SIEMENS

Data sheet

6ES7677-2DB42-0GK0



SIMATIC ET 200SP Open Controller, CPU 1515SP PC2 + HMI 128PT, 8 GB RAM (basic device 6ES76772DB400AA0), 128 GB CFast with Windows 10 IoT Enterprise 64-bit, S7-1500, Software Controller CPU 1505SP and WinCC Runtime Advanced preinstalled, with 128 PowerTags license, interfaces: 1x slot CFast, 1x slot SD/MMC, 1x connection for ET 200SP BusAdapter PROFINET, 1x 10/100/1000 Mbps Ethernet, 2x USB 3.0; 2x USB 2.0, 1x DisplayPort, documentation on CFast, restore image on CFast

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General information	
Product type designation	CPU 1515SP PC2
HW functional status	from FS04
Firmware version	V21.9
Engineering with	
 STEP 7 TIA Portal configurable/integrated from version 	V17
Installed software	
Visualization	WinCC Runtime Advanced V17
Control	S7-1500 Software Controller CPU 1505SP
Configuration control	
via dataset	Yes
Control elements	
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)	1.8 A; Full processor load, incl. ET 200SP modules and using USB
Current consumption (in no-load operation), typ.	0.5 A
Current consumption, max.	2.9 A
l²t	0.426 A ² ·s; with starting current inrush
Power	
Active power input, max.	43 W; incl. ET 200SP modules and using USB
Infeed power to the backplane bus	8.75 W
Power loss	
Power loss, typ.	15 W; without ET 200SP modules and without using USB
Processor	
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores
Memory	
Type of memory	DDR3L
Main memory	8 GB RAM
CFast memory card	Yes; 128 GB flash memory
SIMATIC memory card required	No
Work memory	
 integrated (for program) 	1 Mbyte

• integrated (for data)	5 Mbyte
integrated (for CPU function library of CPU Runtime)	20 Mbyte
Load memory	
integrated (on PC mass storage)	320 Mbyte
Backup	Vest all mamory areas dealered retentive
• with UPS	Yes; all memory areas declared retentive
with non-volatile memory	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
CPU-blocks	
Number of elements (total)	6 000; In addition to blocks such as DBs, FBs and FCs, UDTs, global
קס	constants, etc. are also regarded as elements
DB	5 000 Number reners 4 to 05525
• Number, max.	5 999; Number range: 1 to 65535
• Size, max.	5 Mbyte
FB	
• Number, max.	5 998; Number range: 1 to 65535
• Size, max.	1 024 kbyte
FC	
• Number, max.	5 999; Number range: 1 to 65535
• Size, max.	1 024 kbyte
OB	
• Size, max.	1 024 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 	1
 Number of technology synchronous alarm OBs 	2
Number of startup OBs	100
 Number of asynchronous error OBs 	4
 Number of synchronous error OBs 	2
 Number of diagnostic alarm OBs 	1
Nesting depth	
per priority class	24
Counters, timers and their retentivity	
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	
	Voc
— adjustable	Yes
IEC timer	Any (only limited by the main memory)
Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max. Flag	410 kbyte; For storage in NVRAM; for storage in mass storage 5 242 020 bytes
• Size, max.	16 kbyte

- Number of clock memories	0: 0 cleak memory bit, grouped into one cleak memory byte
Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	Van
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	8 192
I/O address area	
Inputs	32 kbyte; All inputs are in the process image
Outputs	32 kbyte; All outputs are in the process image
Subprocess images	
Number of subprocess images, max.	32
Hardware configuration	
Integrated power supply	Yes
Number of distributed IO systems	20
Number of DP masters	
• Via CM	1
Number of IO Controllers	
via PC interfaces	1
Rack	
 Modules per rack, max. 	64; CPU 1515SP PC + 64 modules + server module
 Quantity of operable ET 200SP modules, max. 	64
 Quantity of operable ET 200AL modules, max. 	16
 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
 Hardware clock (real-time) 	Yes; Resolution: 1 s
· · ·	
Backup time	6 wk; At 40 °C ambient temperature, typically
Backup time	6 wk; At 40 °C ambient temperature, typically
Backup timeDeviation per day, max.	6 wk; At 40 °C ambient temperature, typically
Backup time Deviation per day, max. Clock synchronization	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s
 Backup time Deviation per day, max. Clock synchronization supported 	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes
Backup time Deviation per day, max. Clock synchronization supported to DP, master	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes Yes
Backup time Deviation per day, max. Clock synchronization supported to DP, master on Ethernet via NTP	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes Yes Yes
Backup time Deviation per day, max. Clock synchronization supported to DP, master on Ethernet via NTP on Windows clock, slave	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes Yes Yes
Backup time Deviation per day, max. Clock synchronization supported to DP, master on Ethernet via NTP on Windows clock, slave Interfaces	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes Yes Yes
