## SIEMENS

## Data sheet

## 6ES7677-2VB42-0GL0



SIMATIC ET 200SP Open Controller, CPU 1515SP PC2 T + HMI 512PT, 8 GB RAM (basic device 6ES7677-2DB40-0AA0), 128 GB CFast with Windows 10 IoT Enterprise LTSC 2019 64-bit, S7-1500 Software Controller CPU 1505SP T V2x and WinCC Runtime Advanced V17 preinstalled, with 512 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,

F	ig	ur	e s	im	ilar

General information	
Product type designation	CPU 1515SP PC2 T
HW functional status	from FS04
Firmware version	V21.9
Engineering with	
<ul> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	V17
Installed software	
Visualization	WinCC Runtime Advanced V17
Control	S7-1500 Software Controller CPU 1505SP T
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	
<ul> <li>Mains/voltage failure stored energy time</li> </ul>	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 <sup>2</sup> ·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.	16 W
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	
<ul> <li>integrated (for program)</li> </ul>	1 Mbyte

- integrated (for data)	
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	
• with UPS	Yes; all memory areas declared retentive
<ul> <li>with non-volatile memory</li> </ul>	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
	constants, etc. are also regarded as elements
DB	
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
<ul> <li>Number of DPV1 alarm OBs</li> </ul>	3
<ul> <li>Number of isochronous mode OBs</li> </ul>	1
<ul> <li>Number of technology synchronous alarm OBs</li> </ul>	2
Number of startup OBs	100
<ul> <li>Number of asynchronous error OBs</li> </ul>	4
<ul> <li>Number of synchronous error OBs</li> </ul>	2
<ul> <li>Number of diagnostic alarm OBs</li> </ul>	1
Nesting depth	
<ul> <li>per priority class</li> </ul>	24
Counters, timers and their retentivity	
S7 counter	
Number	2 048
Retentivity	
— adjustable	Yes
IEC counter	
Number	Any (only limited by the main memory)
	Any (only limited by the main memory)
Retentivity	Var
— adjustable	Yes
S7 times	
• Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	
	Any (only limited by the main memory)
• Number	Any (only initial by the main memory)
Number     Retentivity	Any (only infined by the main memory)
	Yes
Retentivity	
Retentivity — adjustable	
Retentivity — adjustable Data areas and their retentivity	Yes

Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	
<ul> <li>Retentivity adjustable</li> </ul>	Yes
Retentivity preset	No
Local data	
<ul> <li>per priority class, max.</li> </ul>	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	
<ul> <li>Number of subprocess images, max.</li> </ul>	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
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
Deviation per day, max.	10 s; Typ.: 2 s
Clock synchronization	10 0, 1 )p. 2 0
supported	Yes
• to DP, master	Yes
on Ethernet via NTP	Yes
• on Windows clock, slave	Yes
Interfaces	
Number of industrial Ethernet interfaces	2
Number of PROFINET interfaces	1
Number of PROFIBUS interfaces	1
Number of RS 485 interfaces	1; Via CM DP module
Number of USB interfaces	4; 2x USB 2.0, 2x USB 3.0 on front side
Number of SD card slots	1
Video interfaces	4. Display Dest
Graphics interface	1x DisplayPort
1. Interface	
Interface type	PROFINET
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Number of connections	88
Interface types	
RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45
— Transmission rate, max.	100 Mbit/s
<ul> <li>Industrial Ethernet status LED</li> </ul>	Yes
Number of ports	2
<ul> <li>integrated switch</li> </ul>	Yes
<ul> <li>BusAdapter (PROFINET)</li> </ul>	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ (from FS03, V2.2), BA SCRJ / RJ45 (from FS03, V3.1), BA SCRJ / FC (from FS03, V3.1), BA 2x LC (from FS03, V3.3), BA LC / RJ45 (from FS03, V3.3), BA LC / FC (from FS03, V3.3)

Protocols

•••BORTINE IO DeviceVis•• Open IE communicationVis•• Open IE communicationVis•• Open IE communicationVis•• Solutions modeVis•• Solutions attribute of labelingVis•• Anniber of connectable IO Devices, max.PROFINET For the PROFINET fueldes, if you want to use the "Prototoced staturup" Imactionality in STEP 7 for the PROFINET fueldes, if you want to use the "Prototoced staturup" Imactionality in STEP 7 for the PROFINET fueldes, if you want to use the "Prototoced staturup" Imactionality in STEP 7 for the PROFINET fueldes, if you want to use the "Prototoced staturup" Imactionality in STEP 7 for the PROFINET fueldes, if you want to use the "Prototoced staturup" Imactionality in STEP 7 for the PROFINET fueldes, if you want to use the "Prototoced staturup" Imactionality in STEP 7 for the PROFINET fueldes, if you want to use the "Prototoced staturup" Imactionality in STEP 7 for the PROFINET fueldes, if you want to use the "Prototoced staturup" Imactionality in STEP 7 for the PROFINET fueldes, if you want to use the "Prototoced staturup" Imactionality in STEP 7 for the PROFINET fueldes, if you want to use the "Prototoced staturup" Imactionality in STEP 7 for the PROFINET fueldes, if you want to use the "Prototoced staturup" Imactionality in STEP 7 for the PROFINET fueldes, if you want to use the "Prototoced staturup" Imactionality in STEP 7 for the PROFINET fueldes, if you want to use the "Prototoced staturup" Imactionality in STEP 7 for the PROFINET fueldes, if yo	PROFINET IO Controller	Yes
