**Data sheet** 

## 6ES7512-1CK00-0AB0



\*\*\* Spare part \*\*\* SIMATIC S7-1500 compact CPU CPU 1512C-1 PN, Central processing unit with work memory 250 KB for program and 1 MB for data, 32 digital inputs, 32 digital outputs, 5 analog inputs, 2 analog outputs, 6 high-speed counters, 4 high-speed counters for PTO/PWM/frequency output 1st interface: PROFINET IRT with 2-port switch, 48 ns bit performance, incl. push-in front connector, SIMATIC Memory Card required

General information	
Product type designation	CPU 1512C-1 PN
HW functional status	FS03
Firmware version	V2.9
Product function	
I&M data	Yes; I&M0 to I&M3
<ul><li>Isochronous mode</li></ul>	Yes; With minimum OB 6x cycle of 625 µs (distributed)
Engineering with	
<ul> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	V17 (FW V2.9) / V13 SP1 Update 4 (FW V1.8) or higher
Configuration control	
via dataset	Yes
Display	
Screen diagonal [cm]	3.45 cm
Control elements	
Number of keys	6
Mode selector switch	1
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V; 20.4 V DC, for supplying the digital inputs/outputs
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; Refers to the power supply on the CPU section
<ul> <li>Repeat rate, min.</li> </ul>	1/s
Input current	
Current consumption (rated value)	0.8 A; Digital onboard I/O modules are supplied separately
Inrush current, max.	1.9 A; Rated value
l²t	0.34 A²·s
Digital inputs	
from load voltage L+ (without load), max.	20 mA; per group
Digital outputs	
<ul> <li>from load voltage L+, max.</li> </ul>	30 mA; Per group, without load
output voltage / header	
Rated value (DC)	24 V
Encoder supply	
Number of outputs	2; One common 24 V encoder supply per 16 digital inputs
24 V encoder supply	

• 24 V

Yes; L+ (-0.8 V)

Short circuit protection	Yes
Short-circuit protection     Output current, max.	1 A
Output current, max.  Power	10
	10.14
Infeed power to the backplane bus  Power consumption from the backplane bus (balanced)	9 W
Power loss	9 **
	45.0 W
Power loss, typ.	15.2 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	250 khyto
<ul><li>integrated (for program)</li><li>integrated (for data)</li></ul>	250 kbyte 1 Mbyte
Load memory	1 Mbyte
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	OZ OBYIC
maintenance-free	Yes
CPU processing times	
for bit operations, typ.	48 ns
for word operations, typ.	58 ns
for fixed point arithmetic, typ.	77 ns
for floating point arithmetic, typ.	307 ns
CPU-blocks	
Number of elements (total)	4 000; Blocks (OB, FB, FC, DB) and UDTs
DB	1 000, Dioono (OD, 1 D, 1 O, DD) and OD 10
Number range	1 60 999; subdivided into: number range that can be used by the user: 1 59 999, and number range of DBs created via SFC 86: 60 000 60 999
• Size, max.	1 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	- 1.112) to, 1.0. 2.20 that account data county, and than 5.12 to 0.1.12
Number range	0 65 535
• Size, max.	250 kbyte
FC	
Number range	0 65 535
• Size, max.	250 kbyte
OB	
• Size, max.	250 kbyte
<ul> <li>Number of free cycle OBs</li> </ul>	100
<ul> <li>Number of time alarm OBs</li> </ul>	20
<ul> <li>Number of delay alarm OBs</li> </ul>	20
<ul> <li>Number of cyclic interrupt OBs</li> </ul>	20; With minimum OB 3x cycle of 500 μs
Number of process alarm OBs	50
Number of DPV1 alarm OBs	3
Number of isochronous mode OBs	1
Number of technology synchronous alarm OBs	2
Number of startup OBs	100
Number of asynchronous error OBs	4
Number of synchronous error OBs	2
Number of diagnostic alarm OBs	1
Nesting depth	24
per priority class	24
Counters, timers and their retentivity S7 counter	
Number	2 048
Retentivity	
— adjustable	Yes
IEC counter	
120 counter	
• Number	Any (only limited by the main memory)
	Any (only limited by the main memory)
Number	Any (only limited by the main memory) Yes

S7 times	
● Number	2 048
Number     Retentivity	2 040
— adjustable	Yes
IEC timer	100
Number	Any (only limited by the main memory)
Retentivity	, any terms and the mean means by
— adjustable	Yes
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	128 kbyte; In total; available retentive memory for bit memories, timers,
	counters, DBs, and technology data (axes): 88 KB
Extended retentive data area (incl. timers, counters, flags), max.	1 Mbyte; When using PS 6 0W 24/48/60 V DC HF
Flag	
Size, max.	16 kbyte
Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	
Retentivity adjustable	Yes
Retentivity preset	No
Local data	
• per priority class, max.	64 kbyte; max. 16 KB per block
Address area	
Number of IO modules	2 048; max. number of modules / submodules
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
Outputs	32 kbyte; All outputs are in the process image
per integrated IO subsystem	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
per CM/CP	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
Subprocess images	
Number of subprocess images, max.	32
Hardware configuration	
Number of distributed IO systems	32; A distributed I/O system is characterized not only by the integration of distributed I/O via PROFINET or PROFIBUS communication modules, but also by the connection of I/O via AS-i master modules or links (e.g. IE/PB-Link)
Number of DP masters	
• Via CM	6; A maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Number of IO Controllers	
<ul><li>integrated</li><li>Via CM</li></ul>	1 6; A maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Rack	
Modules per rack, max.	32; CPU + 31 modules
Number of lines, max.	1
PtP CM	
Number of PtP CMs	the number of connectable PtP CMs is only limited by the number of available slots
Time of day	
Clock	
• Type	Hardware clock
Backup time	6 wk; At 40 °C ambient temperature, typically
Deviation per day, max.	10 s; Typ.: 2 s
Operating hours counter	"
• Number	16
Clock synchronization	
• supported	Yes

