6ES7677-2SB42-0GB0

## **Data sheet**



SIMATIC ET 200SP Open Controller, CPU 1515SP PC2 F, 8 GB RAM, 128 GB CFast with Windows 10 IoT Enterprise 64-bit and S7-1500 Failsafe Software Controller CPU 1505SP F pre-installed, Interfaces: 1x Slot CFast, 1x slot SD/MMC, 1x connection for ET 200SP bus Adapter PROFINET, 1x 10/100/1000 Mbit/s Ethernet, 2x USB 3.0, 2x USB 2.0, 1x display port, Documentation on CFast Restore image on CFast

General information	
Product type designation	CPU 1515SP PC2 F
HW functional status	from FS04
Firmware version	V20.8
Engineering with	
<ul> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	V16
Installed software	
<ul> <li>Visualization</li> </ul>	No
<ul> <li>Control</li> </ul>	S7-1500 Software Controller CPU 1505SP F
Configuration control	
via dataset	Yes
Control elements	
Mode selector switch	1
Supply voltage	
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.	55 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)	1.5 Mbyte

interpreted (for data)	E Miles de
• integrated (for data)	5 Mbyte
<ul> <li>integrated (for CPU function library of CPU Runtime)</li> </ul>	20 Mbyte
Load memory	
-	320 Mbyte
• integrated (on PC mass storage)	320 Mibyte
Backup	Vacually managery areas declared retenting
• 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 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	- OZ - NOJIO
Number, max.	5 999; Number range: 1 to 65535
• Size, max.	1 024 kbyte
OB	1 024 kbyte
• Size, max.	1 048 kbyte
	100
Number of free cycle OBs  Number of fire clarm OBs	
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
<ul> <li>Number of technology synchronous alarm OBs</li> </ul>	2
<ul> <li>Number of startup OBs</li> </ul>	100
<ul> <li>Number of asynchronous error OBs</li> </ul>	4
<ul> <li>Number of synchronous error OBs</li> </ul>	2
Number of diagnostic alarm OBs	1
Nesting depth	
<ul> <li>per priority class</li> </ul>	24; Up to 8 possible for F-blocks
Counters, timers and their retentivity	
S7 counter	
Number	2 048
Retentivity	
— adjustable	Yes
IEC counter	
Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
S7 times	
Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	
Number	Any (only limited by the main memory)
Retentivity	. a., (any mines of the main monory)
— adjustable	Yes
Data areas and their retentivity	440 librator For otorogo in NV/DANA for storogo
Retentive data area (incl. timers, counters, flags), max.	410 kbyte; For storage in NVRAM; for storage in mass storage 5 242

	020 bytes
Flag	
• Size, max.	16 kbyte
Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	· · · · · · · · · · · · · · · · · · ·
Retentivity adjustable	Yes
Retentivity preset	No
Local data	2411
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
of which per assigned PC interface	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
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
Rack	
<ul> <li>Modules per rack, max.</li> </ul>	64; CPU 1515SP PC + 64 modules + server module
<ul> <li>Quantity of operable ET 200SP modules, max.</li> </ul>	64
<ul> <li>Quantity of operable ET 200AL modules, max.</li> </ul>	16
Number of lines, max.	1
PtP CM	
<ul> <li>Number of PtP CMs</li> </ul>	the number of connectable PtP CMs is only limited by the number of
The of deep	available slots
Time of day	
Clock	
• Type	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	V
• supported	Yes
• to DP, master	No
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	
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
<u> </u>	

- Transmission rate, max.   100 Mbt/bs		
	<ul> <li>Transmission rate, max.</li> </ul>	100 Mbit/s
Integrated switch   Ves   Compatible BusAdapter (PROFINET)   Ves   Compatible BusAdapter (PROFINET)   Ves   Compatible BusAdapter (PROFINET)   Ves   Compatible BusAdapter (PROFINET)   Protocols	<ul> <li>Industrial Ethernet status LED</li> </ul>	Yes
**BusAdapter (PROFINET)  **Yes: Compatible BusAdapter: BA & R. ALS, BA & R. ALF, C. (from FSG3, V.3.2), BA LC / R. ALF, C. (from FSG3, V.3.3), BA LC	<ul> <li>Number of ports</li> </ul>	2
(from FS03, V2.2), BA SCRJ / FLAF (from FS03, V3.1), BA SCRJ / FC (from FS03, V3.3), BA LC / RJ45 (from FS03, V3.3), BA LC / R	<ul> <li>integrated switch</li> </ul>	Yes
(from FS03, V3.1), BA LC / RJ45 (from FS03, V3.3), BA LC / RS03, V3.3, V45 (FS03, V45), V45 (	<ul><li>BusAdapter (PROFINET)</li></ul>	
Frotocols  Procinity To Controller Procinity To Device SiMATIC communication Procinity To Centroller Services Services  - Isochronous mode - shortest clock pulse - IRT - Prioritized startup Number of connectable IO Devices, max Of which In line, max Update time for IRT - For send cycle of 100 by - for send cycle of 1 ms - for send cycle of 2 ms - Whit Tr and parameterization of "odd" send cycles for 600 us - White Tr Approximate Services - White Tr Approximate Services - Number of Connectable IO Devices (Tr Approximate) - Number of Connectable IO Devices (Tr Approximate) - Number of Connectable IO Devices for RT, max Of which in line, max Of which in line, max IO Devices chart can be simultaneously activated/deactivated, max - IO Devices chart can be simultaneously activated/deactivated, max - IO Devices chart can be simultaneously activated/deactivated, max - Update time for IRT - for send cycle of 100 us - for send c		(from FS03, V2.2), BA SCRJ / RJ45 (from FS03, V3.1), BA SCRJ / FC
Protocols  PROFINET IO Controller PROFINET IO Device PROFINET IO Device SinkATIC communication Pres Open IE communication Profine II Countrier  Profine II Countrier Profine II Countrier Profine II Countrier Profine II Countrier Profine II Countrier Profine II Countrier Profine II Countrier Profine II Countrier Profine II Countrier Profine II Countrier Profine II Countrier Profine II Countrier Profine II Countrier Profine II		
PROFINET IO Device  ◆ SIMATIC communication  ◆ Open IE communication  ◆ Web server  PROFINET IO Controller  Services  — Isochronous mode — shortest clock pulse — shortest clock puls	Protocols	
• SIMATIC communication • Qen IE communication • Web severe Yes  PROCINET IO Controller  Services  - Isochronous mode - shortest clock pulse - IRT - Prioritized startup - Number of connectable IO Devices, max Of which in line, max In Market of connectable IO Devices for RT, max of which in line, max In Devices changing during operation (partner ports), supported - Number of IO Devices per tool, max IO Devices changing during operation (partner ports), supported - Number of IO Devices per tool, max Updating times - For send cycle of 1 ms - for send cycle of 1 ms - for send cycle of 4 ms - with IRT and parameterization of "odd" send cycles  Update time for RT - for send cycle of 1 ms - for send cycle of 2 ms - gen for conclusions and the cycles - For send cycle of 2 ms - for send cycle of 3 ms - for send cycle of 4 ms - which in IRT and parameterization of "odd" send cycles - IRT - Prioritized startup - Shared device - Number of IO Controllers with shared device, max.  2. Interface types - Shared device - Number of IO Controllers with shared device, max.  2. Interface types - Web [INT through thr	PROFINET IO Controller	Yes