• • • • • • • • • • • • • • • • • • •		
••• SectionVisionProceedings of the section of the secti		
• Vis           PROFINE TIO Control           Service           - indicit cock pulse         600 µs           - indicit cock pulse         600 µs           - indicit cock pulse         600 µs           - PROFILEE restry         Yes           - PROFILEE restry         Yes           - PROFILEE restry         Yes           - Number of connectable IO Devices, max.         128           - O which IO devices with RT, max.         64           - of which Inso, max.         128           - of which Inso, Inso.         The minimum value of the update time also depends on communication share update PROFINETTICO which Inso.           - of which Opel of 500 µs         500 µs to 250 ms           - of which Opel of 500 µs         27ms to 12 ms <t< td=""><td></td><td></td></t<>		
Update fine for IRT         Yes                - Isochronous mode             - shortest dook puble             - shortest dook puble             - shortest dook puble             - PROFilewarg             - PROFilewarg             - PROFilewarg             - PROFilewarg             - PROFilewarg             - Provinized startup             - Provinized startup             - Number of connectable IO Devices, max.             2 PROFINET devices: if you want to use the "Provinized startup"             / functionality in STEP 7 to the PROFINET devices: if you want to use the "Provinized startup"             / functionality in STEP 7 to the PROFINET interface of the CPU and             the device runs be separated by means of a switch (e.g. SCALANCE.X208)             - Of which in line, max.             - for send cycle of an		
Service         - shothest lock pulse           - shothest lock pulse         560 µs           - shothest lock pulse         560 µs           - PROFILE         Yes           - Prioritized startup         Yes           - Prioritized startup         Yes           - Prioritized startup         Yes           - Number of connectable I/D Devices, max.         128           - of which in line, max.         64           - of which in line, max.         64           - of which in line, max.         128           - of which in line, max.         128           - Number of IO Devices that pain be simultaneously activated decativated, max.         128           - Number of IO Devices perion (max).         8           - Updating times         500 µs to 8 ms           - IO Devices for IT max.         128           - Updating times         500 µs to 8 ms           - for send cycle of 100 µs         1ms to 16 ms           - for send cycle of 100 µs         500 µs to 8 ms           - for send cycle of 100 µs         2ms to 137 ms           - for send cycle of 100 µs         1ms to 16 ms           - for send cycle of 20 µs         500 µs to 28 ms           - for send cycle of 20 µs         500 µs to 28 ms           -		Tes
- Isochronous mode         Yes           - ahortset clock pulse         Solo jus           - PROFInency         Yes           - PROFInency         Yes           - Profitzed startup         Transmission must be separated by means of a switch (e.g. SCALANCE X200)           - Or which IO devices with IRT, max.         64           - Or which IO devices that IRT, max.         64           - Or which IO devices that an be simultaneously         8           - Or which IN devices that an be simultaneously         8           - Or which IN IRE, max.         64           - Number of connectable IO Devices for RT, max.         128           - Number of Connectable IO Devices for RT, max.         128           - Number of IO Devices that an be simultaneously         8           - Number of IO Devices that an be simultaneously         8           - Number of IO Devices peritoli, (nance         6           - Number of IO Devices peritoli, (nance         500 jus ID 8m           - for send cycle of 500 jus         500 jus ID 8m           - for send cycle of 200 jus         27m for 32 ms           - for send cycle of 200 jus         27m for 32 ms           - for send cycle of 200 jus         27m for 32 ms           - for send cycle of 10m         10m for 10m           - for send cycl		
- shortset clock pulse500 µs- IRTYes- PROFInergryYes- Profitized startupYes, max. 32 PROFINET devices; if you want to use the "Prioritzed startup"- Number of connectable IO Devices, max.128- Of which IO devices with IRT, max.64- Of which In Ine, max.128- Of which Ine max.128- of which Optoce Iter128- of which Optoce Iter128- of which Optoce Iter200 µsto 8 max of which Optoce Iter500 µsto 26 max of which Optoce Iter500 µsto 26 max of which Optoce Iter500 µsto 26 max.		Yes