	V
• in AS, master	Yes
• in AS, slave	Yes
on Ethernet via NTP	Yes
Digital inputs	
integrated channels (DI)	32
Digital inputs, parameterizable	Yes
Source/sink input	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
Gate start/stop	Yes
Capture	Yes
Synchronization	Yes
Input voltage	165
Type of input voltage	DC
Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
Input current	11101000
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	E.V III/A
for standard inputs  — parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms
— parameterizable — at "0" to "1", min.	4 μs; for parameterization "none"
— at "0" to "1", max.	20 ms
— at "0 to ", max. — at "1" to "0", min.	4 μs; for parameterization "none"
— at "10" to ", min. — at "1" to "0", max.	20 ms
for interrupt inputs	ZU IIIS
	Voc: Same as far standard inputs
— parameterizable	Yes; Same as for standard inputs
for technological functions	Voc: Same as far standard inputs
— parameterizable	Yes; Same as for standard inputs
Cable length  • shielded, max.	1 000 m; 600 m for technological functions; depending on input
• Shielded, max.	1 000 m; 600 m for technological functions; depending on input frequency, encoder and cable quality; max. 50 m at 100 kHz
<ul><li>unshielded, max.</li></ul>	600 m; for technological functions: No
Digital outputs	, , , , , , , , , , , , , , , , , , , ,
Type of digital output	Transistor
integrated channels (DO)	32
Current-sourcing	Yes; Push-pull output
Short-circuit protection	Yes; electronic/thermal
Response threshold, typ.	1.6 A with standard output, 0.5 A with high-speed output; see manual for
* Nesponse uneshold, typ.	details
Limitation of inductive shutdown voltage to	-0.8 V
Controlling a digital input	Yes
Accuracy of pulse duration	Up to ±100 ppm ±2 μs at high-speed output; see manual for details
minimum pulse duration	2 μs; With High Speed output
Digital output functions, parameterizable	
Switching tripped by comparison values	Yes; As output signal of a high-speed counter
PWM output	Yes
— Number, max.	4
Cycle duration, parameterizable	Yes
— ON period, min.	0 %
— ON period, max.	100 %
Resolution of the duty cycle	0.0036 %; For S7 analog format, min. 40 ns
Frequency output	Yes
Switching capacity of the outputs	
with resistive load, max.	0.5 A; 0.1 A with high-speed output, i.e. when using a high-speed
•	output; see manual for details
• on lamp load, max.	5 W; 1 W with high-speed output, i.e. when using a high-speed output; see manual for details
Load resistance range	

• lower limit	48 $\Omega$ ; 240 ohms with high-speed output, i.e. when using a high-speed output; see manual for details
• upper limit	12 kΩ
Output voltage	
<ul> <li>Type of output voltage</li> </ul>	DC
• for signal "0", max.	1 V; With high-speed output, i.e. when using a high-speed output; see manual for details
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; 0.1 A with high-speed output, i.e. when using a high-speed output, observe derating; see manual for details
<ul><li>for signal "1" permissible range, min.</li></ul>	2 mA
• for signal "1" permissible range, max.	0.6 A; 0.12 A with high-speed output, i.e. when using a high-speed
	output, observe derating; see manual for details
■ for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	200 μs
• "1" to "0", max.	500 µs; Load-dependent
for technological functions	
— "0" to "1", max.	5 μs; Depending on the output used, see additional description in manual
— "1" to "0", max.	5 µs; Depending on the output used, see additional description in manual
Parallel switching of two outputs	
• for logic links	Yes; for technological functions: No
• for uprating	No
for redundant control of a load	Yes; for technological functions: No
	1 CS, 101 CCTITIOLOGICAL PATICITIONS. TVO
Switching frequency	100 kHz: For high appead output, 100 Hz for standard output
with resistive load, max.	100 kHz; For high-speed output, 100 Hz for standard output
with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
on lamp load, max.	10 Hz
Total current of the outputs	
<ul> <li>Current per channel, max.</li> </ul>	0.5 A; see additional description in the manual
<ul> <li>Current per group, max.</li> </ul>	8 A; see additional description in the manual
Current per power supply, max.	4 A; 2 power supplies for each group, current per power supply max. 4 A, see additional description in manual
for technological functions	
<ul> <li>Current per channel, max.</li> </ul>	0.5 A; see additional description in the manual
Relay outputs	
Number of relay outputs	0
Cable length	•
• shielded, max.	1 000 m; 600 m for technological functions; depending on output frequency, load, and cable quality; max. 50 m at 100 kHz
• unshielded, max.	600 m; for technological functions: No
Analog inputs	
Number of analog inputs	5; 4x for U/I, 1x for R/RTD
For current measurement	4; max.
<ul> <li>For voltage measurement</li> <li>For resistance/resistance thermometer measurement</li> </ul>	4; max. 1
permissible input voltage for voltage input (destruction limit), max.	28.8 V
permissible input current for current input (destruction	40 mA
limit), max.  Cycle time (all channels), min.	1 ms; Dependent on the parameterized interference frequency suppression; for details, see conversion procedure in manual
Technical unit for temperature measurement adjustable	Yes; °C/°F/K
Technical unit for temperature measurement adjustable	163, 0/1/10
Input ranges (rated values), voltages	V - Bl - i - l
<ul><li>0 to +10 V</li><li>— Input resistance (0 to 10 V)</li></ul>	Yes; Physical measuring range: $\pm$ 10 V 100 k $\Omega$
• 1 V to 5 V	Yes; Physical measuring range: ± 10 V
<ul><li>— Input resistance (1 V to 5 V)</li></ul>	100 kΩ
• -10 V to +10 V	Yes

Input resistance / 10 V to ±10 V/	100 kΩ
<ul><li>— Input resistance (-10 V to +10 V)</li><li>• -5 V to +5 V</li></ul>	7.5.5.11
	Yes; Physical measuring range: ± 10 V 100 kΩ
— Input resistance (-5 V to +5 V)	100 ΚΩ
Input ranges (rated values), currents	V DI : 1
• 0 to 20 mA	Yes; Physical measuring range: ± 20 mA
— Input resistance (0 to 20 mA)	50 Ω; Plus approx. 55 ohm for overvoltage protection by PTC
• -20 mA to +20 mA	Yes
— Input resistance (-20 mA to +20 mA)	50 $\Omega$ ; Plus approx. 55 ohm for overvoltage protection by PTC
• 4 mA to 20 mA	Yes; Physical measuring range: ± 20 mA
— Input resistance (4 mA to 20 mA)	50 Ω; Plus approx. 55 ohm for overvoltage protection by PTC
Input ranges (rated values), resistance thermometer	
• Ni 100	Yes; Standard/climate
<ul><li>— Input resistance (Ni 100)</li></ul>	10 ΜΩ
• Pt 100	Yes; Standard/climate
— Input resistance (Pt 100)	10 ΜΩ
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes; Physical measuring range: 0 600 ohms
<ul><li>— Input resistance (0 to 150 ohms)</li></ul>	10 ΜΩ
• 0 to 300 ohms	Yes; Physical measuring range: 0 600 ohms
— Input resistance (0 to 300 ohms)	10 ΜΩ
• 0 to 600 ohms	Yes
— Input resistance (0 to 600 ohms)	10 ΜΩ
Cable length	
shielded, max.	800 m; for U/I, 200 m for R/RTD
Analog outputs	555 m, 151 571, 255 m 151 FUTUE
	2
integrated channels (AO)	2
Voltage output, short-circuit protection	Yes
Cycle time (all channels), min.	1 ms; Dependent on the parameterized interference frequency suppression; for details, see conversion procedure in manual
Output ranges, voltage	suppression, for details, see conversion procedure in mandar
• 0 to 10 V	Yes
• 1 V to 5 V	Yes
• -10 V to +10 V	Yes
Output ranges, current	V
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Load impedance (in rated range of output)	
<ul><li>with voltage outputs, min.</li></ul>	1 kΩ
<ul> <li>with voltage outputs, capacitive load, max.</li> </ul>	100 nF
<ul><li>with current outputs, max.</li></ul>	500 Ω
with current outputs, inductive load, max.	1 mH
Cable length	
<ul><li>shielded, max.</li></ul>	200 m
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
Resolution with overrange (bit including sign), max.	16 bit
Integration time, parameterizable	Yes; 2.5 / 16.67 / 20 / 100 ms, acts on all channels
Interference voltage suppression for interference	400 / 60 / 50 / 10
frequency f1 in Hz	1007 007 10
Smoothing of measured values	
parameterizable	Yes
Step: None	Yes
• Step: low	Yes
• Step: Nedium	Yes
• Step: High	Yes
	100
Analog value generation for the outputs	
Integration and conversion time/resolution per channel	4017
Resolution with overrange (bit including sign), max.	16 bit
Settling time	