Backup time Deviation per day, max. Clock synchronization supported to DP, master on Ethernet via NTP on Windows clock, slave Interfaces Number of industrial Ethernet interfaces	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes Yes Yes Yes
Backup time Deviation per day, max. Clock synchronization supported to DP, master on Ethernet via NTP on Windows clock, slave Interfaces Number of industrial Ethernet interfaces Number of PROFINET interfaces	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes Yes Yes Yes 1
Backup time Deviation per day, max. Clock synchronization supported to DP, master on Ethernet via NTP on Windows clock, slave Interfaces Number of industrial Ethernet interfaces Number of PROFINET interfaces Number of PROFIBUS interfaces	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes Yes Yes Yes 1 1 1
Backup time Deviation per day, max. Clock synchronization supported to DP, master on Ethernet via NTP on Windows clock, slave Interfaces Number of industrial Ethernet interfaces Number of PROFINET interfaces Number of PROFIBUS interfaces Number of RS 485 interfaces	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes Yes Yes Yes 2 1 1 1 1 1; Via CM DP module
Backup time Deviation per day, max. Clock synchronization supported to DP, master on Ethernet via NTP on Windows clock, slave Interfaces Number of industrial Ethernet interfaces Number of PROFINET interfaces Number of PROFIBUS interfaces Number of RS 485 interfaces Number of USB interfaces	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes Yes Yes Yes 2 1 1 1 1; Via CM DP module 4; 2x USB 2.0, 2x USB 3.0 on front side
Backup time Deviation per day, max. Clock synchronization supported to DP, master on Ethernet via NTP on Windows clock, slave Interfaces Number of industrial Ethernet interfaces Number of PROFINET interfaces Number of PROFIBUS interfaces Number of RS 485 interfaces Number of USB interfaces Number of SD card slots	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes Yes Yes Yes 2 1 1 1 1; Via CM DP module 4; 2x USB 2.0, 2x USB 3.0 on front side
Backup time Deviation per day, max. Clock synchronization supported to DP, master on Ethernet via NTP on Windows clock, slave Interfaces Number of industrial Ethernet interfaces Number of PROFINET interfaces Number of PROFIBUS interfaces Number of RS 485 interfaces Number of USB interfaces Number of SD card slots Video interfaces	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes Yes Yes Yes I 1 1 1 1, Via CM DP module 4; 2x USB 2.0, 2x USB 3.0 on front side 1
Backup time Deviation per day, max. Clock synchronization supported to DP, master on Ethernet via NTP on Windows clock, slave Interfaces Number of industrial Ethernet interfaces Number of PROFINET interfaces Number of PROFIBUS interfaces Number of PROFIBUS interfaces Number of USB interfaces Number of SD card slots Video interfaces oraphics interface 1. Interface	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes Yes Yes Yes 2 1 1 1 1; Via CM DP module 4; 2x USB 2.0, 2x USB 3.0 on front side 1 1x DisplayPort
Backup time Deviation per day, max. Clock synchronization supported to DP, master on Ethernet via NTP on Windows clock, slave Interfaces Number of industrial Ethernet interfaces Number of PROFINET interfaces Number of PROFIBUS interfaces Number of RS 485 interfaces Number of USB interfaces Number of SD card slots Video interfaces Graphics interface	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes Yes Yes Yes I 1 1 1 1, Via CM DP module 4; 2x USB 2.0, 2x USB 3.0 on front side 1
Backup time Deviation per day, max. Clock synchronization supported to DP, master on Ethernet via NTP on Windows clock, slave Interfaces Number of industrial Ethernet interfaces Number of PROFINET interfaces Number of PROFIBUS interfaces Number of RS 485 interfaces Number of USB interfaces Number of SD card slots Video interfaces o Graphics interface Interface Interface Interface Interface	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes Yes Yes Yes 2 1 1 1 1, Via CM DP module 4; 2x USB 2.0, 2x USB 3.0 on front side 1 PROFINET PROFINET
Backup time Deviation per day, max. Clock synchronization supported to DP, master on Ethernet via NTP on Windows clock, slave Interfaces Number of industrial Ethernet interfaces Number of PROFINET interfaces Number of PROFIBUS interfaces Number of RS 485 interfaces Number of USB interfaces Number of SD card slots Video interfaces o Graphics interface Interface type automatic detection of transmission rate Autonegotiation	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes Yes Yes Yes Z 1 1 1 1, Via CM DP module 4; 2x USB 2.0, 2x USB 3.0 on front side 1 X DisplayPort PROFINET Yes