−IRT         Yes           −PROFINE         Yes           −PROFINE         Yes           −Profitzed samp         Yes           −Number of connectable IO Devices, max.         128           −O' which in kine, max.         64           −O' which in kine, max.         128           −O' which in the max.         128           −O' which in kine, max.         128           −O' which in kine, max.         128           −O' which in kine kine allow device of low device allow device of kine al		
- PROFInency         Yes           - Prioritzed startup         Startup           - Number of connectable IO Devices, max.         128           - Of which in line, max.         64           - Of which in line, max.         128           - Or baylices with line, max.         128           - Or baylices bart can be simultaneously adviced/starture, max.         128           - Or baylices bart can be simultaneously adviced/starture, max.         128           - Or baylices data film         Yes           - Or bayling times         500 jus to 8 ms           - Or bayling times         1 ms to 16 ms           - for send cycle of 500 jus         1 ms to 16 ms           - for send cycle of 500 jus         1 ms to 12 ms           - for send cycle of 500 jus         1 ms to 12 ms           - for send cycle of 500 jus         1 ms to 12 ms           - for send cycle of 1 ms         1 ms to 12 ms		
- Prioritzed starup         Yes, max. 32 PROFINET devices, fivou want to see prioritzed starup the device must be separated by means of a switch (e.g. SCALANCE X205) the device must be separated by means of a switch (e.g. SCALANCE X205)           - Of which 10 devices with IRT, max.         64           - of which in line, max.         78           - Wonder of OD Devices hang during operation (partner ports), supported         8           - Wonder of OD Devices per tool, max.         8           - Wonder of OD Devices per tool, max.         8           - For send cycle of 100 µs         500 µs to 8 m           - for send cycle of 100 µs         500 µs to 8 m           - for send cycle of 100 µs         2 ms to 32 ms           - for send cycle of 100 µs         500 µs to 25 ms           - for send cycle of 100 µs         500 µs to 25 ms           - for send cycle of 100 µs         2 ms to 32 ms           - for send cycle of 100 µs         2 ms to 32 ms           - for send cycle of 100 µs         2 ms to 512 ms           - for send cycle of 100 µs         2 ms to 512 ms           <		
- Of which ID devices with IRT, max.64- of which ID devices for RT, max.128- of which ID here of concetable ID Devices for RT, max.128- of which ID here of ID Devices that can be simultanously devices charging during operation (partner parts), supported8- Number of ID Devices per tool, max.8- Obdecise sharging during operation (partner parts), supported8- Updecise sharging during operation (partner parts), supported8- Updeting times500 µs to 8 ms- Ter send cycle of ID500 µs to 8 ms- for send cycle of In max100 devices, and on the quantity of 100 devices and on the quantity of 100 parts- for send cycle of Ims500 µs to 8 ms- for send cycle of 10 ms1 ms to 16 ms- for send cycle of 10 ms3 ms to 32 ms- for send cycle of 10 ms3 ms to 54 ms- for send cycle of 10 ms1 ms to 512 ms- for send cycle of 10 ms1 ms to 512 ms- for send cycle of 1 ms500 µs to 256 ms- for send cycle of 1 ms1 ms to 512 ms- for send cycle of 2 ms2 ms to 512 ms- for send cycle of 2 ms8 kityle- for send cycle of 2 ms8 kityle- for send cycle of 2 ms8 kityle- for send cycle of 2 ms9 cs- for send cycle of 2 m		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
	- Number of connectable IO Devices, max.	128
- Number of connectable IO Devices for RT, max.128- of which in line, max.128- Wuhber of IO Devices that can be simultaneously activated/descrivated, max.8- IO Devices changing during operation (partner ports), supported8- Number of IO Devices per tool, max.8- Updating times500 µs to 8 ms- Updating times500 µs to 8 ms- for send cycle of 500 µs500 µs to 8 ms- for send cycle of 1 ms1 ms to 16 ms- for send cycle of 2 ms2 ms to 32 ms- for send cycle of 1 ms1 ms to 16 ms- for send cycle of 1 ms500 µs to 8 ms- for send cycle of 500 µs500 µs to 256 ms- for send cycle of 500 µs500 µs to 256 ms- for send cycle of 500 µs500 µs to 256 ms- for send cycle of 500 µs500 µs to 256 ms- for send cycle of 1 ms1 ms to 512 ms- for send cycle of 1 ms500 µs to 256 ms- for send cycle of 1 ms500 µs to 256 ms- for send cycle of 4 ms8 kbyte- for send cycle of 4 ms8 kbyte- for send cycle of 4 ms8 kbyte- for send cycle of 4 ms9 kbyte- shared device9 kbyte- for send cycle of cycle of	- Of which IO devices with IRT, max.	64