• Open IE communication  • Web server  PROFINET IO Controller  Services  — Isochronous mode — shortest clock pulse — Shortest clock pulse — IRT — Prioritized startup — Number of connectable IO Devices, max. — of which in line, max — Io Devices charging during operation (partner ports), supported — Number of IO Devices that can be simultaneously activated/deactivated. max. — Io Devices charging during operation (partner ports), supported — Number of IO Devices per tool, max. — Updating times  — Start 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 — for send cycle of 1 ms — for send cycle of 4 ms — With IRT and parameterization of "odd" send cycles  Update time for RT — for send cycle of 1 ms —	PROFINET IO Device	Yes
PROFINET IO Controller  Services	<ul> <li>SIMATIC communication</li> </ul>	Yes
PROFINET IO Controller	Open IE communication	Yes
Services	Web server	Yes
Isochronous mode	PROFINET IO Controller	
shortest clock pulse IRT Prioritized startup Number of connectable IO Devices, max Of which in line, max Of which in line, max Number of connectable IO Devices for RT, max of which in line, max Number of IO Devices that can be simultaneously activated/ideactivated, max IO Devices changing during operation (partner ports), supported Number of IO Devices per tool, max Updating times For send cycle of 10 Devices per tool, max For send cycle of 20 per per tool, max For send cycle of 20 per per tool, max For send cycle of 20 per per tool, max For send cycle of 20 per per tool, max For send cycle of 20 per per tool, max For send cycle of 20 per per tool, max For send cycle of 20 per per tool, max For send cycle of 20 per per tool, max For send cycle of 20 per per tool, max For send cycle of 20 per per tool, max For send cycle of 20 per per tool, max For send cycle of 20 per per tool, max For send cycle of 20 per per tool, max For send cycle of 20 per per tool, max For send cycle of 20 per per tool, max For send cycle of 20 per per t	Services	
	— Isochronous mode	Yes
Prioritized startup  Number of connectable IO Devices, max, Of which in line, max.  - of which in line, max.  Number of connectable IO Devices for RT, max.  - of which in line, max.  - line 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 configuration of white set for PROFINET IO, on the number of iO devices, and on the quantity of configuration of white set for PROFINET IO, on the number of iO devices, and on the quantity of the update time also depends on communication share set for PROFI	— shortest clock pulse	500 μs
- Number of connectable IO Devices, max Of which IO devices with IRT, max of which In line, max Number of connectable IO Devices for RT, max of which in line, max Number of IO Devices that can be simultaneously activated/deactivated, max IO Devices changing during operation (partner ports), supported - Number of IO Devices per tool, max Updating times - Updating times - Updating times - For send cycle of 500 µs - for send cycle of 500 µs - for send cycle of 1 ms - for send cycle of 2 ms - for send cycle of 4 ms - With IRT and parameterization of "odd" send cycles - For send cycle of 500 µs - for send cycle of 500		Yes
- Of which In line, max of which in line, max Number of connectable IO Devices for RT, max of which in line, max Number of IO Devices that can be simultaneously activated/deactivated, max IO Devices changing during operation (partner ports), supported - Number of IO Devices per tool, max Updating times - Updating times - 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 1 ms - for send cycle of 4 ms - with IRT and parameterization of "odd" send cycles - With IRT and parameterization of "odd" send cycles - Tor send cycle of 500 µs - for send cycle of 1 ms - for send cycle of 2 ms - for send cycle of 4 ms - for send cycle of 500 µs - for send cycle of 4 ms - for send cycle of 500 µs - for send cycle of 500 µs - for send cycle of 4 ms - for send cycle of 4 ms - for send cycle of 4 ms - for send cycle of 500 µs	— Prioritized startup	Yes; Max. 32 PROFINET devices
- of which in line, max Number of connectable IO Devices for RT, max of which in line, max of which in line, max Number of IO Devices that can be simultaneously activated/deactivated, max IO Devices changing during operation (partner ports), supported - Number of IO Devices per tool, max Updating times - Ves - Number of IO Devices per tool, max Updating times - Updating times - In 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 - For send cycle of 2 ms - For send cycle of 2 ms - With IRT and parameterization of "odd" send cycles - Update time for RT - For send cycle of 500 μs - For send cycle of 4 ms - For send cycle of 500 μs - For send cycle of 500 μs - For send cycle of 4 ms - For send cycle of 500 μs - For send cy	<ul> <li>Number of connectable IO Devices, max.</li> </ul>	128
- of which in line, max Number of connectable IO Devices for RT, max of which in line, max of which in line, max Number of IO Devices that can be simultaneously activated/deactivated, max IO Devices changing during operation (partner ports), supported - Number of IO Devices per tool, max Updating times - Ves - Number of IO Devices per tool, max Updating times - Updating times - In 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 - For send cycle of 2 ms - For send cycle of 2 ms - With IRT and parameterization of "odd" send cycles - Update time for RT - For send cycle of 500 μs - For send cycle of 4 ms - For send cycle of 500 μs - For send cycle of 500 μs - For send cycle of 4 ms - For send cycle of 500 μs - For send cy	— Of which IO devices with IRT, max.	64
max.  — of which in line, max.  — Number of IO Devices that can be simultaneously activated/deactivated, max.  — IO Devices changing during operation (partner ports), supported  — Number of IO Devices per tool, max.  — 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 — for send cycle of 2 ms — for send cycle of 4 ms — with IRT and parameterization of "odd" send cycles  Update time for RT  — for send cycle of 1 ms — for send cycle of 1 ms — to send cycle of 1 ms — with IRT and parameterization of "odd" send cycles  Update time for RT  — for send cycle of 1 ms — for send cycle of 4 ms — for send cycle of 1 ms — for send cycle of 4 ms — for send cycle of 4 ms — to 512 ms — for send cycle of 4 ms — the send cycle of 500 µs — for send cycle of 1 ms — for send cycle of 4 ms — the send cycle of 2 ms — for send cycle of 4 ms — the send cycle of 512 ms — for send cycle of 500 µs — for send cycle of 2 ms — for send cycle of 4 ms — the send cycle of 512 ms — for send cycle of 4 ms — the send cycle of 512 ms — for send cycle of 4 ms — the send cycle of 512 ms  PROFINET IO Device  Services  — Isochronous mode — IRT — Prioritized startup — Yes — Shared device — Number of IO Controllers with shared device, max.  Interface bype  Autonegotiation  Pess  Autonegotiation  Figure 4  Ves Integrated Ethernet interface  Autonegotiation  Pess  Provertice to the update time also depends on communication shares and on the quantity of configured user data  Integrated Ethernet interface  Autonegotiation  Pess  Provertice 5  Pess  Autonegotiation  Pess  Provertice 5  Pess  Autonegotiation  Pess  Provertice 5  Pess  Provertice 6  Pess  Provertice 6  Pess  Provertice 7  Pess  Provertice 7  Pess  Provertice 7  Pess  Provertice 6  Pess  Provertice 7  Pess  Provertice 7  Pess  Provertice 7  P	— of which in line, max.	64