Backup time Deviation per day, max. Clock synchronization supported to DP, master on Ethernet via NTP on Windows clock, slave Interfaces Number of industrial Ethernet interfaces Number of PROFINET interfaces Number of PROFIBUS interfaces Number of RS 485 interfaces Number of USB interfaces Number of SD card slots Video interfaces o Graphics interface Interface Interface Interface Interface	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes Yes Yes Yes Yes 2 2 1 1 1 1, Via CM DP module 4; 2x USB 2.0, 2x USB 3.0 on front side 1 Yes PROFINET Yes Yes
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Backup time Deviation per day, max. Clock synchronization supported to DP, master on Ethernet via NTP on Windows clock, slave Interfaces Number of industrial Ethernet interfaces Number of PROFINET interfaces Number of PROFIBUS interfaces Number of PROFIBUS interfaces Number of USB interfaces Number of SD card slots Video interfaces of SD card slots Video interfaces of aphics interface Interface type automatic detection of transmission rate Autorcossing Number of connections Interface types	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes Yes Yes Yes Yes 2 1 1 1 1 1 1 1 Via CM DP module 4; 2x USB 2.0, 2x USB 3.0 on front side 1 PROFINET Yes Yes Yes 88
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 Backup time Deviation per day, max. Clock synchronization supported to DP, master on Ethernet via NTP on Windows clock, slave Interfaces Number of industrial Ethernet interfaces Number of PROFINET interfaces Number of PROFIBUS interfaces Number of RS 485 interfaces Number of SD card slots Video interfaces Graphics interface Interface type automatic detection of transmission rate Autonegotiation Autocrossing Number of connections Interface types RJ 45 (Ethernet) Transmission rate, max. Industrial Ethernet status LED Number of ports 	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes 1 1 Yia CM DP module 4; 2x USB 2.0, 2x USB 3.0 on front side 1 Yes PROFINET Yes Yes 88 Yes; Via BusAdapter BA 2x RJ45 100 Mbit/s Yes 2
 Backup time Deviation per day, max. Clock synchronization supported to DP, master on Ethernet via NTP on Windows clock, slave Interfaces Number of industrial Ethernet interfaces Number of PROFINET interfaces Number of PROFIBUS interfaces Number of RS 485 interfaces Number of SD card slots Video interfaces oraphics interface Interface type automatic detection of transmission rate Autonegotiation Autocrossing Number of connections Interface types RJ 45 (Ethernet) Transmission rate, max. Industrial Ethernet status LED 	6 wk; At 40 °C ambient temperature, typically 10 s; Typ.: 2 s Yes 1 1 1; Via CM DP module 4; 2x USB 2.0, 2x USB 3.0 on front side 1 Yes PROFINET Yes Yes Yes 88 Yes; Via BusAdapter BA 2x RJ45 100 Mbit/s Yes

BA LC/RJ45, BA LC/FC, BA 2x SCRJ, BA SCRJ/RJ45, BA SCRJ/FC,

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
PROFINET IO Controller	
Services	
— Isochronous mode	Yes
— shortest clock pulse	500 µs
— IRT	Yes
— PROFlenergy	Yes
— Prioritized startup	Yes; max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
— of which in line, max.	64
- Number of connectable IO Devices for RT, max.	128
— of which in line, max.	128
 — Number of IO Devices that can be simultaneously activated/deactivated, max. 	8
 — IO Devices changing during operation (partner ports), supported 	Yes
- Number of IO Devices per tool, max.	8
— Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT	
— for send cycle of 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 $\mu s:$ 625 μs 3 875 $\mu s)$ minimum cycle time start from 500 μs
Update time for RT	
— for send cycle of 500 µs	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms
— for send cycle of 4 ms	4 ms to 512 ms
Address area	
— Inputs, max.	8 kbyte
— Outputs, max.	8 kbyte
PROFINET IO Device	
Services	
 — Isochronous mode 	No
— shortest clock pulse	500 µs
— IRT	Yes
— PROFlenergy	Yes
— Prioritized startup	Yes
— Shared device	Yes
 Number of IO Controllers with shared device, max. 	4
— Asset management record	Yes
2. Interface	
Interface type	Integrated Ethernet interface
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
• RJ 45 (Ethernet)	Yes; Integrated
— Transmission rate, max.	1 000 Mbit/s

Number of pols 1 2. Introduce PROFIBUS with CM DP Number of zonections 44 • INS ABS Yes • INDOFISION DP always Yes • INDOFISION DP always Yes • PROFISION DP always Yes • Mumber of DP always No • Legidistance No • More of DP always Yes • Mumber of connections made No • Mumber of connections made No • Transmission rate, max. 12 Mores PROFISION PROFISION • Mumber of connections made No • Mumber of connections made B • Mumber of connections made B • Mumber of connections made	— Industrial Ethernet status LED	No
Interface type PROFILIES With CM DP Interface type PROFILIES With CM DP Interface type Yes Interface type No Interface type Yes Interface type Yes <		
Interface type PROFIBUS with CM DP Number of connections 44 Interface type Yes • R53 485 Yes • PROFIBUS DP master Yes • PROFIES DP master Yes • PROFIES DP master Yes • PROFIES DP master Yes • Number of DP favore, max. 125 Services Services - Equiditance No - Boothmous mode No - Outyok, mox. 8 kbyte Martine of connections, max. 12 kbbbs • Number of connections, max. 8 kbyte • Number of connections, max. 12 kbbbs • Number of connections, max. 10 • Stocknow from online break, kpp 200 ms • Stocknore from online break, kpp 200 ms		
