SIEMENS

Data sheet

6ES7517-3AP00-0AB0

SIMATIC S7-1500, CPU 1517-3 PN/DP, Central processing unit with work memory 2 MB for Program and 8 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 3rd interface: PROFIBUS, 2 ns bit performance, SIMATIC Memory Card required



General information	
Product type designation	CPU 1517-3 PN/DP
HW functional status	FS06
Firmware version	V2.6
Product function	
● I&M data	Yes; I&M0 to I&M3
Engineering with	
 STEP 7 TIA Portal configurable/integrated as of version 	V15.1 (FW V2.6) / V13 Update 3 (FW V1.6) or higher
Configuration control	
Configuration control via dataset	Yes
	Yes
via dataset	Yes 6.1 cm
via dataset Display	
via dataset Display Screen diagonal [cm]	
via dataset Display Screen diagonal [cm] Control elements	6.1 cm

Type of supply voltage permissible range, lower limit (DC) permissible range, upper limit (DC) 28.8 V Reverse polarity protection Wes Mains buffering • Mains/voltage failure stored energy time • Repeat rate, min. 1/s Input current Current consumption (rated value) Inrush current, max. 2.4 A; Rated value Pt 0.02 A*s Power Infeed power to the backplane bus 12 W Power consumption from the backplane bus (balanced) Power loss. Power loss, typ. Wemory Number of slots for SiMATIC memory card • Integrated (for data) • Integrated (for gorgam) • Integrated (for gorgam) • Integrated (for data) • Plug-in (SiMATIC Memory Card), max. Backup • Plug-in (SiMATIC Memory Card), max. Backup • Integrated power to the packplane by Power consumption from the backplane by Power loss, typ. 2 Mbyte 8 Mbyte Ood memory • Plug-in (SiMATIC Memory Card), max. 32 Gbyte Backup • Integrated (for data) • Processing times for bit operations, typ. 2 ns for word operations, typ. 2 ns for fixed point arithmetic, typ. 3 ns for fixed point arithmetic, typ. 12 ns CPU-blocks Number of elements (total) Power consumption from the backplane bus 160 999; subdivided into: number range that can be used by the user: 159 999, and number range of DBs created via SFC 86: 80 000 60 999 8 Mbyte; For DBs with absolute addressing, the max. size is 64 KB		
permissible range, upper limit (DC) Reverse polarity protection Wains buffering Mains/voltage failure stored energy time Repeat rate, min. Nation of the power to the backplane bus 1.55 A	Type of supply voltage	24 V DC
Reverse polarity protection Mains buffering • Mains/voltage failure stored energy time • Repeat rate, min. Input current Current consumption (rated value) Insus current, max. Pt 0.02 A*s Power Infeed power to the backplane bus (balanced) Power loss Power loss Power loss Power loss, typ. Alway and the program • integrated (for program) • integrated (for data) • integrated (for data) Load memory • Plug-in (SIMATIC Memory Card), max. Backup • maintenance-free Pyes CPU processing times for bit operations, typ. for fixed point arithmetic, typ. for fixed point arithmetic, typ. for footing point arithmetic, typ. for floating point arithmetic, typ. Power loss 12 W Alway 12 W Memory 2 W Memory • Plug-in (SIMATIC Memory Card), max. 32 Gbyte Backup • maintenance-free Yes CPU processing times for bit operations, typ. for fixed point arithmetic, typ. 12 ns CPU-blocks Number of elements (total) 12 000; Blocks (OB, FB, FC, DB) and UDTs B • Number range • Size, max. 8 Mbyte; For DBs with absolute addressing, the max. size is 64 KB	permissible range, lower limit (DC)	19.2 V
Mains buffering • Mains/voltage failure stored energy time • Repeat rate, min. Input current Current consumption (rated value) Inrush current, max. 2.4 A; Rated value Pt 0.02 A²s Power Infeed power to the backplane bus (balanced) Power consumption from the backplane bus (balanced) Power loss Power loss Power loss, typ. 24 W Memory Number of slots for SIMATIC memory card SIMATIC memory card required Yes Work memory • Integrated (for orgaran) • Integrated (for data) Load memory • Plug-in (SIMATIC Memory Card), max. Backup • maintenance-free Yes CPU processing times for bit operations, typ. 2 ns for word operations, typ. 2 ns for fixed point arithmetic, typ. 3 ns for fixed point arithmetic, typ. 12 ns CPU-blocks Number of elements (total) DB • Number range • Size, max. 8 Mbyte; For DBs with absolute addressing, the max. size is 64 KB	permissible range, upper limit (DC)	28.8 V