- of which in line, max.  - Number of IO Devices that can be simultaneously activated/deactivated, max.  - IO Devices changing during operation (partner ports), supported  - Number of IO Devices per tool, max.  - Updating times  - Number of IO Devices per tool, max.  - Updating times  - 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 - for send cycle of 1 ms - for send cycle of 4 ms - With IRT and parameterization of "odd" send cycles - With IRT and parameterization of "odd" send cycles - for send cycle of 500 μs - for send cycle of 500 μs - for send cycle of 500 μs - for send cycle of 1 ms - for send cycle of 2 ms - for send cycle of 2 ms - for send cycle of 4 ms - for send cycle of 7 ms - for send cycle of 9 ws - for send cycle of 4 ms - for send cycle of 4 ms - for send cycle of 500 μs - for send cycle of 500 μs - for send cycle of 4 ms - for send cycle of 4 ms - for send cycle of 500 μs - for send cycle of 9 ws - for	<ul> <li>Number of connectable IO Devices for RT,</li> </ul>	128
- Number of IO Devices that can be simultaneously activated/ideactivated, max.  - IO Devices changing during operation (partner ports), supported  - Number of IO Devices per tool, max.  - Updating times  - Updating times  - Update time for IRT  - for send cycle of 500 μs - for send cycle of 1 ms - for send cycle of 4 ms - With IRT and parameterization of "odd" send cycles  - Update time for RT  - for send cycle of 4 ms - With IRT and parameterization of "odd" send cycles  - For send cycle of 1 ms - for send cycle of 500 μs - For send cycle of 1 ms - For send cycle of 2 ms - For send cycle of 2 ms - For send cycle of 3 ms - For send cycle of 4 ms - For send cycle of 5 ms - For send cycle of 4 ms - For send cycle of 5		
simultaneously activated/deactivated, max.  — IO Devices changing during operation (partner ports), supported  — Number of IO Devices per tool, max.  — Updating times  — 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 — for send cycle of 1 ms — for send cycle of 2 ms — for send cycle of 4 ms — With IRT and parameterization of "odd" send cycles  Update time for RT — for send cycle of 500 µs — for send cycle of 500 µs — for send cycle of 1 ms — for send cycle of 1 ms — for send cycle of 1 ms — for send cycle of 500 µs — for send cycle of 4 ms — hor send cycle of 4 ms — for send cycle of 4 ms — hor send cycle of 500 µs — ho	— of which in line, max.	128
- IO Devices changing during operation (partner ports), supported  - Number of IO Devices per tool, max.  - 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 - for send cycle of 1 ms - for send cycle of 2 ms - for send cycle of 4 ms - With IRT and parameterization of "odd" send cycles  Update time for RT  - for send cycle of 500 μs - for send cycle of 4 ms - For send cycle of 500 μs -		8
ports), supported  Number of IO Devices per tool, max.  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  for send cycle of 1 ms  for send cycle of 4 ms  with IRT and parameterization of "odd" send cycles  Update time for RT  for send cycle of 500 μs  Update time for RT  for send cycle of 500 μs  Update time for RT  for send cycle of 500 μs  for send cycle of 1 ms  for send cycle of 4 ms  for send cycle of 500 μs  for send cycle of 500		v.
- Updating times  The minimum value of the update time also depends on communication share set for PROFINET 10, on the number of IO devices, and on the quantity of configured user data  Update time for IRT  - for send cycle of 500 μs - for send cycle of 1 ms - for send cycle of 2 ms - for send cycle of 4 ms - With IRT and parameterization of "odd" send cycles  Update time for RT  - for send cycle of 500 μs - for send cycle of 500 μs - for send cycle of 500 μs  Update time for RT - for send cycle of 500 μs - for send cycle of 1 ms - for send cycle of 1 ms - for send cycle of 2 ms - for send cycle of 2 ms - for send cycle of 4 ms - with 18T nd parameterization of "odd" send cycle 550 μs to 256 ms - for send cycle of 4 ms - for send cycle of 2 ms - for send cycle of 4 ms - FROFINET IO Device  Services - Isochronous mode - IRT - Prioritized startup - Shared device - Number of IO Controllers with shared device, max.  2. Interface Interface type  automatic detection of transmission rate - FRJ 45 (Ethernet) - FRJ 45 (Ethernet) - Yes; Integrated	<ul> <li>IO Devices changing during operation (partner ports), supported</li> </ul>	Yes
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 — for send cycle of 1 ms — for send cycle of 2 ms — for send cycle of 4 ms — With IRT and parameterization of "odd" send cycles  Update time for RT — for send cycle of 500 µs — for send cycle of 500 µs — for send cycle of 500 µs — for send cycle of 1 ms — for send cycle of 500 µs — for send cycle of 2 ms — for send cycle of 4 ms  PROFINET IO Device  Services  — Isochronous mode — IRT — Prioritized startup — Shared device — Number of IO Controllers with shared device, max.  2. Interface  Interface type  Integrated Ethernet interface  automatic detection of transmission rate — RJ 45 (Ethernet)  Yes; Integrated  Yes; Integrated	<ul> <li>Number of IO Devices per tool, max.</li> </ul>	8
Quantity of configured user data    Update time for IRT	<ul><li>Updating times</li></ul>	
Update time for IRT		
- for send cycle of 500 μs - for send cycle of 1 ms - for send cycle of 2 ms - for send cycle of 4 ms - for send cycle of 4 ms - for send cycle of 4 ms - With IRT and parameterization of "odd" send cycles  - With IRT and parameterization of "odd" send cycles  Update time for RT - for send cycle of 500 μs - for send cycle of 500 μs - for send cycle of 1 ms - for send cycle of 2 ms - for send cycle of 2 ms - for send cycle of 4 ms - IRT - Prioritized startup - Shared device - Number of IO Controllers with shared device, max.  2. Interface  Interface type  automatic detection of transmission rate - KB 45 (Ethernet) - KB 45 (Ethernet) - Yes; Integrated - Ves; Integrated	Update time for IRT	quantity of cornigation data