Number of consectors 44 Interface types 45 In		PROFIBUS with CM DP
Interface types • FR3 455 Yes • PROCESUS DP master Yes • PROCESUS DP lave Yes • REGOLISUS DP lave Yes • REGOLISUS DP master Yes • Number of DP sloves, max. 125 Services - - Equiditance No - Houthonous mode No Address area - - Induits, max. 8 ktyle - Induits, max. 8 ktyle • Transmission rate, max. 12 Matrix • Revised - • Number of connections, max. 8 ktyle • Number of connections, max. 12 Matrix • Number of connections, max. 8 style • Number of connections, max. 8 style • Number of connections, max. 8 style • Number of connections, max. 9 style • Number of connections, max. <td></td> <td></td>		
• PS 485 Yes Protocol - • PROFIBUS DP master Yes • SIMATIC communication Yes • Similar DP Bakes, max. 125 Services - - Equidatione No. Indust, max. 8 kbyte Indust, max. 8 kbyte Outputs, max. 8 kbyte Outputs, max. 8 kbyte Outputs, max. 8 kbyte Torget and the second and		
• PPOPEBUS DP master Yes • PROFIBUS DP failer Yes • SIMATIC communication Yes • Similar Communication Yes • Runder OP staves, max. 125 Services - - Equidistance No - Isochronous mode No - Transmission rate, max. 8 ktyte Interface types - PROFision No Number of connections, max. 88 • Number of connections, max. 88 • Number of ST counce parts 13 • Rediandancy model - - MRP Yes - MRP Yes - Stochrower time on ine break, typ. 200 ms - Stochrower time on ine break, typ. 200 ms - Stochrower time on ine break, typ. 200 ms - Stochrower time on ine break, typ. 200 ms - Stochrower time on ine break, typ. 200 ms - Stochrower time on ine break, typ. 200 ms - Stocommunication, as elient Yes </td <td></td> <td>Yes</td>		Yes
• PROFIBUS OP state Yes • Number of DP stores, max. 125 Services - - Equidatance No - Equidatance No - Address area 8 kbyte - Inputs, max. 8 kbyte - Ougule, max. 8 kbyte - Transmission rate, max. 12 Mobiles PROFISE - Protocols - Number of connections, max. 88 • Number of connections reserves for ESHMIWeb 10 • Number of connections reserves	Protocols	
NUMPIC communication Yes PROFIBUS DP master 125 Services No - Equidatance No - Isochronous mode No Address area - - Uppuls, max. 8 kbyte - Outpuls, max. 8 kbyte Warface types - Transmission rate, max. 12 Matrix PROFIBUR - Procode - Number of connections, max. 88 Number of connections reserved for ES/MM/web 10 Number of connections reserved for ES/MM/web 10 Number of stronoung paths 16 Redundancy mode - Media redundancy - - MRP Yes - Stronomunication Yes - Stronom	PROFIBUS DP master	Yes
PROFIBUS DP master • Number of DP slaves, max. 125 Services • - Equidistance No - Address area • - Inputs, max. 8 kbyte Address area • - Uputs, max. 8 kbyte Interface types • RS 485 • • Transmission rate, max. 12 Mbit/s Prococols • PROFIBME 88 • Number of connections, max. 88 • Number of connections reserved for ESHMI/web 10 • Number of stations in the ring, max. 50 StiMatCommunication Yes • Strictorize the on line brack, typ. 200 ms - Strictorize the on line brack, typ. 50 Strict communication Yes • ST coumunication, as server Yes • ST coumunication is a server Yes	PROFIBUS DP slave	Yes
• Number of DP slaves, max. 125 Services No	SIMATIC communication	Yes
Services No - Equidistance No - Isochronous mode No Address area - - Unputs, max. 8 ktyle - Outputs, max. 8 ktyle - Outputs, max. 8 ktyle Interface.types - FRS 485 - - Transmission rate, max. 12 Mbt/s Protocols - - Number of connections, max. 88 - Number of connections reserved for ESMMI/web 10 - Number of connections reserved for ESMMI/web 10 - Number of connections reserved for ESMMI/web 10 - Number of connections reserved for SV outing paths 16 Redundancy mode - - MRP Yes - MMPD Yes - SV outing a server Yes SY continuication Yes SY continuication Set ktyle; SEND/BRCV: 64 KB; PUT/GET: 960 bytes	PROFIBUS DP master	
Equidistance No	Number of DP slaves, max.	125
−lschhonous mode No Adtress area 8 ktyle −loputs, max. 8 ktyle −Outputs, max. 8 ktyle −Outputs, max. 8 ktyle ■Stads 12 Mbl/s PROFISATE No PROFISATE No Number of connections, max. 88 • Number of connections reserved for ESHMI/web 10 • Number of connections reserved for ESHMI/web 16 Redunation mode 16 Redunation mode 10 • Number of connections reserved for ESHMI/web 10 • Number of Strouting paths 16 Redunation mode 10 • Number of stations in the brias, typ. 200 ms - MRP Yes - Strouting Yes • PO(OP communication Yes • Strouting	Services	
Address area -	— Equidistance	No
- Inputs, max. 8 kbyte - Outputs, max. 8 kbyte Nurface types - R8 485 - • Tarasmission rate, max. 12 Mbit/s PROFICATION - PROFISATE No Number of connections, max. 88 • Number of structing paths 16 Redundancy mode - MRP Yes - MRPD Yes - Switchover time on line break, typ. 200 ms - Number of stations in the ring, max. 50 SIMATIC communication Yes • ST courting Yes • Deal length, max. 64 kbyte • UOP Yes • Data length, max. 64 kbyte • UOP Yes • Data length, max. 64 kbyte • UDP	— Isochronous mode	No