for an elektrical and	45
• for resistive load	1.5 ms
• for capacitive load	2.5 ms
for inductive load	2.5 ms
Encoder	
Connection of signal encoders	
for voltage measurement	Yes
for current measurement as 4-wire transducer	Yes
<ul> <li>for resistance measurement with two-wire connection</li> </ul>	Yes
for resistance measurement with three-wire connection	Yes
for resistance measurement with four-wire connection	Yes
Connectable encoders	
2-wire sensor	Yes
<ul> <li>permissible quiescent current (2-wire sensor), max.</li> </ul>	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
Input voltage	24 V
Input frequency, max.	100 kHz
Counting frequency, max.	400 kHz; with quadruple evaluation
Signal filter, parameterizable	Yes
<ul> <li>Incremental encoder with A/B tracks, 90° phase</li> </ul>	Yes
offset	
<ul> <li>Incremental encoder with A/B tracks, 90° phase offset and zero track</li> </ul>	Yes
<ul> <li>pulse encoder</li> </ul>	Yes
<ul> <li>pulse encoder with direction</li> </ul>	Yes
<ul> <li>pulse encoder with one impulse signal per count direction</li> </ul>	Yes
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.1 %
Temperature error (relative to input range), (+/-)	0.005 %/K
Crosstalk between the inputs, max.	-60 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.05 %
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	0.02 %
Linearity error (relative to output range), (+/-)	0.15 %
Temperature error (relative to output range), (+/-)	0.005 %/K
Crosstalk between the outputs, max.	-80 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.05 %
Operational error limit in overall temperature range	
<ul> <li>Voltage, relative to input range, (+/-)</li> </ul>	0.3 %
<ul> <li>Current, relative to input range, (+/-)</li> </ul>	0.3 %
<ul> <li>Resistance, relative to input range, (+/-)</li> </ul>	0.3 %
<ul> <li>Resistance thermometer, relative to input range, (+/-)</li> </ul>	Pt100 Standard: ±2 K, Pt100 Climate: ±1 K, Ni100 Standard: ±1.2 K, Ni100 Climate: ±1 K
<ul> <li>Voltage, relative to output range, (+/-)</li> </ul>	0.3 %
Current, relative to output range, (+/-)	0.3 %
Basic error limit (operational limit at 25 °C)	
<ul> <li>Voltage, relative to input range, (+/-)</li> </ul>	0.2 %
• Current, relative to input range, (+/-)	0.2 %
• Resistance, relative to input range, (+/-)	0.2 %
<ul> <li>Resistance thermometer, relative to input range, (+/-)</li> </ul>	Pt100 Standard: ±1 K, Pt100 Climate: ±0.5 K, Ni100 Standard: ±0.6 K, Ni100 Climate: ±0.5 K
<ul> <li>Voltage, relative to output range, (+/-)</li> </ul>	0.2 %
Current, relative to output range, (+/-)	0.2 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 =	interference frequency
<ul> <li>Series mode interference (peak value of interference &lt; rated value of input range), min.</li> </ul>	30 dB
<ul> <li>Common mode voltage, max.</li> </ul>	10 V

Common mode interference, min.	60 dB; at 400 Hz: 50 dB
Interfaces	
Number of PROFINET interfaces	1
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
<ul> <li>Number of ports</li> </ul>	2
• integrated switch	Yes
Protocols	V. 12.
IP protocol	Yes; IPv4
PROFINET IO Controller      PROFINET IO Device	Yes Yes
SIMATIC communication	Yes
Open IE communication	Yes; Optionally also encrypted
Web server	Yes
Media redundancy	Yes
PROFINET IO Controller	165
Services	
— PG/OP communication	Yes
— Isochronous mode	Yes
— Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
— IRT	Yes
— PROFlenergy	Yes; per user program
<ul> <li>Prioritized startup</li> </ul>	Yes; Max. 32 PROFINET devices
<ul> <li>Number of connectable IO Devices, max.</li> </ul>	128; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
<ul><li>Of which IO devices with IRT, max.</li></ul>	64
<ul> <li>Number of connectable IO Devices for RT, max.</li> </ul>	128
— of which in line, max.	128
<ul> <li>Number of IO Devices that can be</li> </ul>	8; in total across all interfaces
simultaneously activated/deactivated, max.  — Number of IO Devices per tool, max.	8
— Updating times	The minimum value of the update time also depends on communication
	share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT	
— for send cycle of 250 μs	$250~\mu s$ to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 $\mu s$ of the isochronous OB is decisive
— for send cycle of 500 μs	500 $\mu s$ to 8 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 $\mu s$ of the isochronous OB is decisive
— for send cycle of 1 ms	1 ms to 16 ms
— for send cycle of 2 ms	2 ms to 32 ms
— for send cycle of 4 ms	4 ms to 64 ms
<ul> <li>With IRT and parameterization of "odd" send cycles</li> </ul>	Update time = set "odd" send clock (any multiple of 125 μs: 375 μs, 625 μs 3 875 μs)
Update time for RT	
— for send cycle of 250 μs	250 µs to 128 ms
— for send cycle of 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
PROFINET IO Device	
Services	
<ul><li>— PG/OP communication</li></ul>	Yes
— Isochronous mode	No
— IRT	Yes
— PROFlenergy	Yes; per user program
— Shared device	Yes
<ul> <li>Number of IO Controllers with shared device, max.</li> </ul>	4
<ul> <li>activation/deactivation of I-devices</li> </ul>	Yes; per user program