for send cycle of 1 ms for send cycle of 2 ms for send cycle of 4 ms for send cycle of 4 ms With IRT and parameterization of "odd" send cycles  Update time for RT for send cycle of 500 μs for send cycle of 1 ms for send cycle of 500 μs for send cycle of 1 ms for send cycle of 1 ms for send cycle of 2 ms for send cycle of 2 ms for send cycle of 4 ms for send cycle of 500 μs for send cycle of	·	500 us to 8 ms
- for send cycle of 2 ms - for send cycle of 4 ms - With IRT and parameterization of "odd" send cycles  Update time for RT - for send cycle of 500 μs - for send cycle of 500 μs - for send cycle of 1 ms - for send cycle of 1 ms - for send cycle of 2 ms - for send cycle of 2 ms - for send cycle of 4 ms - for send cycle of 4 ms - for send cycle of 2 ms - for send cycle of 4 ms - for send cycle of 500 μs - for send cycle of 6 ms - for send cycle of 6 ms - for send cycle of 7 ms - for send cycle of 9 ms - for send cycle time set "odd" send clock (any multiple of 125 μs - 87 μs - for del ms - for send cycle of 9 ms - f	-	·
- for send cycle of 4 ms - With IRT and parameterization of "odd" send cycles  - With IRT and parameterization of "odd" send cycles  Update time = set "odd" send clock (any multiple of 125 μs: 625 μs 3 875 μs) minimum cycle time start from 500 μs  Update time for RT  - for send cycle of 500 μs - for send cycle of 1 ms - for send cycle of 2 ms - for send cycle of 2 ms - for send cycle of 4 ms - for send cycle of 4 ms  PROFINET IO Device  Services  - Isochronous mode - IRT - Prioritized startup - Shared device - Number of IO Controllers with shared device, max.  2. Interface Interface type  Autocrossing - RJ 45 (Ethernet)  Yes; Integrated  Yes; Integrated		
- With IRT and parameterization of "odd" send cycles  Update time for RT  - for send cycle of 500 μs - for send cycle of 2 ms - for send cycle of 4 ms - for send cycle of 500 μs - for send cycle of 500 μs - for send cycle of 2 ms - for send cycle of 4 ms - for send cycle of 500 μs - for send cycle of 2 ms - for send cycle of 500 μs - for send cycle of 2 ms - for send cycle of 500 μs - for send cycle of 2 ms - for send cycle of 500 μs - for send cycle of 2 ms - for send cycle of 3 ms		
Cycles  Update time for RT  — for send cycle of 500 μs — for send cycle of 1 ms — for send cycle of 2 ms — for send cycle of 4 ms — for send cycle of 500 μs — for send cycle of 500 μs — for send cycle of 500 μs — for send cycle of 4 ms — to 512 ms  PROFINET IO Device  Services — Isochronous mode — IRT — Prioritized startup — Yes — Shared device — Number of IO Controllers with shared device, max.  2. Interface  Interface type  automatic detection of transmission rate  Autonegotiation — Yes  Autocrossing — RJ 45 (Ethernet)  Yes; Integrated  Yes; Integrated  Yes; Integrated	-	
for send cycle of 500 µs for send cycle of 1 ms for send cycle of 2 ms for send cycle of 2 ms for send cycle of 4 ms for send cycle of 5 ms for send cycle of 5 ms for send cycle of 2 ms for send cycle of 2 ms land l	·	
for send cycle of 1 ms for send cycle of 2 ms for send cycle of 2 ms for send cycle of 4 ms for send cycle of 2 ms	Update time for RT	
— for send cycle of 2 ms — for send cycle of 4 ms  PROFINET IO Device  Services  — Isochronous mode — IRT — Prioritized startup — Shared device — Number of IO Controllers with shared device, max.  2. Interface  Interface type automatic detection of transmission rate  Autocrossing Interface types  ● RJ 45 (Ethernet)  Yes to 512 ms  4 ms to 512 ms  Yes  Yes  Interface  Interface  Interface  Yes  Yes  Integrated Ethernet interface  Yes  Autocrossing  Yes  Integrated types  ● RJ 45 (Ethernet)  Yes; Integrated	— for send cycle of 500 μs	500 μs to 256 ms
— for send cycle of 4 ms 4 ms to 512 ms  PROFINET IO Device  Services  — Isochronous mode No — IRT Yes — Prioritized startup Yes — Shared device Yes — Number of IO Controllers with shared device, max.  2. Interface Interface type Integrated Ethernet interface automatic detection of transmission rate Yes Autorossing Yes Interface types ● RJ 45 (Ethernet)  Yes; Integrated	— for send cycle of 1 ms	1 ms to 512 ms
PROFINET IO Device  Services	— for send cycle of 2 ms	2 ms to 512 ms
Services  Isochronous mode IRT Prioritized startup Shared device Number of IO Controllers with shared device, max.  2. Interface Interface type automatic detection of transmission rate Autorossing Autocrossing Interface types RJ 45 (Ethernet)  Yes  No Yes Yes Ves V	— for send cycle of 4 ms	4 ms to 512 ms
- Isochronous mode - IRT - Prioritized startup - Shared device - Number of IO Controllers with shared device, max.  2. Interface Interface type automatic detection of transmission rate  Autonegotiation Autocrossing Interface types - RJ 45 (Ethernet)  Yes  No Yes  Yes  Yes  Integrated Ethernet interface  Yes  Yes  Interface types  Yes  Integrated Ethernet interface	PROFINET IO Device	
<ul> <li>— IRT</li> <li>— Prioritized startup</li> <li>— Shared device</li> <li>— Number of IO Controllers with shared device, max.</li> <li>2. Interface</li> <li>Interface type</li> <li>automatic detection of transmission rate</li> <li>Autonegotiation</li> <li>Autocrossing</li> <li>Interface types</li> <li>■ RJ 45 (Ethernet)</li> <li>Yes; Integrated</li> </ul>	Services	
— Prioritized startup — Shared device — Number of IO Controllers with shared device, max.  2. Interface Interface type automatic detection of transmission rate  Autonegotiation Autocrossing Interface types  ● RJ 45 (Ethernet)  Yes  Yes  Yes  Yes  Yes  Yes  Integrated Ethernet interface  Yes  Yes  Yes  Interface types  Yes  Yes  Yes  Interface types	<ul> <li>Isochronous mode</li> </ul>	No
- Shared device - Number of IO Controllers with shared device, max.  2. Interface Interface type automatic detection of transmission rate  Autonegotiation Autocrossing Yes  Autocrossing Yes  Interface types  • RJ 45 (Ethernet)  Yes  Yes  Yes; Integrated	— IRT	Yes
— Number of IO Controllers with shared device, max.  2. Interface Interface type Integrated Ethernet interface automatic detection of transmission rate Yes Autonegotiation Yes Autocrossing Yes Interface types • RJ 45 (Ethernet)  Yes; Integrated	<ul> <li>Prioritized startup</li> </ul>	Yes
max.  2. Interface Interface type Integrated Ethernet interface automatic detection of transmission rate Yes Autonegotiation Yes Autocrossing Yes Interface types  • RJ 45 (Ethernet) Yes; Integrated	— Shared device	Yes
2. Interface Interface type Integrated Ethernet interface automatic detection of transmission rate  Autonegotiation Yes Autocrossing Yes Interface types • RJ 45 (Ethernet)  Yes; Integrated	•	4
Interface type automatic detection of transmission rate  Autonegotiation  Autocrossing  Interface types  • RJ 45 (Ethernet)  Integrated Ethernet interface  Yes  Yes  Yes  Yes  Yes  Yes  Yes  Y		
automatic detection of transmission rate  Autonegotiation  Autocrossing  Yes  Autocrossing  Yes  Interface types  • RJ 45 (Ethernet)  Yes; Integrated		