- of which in line, max.128- Number of IO Devices that can be simultaneously activated/decktivade, max.8- IO Devices changing during operation (partner ports), supportedYes- IO Devices changing during operation (partner ports), supported8- Number of IO Devices per tool, max.8- Updating times500 µs to 8 ms- Updating times500 µs to 8 ms- for send cycle of 500 µs500 µs to 8 ms- for send cycle of 1 ms1 ms to 16 ms- for send cycle of 1 ms2 ms to 32 ms- for send cycle of 4 ms4 ms to 24 ms- for send cycle of 100 devices, and on the quantity of 	— of which in line, max.	64
Number of IO Devices that can be simultaneously activited/deactivated, max.         8	- Number of connectable IO Devices for RT, max.	128
activated deactivated, max.	— of which in line, max.	128
- Number of IO Devices per tool, max.         8           - Updating times         8           - Update time for IRT         - Configured user data           - for send cycle of 500 µs         500 µs to 8 ms           - for send cycle of 500 µs         2 ms to 32 ms           - for send cycle of 1 ms         1 ms to 16 ms           - for send cycle of 4 ms         4 ms to 84 ms           - for send cycle of 4 ms         4 ms to 84 ms           - for send cycle of 500 µs         500 µs to 256 ms           - for send cycle of 4 ms         4 ms to 84 ms           - for send cycle of 500 µs         500 µs to 256 ms           - for send cycle of 500 µs         500 µs to 256 ms           - for send cycle of 2 ms         2 ms to 512 ms           - for send cycle of 4 ms         4 ms to 54 ms           - for send cycle of 4 ms         8 ktyle           - for send cycle of 4 ms         8 ktyle           - for send cycle of 4 ms         500 µs           - for send cycle of 4 ms         8 ktyle           - for send cycle of 4 ms         9 ktyle           - for send cycle of 4 ms         9 ktyle           - for send cycle of 4 ms         9 ktyle           - For send cycle of 4 ms         9 ktyle           - For send cycle of 4 ms <t< td=""><td></td><td>8</td></t<>		8
		Yes
Bestfor PROFINET IO, on the number of IO devices, and on the quantity of configured user data           Update time for IRT           - 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 500 µs         500 µs to 256 ms           - With IRT and parameterization of 'odd' send cycle         Update time for and cycle of 500 µs           - for send cycle of 500 µs         500 µs to 256 ms           - for send cycle of 500 µs         500 µs to 256 ms           - for send cycle of 500 µs         500 µs to 256 ms           - for send cycle of 500 µs         500 µs to 256 ms           - for send cycle of 500 µs         500 µs to 256 ms           - for send cycle of 500 µs         500 µs to 256 ms           - for send cycle of 500 µs         500 µs to 256 ms           - for send cycle of 500 µs         500 µs           - for send cycle of 500 µs         500 µs           - for send cycle of 500 µs         4 ms to 512 ms           - for send cycle of 4 ms         4 ms to 512 ms           - for send cycle of 4 ms         500 µs           - For Send cycle of 4 ms         4 ms to 512 ms           - Forbuts         500 µs           - Isochronous mode <t< td=""><td>- Number of IO Devices per tool, max.</td><td>8</td></t<>	- Number of IO Devices per tool, max.	8
- 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 4 ms         4 ms to 64 ms           - with IRT and parameterization of "odd" send cycles         Update time = set "odd" send cicks (any multiple of 125 μs: 375 μs, 625 μs3           Update time for RT         -           - for send cycle of 2 ms         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 2 ms         4 ms to 512 ms           - for send cycle of 2 ms         4 ms to 512 ms           - for send cycle of 2 ms         4 ms to 512 ms           - for send cycle of 2 ms         8 kbyte           - longuts, max.         8 kbyte           - Outputs, max.         8 kbyte           - Inputs, max.         8 kbyte           - shortest clock pulse         500 μs           - Number of IO Controtell	— Updating times	set for PROFINET IO, on the number of IO devices, and on the quantity of
- 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- Wth IRT and parameterization of "odd" send cyclesUgdate time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs3VUpdate time for RT500 µs to 256 ms- for send cycle of 500 µs500 µs to 256 ms- for send cycle of 4 ms4 ms to 512 ms- for send cycle of 4 ms4 ms to 512 ms- for send cycle of 4 ms4 ms to 512 ms- for send cycle of 4 ms4 kbyte- outputs, max.8 kbyte- outputs, max.8 kbyte- Services Inputs.8 kbyte- Inputs.9 kbyte- Services Insochronous modeNo- Shortes clock pulse500 µs- Shortes clock pulse9 ks- PROFINET to DeviceYes- Shared deviceYes- Namber of IO Controllers with shared device, max.4- Asset management recordYes- Number of IO Controllers with shared device, max.4- AutorosingYes- AutorosingYes- AutorosingYes- AutorosingYes- RIA 45 (Ethernet)Yes integrated- RIA 45 (Ethernet)Yes integrated- RIA 45 (Ethernet)Yes integrated- AutorosingYes integrated- AutorosingYes integrated- AutorosingYes integrated- Fuld 45 (Ethernet)Yes integrated- Autoro	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