Interface types  R. 4.5 (Ehemet)  • Autocrossing •	— Asset management record	Yes; per user program
Not Maps     Autonorposation     Autonorp	Interface types	
Autororosaing Autorosaing Aut	RJ 45 (Ethernet)	
Autocrossing	• 100 Mbps	Yes
Industrial Ethernet status LED  Protocots  Number of connections, max.  Number of connections, max.  Number of connections reserved for ES/HMI/web  Number of connections reserved for ES/HMI/web  Number of connections reserved for ES/HMI/web  Number of stronding paths  Redundancy mode  H-Sync forwarding Yes  Media redundancy  Media redundancy  Media redundancy  MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager, MRP Client  Yes, a MRP Pinterconnection, supported  MRPD  MRP interconnection, supported  MRPD  Yes, Requirement, IRT  200 ms; For MRP, bumpless for MRPD  Switchover time on line break, typ.  Number of stations in the ring, max.  New Yes  Nor communication  PG/OP communication  PG/OP communication  PG/OP communication  PG/OP communication, as server  Nes  Torpin  Nes  See online help (S7 communication, user data size)  Pen IE communication  PG/OP (RFC1006)  Data length, max.  See online help (S7 communication, user data size)  Pen Data length, max.  See online help (S7 communication, user data size)  Pen Data length, max.  See online help (S7 communication, user data size)  Pen Data length, max.  See online help (S7 communication, user data size)  Pobla length, max.  See online help (S7 communication, user data size)  Pen Data length, max.  See online help (S7 communication, user data size)  Pen Data length, max.  See online help (S7 communication, user data size)  Pen Data length, max.  See online help (S7 communication, user data size)  Pen Data length, max.  See online help (S7 communication, user data size)  Pen Data length, max.  See online help (S7 communication, user data size)  Pen Data length, max.  See online help (S7 communication, user data size)  Pen Data length, max.  See online help (S7 communication, user data size)  Pen Data length, max.  See online help (S7 communication, user data size)  Pen Data length, max.  See online help (S7 communication, user data size)  Pen Data length, max.  See online help (S7 communication, user data size)  Pen Data length, max.  See online h	<ul> <li>Autonegotiation</li> </ul>	Yes
Number of connections	<ul> <li>Autocrossing</li> </ul>	Yes
Number of connections  Number of connections max. Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces Number of S7 routing paths Neduration only via 1st interface (X1) Neg MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Monager, IRPP Client NRPD NRPD NRPD NRPD NRPD NRPD Number of stations in the ring, max. Number of stations in the ring, max.  Number of stations in the ring, max.  Number of stations in the ring, max.  Neg Name of S7 routing ves on NRPD Nes Name of S8 routing ves on NRPD Nes Name of S8 routing ves on NRPD Nes Name of NRPD Nes Name of NRPD Nes Name Nes Name of NRPD Nes Name Nes Name Nes Name Nes Name Nes Name Name Nes Name Nes Name Nes Name Nes Name Nes Name Nes Name Name of elements for one call of OPC UA_NodeSetHandleList/OPC_UA_ReadList/Opc Name Name of Name Name Name of elements for one call of OPC UA_NodeSetHandleList/OPC_UA_ReadList/Opc Name Name of Name Name Name of elements for one call of OPC UA_NodeSetHandleList/Opc_UA_ReadList/Opc. Name Name Name Name Name Name Name Name	<ul> <li>Industrial Ethernet status LED</li> </ul>	Yes
Number of connections, max Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces Number of S7 routing paths  Number of S7 routing paths  Nedundancy	Protocols	
Number of connections via integrated interfaces Number of S7 routing paths  Redundancy mode  - H-Sync frowarding Media redundancy — Media redundancy — MRP — MRP — MRP interconnection, supported — Satisfaction in the ring, max. — Satisfaction in the ring, max. — See on the first interface interface interface interface interface interface interface interface interface, max. — See on the left interface inte	Number of connections	
Number of Somotions via integrated interfaces Number of Somotion paths  Redundancy  - Media redundancy  - Media redundancy  - MRP media redundancy  - MRP interconnection, supported  - MRPD  - MRP interconnection, supported  - MRPD  - Number of stations in the ring, max.  SIMATIC communication  - PCIOP communication  - PCIOP communication  - PCIOP communication  - Somotion interfaces  - PCIOP communication  - TCPIP  - Data length, max  - several passive connections per port, supported  - Sistem in max  - Somotion in max  - So	<ul> <li>Number of connections, max.</li> </ul>	128; via integrated interfaces of the CPU and connected CPs / CMs
Redundancy mode  - H-Sync forwarding  Media redundancy  - Media redundancy  - Media redundancy  - MRP  - MRP  - MRP Automanager according to IEC 62439-2 Edition 2.0, MRP  Manager, MRP Client  - MRP interconnection, supported  - MRP interconnection, supported  - MRPD  - MRPD  - Witchover time on line break, typ.  - Switchover time on line break, typ.  - Witchover time on line break, typ.  - Witchover time on sine break, typ.  - Witchover time on line break, typ.  - Witchover time on sine break, typ.  - Witchover time on line break, typ.  - Wes; Requirement. IRT  - Witchover time on line break, typ.  - Wes; Requirement. IRT  - Witchover time on line break, typ.  - Wes; Requirement. IRT  - Witchover time on line break, typ.  - Wes; Requirement. IRT  - Wes; encryption with TLS V1.3 pre-selected  - Yes; encryption with TLS V1.3 pre-selected  - Yes  - So communication. Selected  - Yes  - Data length, max.  - G4 kbyte  - Selected  - Wes  - Wes  - Bata length, max.  - Witchover time on line break, typ.  - Yes  - Wes  - Witchover time on line break. Its  - Wes  - Witchover time on line break. Its  - Wes  - Witchover time on line break. Its  - Yes  - Witchover time on line break. Its  - Yes  - Witchover time on line break. Its  - Yes  - Witchover time on line break. Its  - Yes  - Witchover time on line break. Its  - Yes  - Witchover time on line break. Its  - Yes  - Witchover time on line break	<ul> <li>Number of connections reserved for ES/HMI/web</li> </ul>	10
Redundancy mode  H-Sync forwarding  Media redundancy  - Media redundancy  - MRP  MRP  - MRP  - MRP  - MRP Hieronnection, supported  - MRPD  - Switchover time on line break, typ.  - Number of stations in the ring, max.  SIMATIC communication  - PG/OP communication  - PG/OP communication  - PG/OP communication  - ST communication, as server  - ST communication, as client  - ST communication  - TCP/IP  - Data length, max.  - several passive connections per port, supported  - ISIO-Data length, max.  - Several passive connections per port, supported  - ISIO-Data length, max.  - Several passive connections per port, supported  - ISIO-Data length, max.  - Several passive connections per port, supported  - ISIO-Data length, max.  - Several passive connections per port, supported  - ISIO-Data length, max.  - Several passive connections per port, supported  - ISIO-DATA ST	<ul> <li>Number of connections via integrated interfaces</li> </ul>	88
Media redundancy — MRP — MRP — MRP Manager, MRP Client — MRP interconnection, supported — MRPD — Switchover time on line break, typ. — Switchover time on line break, typ. — Number of stations in the ring, max.  SIMIATIC communication  • PG/OP communication • PG/OP communication • PG/OP communication • S'r routing • S'r communication, as server • S'r communication, as client • User data per job, max.  Open IE communication • TCP/IP — Data length, max. — See online help (S7 communication, user data size)  • ISO-on-TCP (RFC1006) — Data length, max. — UDP multicast • DHCP • DNS • SNMP • DCP • DNS • PGS • SNMP • DCP • LLDP • LLDP • LTP • LTP • PS • Standard and user pages • HTTP • Pes; Standard and user pages •	Number of S7 routing paths	16
Media redundancy — Media redundancy — MirP — MRP — MRP — MRP interconnection, supported — MRP interconnection, supported — MRPD — Switchover time on line break, typ. — PG/D communication • PG/D communication • PG/D communication • PG/D communication, as server • S'r communication, as client • Yes • S'r communication, as client • Yes • S'r communication, as client • Yes • See online help (S'r communication, user data size)  Open IE communication • TCP/IP  — Data length, max. — Several passive connections per port, supported • ISO-on-TCP (RFC1006) — Data length, max. — UDP — Data length, max. — UDP multicast • PGP • DNS • DNS • PGP • DNS • PGP • DNS • SNMP • Yes • DDP • PGP • DNS • SNMP • Yes • DCP • PYes • LLDP • LEncyption  Web server • HTTP • Yes: Standard and user pages • HTTPS • Yes: Standard and user pages • HTTPS • Yes: Standard and user pages • HTTPS • Yes: Standard and user pages • PGP UA • Runtime license required • OPC UA Client • Application authentication • Security policies • Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 • Basic256Sha256 • Basic256Sha256 • Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 • Available security policies: None, Basic108Rsa15, Basic256Rsa15, Basic256Sha256 • Available security policies: None, Basic108Rsa15, Basic256Rsa15, Basic256Sha256 • Sandard and User pages • User authentication • Number of connections, max.  • Number of elements for one call of  OPC_UA_NoteGetHandleList/OPC_UA_ReadList/ORD • Sandard and User pages • U	•	
Media redundancy MRP MRP interconnection, supported MRPD MRPD Switchover time on line break, typ Switchover time on line break, typ Number of stations in the ring, max.    SIMATIC communication   PG/OP communication    - ST routing    - ST rout	-	Yes
- MRP - MRP interconnection, supported - MRP interconnection, supported - MRP interconnection, supported - MRP interconnection, supported - MRPD - Switchover time on line break, typ Number of stations in the ring, max.  SIMATIC communication - PG/OP communication - PG/OP communication - ST routing - ST routing - ST communication, as server - ST communication, as client - ST routing - ST communication, as client - ST communication, as client - Ves - ST communication, as client - Ves - ST communication, user data size)  Open IE communication - TCPIP - Data length, max Several passive connections per port, supported - ISO-on-TCP (RFC1006) - Data length, max UDP multicast - DNS - SNMP - DNS - SNMP - DCP - DNS - SNMP - DCP - LLDP - Encryption  Web server - HTTP - HTTP - Yes; Standard and user pages - Ves; Standard and u		
- MRPD - Switchover time on line break, typ Number of stations in the ring, max.  50  SIMATIC communication  • PG/OP communication • PG/OP communication • S7 routing • S7 communication, as server • S7 communication, as server • S7 communication, as silent • User data per job, max.  See online help (S7 communication, user data size)  Open IE communication • TCP/IP - Data length, max several passive connections per port, supported • ISO-on-TCP (RFC1006) - Data length, max UDP - Data length, max UDP - Data length, max UDP willicast • DHCP • DNS • SNMP - Ves • DNS • SNMP - Ves • Encryption  • TCP/IP  • DNS • SNMP - Ves • SNMP - Ves • Encryption  • Test of MRP, bumpless for MRPD		Manager; MRP Client
- Switchover time on line break, typ Number of stations in the ring, max.  SIMATIC communication  • PG/OP communication • PG/OP communication • PG/OP communication • PG/OP communication • PG/OP communication • S7 routing • S7 communication, as server • S7 communication, as client • User data per job, max.  • User data per job, max.  Open IE communication • TCP/IP  - Data length, max several passive connections per port, supported • ISO-on-TCP (RFC1006) - Data length, max. • UDP - Data length, max UDP multicast • DHCP - DNS • SNMP - DRS • SNMP • DCP • Encryption with TLS V1.3 pre-selected  Yes • See online help (S7 communication, user data size)  Open IE communication • TCP/IP  - Possible length, max Several passive connections per port, supported  **ISO-on-TCP (RFC1006) - Data length, max UDP multicast • DNS • Yes • DNS • SNMP - Yes • DNS • Yes • SNMP • DCP • Yes • LLDP • Yes • Encryption  Web server  • HTTP  - Yes; Standard and user pages  OPC UA • Runtime license required • OPC UA Client - Application authentication - Security policies - User authentication - Number of nodes of the client interfaces, max Number of ondes of the client interfaces, max Number of ondes of the client interfaces, max Number of ondes of the client interfaces, max Number of nodes of the		
- Number of stations in the ring, max.  SIMATIC communication  P G/GOP communication  S 7 routing  S 7 routing  S 7 communication, as server  S 7 communication, as client  Yes  See online help (\$7 communication, user data size)  Open IE communication  TCPIP  Data length, max.  See online help (\$7 communication, user data size)  Open IE communication  TCPIP  Data length, max.  See online help (\$7 communication, user data size)  Open IE communication  TCPIP  Data length, max.  See online help (\$7 communication, user data size)  Open IE communication  TCPIP  Data length, max.  See online help (\$7 communication, user data size)  Open IE communication  Test of the size of th		·
SIMATIC communication  PG/OP communication  PG/OP communication  S7 routing  S7 communication, as server  S7 communication, as server  S8 communication, as selvent  User data per job, max.  See online help (S7 communication, user data size)  Open IE communication  TCP/IP  Data length, max. See online help (S7 communication, user data size)  Open IE communication  TCP/IP  Data length, max. See online help (S7 communication, user data size)  Open IE communication  TCP/IP  Data length, max. See online help (S7 communication, user data size)  Open IE communication  Yes  SSO-On-TOP (RFC1006) Yes  SISO-On-TOP (RFC1006) Pyes  Data length, max. See of the kbyte  Yes  DDP  Data length, max. See of the kbyte  Yes  DDP  DATA length, max. See of the length in		
PG/OP communication S7 routing S7 routing S7 communication, as server S7 communication, as server S7 communication, as client S8 communication, as client Ves User data per job, max. See online help (S7 communication, user data size)  Poen IE communication TCP/IP Data length, max. S6 dk byte S8 communication S8 communication S8 communication S9 communication S9 communication S9 communication S9 communication S9 communication S9 communication, user data size)  Poen IE communication S9 communication S9 communication S9 communication, user data size)  Poen IE communication S9 communication, user data size)  Poen IE communication S9 communication, user data size)  Poen IE communication S9 communica		50