Autonegotiation  Autocrossing  Yes  Interface types  • RJ 45 (Ethernet)  Yes; Integrated		
Autocrossing Yes  Interface types  • RJ 45 (Ethernet)  Yes; Integrated		
Interface types  • RJ 45 (Ethernet)  Yes; Integrated	-	Yes
RJ 45 (Ethernet)  Yes; Integrated		Yes
	- 1	
— Transmission rate, max. 1 000 Mbit/s		
	— Transmission rate, max.	1 000 Mbit/s

- Industrial Ethernet status LED No No Number of ports 1  Interface byse PROFIBUS with CM DP Interface byse PROFIBUS with CM DP Interface byse PROFIBUS Plays		
Interface bype Interface bype Number of connections  44  Number of connections  45  FROFIBUS With CM DP  Number of connections  46  FROFIBUS DP alsve PROFIBUS DP alsve PROFIBUS DP alsve PROFIBUS DP alsve PROFIBUS DP slave Number Of De slaves, max.  125  Services PROFIBUS DP master Number of connections  12 Mbitis Protocols PROFIBUS DP slaves, max.  12 Mbitis Protocols PROFIBUS DP slaves, max.  12 Mbitis Protocols PROFIBUS DP slaves, max.  12 Mbitis Protocols PROFIBUS DP master Protocols PROFIBUS DP master PRO	— Industrial Ethernet status LED	No
Interface type		1
Number of connections Interface kipy gess  RS 495 Protocols PROFIBUS DP master PROFIBUS DP slave Number of DP slaves, max.  125  Services Fequidatance Frofisate Profisate Protocols PROFIsate Protocols PROFIsate Protocols PROFIsate Fequidatance Fequida		PROFINIA W CMPR
Record   R		
PROFIBUS DP slave		44
Protocols PROFIBUS DP master PROFIBUS DP master Number of DP slaves, max. Paginistrance Services PROFIBUS DP master Number of DP slaves, max. 125 Services Paginistrance No Interface types Sta 485 Transmission rate, max. 12 Mbit/s Protocols PROFIBUS DP master Number of connections, max. Number of connections, max. Number of connections, max. Number of connections reserved for ESI-HMI/web Number of strong paths Number of strong paths Number of strong paths Number of strong paths Number of ST routing paths Number of routing paths Number		v.
PROFIBUS DP master		Yes
		Voc
SIMATIC communication PROFIBUS DP master  Number of DP slaves, max.  Services		
PROFIBUS DP master  Number of DP slaves, max.  Equidistance  Equidistance  No  Interface types  R8 485  Transmission rate, max.  12 Mbit/s  Protocols  PROFisate  Number of connections, max.  Number of connections, max.  Number of connections reserved for ES/HMI/web  Number of S7 routing paths  Redurndancy  MRP  MRP  MRP  MRP  MRP  MRP  MRP  Switchover time on line break, typ.  Switchover time on line break, typ.  Switchover time on line break, typ.  PROFisate  S7 routing  PROFice  S7 routing  PROFice  S7 routing  PROFice  PROFice  PROFice  PROFice  MRP  MRP  MRP  MRP  MRP  MRP  MRP  MR		
Number of DP slaves, max.   125		tes
Services		125
- Equidistance No No No Interface types  RS 485  ■ Transmission rate, max. 12 Mbit/s  Protocols  PROFIsate Yes; V2.4 / V2.6  Number of connections, max. 88  ■ Number of connections reserved for ES/HMi/web 10  ■ Number of S7 routing paths 16  Redundancy mode Media redundancy  - MRP Yes Yes  - Switchover time on line break, typ. 200 ms  - Number of stations in the ring, max. 50  SIMATIC communication Yes  ■ PG/OP communication Yes  ■ S7 routing Yes  ■ S7 routing Yes  ■ S7 routing Yes  ■ S7 routing As server Yes  ■ S7 roummunication, as server Yes  ■ S7 roummunication, as client Yes  ■ S7 communication, as client Yes  ■ User data per job, max. 64 kbyte  Open Ecommunication  ■ TCP/IP  — Data length, max. 64 kbyte  ■ UDP  — Data length, max. 2048 byte  ■ DCP  ■ LLDP  ■ Data length, max. 2048 byte  ■ DCP  ■ LLDP  ■ Data length, max. 2048 byte  ■ DCP  ■ LLDP  ■ Communication Yes  ■ UNDP  ■ Data length, max. 2048 byte  ■ DCP  ■ HTTP  ■ Yes; Via Windows and PROFINET interface  Yes: Data access (read, with), method call  Yes: Available security policies: None, Basic126Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Rsa15,		123
		No
Interface types  RS 485  Transmission rate, max.  12 Mbit/s  Protocols  PROFIsafe  Number of connections, max.  Number of connections, max.  Number of connections reserved for ES/HMI/web Number of 57 routing paths  Network of the standard		
Transmission rate, max.   12 Mbit/s		INO
● Transmission rate, max.    Yes; V2.4 / V2.6		
Protocols  ProTisate Number of connections, max.  Number of connections reserved for ES/HMI/web Number of S7 routing paths Number of stations in the ring, max Number of stations in the ring, max. S0  SIMATIC communication PG/OP communication PG/OP communication S7 routing S7 communication, as server Yes S7 communication, as client User data per job, max. Pyes S7 communication, as client User data per job, max. S0  POPIP Data length, max. S64 kbyte DDP Pata length, max. S8-A-Ves SNMP DDP Pata length, max. SNMP Yes DDP Pata length, max. SNMP Yes DDP Pata length, max. SNMP Yes SNMP Pata length, max. SNMP Yes SNMP Pata length, max. Pata l		12 Mait/c
PROFIsate  Number of connections  Number of connections, max. Number of connections, max. Number of connections reserved for ES/HMI/web Number of S7 routing paths  Redundancy mode  Media redundancy		12 IVIUIVS
Number of connections  Number of connections, max. Number of connections reserved for ES/HMI/web Number of S7 routing paths  Redundancy mode  Media redundancy		Vest V0 4 / V0 C
Number of connections, max. Number of connections reserved for ES/HMI/web Number of S7 routing paths  Redundancy mode  Media redundancy — MRP — MRP — MRP — MRP — Switchover time on line break, typ. — Number of stations in the ring, max.  SIMATIC communication  PG/OP communication  PG/OP communication  PG/OP communication, as server S7 communication, as server S7 communication, as client Ves S7 communication, as client Ves S8 communication, as client Ves S9 communication  TCP/IP — Data length, max. S80-on-TCP (RFC1006) — Data length, max. S9 communication  PGOP  PGS  PGS  Wes  Wes  Wes  Wes  Wes  Wes  Wes  We		res; vz.4 / vz.0
Number of S7 routing paths Number of S7 routing paths  Media redundancy		00
Redundancy mode  Media redundancy  - MRP - MRPD - MRPD - Switchover time on line break, typ Sumber of stations in the ring, max.  50  SIMATIC communication  • PG/OP communication • S7 routing • S7 communication, as server • S7 communication, as server • S7 communication, as server • S8 communication, as client • User data per job, max. • 64 kbyte  Open IE communication  • TCP/IP - Data length, max. • 64 kbyte • ISO-on-TCP (RFC1006) - Data length, max. • 64 kbyte • UDP - Data length, max. • 64 kbyte • DDP - Data length, max. • S9 Web server • HTTP • Yes • LLDP  Web server • HTTP • Yes; Via Windows and PROFINET interface • HTTPS • Yes; Via Windows and PROFINET interface • PTTP • HTTP • Yes; Via Windows and PROFINET interface • PC UA Client - Application authentication - Security policies - Security policies - Security policies - Security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 - User authentication - Number of connections, max Number of nodes of the client interfaces, max.		