Mains/voltage failure stored energy time Repeat rate, min. Input current Current consumption (rated value) Inrush current, max. 2.4 A; Rated value Pt 0.02 A*s Power Infeed power to the backplane bus (balanced) Power loss Power loss Power loss, typ. 24 W Memory Integrated (for program) Integrated (for program) Integrated (for data) Integrated (for data) Ead May 12 Pug-in (SIMATIC Memory Card), max. Backup Maintenance-free Proyecsing times For bit operations, typ. for fixed point arithmetic, typ. for fixed point arithmetic, typ. For fixed point arithmetic, typ. For floating point arithmetic, typ. For Off loating point arithmetic, typ. For Gelements (total) Power loss Power loss Power loss Sample Sam	Reverse polarity protection	Yes
Input current Current consumption (rated value) Inrush current, max. 2.4 A; Rated value Power Infleed power to the backplane bus (balanced) Power loss Power loss Power loss, typ. 24 W Memory Integrated (for program) Integrated (for program) Integrated (for program) Integrated (for data) Icade mony Plug-in (SIMATIC Memory Card), max. Backup Indigonal (SIMATIC Memory Card), max. Backup Integrated (for data) Integrated (for portions) Integrated (for data) Integrated (for data) Integrated (for data) Integrated (for data) Integrated (for portions) Integrated (for data) Integrated (for data	Mains buffering	
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Current consumption (rated value) Inrush current, max. Power Infleed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss Power loss, typ. 24 W Memory Number of slots for SIMATIC memory card SIMATIC memory • integrated (for program) • integrated (for program) • Plug-in (SIMATIC Memory Card), max. Backup • maintenance-free Pes CPU processing times for fixed point arithmetic, typ. for fixed point arithmetic, typ. for folioling point arithmetic, typ. Power loss 1 2 W Memory 2 4 W Memory 2 Mbyte 8 Mbyte 2 Mbyte 8 Mbyte 2 Sebyte 2 Sebyte 2 Des CPU-blocks Number of elements (total) 1 2 000; Blocks (OB, FB, FC, DB) and UDTs 8 Mbyte unumber range that can be used by the user: 1 59 999, and number range of DBs created via SFC 86: 60: 000 60: 999 8 Mbyte; For DBs with absolute addressing, the max. size is 64 KB	● Repeat rate, min.	1/s
Inrush current, max. Pt O.02 A²s Power Infeed power to the backplane bus I2 W Power consumption from the backplane bus (balanced) Power loss Power lose Po	Input current	
Power Infeed power to the backplane bus 12 W Power consumption from the backplane bus 30 W (balanced) Power loss Power loss Power loss, typ. 24 W Memory Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes Work memory • integrated (for program) 2 Mbyte • integrated (for program) 8 Mbyte Load memory • Plug-in (SIMATIC Memory Card), max. 32 Gbyte Backup • maintenance-free Yes CPU processing times for bit operations, typ. 2 ns for fixed point arithmetic, typ. 3 ns for fixed point arithmetic, typ. 12 ns CPU-blocks Number of elements (total) 12 000; Blocks (OB, FB, FC, DB) and UDTs DB • Number range 1 60 999; subdivided into: number range that can be used by the user: 1 59 999, and number range of DBs created via SFC 86: 60 000 60 999 • Size, max.	Current consumption (rated value)	1.55 A
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Infeed power to the backplane bus Power consumption from the backplane bus (balanced) Power loss Power loss, typ. 24 W Memory Number of slots for SIMATIC memory card SIMATIC memory card required Yes Work memory • integrated (for program) • integrated (for data) Load memory • Plug-in (SIMATIC Memory Card), max. Backup • maintenance-free Yes CPU processing times for bit operations, typ. for fixed point arithmetic, typ. for fixed point arithmetic, typ. for floating point arithmetic, typ. 12 ns CPU-blocks Number of elements (total) DB • Number range • Size, max. 12 W 30 W 4 W 4 W 4 W 4 W 4 W 4 W 4 Public for SIMATIC memory card 1 Shyte 2 Mbyte 2 Mbyte 2 Mbyte 2 Mbyte 3 Sebyte 3 Sebyte 2 ns 6 For bid operations, typ. 3 ns 6 For word operations, typ. 4 12 ns CPU-blocks Number of elements (total) DB • Number range 1 60 999; subdivided into: number range that can be used by the user: 1 59 999, and number range of DBs created via SFC 86: 60 000 60 999 • Size, max. 8 Mbyte; For DBs with absolute addressing, the max. size is 64 KB	l ² t	0.02 A ² ·s