• \$7 routing • \$7 communication, as server • \$7 communication, as client • \$7 communication, as client • \$7 communication • \$7		Voca open with TI C V/4 2 are releated
ST communication, as server ST communication, as client User data per job, max.  See online help (S7 communication, user data size)  Open IE communication  TCP/IP  Data length, max. See online help (S7 communication, user data size)  For IP  Data length, max. See online help (S7 communication, user data size)  Open IE communication  TCP/IP  Data length, max. See online help (S7 communication, user data size)  Open IE communication  For IP  Data length, max. See online help (S7 communication, user data size)  Open IE communication See online help (S7 communication, user data size)  Open IE communication See online help (S7 communication, user data size)  Open IE communication See online help (S7 communication, user data size)  Open IE communication See online help (S7 communication, user data size)  Open IE communication See online help (S7 communication, user data size)  Open IE communication See online help (S7 communication, user data size)  Open IE communication See online help (S7 communication, user data size)  Open IE communication See online help (S7 communication, user data size)  Open IE communication See online help (S7 communication, user data size)  Open IE communication See online help (S7 communication, user data size)  Open IE communication See online help (S7 communication, user data size)  Open IE communication See online help (S7 communication, user data size)  Open IE communication See online help (S7 communication) See online help (S7 commun		
S7 communication, as client User data per job, max.  See online help (\$7 communication, user data size)  Open IE communication  TCP/IP Data length, max. Seevarl passive connections per port, supported ISO-on-TCP (RFC1006) Data length, max. UDP Data length, max. Seevarl passive connections per port, supported ISO-on-TCP (RFC1006) Data length, max. Seevarl passive connections per port, supported Supporte	G Committee of the comm	
User data per job, max.  Open IE communication  TCP/IP  Data length, max. See online help (S7 communication, user data size)  TCP/IP  Obta length, max. Seeveral passive connections per port, supported  SO-On-TCP (RFC1006) Data length, max. See with supported  Solon-TCP (RFC1006) Data length, max. See with supported  Ves Dup  Data length, max. See with supported  Ves See with supported		
Open IE communication  TCP/IP  Data length, max. Several passive connections per port, supported  ISO-on-TCP (RFC1006) Data length, max. Supported  ISO-on-TCP (RFC1006) Data length, max. Supported  IDP Yes Data length, max. Subject of the supported of the support of the suppo		
TCP/IP Data length, max. Several passive connections per port, supported  ISO-on-TCP (RFC1006) Data length, max. Several passive connections per port, supported  ISO-on-TCP (RFC1006) Data length, max. Several passive connections per port, yes Data length, max. Several passive connections per port, yes Several passive for UDP broadcast Severy UDP proadcast Severy passive for UDP broadcast Severy UDP Passive for UDP broadcast Severy Passive for UDP broadcast Severy UDP Passive for UDP broadcast Severy UDP Passive for UDP broadcast Severy UDP Passive for UDP passive for UDP per allowed for UDP passive for UDP		- Continue help (or continuence alon, user data size)
Data length, max several passive connections per port, supported  ISO-on-TCP (RFC1006) Data length, max UDP Data length, max UDP Data length, max UDP multicast Ves; Max. 5 multicast circuits Ves DNS SNMP Ves DCP Ves LLDP Ves LLDP Yes LLDP Ves Ves; Optional  Web server HTTP Ves; Standard and user pages Ves; "Small" license required OPC UA Client Application authentication Security policies Security policies Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 User authentication Number of connections, max Number of nodes of the client interfaces, max Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.	·	Yes
several passive connections per port, supported  ISO-on-TCP (RFC1006) Data length, max.  IUDP Data length, max UDP multicast Ves; Max. 5 multicast circuits DNS Security policies Application authentication Number of connections, max Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.  Ves		
ISO-on-TCP (RFC1006)  — Data length, max.  UDP  — Data length, max.  UDP  — Data length, max.  — UDP multicast  DHCP  DNS  SNMP  Encryption  Web server  HTTP  HTTP  A Runtime license required  OPC UA Client  — Application authentication — Security policies  — User authentication — Number of connections, max. — Number of lements for one call of OPC UA ReadList/C max.  Pass (Abyte; 1472 bytes for UDP broadcast Yes; Max. 5 multicast circuits  Yes; Max. 5 multicast circuits  Yes; Outper of UDP  Yes  Yes  Yes  Yes  Yes  Yes  Standard and user pages  Yes; Standard and user pages  Yes; Standard and user pages  Yes; "Small" license required  Yes  "anonymous" or by user name & password  4  1 000  300	<ul> <li>several passive connections per port,</li> </ul>	
- Data length, max.  • UDP  - Data length, max.  - UDP multicast  - Ves; Max. 5 multicast circuits  - Ves  - DNS  - SNMP  - Ves  - SNMP  - DCP  - Encryption  - Ves; Optional  - Web server  - HTTP  - Yes; Standard and user pages  - HTTPS  - Ves; Standard and user pages  - OPC UA  - Runtime license required  - OPC UA Client  - Application authentication  - Security policies  - Security policies  - User authentication  - Number of connections, max.  - Number of lements for one call of  OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C  max.  - Output  - Ves  - Namber of lements for one call of  OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C  max.  - Control of the client interfaces, max.  - Output  - OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C  max.  - Output  - Ves  - Ves  - Ves  - Ves  - Number of lements for one call of  OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C  max.  - Output  - Ves		Yes
UDP Data length, max. UDP multicast  Ves; Max. 5 multicast circuits  DHCP DNS Ves SNMP DCP Ves SNMP DCP Ves Encryption  Web server  HTTP Yes; Standard and user pages PHTTPS Ves; Standard and user pages  OPC UA  Runtime license required OPC UA Client Application authentication Security policies  Security policies Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256  — User authentication — Number of connections, max. — Number of rodes of the client interfaces, max. — Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.  Ves; Wax. 5 multicast circuits Yes  Yes  Ves  Yes  Ves Standard and user pages  Yes; Standard and user pages  Yes; Standard and user pages  Ves; "Small" license required  Yes  Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256  — User authentication — Number of connections, max. — Number of nodes of the client interfaces, max. — Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.	,	
- Data length, max UDP multicast  DHCP  DNS  SNMP  Encryption  Web server  HTTP  Runtime license required  OPC UA Client  - Application authentication  Security policies  - Security policies  - User authentication  Number of connections, max.  Number of nodes of the client interfaces, max.  Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.  Pes  Yes; Max. 5 multicast circuits  Yes  Yes  Yes  Yes  Yes  Yes  Yes  Standard and user pages  Yes; Standard and user pages  Yes; Standard and user pages  Yes; "Small" license required  Yes  Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256  "anonymous" or by user name & password  4  1 000  300	-	
- UDP multicast  • DHCP  • DNS  • DNS  • SNMP  • DCP  • LLDP  • Encryption  Web server  • HTTP  • HTTPS  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.  - Number of nodes of the client interfaces, max.  - Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.  Yes  Yes  Yes  Yes  Yes  Yes  Yes  Ye		
SNMP     SNMP     Yes     DCP     Yes     LLDP     Yes     Encryption  Web server      HTTP     Yes; Standard and user pages     HTTPS     Yes; Standard and user pages  OPC UA      Runtime license required     OPC UA Client     — Application authentication     — Security policies     — User authentication     — Number of connections, max.     — Number of lements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.      Yes     Yes     Yes; "Small" license required     Yes     Yes     Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256     "anonymous" or by user name & password     1 000     300	_	
SNMP DCP LLDP Yes  Encryption  Web server  HTTP HTTPS Yes; Standard and user pages Yes; Standard and user pages Yes; Standard and user pages  OPC UA  Runtime license required OPC UA Client Application authentication Security policies  Wes authentication Number of connections, max. Number of nodes of the client interfaces, max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.  Yes  Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256  "anonymous" or by user name & password  1 000 300	• DHCP	Yes
DCP LLDP Encryption Yes Fincryption Yes; Optional  Web server  HTTP HTTPS Yes; Standard and user pages Yes; Standard and user pages  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. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.  Yes Yes; Standard and user pages	• DNS	Yes
LLDP Encryption Yes; Optional  Web server  HTTP HTTP HTTPS Yes; Standard and user pages Yes; Standard and user pages Yes; Standard and user pages  OPC UA  Runtime license required OPC UA Client Application authentication Security policies Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256  User authentication Number of connections, max. Number of nodes of the client interfaces, max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.	• SNMP	Yes
Encryption     Web server     HTTP     Yes; Standard and user pages     HTTPS     Yes; Standard and user pages  OPC UA      Runtime license required     OPC UA Client     — Application authentication     — Security policies     — User authentication     — Number of connections, max.     — Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.      Yes; Standard and user pages     Yes; "Small" license required     Yes     Yes     Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256     "anonymous" or by user name & password     1 000     300	• DCP	Yes
Web server  HTTP HTTPS Yes; Standard and user pages Yes; Standard and user pages  OPC UA  Runtime license required OPC UA Client  Application authentication Security policies  Ves Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256  User authentication Number of connections, max.  Number of nodes of the client interfaces, max.  Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.	• LLDP	Yes
<ul> <li>HTTP</li> <li>HTTPS</li> <li>Yes; Standard and user pages</li> <li>Yes; Standard and user pages</li> </ul> OPC UA <ul> <li>Runtime license required</li> <li>OPC UA Client</li> <li>Application authentication</li> <li>Security policies</li> <li>Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</li> </ul> — User authentication <ul> <li>Number of connections, max.</li> <li>Number of nodes of the client interfaces, max.</li> <li>Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.</li> </ul> 300 300	Encryption	Yes; Optional
<ul> <li>◆ HTTPS</li> <li>OPC UA</li> <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>← Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.</li> </ul> Yes; "Small" license required Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 4 1 000 300	Web server	
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.  — Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.  Press ("Small" license required  Yes  Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256  "anonymous" or by user name & password  1 000  300	• HTTP	Yes; Standard and user pages
<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>— Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.</li> <li>Yes</li> <li>Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Rsa15, Basic256Sha256</li> <li>"anonymous" or by user name &amp; password</li> <li>1 000</li> <li>300</li> </ul>	• HTTPS	Yes; Standard and user pages
<ul> <li>OPC UA Client         <ul> <li>Application authentication</li> <li>Security policies</li> </ul> </li> <li>Ves         <ul> <li>Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</li> </ul> </li> <li>User authentication             <ul> <li>Number of connections, max.</li> <li>Number of nodes of the client interfaces, max.</li> <li>Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.</li> <li>OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.</li> </ul> </li></ul>	OPC UA	
<ul> <li>Application authentication</li> <li>Security policies</li> <li>Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256</li> <li>User authentication</li> <li>"anonymous" or by user name &amp; password</li> <li>Number of connections, max.</li> <li>Number of nodes of the client interfaces, max.</li> <li>Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.</li> </ul>	•	Yes; "Small" license required
- Security policies  Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256  - User authentication  - Number of connections, max.  - Number of nodes of the client interfaces, max.  - Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.  Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256  **anonymous** or by user name & password  4  1 000  300	<ul> <li>OPC UA Client</li> </ul>	Yes
— User authentication "anonymous" or by user name & password  — Number of connections, max. 4  — Number of nodes of the client interfaces, max. 1 000  — Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.	• •	
<ul> <li>Number of connections, max.</li> <li>Number of nodes of the client interfaces, max.</li> <li>Number of elements for one call of</li> <li>OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.</li> </ul>	— Security policies	Basic256Sha256
<ul> <li>Number of nodes of the client interfaces, max.</li> <li>Number of elements for one call of</li> <li>OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.</li> </ul>	<ul><li>User authentication</li></ul>	"anonymous" or by user name & password
— Number of elements for one call of 300 OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.	<ul> <li>Number of connections, max.</li> </ul>	4
OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max.	•	1 000
	OPC_UA_NodeGetHandleList/OPC_UA_ReadList/O	
	<ul> <li>Number of elements for one call of</li> </ul>	20

