection/password protection Copy protection Block protection Access protection	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection User program protection/password protection Copy protection Block protection Access protection Password for display	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. configuration / header configuration / programming / header Programming language LAD FBD STL SCL GRAPH Know-how protection User program protection/password protection Copy protection Block protection Access protection Password for display Protection level: Write protection	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. configuration / header configuration / programming / header Programming language LAD FBD STL SCL GRAPH Know-how protection User program protection/password protection Copy protection Block protection Password for display Protection level: Write protection Protection level: Read/write protection	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. vertical installation, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection Password for display Protection level: Write protection Protection level: Read/write protection Protection level: Complete protection	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
High-speed counter Ambient conditions Ambient temperature during operation horizontal installation, min. horizontal installation, max. vertical installation, min. vertical installation, max. vertical installation, max. configuration / header configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection Password for display Protection level: Write protection Protection level: Read/write protection Protection level: Complete protection Programming / cycle time monitoring / header	0 °C 60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off 0 °C 40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off Yes; incl. failsafe Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye

Dimensions	
Width	70 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	845 g

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