With IRT and parameterization of "odd" send cycles     Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs 3 g75 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       for send cycle of 4 ms     4 ms to 512 ms       for send cycle of 4 ms     8 kbyte       for send cycle of 4 ms     9 kbyte       for send cycle of 4 ms     8 kbyte       Outputs, max.     8 kbyte       Outputs, max.     8 kbyte       Bochronous mode     No       shortest clock pulse     500 µs       IRT     Yes       Prioritized startup     Yes       Shared device     Yes       Number of IO Controllers with shared device, max.     4       Asset management record     Yes       Autoreosting     Yes       Autoreosting     Yes       Autoreosting     Yes       Interfac	— for send cycle of 2 ms	2 ms to 32 ms
Update time for RT- for send cycle of 500 µs500 µs to 256 ms- for send cycle of 20 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 ms8 kbyte- Inputs, max.8 kbyte- Outputs, max.8 kbytePROFINET IO DeviceServices Isochronous modeNo- shortest clock pulse500 µs- PROFINET IO DeviceServices IRTYes- PROFIenergyYes- Shared deviceYes- Shared deviceYes- Number of 10 Controllers with shared device, max.4- Asset management recordYes2 InterfaceIntegrated Ethernet interfaceautomatic detection of transmission rateYesAutorcospingYes- RJ 45 (Ethernet)Yes; Integrated- Transmission rate, max.1000 Mbit/s- Nurber of ports1	— for send cycle of 4 ms	4 ms to 64 ms
- for send cycle of 500 μs500 μs to 256 ms- for send cycle of 1 ms1 ms to 512 ms- for send cycle of 2 ms2 ms to 512 ms- for send cycle of 4 ms4 ms to 512 ms- for send cycle of 4 ms4 ms to 512 ms- datterss area Inputs, max.8 kbyte- Outputs, max.8 kbyte- PROFINET IO Device-Services Inschronous modeNo- shortest clock pulse500 μs- IRTYes- PROFIenergyYes- PROFIenergyYes- Shard deviceYes- Asset management recordYes2. Interface typeIntegrated Etternet interface- AutocrossingYes- AutocrossingYes- AutocrossingYes- RJ 45 (Ethernet)Yes; Integrated- RJ 45 (Ethernet)Yes; Integrated- Fransmission rateYes; Integrated- RJ 45 (Ethernet)Yes; Integrated- Industrial Ethernet status LEDNo- Number of ports1	<ul> <li>— With IRT and parameterization of "odd" send cycles</li> </ul>	
- 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 msAddress area5 ms to 512 ms- Inputs, max.8 kbyte- Outputs, max.8 kbytePROFINET IO Device5Services Isochronous modeNo- shortest clock pulse500 µs- IRTYes- PROFInergyYes- Shared deviceYes- Shared deviceYes- Number of IO Controllers with shared device, max.4- Asset management recordYesAutoreoglationYesAutoreosingYesAutoreosingYesAutoreosingYesAutoreosingYesAutoreosingYesAutoreosingYes- RJ 45 (Ethernet)Yes- RJ 45 (Ethernet)Yes integrated- Transmission rate, max.1000 Mbit/s- Industrial Ethernet status LEDNo- Number of ports1	Update time for RT	
- for send cycle of 2 ms2 ms to 512 ms- for send cycle of 4 ms4 ms to 512 msAddress area8 kbyte- Inputs, max.8 kbyte- Outputs, max.8 kbytePROFINET IO Device500 µs- Isochronous mode500 µs- Isochronous mode500 µs- IRTYes- PROFInergyYes- Prioritized startupYes- Number of IO Controllers with shared device, max.4- Asset management recordYes- Interface typeIntegrated Ethernet interfaceAutoregotationYesAutoressingYes- RTYes- Interface typeIntegrated Ethernet interface- AutoressingYes- AutoressingYes- Interface typeIntegrated Ethernet interface- AutoressingYes- Transmission rate, max.1000 Mbit/s- Transmission rate, max.1000 Mbit/s- Industrial Ethernet status LEDNo- Number of ports1	— for send cycle of 500 μs	500 µs to 256 ms
- for send cycle of 4 ms       4 ms to 512 ms         Address area       4 ms to 512 ms         - Inputs, max.       8 kbyte         - Outputs, max.       8 kbyte         PROFINET IO Device       500 µs         - Isochronous mode       No         - shortest clock pulse       500 µs         - IRT       Yes         - PROFInergy       Yes         - PROFInergy       Yes         - Shared device       Yes         - Number of IO Controllers with shared device, max.       4         Autoregotiation       Yes         Autoregotiation       Yes         Autoregotiation       Yes         Autoregotiation       Yes         FIRFAce type       Integrated Ethernet interface         Autoregotiation       Yes         Autoregotiation       Yes         - FIRJ 45 (Ethernet)       Yes; Integrated         - Transmission rate, max.       1000 Mbit/s         - Transmission rate, max.       1000 Mbit/s         - Transmission rate, max.       No         - Transmission rate, max.       1000 Mbit/s         - Transmission rate, max.       1000 Mbit/s	— for send cycle of 1 ms	1 ms to 512 ms