−Outputs, max. 8 ktyle Interface kypes Iteration kypes RS 485 12 Mbit/s Protocols Protocols PROFisafe No Number of connections, max. 88 • Number of connections, max. 96 Eductionatory, mode - - MRPD Yes - NRPD Yes - NRPD Yes - Stroting Yes • Dotal length, max. 64 kbyte • Dotal length, max. 64 kbyte	Address area	
Interface types R5 485 • Transmission rate, max. 12 Mbit/s PROFisafe No Number of connections, max. 88 • Number of connections, max. 88 • Number of connections reserved for ESHMI/web 10 • Number of connections reserved for ESHMI/web 10 • Number of s7 routing paths 16 Redundancy mode	— Inputs, max.	8 kbyte
RS 485 • Transmission rate, max. 12 Mbb/s PROFisafe No Number of connections, max. 88 • Number of stronging mode 10 Media redundancy	— Outputs, max.	8 kbyte
	Interface types	
Protocols PROFisate No Number of connections, max. 88 • Number of connections reserved for ES/HMI/web 10 • Number of S7 routing paths 16 Redundancy mode 10 — MRP Yes — MRPD Yes — MRPD Yes — Number of stations in the ring, max. 50 SIMATIC communication Yes • Strothy Yes • Ording Yes • ST communication, as client Yes • ST communication, as client Yes • User data per job, max. 64 kbyte; BSEND/BRCV: 64 KB, PUT/GET: 960 bytes Open IE communication Yes • ST communication Yes • IDP Yes - Data length, max. 64 kbyte; BSEND/BRCV: 64 KB, PUT/GET: 960 bytes Open IE communication Yes • IDP Yes - Data length, max. 64 kbyte • IDP Yes • DDP Yes • DDP Yes • DDP	RS 485	
PROFisafe No Number of connections 88 • Number of connections, max. 88 • Number of S7 routing paths 10 • Redundancy mode 10 Media redundancy 10 - MRP Yes - MRPD Yes - Switchover time on line break, typ. 200 ms - Number of stations in the ring, max. 50 SIMATIC communication Yes • 67 couting Yes • 57 continuincitation, as client Yes • 100 communication, as client Yes • 100 communication, as client Yes • 100 cP/IP Yes • 100 cP/IP Yes • 000 ms 4kbyte • 100 cP/IP Yes • 010 cP Yes <	Transmission rate, max.	12 Mbit/s
Number of connections, max. 88 • Number of connections reserved for ES/HMI/web 10 • Number of S7 routing paths 16 Redundancy mode	Protocols	
• Number of connections, max. 88 • Number of connections reserved for ES/HMI/web 10 • Number of S7 routing paths 16 Redundancy mode	PROFIsafe	No
• Number of connections reserved for ES/HMI/web 10 • Number of S7 routing paths 16 Redundancy mode	Number of connections	
• Number of S7 routing paths 16 Redundancy mode	 Number of connections, max. 	88
Redundancy mode Media redundancy MRP Yes MRPD Yes MRPD Yes Switchover time on line break, typ. 200 ms Number of stations in the ring, max. 50 SIMATIC communication Yes ST contunication Yes ST communication, as server Yes ST communication, as client Yes Open IE communication Yes - Data length, max. 64 kbyte ISO-on-TCP (RFC1006) Yes - Data length, max. 64 kbyte UDP - Data length, max. 64 kbyte UDP - Data length, max. 2048 byte SMMP Yes • DCP Yes Veb server • HTTP Yes; Via Windows and PROFINET interface HTTPS Yes; Via Windows and PROFINET interface OPC UA • Runtime license required • OPC UA Client Yes; Toma SW CPU 150S5P V2.6 • OPC UA Server • Application authenticatio	 Number of connections reserved for ES/HMI/web 	10
Media redundancy Yes - MRPD Yes - MRPD 200 ms - Number of stations in the ring, max. 50 SIMATIC communication Yes Yes • ST routing Yes • ST communication Yes • ST communication, as server Yes • ST communication, as server Yes • User data per job, max. 64 kbyte: • User data per job, max. 64 kbyte • TCP/IP Yes • Deat length, max. 64 kbyte • ISO-on-TCP (RFC1006) Yes • Data length, max. 64 kbyte • UDP Yes • Data length, max. 64 kbyte • UDP Yes • Data length, max. 2048 byte • SINMP Yes • DDCP Yes • LLDP Yes • HTTPS Yes; Via Windows and PROFINET interface • HTTPS Yes; Via Windows and PROFINET interface • HTTPS Yes; Yoa Windows and PROFINET interface • OPC UA Yes; Yoa Windows and PROFINET interface	 Number of S7 routing paths 	16
MRP Yes MRPD Yes Second Second	Redundancy mode	
MRPDYesSwitchover time on line break, typ.200 msNumber of stations in the ring, max.50SIMATIC communicationYesSIMATIC communicationYesPG/OP communication, as serverYesS7 contingYesS7 communication, as serverYesS7 communication, as serverYesS7 communication, as clientYes	Media redundancy	
Switchover time on line break, typ.200 ms Number of stations in the ring, max.50SIMATIC communicationFG/OP communicationYes• S7 routingYes• S7 communication, as serverYes• S7 communication, as clientYes• User data per job, max.64 kbyte; BSEND/BRCV: 64 KB; PUT/GET: 960 bytesOpen IE communication• TCP/IPYes- Data length, max.64 kbyte• ISO-on-TCP (RFC1006)Yes- Data length, max.64 kbyte• UDPYes- Data length, max.64 kbyte• UDPYes- Data length, max.2048 byte• SNMPYes• LLDPYes• DCPYes• HTTPYes; Via Windows and PROFINET interface• HTTPYes; Via Windows and PROFINET interface• DFC UAYes; From SW CPU 150SSP V2.6• OPC UA ClientYes; From SW CPU 150SSP V2.6• OPC UA ServerYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa256- Security policiesYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa256	— MRP	Yes