Redundancy mode           Media redundancy         Yes           — MRPD         Yes           — Switchover time on line break, typ.         200 ms           — Switchover time on line break, typ.         200 ms           — Switchover time on line break, typ.         200 ms           — Switchover time on line break, typ.         200 ms           — Switchover time on line break, typ.         200 ms           — Switchover time on line break, typ.         200 ms           — Switchover time on line break, typ.         200 ms           SIMATIC communication         Yes           • S7 routing         Yes           • S7 routing         Yes           • S7 communication         Yes           • Sr communication, as server         Yes           • User data per job, max.         64 kbyte           • Den Lacommunication         Yes           • Lacommunication         Yes           • Data length, max.         64 kbyte           • LDP         Yes           • DCP         Yes           • LLDP         Yes           • LLDP         Yes           • LLDP         Yes; Via Windows and PROFINET interface           • HTTP         Yes; "Small" license required <t< td=""><td></td><td></td></t<>		
Media redundancy         Yes           — MRPD         Yes           — Switchover time on line break, typ.         200 ms           — Number of stations in the ring, max.         50           SIMATIC communication           • PG/OP communication         Yes           • S7 routing         Yes           • S7 communication, as server         Yes           • S7 communication, as client         Yes           • User data per job, max.         64 kbyte           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           • SNMP         Yes           • DCP         Yes           • LLDP         Yes           Web server         **Yes           • HTTPS         Yes; Via Windows and PROFINET interface           • HTTPS         Yes; Via Windows and PROFINET interface           • PCU UA         **Yes; Data access (read, write), method call           • Application authentication         Yes; Data access (read, write), method call		10
— MRP — MRPD         Yes           — MRPD         Yes           — Switchover time on line break, typ.         200 ms           — Number of stations in the ring, max.         50           SIMATIC communication           ● PG/OP communication         Yes           ● S7 routing         Yes           ● S7 communication, as server         Yes           ● S7 communication, as client         Yes           ● User data per job, max.         64 kbyte           ● User data per job, max.         64 kbyte           ● Lore 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.         64 kbyte           ● SMMP         Yes           ● DCP         Yes           ● LLDP         Yes           Web server         ● HTTP           ● HTTP PS         Yes, Via Windows and PROFINET interface           P HTTP PS         Yes, "Small" license required	•	
	·	Von
- Switchover time on line break, typ Number of stations in the ring, max.  50  SIMATIC communication  PG/OP communication  PG/OP communication  PS 7 routing  Yes  \$7 routing  Yes  \$7 communication, as server  Yes  \$7 communication, as client  Yes  \$7 communication  PTCP/IP  Data length, max.  \$8 kbyte  Pata length, max.  \$8 kbyte  Pata length, max.  \$9 cube between  Pata length, max.  \$1 cube between  Pata length, max.  \$2 cube byte  Pasa length, max.  \$2 cube byte  Pasa length, max.  \$3 cube between  Pata length, max.  \$4 cube between  Pata length, max.  \$2 cube byte  Pasa length, max.  Pasa leng		
Number of stations in the ring, max.  SIMATIC communication  PG/OP communication  9 FG/OP communication  9 FG routing  9 F7 routing  9 F7 communication, as server  9 F8 F7 communication, as server  9 F8 F7 communication, as client  9 F8		
SIMATIC communication  PG/OP communication  Yes S7 routing S7 communication, as server S7 communication, as client User data per job, max.  Pes S7 communication User data per job, max.  Pes S8 communication S1 communication S1 communication S1 communication  PTCP/IP S2 communication  PTCP/IP S3 communication  PTCP/IP S4 communication  PTCP/IP S5 communication  PTCP/IP S6 communication  PTCP/IP S7 communication  PTCP/IP S8 communication PTCP/IP S8 communication PTCP/IP S9 communication S9 co		
PG/OP communication S7 routing S7 routing S7 communication, as server S7 communication, as client User data per job, max.  Open IE communication TCP/IP Data length, max. S0-on-TCP (RFC1006) Data length, max. S0-on-TCP (RFC1006) Data length, max. S0-on-TCP (RFC1006) Data length, max. SNMP Ves DDP SNMP Ves DCP SNMP SNMP Yes DCP SULDP Yes ULDP Yes ULDP Yes ULDP Yes ULDP Yes UCP SUB Web server  PHTTP Syes, Via Windows and PROFINET interface Yes; Via Windows and PROFINET interface		30
• S7 routing • S7 communication, as server • S7 communication, as client • User data per job, max.  Open IE communication  • TCP/IP — Data length, max. • ISO-on-TCP (RFC1006) — Data length, max. • UDP — Data length, max. • SNMP — Data length, max. • SNMP • DCP • LLDP • Yes • DCP • LLDP  Web server  • HTTP • HTTPS  OPC UA  • Runtime license required • OPC UA Client — Application authentication — Security policies — User authentication — Number of connections, max.  • Ves  Yes • Yes • Yes • Data length, max.  • SNMP • Yes • DCP • Yes • Web server • HTTP • Yes; Via Windows and PROFINET interface Yes; Via Windows and PROFINET interface  Yes in the via Authority i		Ves
S7 communication, as server S7 communication, as client User data per job, max.  64 kbyte  Open IE communication  TCP/IP Data length, max. SISO-on-TCP (RFC1006) SISO-on-TCP		
S7 communication, as client User data per job, max.  Open IE communication  TCP/IP  Data length, max. S8-on-TCP (RFC1006) Data length, max. UDP Data length, max. SNMP SNMP DCP LLDP Yes LLDP Yes LLDP Yes  LLDP Yes  Web server  HTTP HTTP Yes; Via Windows and PROFINET interface HTTPS Yes; Via Windows and PROFINET interface  OPC UA Client OPC UA Client Application authentication Security policies  Security policies  Push Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256  — User authentication Number of nodes of the client interfaces, max.  10 Number of nodes of the client interfaces, max.	<u> </u>	
User data per job, max.  Open IE communication  TCP/IP Data length, max. Source For Possible For School For S		
Open IE communication  TCP/IP Data length, max. 64 kbyte ISO-on-TCP (RFC1006) Data length, max. 64 kbyte  UDP Data length, max. 2048 byte SNMP PocP SNMP PocP ULDP Yes ULDP Yes ULDP Yes Ves Ves Ves Ves Ves Ves Ves Ves OCP UA  Runtime license required OPC UA Client Application authentication Security policies Yes; Varianonymous" or by user name & password Number of connections, max. Number of nodes of the client interfaces, max.		