Address area       8 kbyte         - Inputs, max.       8 kbyte         PROFINET IO Device       8 kbyte         FROFINET IO Device       9         Services       500 µs         - Isochronous mode       No         - shortest clock pulse       500 µs         - IRT       Yes         - PROFIenergy       Yes         - Prioritized startup       Yes         - Shared device       Yes         - Number of IO Controllers with shared device, max.       4         - Asset management record       Yes         Interface type       Integrated Ethernet Interface         automatic detection of transmission rate       Yes         Autorosping       Yes         Interface types       Yes         - RJ 45 (Ethernet)       Yes integrated         - Transmission rate, max.       1000 Mbit/s         - Transmission rate, max.       1000 Mbit/s         - Transmission rate, max.       1000 Mbit/s         - Number of ports       1	— for send cycle of 2 ms	2 ms to 512 ms
Inputs, max.       8 kbyte         PROFINET IO Device       8 kbyte         PROFINET IO Device       9         Services       9         Isochronous mode       No         Services       9         Isochronous mode       90 µs         Services       9         IRT       Yes         PROFIenergy       Yes         PROFienergy       Yes         Shared device       Yes         Number of IO Controllers with shared device, max.       4         Asset management record       Yes         Interface type       Integrated Ethernet interface         Autonegotiation       Yes         Autocrossing       Yes         Interface types       Yes         Interface type       Integrated Ethernet interface         Autocrossing       Yes         Interface types       Yes </td <td>— for send cycle of 4 ms</td> <td>4 ms to 512 ms</td>	— for send cycle of 4 ms	4 ms to 512 ms
Outputs, max.8 kbytePROFINET IO DeviceServices Isochronous modeNo Isochronous mode500 µs Isochronous mode500 µs IRTYes PROFIenergyYes PROFIenergyYes Shared deviceYes Number of IO Controllers with shared device, max.4 Asset management recordYesInterface typeIntegrated Ethernet interfaceautomatic detection of transmission rateYesAutocrossingYesInterface typesIntegrated Ethernet interfaceInterface type1000 Mbit/s Transmission rate, max.1000 Mbit/s Transmission rate, max.1000 Mbit/s Industrial Ethernet status LEDNo Number of ports1	Address area	
PROFINET IO Device         Services       No         - Isochronous mode       No         - shortest clock pulse       500 µs         - IRT       Yes         - PROFIenergy       Yes         - Prioritized startup       Yes         - Shared device       Yes         - Number of IO Controllers with shared device, max.       4         - Asset management record       Yes         Interface type         Interface type       Integrated Ethernet interface         automatic detection of transmission rate       Yes         Autocrossing       Yes         • RJ 45 (Ethernet)       Yes; Integrated         • RJ 45 (Ethernet)       Yes; Integrated         • Industrial Ethernet status LED       No         • Number of ports       1	— Inputs, max.	8 kbyte
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         Interface type       Integrated Ethernet interface         automatic detection of transmission rate       Yes         Autocrossing       Yes         Interface types       Yes         • RJ 45 (Ethernet)       Yes integrated         • RJ 45 (Ethernet)       Yes; Integrated         • Industrial Ethernet status LED       No         • Number of ports       1	— Outputs, max.	8 kbyte
— Isochronous modeNo— Isochronous mode500 µs— IRTYes— PROFIenergyYes— Prioritized startupYes— Shared deviceYes— Number of IO Controllers with shared device, max.4— Asset management recordYesInterface typeIntegrated Ethernet interfaceautomatic detection of transmission rateYesAutorogotiationYesInterface typesYesInterface typesYesIndustrial Ethernet status LEDNoNoNumber of portsIndustrial Ethernet status LEDNo	PROFINET IO Device	
<ul> <li>shortest clock pulse</li> <li>- IRT</li> <li>Yes</li> <li>- PROFlenergy</li> <li>Yes</li> <li>- Prioritized startup</li> <li>Shared device</li> <li>Shared device</li> <li>Number of IO Controllers with shared device, max.</li> <li>- Asset management record</li> <li>Yes</li> </ul> 2. Interface Interface type <ul> <li>Integrated Ethernet interface</li> <li>Autonegotiation</li> <li>Yes</li> <li>Autorossing</li> <li>Ves</li> </ul> • RJ 45 (Ethernet) <ul> <li>Yes integrated</li> <li>Ves</li> </ul> • RJ 45 (Ethernet) <ul> <li>Yes integrated</li> <li>- Transmission rate, max.</li> <li>- Industrial Ethernet status LED</li> <li>No</li> </ul> • Number of ports <ul> <li>1</li> </ul>	Services	
- IRTYes- PROFlenergyYes- Prioritized startupYes- Shared deviceYes- Number of IO Controllers with shared device, max.4- Asset management recordYes- Asset management recordYesInterface typeIntegrated Ethernet interfaceautomatic detection of transmission rateYesAutonegotiationYesAutorossingYes• RJ 45 (Ethernet)Yes; Integrated• RJ 45 (Ethernet)Yes; Integrated- Transmission rate, max.1 000 Mbit/s- Industrial Ethernet status LEDNo• Number of ports1	— Isochronous mode	