Number of stations in the ring, max. 50 SIMATIC communication Yes • PG/OP communication Yes • S7 routing Yes • S7 communication, as server Yes • S7 communication, as client Yes • User data per job, max. 64 kbyte; BSEND/BRCV: 64 KB; PUT/GET: 960 bytes Open IE communication Yes • TCP/IP Yes - Data length, max. 64 kbyte • ISO-on-TCP (RFC1006) Yes - Data length, max. 64 kbyte • UDP Yes - Data length, max. 64 kbyte • DAta length, max. 64 kbyte • DDP Yes - Data length, max. 64 kbyte • DDP Yes • DDP Yes • DLP Yes • LLDP Yes Web server - • HTTPS Yes; Via Windows and PROFINET interface • HTTPS Yes; Via Windows and PROFINET interface • OPC UA Yes; Tom SW CPU 1505SP V2.6 • OPC UA Server Yes; Data access (read, write, subscribe), runtime license required	— MRPD	Yes
SIMATIC communication Yes • PG/OP communication Yes • S7 routing Yes • S7 communication, as server Yes • S7 communication, as client Yes • User data per job, max. 64 kbyte; BSEND/BRCV: 64 KB; PUT/GET: 960 bytes Open IE communication • TCP/IP Yes - Data length, max. 64 kbyte • ISO-on-TCP (RFC1006) Yes - Data length, max. 64 kbyte • UDP Yes - Data length, max. 2 048 byte • SNMP Yes - Data length, max. 2 048 byte • SNMP Yes • LDP Yes Veb server Yes; Via Windows and PROFINET interface • HTTP Yes; Via Windows and PROFINET interface • HTTPS Yes; Via Windows and PROFINET interface OPC UA Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic2566Rsa15, Basic2566Rsa15, Basic2566Rsa15, Basic2566Rsa15, Basic2566	 — Switchover time on line break, typ. 	200 ms
• PG/OP communication Yes • S7 routing Yes • S7 communication, as server Yes • S7 communication, as client Yes • User data per job, max. 64 kbyte; BSEND/BRCV: 64 KB; PUT/GET: 960 bytes Open IE communication Yes • TCP/IP Yes • Data length, max. 64 kbyte • ISO-on-TCP (RFC1006) Yes • Data length, max. 64 kbyte • UDP Yes • Data length, max. 64 kbyte • UDP Yes • Data length, max. 2 048 byte • SNMP Yes • DCP Yes • LDP Yes • UDP Yes • DCP Yes • LLDP Yes • ULP Yes; Via Windows and PROFINET interface • HTTPS Yes; Via Windows and PROFINET interface • HTTPS Yes; Small* license required • OPC UA Yes; From SW CPU 150SP V2.6 • OPC UA Client Yes; From SW CPU 150SPS V2.6 • OPC UA Server Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Rs	— Number of stations in the ring, max.	50
• S7 routingYes• S7 communication, as serverYes• S7 communication, as clientYes• User data per job, max.64 kbyte; BSEND/BRCV: 64 KB; PUT/GET: 960 bytesOpen IE communicationTCP/IP• TCP/IPYes- Data length, max.64 kbyte• ISO-on-TCP (RFC1006)Yes- Data length, max.64 kbyte• UDPYes- Data length, max.9048 byte• DCPYes• DCPYes• LLDPYesVeb serverYes; Via Windows and PROFINET interface• HTTPSYes; Via Windows and PROFINET interface• HTTPSYes; Via Windows and PROFINET interface• DPC UAYes; From SW CPU 1505SP V2.6• OPC UA ClientYes; Ton SW CPU 1505SP V2.6• OPC UA ServerYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Rsa15, Casic256Rsa15, Casic2		
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• S7 communication, as clientYes• User data per job, max.64 kbyte; BSEND/BRCV: 64 KB; PUT/GET: 960 bytesOpen IE communication• TCP/IPYes• Data length, max.64 kbyte• ISO-on-TCP (RFC1006)Yes- Data length, max.64 kbyte• UDPYes- Data length, max.64 kbyte• UDPYes- Data length, max.64 kbyte• UDPYes- Data length, max.2048 byte• DDPYes- Data length, max.2048 byte• DCPYes• DCPYes• LDPYes• LDPYes• LDPYes• LDPYes• DCPYes• LDPYes• DCPYes• LDPYes• DCPYes; Via Windows and PROFINET interface• HTTPSYes; Via Windows and PROFINET interface• HTTPSYes; Via Windows and PROFINET interface• OPC UAYes; Small" license required• OPC UA ClientYes; From SW CPU 1505SP V2.6• OPC UA ServerYes; Data access (read, write, subscribe), runtime license required- Application authenticationYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa15, Casic256Rsa15, Basic256Rsa15, Casic256Rsa15, C		
• User data per job, max.64 kbyte; BSEND/BRCV: 64 KB; PUT/GET: 960 bytesOpen IE communication• TCP/IPYes- Data length, max.64 kbyte• ISO-on-TCP (RFC1006)Yes- Data length, max.64 kbyte• UDPYes- Data length, max.2048 byte• DCPYes• DCPYes• LLDPYes• HTTPYes; Via Windows and PROFINET interface• HTTPSYes; Via Windows and PROFINET interface• HTTPSYes; Via Windows and PROFINET interface• HTTPSYes; Small" license required• OPC UAYes; Trom SW CPU 1505SP V2.6• OPC UA ClientYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15,		