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Power loss, typ. Power loss, typ. 24 W Memory Number of slots for SIMATIC memory card SIMATIC memory card required Yes Work memory integrated (for program) integrated (for data) Load memory Plug-in (SIMATIC Memory Card), max. Backup maintenance-free Yes CPU processing times for bit operations, typ. for word operations, typ. for fixed point arithmetic, typ. for floating point arithmetic, typ. To floating point arithmetic, typ. 12 ns CPU-blocks Number of elements (total) P 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 Number, For DBs with absolute addressing, the max. size is 64 KB	·	30 W
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SIMATIC memory card required Work memory integrated (for program) integrated (for data) Number of elements (total) Number range Number range integrated (for program) 2 Mbyte 8 Mbyte 2 Mbyte 8 Mbyte 2 Mbyte 8 Mbyte 2 Mbyte 8 Mbyte 2 Dys 2 Dys 2 Dys 2 Dys 3 Dys 4 Dys 4 Dys 6 Dys 6 Dys 7 Dys 8 Dys 8 Dys 8 Dys 8 Dys 8 Dys 8 Dys 9	· · · · · · · · · · · · · · · · · · ·	
Work memory • integrated (for program) • integrated (for data) • Mbyte • Integrated (for data) • Mbyte • Integrated (for data) • Murber of elements (total) • Number range • Size, max. • Size, max. • Mbyte 2 Mbyte 8 Mbyte 2 Mbyte 8 Mbyte 2 Mbyte 8 Mbyte 2 Das 32 Gbyte 32 Gbyte 32 Gbyte 32 Gbyte 32 Gbyte 32 Gbyte 33 Gbyte 4 May 12 Gbyte 4 May 12 Gbyte 4 May 12 Gbyte 8 Mbyte 12 Das 12 Das 12 Das 13 Das 14 Das 15 Das 15 Das 16 Das Created via SFC 86 60 000 60 999 8 Mbyte; For DBs with absolute addressing, the max. size is 64 KB	Number of slots for SIMATIC memory card	1
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for bit operations, typ. for word operations, typ. for fixed point arithmetic, typ. for floating point arithmetic, typ. 12 ns CPU-blocks Number of elements (total) Number range 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. 8 Mbyte; For DBs with absolute addressing, the max. size is 64 KB	Backup	
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for word operations, typ. for fixed point arithmetic, typ. 3 ns for floating point arithmetic, typ. 12 ns CPU-blocks Number of elements (total) 12 000; Blocks (OB, FB, FC, DB) and UDTs DB Number range 1 60 999; subdivided into: number range that can be used by the user: 1 59 999, and number range of DBs created via SFC 86: 60 000 60 999 Size, max. 8 Mbyte; For DBs with absolute addressing, the max. size is 64 KB	CPU processing times	
for fixed point arithmetic, typ. for floating point arithmetic, typ. 12 ns CPU-blocks Number of elements (total) PNumber range 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. 8 Mbyte; For DBs with absolute addressing, the max. size is 64 KB	for bit operations, typ.	2 ns
for floating point arithmetic, typ. CPU-blocks Number of elements (total) PNumber range 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. 8 Mbyte; For DBs with absolute addressing, the max. size is 64 KB	for word operations, typ.	3 ns
CPU-blocks Number of elements (total) 12 000; Blocks (OB, FB, FC, DB) and UDTs DB • Number range 1 60 999; subdivided into: number range that can be used by the user: 1 59 999, and number range of DBs created via SFC 86: 60 000 60 999 • Size, max. 8 Mbyte; For DBs with absolute addressing, the max. size is 64 KB	for fixed point arithmetic, typ.	3 ns
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 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. 8 Mbyte; For DBs with absolute addressing, the max. size is 64 KB 	CPU-blocks	
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the user: 1 59 999, and number range of DBs created via SFC 86: 60 000 60 999 • Size, max. 8 Mbyte; For DBs with absolute addressing, the max. size is 64 KB	DB	
KB	Number range	the user: 1 59 999, and number range of DBs created via SFC
	● Size, max.	
<u> ЕВ</u>	FB	