TCP/IP  Data length, max.  64 kbyte  1SO-on-TCP (RFC1006)  Data length, max.  64 kbyte  Yes  Abyte  1UDP  Data length, max.  64 kbyte  Yes  40 kbyte  Yes  Data length, max.  2048 byte  Yes  End of the server  Pes  LLDP  Web server  HTTP  Yes; Via Windows and PROFINET interface  PC UA  Runtime license required  OPC UA Client  Application authentication  Security policies  Yes; "Small" license required  Yes; Data access (read, write), method call  Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256  User authentication  Number of connections, max.  Number of nodes of the client interfaces, max.  10  2000		OH NOYIO
- Data length, max.  • ISO-on-TCP (RFC1006)  - Data length, max.  • UDP  - Data length, max.  • UDP  - Data length, max.  • UDP  - Data length, max.  • SNMP  • SNMP  • DCP  • LLDP  Yes  • LLDP  Web server  • HTTP  • HTTPS  Yes; Via Windows and PROFINET interface  • HTTPS  Yes; Via Windows and PROFINET interface  OPC UA  • Runtime license required  • OPC UA Client  - Application authentication  - Security policies  Pes; Waviable security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256  - User authentication  - Number of connections, max.  - Number of nodes of the client interfaces, max.  10  Number of nodes of the client interfaces, max.	·	Yes
ISO-on-TCP (RFC1006) Data length, max.  64 kbyte  UDP Yes Data length, max.  2 048 byte  SNMP PCP Ves ULDP Yes  LLDP Yes  LLDP Yes  Web server  HTTP Yes; Via Windows and PROFINET interface  OPC UA  Runtime license required OPC UA Client Yes; "Small" license required Yes; Data access (read, write), method call Yes Pes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256  User authentication Number of connections, max. Number of nodes of the client interfaces, max.  10  Number of nodes of the client interfaces, max.		
- Data length, max.  • UDP  - Data length, max.  • SNMP  • DCP  • LLDP  Yes  • LLDP  Web server  • HTTP  • HTTPS  Partial license required  • OPC UA  • Runtime license required  • OPC UA Client  - Application authentication  - Security policies  - User authentication  - Number of connections, max.  - Number of nodes of the client interfaces, max.  64 kbyte  Yes  Yes  Yes  Yes  2 048 byte  Yes  Yes  Yes  Yes  Yes  Yes  Yes  Y		
<ul> <li>UDP</li></ul>		
- Data length, max.  SNMP  DCP  LLDP  Yes  LLDP  Web server  HTTP  HTTPS  Yes; Via Windows and PROFINET interface Yes; Via Windows and PROFINET interface  PRUNTINE license required  Runtime license required  OPC UA  Runtime license required  OPC UA Client  Application authentication  Security policies  Yes; "Small" license required  Yes; "Small" license required  Yes; Data access (read, write), method call  Yes  Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15,  Basic256Sha256  User authentication  Number of connections, max.  Number of nodes of the client interfaces, max.	_	
SNMP DCP LLDP Yes  Web server  HTTP Yes; Via Windows and PROFINET interface HTTPS Yes; Via Windows and PROFINET interface Yes; Via Windows and PROFINET interface  OPC UA Runtime license required OPC UA Client Yes; "Small" license required OPC UA Client Yes; Data access (read, write), method call Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 User authentication Number of connections, max. Number of nodes of the client interfaces, max.  10 Number of nodes of the client interfaces, max.		
<ul> <li>DCP</li> <li>LLDP</li> <li>Yes</li> <li>Web server</li> <li>HTTP</li> <li>HTTPS</li> <li>Yes; Via Windows and PROFINET interface</li> <li>Yes; Via Windows and PROFINET interface</li> </ul> OPC UA <ul> <li>Runtime license required</li> <li>OPC UA Client</li> <li>Application authentication</li> <li>Security policies</li> <li>Yes; Pata access (read, write), method call</li> <li>Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</li> <li>User authentication</li> <li>Number of connections, max.</li> <li>Number of nodes of the client interfaces, max.</li> </ul> Yes <ul> <li>Yes</li> <li>"anonymous" or by user name &amp; password</li> <li>Number of nodes of the client interfaces, max.</li> </ul>	_	
● LLDP  Web server  ● HTTP  ● HTTPS  Yes; Via Windows and PROFINET interface  PCC UA  ● Runtime license required  ● OPC UA Client  — Application authentication  — Security policies  Pccurity policies  Yes; "Small" license required  Yes; Data access (read, write), method call  Yes  Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256  — User authentication  — Number of connections, max.  — Number of nodes of the client interfaces, max.  2 000		
Web server  HTTP Yes; Via Windows and PROFINET interface Yes; Via Windows and PROFINET interface Yes; Via Windows and PROFINET interface  OPC UA  Runtime license required OPC UA Client Yes; "Small" license required Yes; Data access (read, write), method call Yes Application authentication Yes Security policies Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 User authentication Number of connections, max. Number of nodes of the client interfaces, max.  2 000		
<ul> <li>HTTP</li> <li>Yes; Via Windows and PROFINET interface</li> <li>Yes; Via Windows and PROFINET interface</li> </ul> OPC UA <ul> <li>Runtime license required</li> <li>OPC UA Client</li> <li>Application authentication</li> <li>Security policies</li> <li>Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</li> <li>User authentication</li> <li>Number of connections, max.</li> <li>Number of nodes of the client interfaces, max.</li> </ul> 2 000 <ul> <li>Yes; Via Windows and PROFINET interface</li> <li>Yes; "Small" license required</li> <li>Yes; Data access (read, write), method call</li> <li>Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</li> </ul> <ul> <li>User authentication</li> <li>Number of connections, max.</li> <li>2 000</li> </ul>		
<ul> <li>HTTPS         Yes; Via Windows and PROFINET interface     </li> <li>OPC UA</li> <li>Runtime license required</li> <li>OPC UA Client</li> <li>Application authentication</li> <li>Security policies</li> <li>Yes; Data access (read, write), method call</li> <li>Yes</li> <li>Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</li> <li>User authentication</li> <li>Number of connections, max.</li> <li>Number of nodes of the client interfaces, max.</li> <li>2 000</li> </ul>		Yes; Via Windows and PROFINET interface
OPC UA  ■ Runtime license required  ■ OPC UA Client  — Application authentication  — Security policies  — User authentication  — Number of connections, max.  — Number of nodes of the client interfaces, max.  ■ Runtime license required  Yes; "Small" license required  Yes; Data access (read, write), method call  Yes  Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15,  Basic256Sha256  Yes; "anonymous" or by user name & password  10  2 000		