OPC_UA_NameSpaceGetIndexList, max.	
<ul> <li>Number of elements for one call of OPC_UA_MethodGetHandleList, max.</li> </ul>	100
Number of simultaneous calls of the client	1
<pre>instructions per connection (except OPC_UA_ReadList,OPC_UA_WriteList,OPC_UA_M max.</pre>	
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>	5 000
<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), method call, custom address space
<ul> <li>Application authentication</li> </ul>	Yes
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
<ul> <li>User authentication</li> </ul>	"anonymous" or by user name & password
<ul> <li>GDS support (certificate management)</li> </ul>	Yes
— Number of sessions, max.	32
<ul> <li>Number of accessible variables, max.</li> </ul>	50 000
<ul> <li>Number of registerable nodes, max.</li> </ul>	10 000
<ul> <li>Number of subscriptions per session, max.</li> </ul>	20
<ul><li>— Sampling interval, min.</li></ul>	100 ms
— Publishing interval, min.	500 ms
Number of server methods, max.	20
<ul> <li>Number of inputs/outputs per server method, max.</li> </ul>	20
<ul> <li>Number of monitored items, max.</li> </ul>	1 000; for 1 s sampling interval and 1 s send interval
— Number of server interfaces, max.	10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace"
<ul> <li>Number of nodes for user-defined server interfaces, max.</li> </ul>	1 000
<ul> <li>Alarms and Conditions</li> </ul>	Yes
<ul> <li>Number of program alarms</li> </ul>	100
Number of alarms for system diagnostics	50
Further protocols	
MODBUS	Yes; MODBUS TCP
Isochronous mode	
Equidistance	Yes
S7 message functions	
Number of login stations for message functions, max.	32
Program alarms	Yes
Number of configurable program messages, max.	5 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH
Number of loadable program messages in RUN, max.	2 500
Number of simultaneously active program alarms	
Number of program alarms	600
Number of alarms for system diagnostics	100
Number of alarms for motion technology objects	80
Test commissioning functions	
Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 5 engineering systems
Status block	Yes; Up to 8 simultaneously (in total across all ES clients)
Single step	No
Number of breakpoints	8
Status/control	
<ul> <li>Status/control variable</li> </ul>	Yes
• Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
<ul> <li>Number of variables, max.</li> </ul>	