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• TCP/IPYes- Data length, max.64 kbyte• ISO-on-TCP (RFC1006)Yes- Data length, max.64 kbyte• UDPYes- Data length, max.64 kbyte• UDPYes- Data length, max.2 048 byte• SNMPYes• DCPYes• DCPYes• LLDPYesWeb serverYes; Via Windows and PROFINET interface• HTTPsYes; Via Windows and PROFINET interface• HTTPsYes; Via Windows and PROFINET interface• HTTPsYes; Via Windows and PROFINET interface• CPC UAYes; Small* license required• Runtime license requiredYes; From SW CPU 150SSP V2.6• OPC UA ClientYes; Data access (read, write, subscribe), runtime license required• Application authenticationYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Rsa15, Complexed• Security policiesYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rs		64 kbyte; BSEND/BRCV: 64 KB; PUT/GET: 960 bytes
- Data length, max.64 kbyte• ISO-on-TCP (RFC1006)Yes- Data length, max.64 kbyte• UDPYes- Data length, max.2 048 byte- Data length, max.2 048 byte• SNMPYes• DCPYes• DCPYes• LLDPYes• HTTPYes• HTTPSYes; Via Windows and PROFINET interface• HTTPSYes; Via Windows and PROFINET interface• HTTPSYes; Via Windows and PROFINET interface• COPC UAYes; Small" license required• OPC UA ClientYes; "Small" license required• OPC UA ServerYes; From SW CPU 1505SP V2.6• OPC UA ServerYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa256- Application authenticationYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Bas		
• ISO-on-TCP (RFC1006)Yes- Data length, max.64 kbyte• UDPYes- Data length, max.2 048 byte• SNMPYes• DCPYes• LDPYes• LLDPYes• HTTPYes (Via Windows and PROFINET interface• HTTPSYes; Via Windows and PROFINET interface• HTTPSYes; Via Windows and PROFINET interface• OPC UAYes; Small* license required• OPC UA ClientYes; "Small* license required• OPC UA ServerYes; Tom SW CPU 150SSP V2.6• OPC UA ServerYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256- Security policiesYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa		
- Data length, max.64 kbyte• UDPYes- Data length, max.2048 byte• SNMPYes• DCPYes• LLDPYes• LLDPYes• HTTPYes; Via Windows and PROFINET interface• HTTPSYes; Via Windows and PROFINET interface• HTTPSYes; Via Windows and PROFINET interface• OPC UAYes; Via Windows and PROFINET interface• PC UAYes; Via Windows and PROFINET interface• PC UAYes; Via Windows and PROFINET interface• PC UAYes; Small" license required• OPC UA ClientYes; From SW CPU 150SSP V2.6• OPC UA ServerYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256- Security policiesYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256	-	
• UDPYes- Data length, max.2 048 byte• SNMPYes• DCPYes• LLDPYes• LLDPYes• HTTPYes; Via Windows and PROFINET interface• HTTPSYes; Via Windows and PROFINET interface• PC UAYes; Small" license required• OPC UAYes; "Small" license required• OPC UA ClientYes; From SW CPU 1505SP V2.6• OPC UA ServerYes; Data access (read, write, subscribe), runtime license required- Application authenticationYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256- Security policiesYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic		
— Data length, max.2 048 byte• SNMPYes• DCPYes• LLDPYes• LLDPYes• Web serverYes; Via Windows and PROFINET interface• HTTPYes; Via Windows and PROFINET interface• HTTPSYes; Via Windows and PROFINET interface• HTTPSYes; Via Windows and PROFINET interface• PC UAYes; Via Windows and PROFINET interface• Runtime license requiredYes; "Small" license required• OPC UA ClientYes; From SW CPU 1505SP V2.6• OPC UA ServerYes; Data access (read, write, subscribe), runtime license required• Application authenticationYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256- Security policiesYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basi	-	
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DCPYesLLDPYesWeb serverYes; Via Windows and PROFINET interface• HTTPYes; Via Windows and PROFINET interface• HTTPSYes; Via Windows and PROFINET interfaceOPC UAYes; Via Windows and PROFINET interface• Runtime license requiredYes; "Small" license required• OPC UA ClientYes; From SW CPU 1505SP V2.6• OPC UA ServerYes; Data access (read, write, subscribe), runtime license required- Application authenticationYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256- Security policiesYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Ba	-	
LLDPYesWeb server• HTTP• HTTPS• HTTPS• HTTPSOPC UA• Runtime license required• OPC UA Client• OPC UA Server- Application authenticationYes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa15, Context Part Part Part Part Part Part Part Par		
Web server • HTTP Yes; Via Windows and PROFINET interface • HTTPS Yes; Via Windows and PROFINET interface OPC UA Yes; "Small" license required • Runtime license required Yes; "Small" license required • OPC UA Client Yes; From SW CPU 1505SP V2.6 • OPC UA Server Yes; Data access (read, write, subscribe), runtime license required - Application authentication Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 - Security policies Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rs		