<ul> <li>Runtime license required</li> <li>OPC UA Client</li> <li>— Application authentication</li> <li>— Security policies</li> <li>— User authentication</li> <li>— Number of connections, max.</li> <li>— Number of nodes of the client interfaces, max.</li> <li>Yes; "Small" license required</li> <li>Yes; Data access (read, write), method call</li> <li>Yes</li> <li>Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</li> <li>Yes; "anonymous" or by user name &amp; password</li> <li>10</li> <li>2 000</li> </ul>		
<ul> <li>OPC UA Client         <ul> <li>Application authentication</li> <li>Security policies</li> <li>User authentication</li> <li>Number of connections, max.</li> <li>Number of nodes of the client interfaces, max.</li> </ul> </li> <li>Yes; Data access (read, write), method call         <ul> <li>Yes</li> <li>Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</li> </ul> </li> <li>Yes; "anonymous" or by user name &amp; password</li> <li>2 000</li> </ul>		Yes; "Small" license required
<ul> <li>Application authentication</li> <li>Security policies</li> <li>Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</li> <li>User authentication</li> <li>Number of connections, max.</li> <li>Number of nodes of the client interfaces, max.</li> <li>Yes; "anonymous" or by user name &amp; password</li> <li>10</li> <li>2 000</li> </ul>		
<ul> <li>— Security policies</li> <li>— Ves; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</li> <li>— User authentication</li> <li>— Number of connections, max.</li> <li>— Number of nodes of the client interfaces, max.</li> <li>Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rs</li></ul>		
Basic256Sha256  User authentication Yes; "anonymous" or by user name & password  Number of connections, max. 10  Number of nodes of the client interfaces, max. 2 000		
<ul> <li>Number of connections, max.</li> <li>Number of nodes of the client interfaces, max.</li> <li>2 000</li> </ul>	> r	
<ul><li>Number of nodes of the client interfaces, max.</li><li>2 000</li></ul>	<ul> <li>User authentication</li> </ul>	Yes; "anonymous" or by user name & password
	<ul> <li>Number of connections, max.</li> </ul>	10
— Number of elements for one call of 300	<ul> <li>Number of nodes of the client interfaces, max.</li> </ul>	2 000
	<ul> <li>Number of elements for one call of</li> </ul>	300

OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.	
<ul> <li>Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.</li> </ul>	20
Number of elements for one call of OPC_UA_MethodGetHandleList, max.	100
Number of simultaneous calls of the client instructions per connection (except	1
OPC_UA_ReadList,OPC_UA_WriteList,OPC_UA_M max.	
Number of simultaneous calls of the client	5
instructions OPC_UA_ReadList,OPC_UA_WriteList and OPC_UA_MethodCall, max.	
<ul> <li>Number of registerable nodes, max.</li> </ul>	2 000
<ul> <li>Number of registerable method calls of OPC_UA_MethodCall, max.</li> </ul>	100
<ul> <li>Number of inputs/outputs when calling OPC_UA_MethodCall, max.</li> </ul>	20
OPC UA Server	Yes; Data access (read, write, subscribe), runtime license required
<ul> <li>Application authentication</li> </ul>	Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— Security policies	Yes; Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
<ul> <li>User authentication</li> </ul>	Yes; "anonymous" or by user name & password
<ul><li>Number of sessions, max.</li></ul>	48
<ul> <li>Number of accessible variables, max.</li> </ul>	100 000
Number of registerable nodes, max.	20 000
<ul> <li>Number of subscriptions per session, max.</li> </ul>	20
— Sampling interval, min.	100 ms
— Publishing interval, min.	200 ms
— Number of server methods, max.	50
Number of server methods, max.      Number of inputs/outputs per server method,	20
— Number of inputs/outputs per server method, max.	20
Number of monitored items, max.	2 000; for 1 s sampling interval and 1 s send interval
Number of server interfaces, max.	10
Number of nodes for user-defined server	5 000
interfaces, max.	
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
	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
Status/control	
Status/control variable	Yes
<ul><li>Variables</li></ul>	Inputs, outputs, memory bits, DB, times, counters
<ul> <li>Number of variables, max.</li> </ul>	
— of which status variables, max.	200
of which control variables, max.	200
Forcing	
• Forcing	Yes
Forcing, variables	Inputs, outputs
<u>.</u>	200
Number of variables, max.  Diagnostic buffer.	200
Diagnostic buffer	

<ul><li>present</li></ul>	Yes
<ul> <li>Number of entries, max.</li> </ul>	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
<ul> <li>Number of available Motion Control resources for technology objects</li> </ul>	2 400
<ul> <li>Required Motion Control resources</li> </ul>	
<ul><li>per speed-controlled axis</li></ul>	40; per axis
<ul><li>per positioning axis</li></ul>	80; per axis
<ul><li>per synchronous axis</li></ul>	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>Positioning axis</li> </ul>	
<ul> <li>Number of positioning axes at motion control cycle of 4 ms (typical value)</li> </ul>	15
<ul> <li>Number of positioning axes at motion control cycle of 8 ms (typical value)</li> </ul>	30
Controller	
<ul><li>PID_Compact</li></ul>	Yes; Universal PID controller with integrated optimization
<ul><li>PID_3Step</li></ul>	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
Highest safety class achievable in safety mode	
<ul> <li>Performance level according to ISO 13849-1</li> </ul>	PLe
• SIL acc. to IEC 61508	SIL 3
Probability of failure (for service life of 20 years and repa	ir time of 100 hours)
<ul> <li>Low demand mode: PFDavg in accordance with SIL3</li> </ul>	< 2.00E-05
<ul> <li>High demand/continuous mode: PFH in accordance with SIL3</li> </ul>	< 1.00E-09 1/h
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	Up to 60 °C with max. 32 ET 200SP modules and 3x 100 mA USB load; up to 55 °C with max. 64 ET 200SP modules and 2x max. 500 mA and 1x max. 100 mA USB load
<ul> <li>horizontal installation, min.</li> </ul>	-20 °C
<ul> <li>horizontal installation, max.</li> </ul>	60 °C
<ul> <li>vertical installation, min.</li> </ul>	-20 °C
vertical installation, max.	50 °C; With max. 32 ET 200SP modules and 3x 100 mA USB load
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C

Vibrations	
Vibrations	W
Operation, tested according to IEC 60068-2-6	Yes
Transport, tested acc. to IEC 60068-2-6  Observations	Yes
Shock testing	W
• 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 2016 LTSB, 64bit, MUI
configuration / header	
configuration / programming / header	
Programming language	
— LAD	Yes; incl. failsafe
— FBD	Yes; incl. failsafe
— 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	
<ul> <li>Protection level: Write protection</li> </ul>	Yes
<ul> <li>Protection level: Read/write protection</li> </ul>	Yes
Protection level: Complete protection	Yes
programming / cycle time monitoring / header	
<ul> <li>lower limit</li> </ul>	adjustable minimum cycle time
upper limit	adjustable maximum cycle time
Open Development interfaces	
Size of ODK SO file, max.	3.8 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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