PROF lenergyYes Prioritized startupYes Shared deviceYes Number of IO Controllers with shared device, max.4 Asset management recordYes2. InterfaceIntegrated Ethernet interfaceautomatic detection of transmission rateYesAutonegotiationYesAutocrossingYesInterface typesIntegrated Ethernet interface• RJ 45 (Ethernet)Yes; Integrated• RJ 45 (Ethernet)Yes; Integrated• RJ 45 (Ethernet)Yes; Integrated• Interface types1	- shortest clock pulse	500 µs
OrYes- Prioritized startupYes- Shared deviceYes- Number of IO Controllers with shared device, max.4- Asset management recordYes2. InterfaceInterface typeIntegrated Ethernet interfaceautomatic detection of transmission rateYesAutonegotiationYesAutocrossingYesInterface typesYes- RJ 45 (Ethernet)Yes; Integrated- Transmission rate, max.1 000 Mbit/s- Industrial Ethernet status LEDNo- Number of ports1	— IRT	Yes
Shared deviceYes Number of IO Controllers with shared device, max.4 Asset management recordYes2. InterfaceIntegrated Ethernet interfaceautomatic detection of transmission rateYesAutonegotiationYesAutocrossingYesInterface typesYes Transmission rate, max.1 000 Mbit/s Transmission rate, max.1 000 Mbit/s Industrial Ethernet status LEDNo• Number of ports1	- PROFlenergy	Yes
- Number of IO Controllers with shared device, max.4- Asset management recordYes2. InterfaceIntegrated Ethernet interfaceInterface typeIntegrated Ethernet interfaceautomatic detection of transmission rateYesAutonegotiationYesAutocrossingYesInterface typesIntegrated Ethernet• RJ 45 (Ethernet)Yes; Integrated- Transmission rate, max.1 000 Mbit/s- Industrial Ethernet status LEDNo• Number of ports1	— Prioritized startup	Yes
— Asset management record       Yes         2. Interface       Integrated Ethernet interface         Interface type       Integrated Ethernet interface         automatic detection of transmission rate       Yes         Autonegotiation       Yes         Autocrossing       Yes         Interface types       Yes         • RJ 45 (Ethernet)       Yes; Integrated         - Transmission rate, max.       1 000 Mbit/s         - Industrial Ethernet status LED       No         • Number of ports       1	— Shared device	Yes
2. Interface         Interface type       Integrated Ethernet interface         automatic detection of transmission rate       Yes         Autonegotiation       Yes         Autocrossing       Yes         Interface types       Yes         • RJ 45 (Ethernet)       Yes; Integrated         - Transmission rate, max.       1 000 Mbit/s         - Industrial Ethernet status LED       No         • Number of ports       1	<ul> <li>Number of IO Controllers with shared device, max.</li> </ul>	4
Interface type       Integrated Ethernet interface         automatic detection of transmission rate       Yes         Autonegotiation       Yes         Autocrossing       Yes         Interface types       Yes; Integrated         • RJ 45 (Ethernet)       Yes; Integrated         — Transmission rate, max.       1 000 Mbit/s         — Industrial Ethernet status LED       No         • Number of ports       1	- Asset management record	Yes
automatic detection of transmission rate       Yes         Autonegotiation       Yes         Autocrossing       Yes         Interface types       Yes; Integrated            - Transmission rate, max.       1 000 Mbit/s            - Industrial Ethernet status LED       No            • Number of ports       1	2. Interface	
Autonegotiation     Yes       Autocrossing     Yes       Interface types     Yes; Integrated            • RJ 45 (Ethernet)      Yes; Integrated            - Transmission rate, max.         1 000 Mbit/s            - Industrial Ethernet status LED         No            • Number of ports         1	Interface type	Integrated Ethernet interface
Autocrossing       Yes         Interface types          • RJ 45 (Ethernet)       Yes; Integrated         - Transmission rate, max.       1 000 Mbit/s         - Industrial Ethernet status LED       No         • Number of ports       1	automatic detection of transmission rate	Yes
Interface types       Yes; Integrated         • RJ 45 (Ethernet)       Yes; Integrated         — Transmission rate, max.       1 000 Mbit/s         — Industrial Ethernet status LED       No         • Number of ports       1	Autonegotiation	Yes
RJ 45 (Ethernet) Yes; Integrated     - Transmission rate, max. 1 000 Mbit/s     - Industrial Ethernet status LED No     Number of ports 1	Autocrossing	Yes
— Transmission rate, max.     1 000 Mbit/s       — Industrial Ethernet status LED     No       • Number of ports     1	Interface types	
Industrial Ethernet status LED     No     Number of ports     1	• RJ 45 (Ethernet)	Yes; Integrated
Number of ports	— Transmission rate, max.	1 000 Mbit/s
Number of ports	— Industrial Ethernet status LED	No
		1
	3. Interface	

Interface type	PROFIBUS with CM DP
Number of connections	44
Interface types	
• RS 485	Yes