• HTTP Yes; Via Windows and PROFINET interface • HTTPS Yes; Via Windows and PROFINET interface OPC UA • Runtime license required Yes; "Small" license required • OPC UA Client Yes; From SW CPU 1505SP V2.6 • OPC UA Server Yes; Data access (read, write, subscribe), runtime license required - Application authentication Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 - Security policies Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256R		Tes
• HTTPS Yes; Via Windows and PROFINET interface OPC UA Yes; Via Windows and PROFINET interface • Runtime license required Yes; "Small" license required • OPC UA Client Yes; From SW CPU 1505SP V2.6 • OPC UA Server Yes; Data access (read, write, subscribe), runtime license required - Application authentication Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 - Security policies Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic2		Vac: Via Windows and DDOEINET interface
OPC UA • Runtime license required • OPC UA Client • OPC UA Server - Application authentication Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 - Security policies		
 Runtime license required OPC UA Client OPC UA Server Application authentication Security policies Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa15, Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic		
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— Application authentication Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 — Security policies Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic25		
— Security policies Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15,		Yes: Available security policies: None, Basic128Rsa15, Basic256Rsa15,
	— Security policies	Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15,

— User authentication	Yes; "anonymous" or by user name & password
Further protocols	
MODBUS	Yes; MODBUS TCP
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	1 000
 Number of program alarms 	1 000
 Number of alarms for system diagnostics 	200
 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
Single step	No
Number of breakpoints	8
Status/control	
Status/control variable	Yes
• Variables	Inputs, outputs, memory bits, DB, times, counters
Number of variables, max.	200
— of which status variables, max.	200
— of which control variables, max.	200
Forcing	Yes
Forcing Forcing Forcing	
 Forcing, variables Number of variables, max. 	Inputs, outputs 200
Diagnostic buffer	200
• present	Yes
Number of entries, max.	1 000
— of which powerfail-proof	300
Traces	
Number of configurable Traces	4
Memory size per trace, max.	512 kbyte
Interrupts/diagnostics/status information	
Diagnostics indication LED	
RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	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 	2 400
Required Motion Control resources	
per speed-controlled axis	40; per axis
— per positioning axis	80; per axis
— per synchronous axis	160; per axis
— per external encoder	80; per external encoder
— per output cam	20; per cam
— per cam track	160; per cam track
— per probe	40; per probe
Positioning axis	
 — Number of positioning axes at motion control cycle of 4 ms (typical value) 	15
 — Number of positioning axes at motion control cycle of 8 ms (typical value) 	30
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	
CE mark	Yes
CSA approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
 horizontal installation, min. 	-20 °C
 horizontal installation, max. 	60 °C; from 55°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast
	memory card max. 10% load; SD card not used
 vertical installation, min. 	-20 °C
 vertical installation, max. 	50 °C; from 45°C: with max. 32 ET 200SP modules; 4x 0.3 A USB load; CFast memory card and SD card; max. 10% load
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Vibrations	
 Operation, tested according to IEC 60068-2-6 	Yes
• Transport, tested acc. to IEC 60068-2-6	Yes
Shock testing	
tested according to IEC 60068-2-6	Yes
• tested according to IEC 60068-2-27	Yes
• tested according to IEC 60068-2-29	Yes
• Storage/transport, tested acc. to IEC 60068-2-27	Yes
Operating systems	
pre-installed operating system	Windows 10 IoT Enterprise 2019 LTSC, 64 bit, MUI
configuration / header	
configuration / programming / header	
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	No
— 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
Protection level: Write protection	Yes
Protection level: Read/write protection	Yes
Protection level: Complete protection	Yes
programming / cycle time monitoring / header	adjustable minimum quale firs-
lower limit	adjustable minimum cycle time
upper limit	adjustable maximum cycle time
Open Development interfaces	5 9 Mbyto
Size of ODK SO file, max. Poripherals/Options	5.8 Mbyte
Peripherals/Options SD card	Ontionally for additional mass storage
SD card Dimensions	Optionally for additional mass storage
	160 mm
Width	160 mm
Height Depth	117 mm 75 mm
Weights	
Weights Weight, approx.	0.83 kg
weight, approx.	
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