— of which status variables, max.	200; per job
of which status variables, max.  — of which control variables, max.	200; per job
— of which control variables, max.  Forcing	200, pei juu
• Forcing	Yes
Forcing, variables	Peripheral inputs/outputs
Number of variables, max.	200
Diagnostic buffer	200
• present	Yes
Number of entries, max.	1 000
— of which powerfail-proof	500
Traces	
Number of configurable Traces	4; Up to 512 KB of data per trace are possible
Interrupts/diagnostics/status information	
Alarms	
Diagnostic alarm	Yes
Hardware interrupt	Yes
Diagnoses	
Monitoring the supply voltage	Yes
Wire-break	Yes; for analog inputs/outputs, see description in manual
Short-circuit	Yes; for analog outputs, see description in manual
A/B transition error at incremental encoder	Yes
Diagnostics indication LED	
RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	Yes
<ul> <li>Monitoring of the supply voltage (PWR-LED)</li> </ul>	Yes
Channel status display	Yes
for channel diagnostics	Yes; For analog inputs/outputs
Connection display LINK TX/RX	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of
Number of available Motion Control resources for technology objects	the PLC program; selection guide via the TIA Selection Tool 800
Required Motion Control resources	
per speed-controlled axis	40
per positioning axis	80
— per synchronous axis	160
— per external encoder	80
— per output cam	20
— per cam track	160
— per probe	40
Positioning axis	
Number of positioning axes at motion control cycle of 4 ms (typical value)	5
Number of positioning axes at motion control  and of 0 me (tyrical value)	10
cycle of 8 ms (typical value)	
Controller	Voca Universal DID controller with interreted as the instance
PID_Compact     PID_3Stop	Yes; Universal PID controller with integrated optimization
<ul><li>PID_3Step</li><li>PID-Temp</li></ul>	Yes; PID controller with integrated optimization for valves
יווט-ויסוווע	Ves: PID controller with integrated ontimization for temporature
Counting and measuring	Yes; PID controller with integrated optimization for temperature
Counting and measuring  • High-speed counter	Yes; PID controller with integrated optimization for temperature  Yes
High-speed counter	
High-speed counter Integrated Functions	
High-speed counter  Integrated Functions  Counting functions	Yes
High-speed counter  Integrated Functions  Counting functions      Continuous counting	Yes Yes
High-speed counter  Integrated Functions  Counting functions      Continuous counting     Counter response parameterizable	Yes Yes Yes
High-speed counter  Integrated Functions  Counting functions      Continuous counting     Counter response parameterizable     Hardware gate via digital input	Yes Yes Yes Yes Yes