Protocols	100
PROFIBUS DP master	Yes
PROFIBUS DP slave	Yes
SIMATIC communication	Yes
PROFIBUS DP master	100
Number of DP slaves, max.	125
Services	125
— Equidistance	No
— Isochronous mode	No
	NU
Address area	9 khuta
— Inputs, max.	8 kbyte
— Outputs, max.	8 kbyte
Interface types	
RS 485	
Transmission rate, max.	12 Mbit/s
Protocols	
PROFIsafe	No
Number of connections	
<ul> <li>Number of connections, max.</li> </ul>	88
<ul> <li>Number of connections reserved for ES/HMI/web</li> </ul>	10
<ul> <li>Number of S7 routing paths</li> </ul>	16
Redundancy mode	
Media redundancy	
<ul> <li>— Switchover time on line break, typ.</li> </ul>	200 ms
<ul> <li>— Number of stations in the ring, max.</li> </ul>	50
SIMATIC communication	
<ul> <li>PG/OP communication</li> </ul>	Yes
S7 routing	Yes
<ul> <li>S7 communication, as server</li> </ul>	Yes
<ul> <li>S7 communication, as client</li> </ul>	Yes
<ul> <li>User data per job, max.</li> </ul>	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.	1 472 kbyte
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Web server	100
• HTTP	Yes; Via Windows and PROFINET interface
• HTTPS	Yes; Via Windows and PROFINET interface
OPC UA	
	Yes; "Small" license required
Runtime license required     OPC LLA Client	
OPC UA Client     OPC UA Server	Yes; From SW CPU 1505SP V2.6
<ul> <li>OPC UA Server</li> <li>Application authentication</li> </ul>	Yes; Data access (read, write, subscribe), runtime license required Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— Security policies	Basic256Sna256 Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— User authentication	Basic256Sna256 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	200 160
Number of alarms for motion technology objects	160
est 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	
<ul> <li>Status/control variable</li> </ul>	Yes
Variables	Inputs, outputs, memory bits, DB, times, counters
<ul> <li>Number of variables, max.</li> </ul>	
— of which status variables, max.	200
<ul> <li>— of which control variables, max.</li> </ul>	200
Forcing	
Forcing	Yes
<ul> <li>Forcing, variables</li> </ul>	Inputs, outputs
<ul> <li>Number of variables, max.</li> </ul>	200
Diagnostic buffer	
• present	Yes
Number of entries, max.	1 000
— of which powerfail-proof	300
Traces	
<ul> <li>Number of configurable Traces</li> </ul>	4
Memory size per trace, max.	512 kbyte
nterrupts/diagnostics/status information	
Diagnostics indication LED	
• RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	Yes
Supported technology objects	
Motion Control	Yes
<ul> <li>Number of available Motion Control resources for technology objects</li> </ul>	2 400
<ul> <li>Required Motion Control resources</li> </ul>	
- 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
<ul> <li>Number of available Extended Motion Control resources for technology objects</li> </ul>	120
<ul> <li>Required Extended Motion Control resources</li> </ul>	
— per cam (1 000 points and 50 segments)	2
— for each set of kinematics	30
— Per leading axis proxy	3
Positioning axis	
<ul> <li>Number of positioning axes at motion control cycle of 4 ms (typical value)</li> </ul>	30
<ul> <li>Number of positioning axes at motion control cycle of 8 ms (typical value)</li> </ul>	30
Controller	
PID_Compact	Yes; Universal PID controller with integrated optimization
	Yes; Universal PID controller with integrated optimization Yes; PID controller with integrated optimization for valves
PID_Compact	• · · ·
<ul><li>PID_Compact</li><li>PID_3Step</li></ul>	Yes; PID controller with integrated optimization for valves

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
<ul> <li>horizontal installation, min.</li> </ul>	-20 °C
<ul> <li>horizontal installation, max.</li> </ul>	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
<ul> <li>vertical installation, min.</li> </ul>	-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	
<ul> <li>Operation, tested according to IEC 60068-2-6</li> </ul>	Yes
• Transport, tested acc. to IEC 60068-2-6	Yes
Shock testing	
• tested according to IEC 60068-2-6	Yes
<ul> <li>tested according to IEC 60068-2-27</li> </ul>	Yes
<ul> <li>tested according to IEC 60068-2-29</li> </ul>	Yes
<ul> <li>Storage/transport, tested acc. to IEC 60068-2-27</li> </ul>	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	
<ul> <li>User program protection/password protection</li> </ul>	Yes
Copy protection	Yes
Block protection	Yes
Access protection	
Protection level: Write protection	Yes
<ul> <li>Protection level: Read/write protection</li> </ul>	Yes
Protection level: Complete protection	Yes
programming / cycle time monitoring / header	
lower limit	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time
Open Development interfaces	
Size of ODK SO file, max.	5.8 Mbyte
Peripherals/Options	
SD card	Optionally for additional mass storage
Dimensions	
Width	160 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	0.83 kg
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