Counting range, parameterizable	Yes
Comparator	
Number of comparators	2; per count channel; see manual for details
Direction dependency	Yes
— Can be changed from user program	Yes
Position detection	
Incremental acquisition	Yes
Suitable for S7-1500 Motion Control	Yes
Measuring functions	
<ul> <li>Measuring time, parameterizable</li> </ul>	Yes
<ul> <li>Dynamic measurement period adjustment</li> </ul>	Yes
<ul> <li>Number of thresholds, parameterizable</li> </ul>	2
Measuring range	
<ul> <li>Frequency measurement, min.</li> </ul>	0.04 Hz
<ul> <li>Frequency measurement, max.</li> </ul>	400 kHz; with quadruple evaluation
<ul> <li>Cycle duration measurement, min.</li> </ul>	2.5 µs
Cycle duration measurement, max.	25 s
Accuracy	
— Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
Potential separation digital inputs	
between the channels	No
between the channels, in groups of	16
Potential separation digital outputs	
between the channels	No 40
between the channels, in groups of	16
Potential separation channels	Ves
between the channels and backplane bus     Petween the channels and lead voltage L+	Yes
Between the channels and load voltage L+	No
Isolation	707 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
Isolation tested with	707 V DC (type test)
Ambient conditions	
Ambient temperature during operation	0.00
horizontal installation, min.	0 °C
horizontal installation, max.	60 °C; note derating data for onboard I/O in the manual. Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
vertical installation, min.	0 °C
<ul> <li>vertical installation, max.</li> </ul>	40 °C; note derating data for onboard I/O in the manual. Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Ambient temperature during storage/transportation	at an operating temperature of typically 40 O, the display is switched oil
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
configuration / header	
configuration / programming / header	
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— GRAPH	Yes
— GRAPH  Know-how protection	Yes
	Yes Yes
Know-how protection	
Know-how protection  • User program protection/password protection	Yes
<ul> <li>Know-how protection</li> <li>User program protection/password protection</li> <li>Copy protection</li> </ul>	Yes Yes
<ul> <li>Know-how protection</li> <li>User program protection/password protection</li> <li>Copy protection</li> <li>Block protection</li> </ul>	Yes Yes

<ul> <li>Password for display</li> </ul>	Yes
<ul> <li>Protection level: Write protection</li> </ul>	Yes
<ul> <li>Protection level: Read/write protection</li> </ul>	Yes
<ul> <li>Protection level: Complete protection</li> </ul>	Yes
Dimensions	
Width	110 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 360 g

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