Number range	0 65 535
• Size, max.	1 Mbyte
SC Size, Max.	1 Mbyte
Number range	0 65 535
• Size, max.	1 Mbyte
OB	1 Wayte
• Size, max.	1 Mbyte
Number of free cycle OBs	100
Number of time alarm OBs	20
Number of delay alarm OBs	20
Number of cyclic interrupt OBs	20; with minimum OB 3x cycle of 100 μs
Number of process alarm OBs	50
Number of DPV1 alarm OBs	3
Number of isochronous mode OBs	3
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
lesting depth	
per priority class	24
ounters, timers and their retentivity	
Number	2 048
	2 040
Retentivity	Yes
— adjustable EC counter	163
Number	Any (only limited by the main memory)
Retentivity	The state of the main memory)
— adjustable	Yes
7 times	100
• Number	2 048
Retentivity	
— adjustable	Yes
EC timer	
• Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
·	
ata areas and their retentivity Retentive data area (incl. timers, counters, flags),	768 kbyte; In total; available retentive memory for bit memories,

Extended retentive data area (incl. timers, counters,	8 Mbyte; When using PS 6 0W 24/48/60 V DC HF
flags), max.	o Mibyte, when using 1 0 0 000 24/40/00 V DOTII
Flag	
Number, 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	16 384; 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)	16 kbyte; 16 KB via the integrated PROFINET IO interface X1, 8 KB via the integrated PROFINET IO interface X2 and via the integrated PROFIBUS DP interface
— Outputs (volume)	16 kbyte; 16 KB via the integrated PROFINET IO interface X1, 8 KB via the integrated PROFINET IO interface X2 and via the integrated PROFIBUS DP interface
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	64; 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	
• integrated	1
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Number of IO Controllers	
• integrated	
intogratou	2
• Via CM	2 8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet)
● Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet)

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
• to DP, master	Yes
• in AS, master	Yes
• in AS, slave	Yes
● on Ethernet via NTP	Yes
Interfaces	
Number of PROFINET interfaces	2
Number of PROFIBUS interfaces	1
1. Interface	
Interface types	
Number of ports	2
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes; X1
Protocols	
• IP protocol	Yes; IPv4
 PROFINET IO Controller 	Yes
 PROFINET IO Device 	Yes
 SIMATIC communication 	Yes
 Open IE communication 	Yes
• Web server	Yes
 Media redundancy 	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO Controller	
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	Yes
 Open IE communication 	Yes
— IRT	Yes
— MRP	Yes; as MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50

— MRPD	Yes; Requirement: IRT
— PROFlenergy	Yes
Prioritized startup	Yes; Max. 32 PROFINET devices
Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected
realiser of connectable to Devices, max.	via AS-i, PROFIBUS or PROFINET
— Of which IO devices with IRT, max.	64
— Number of connectable IO Devices for RT,	512
max.	
— of which in line, max.	512
 Number of IO Devices that can be simultaneously activated/deactivated, max. 	8; in total across all interfaces
 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 μs to 4 ms
— for send cycle of 500 μs	500 μs to 8 ms
— for send cycle of 1 ms	1 ms to 16 ms
— for send cycle of 2 ms	2 ms to 32 ms
— for send cycle of 4 ms	4 ms to 64 ms
 With IRT and parameterization of "odd" send cycles 	Update time = set "odd" send clock (any multiple of 125 μ s: 375 μ s, 625 μ s 3 875 μ s)
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	
— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	No
 Open IE communication 	Yes
— IRT	Yes
— MRP	Yes; as MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
— MRPD	Yes; Requirement: IRT
— PROFlenergy	Yes; per user program
— Shared device	Yes
 Number of IO Controllers with shared device, max. 	4

 Asset management record

Yes; per user program

2. Interface	
Interface types	
Number of ports	1
• integrated switch	No
• RJ 45 (Ethernet)	Yes; X2
Protocols	
• IP protocol	Yes; IPv4
 PROFINET IO Controller 	Yes
PROFINET IO Device	Yes
 SIMATIC communication 	Yes
 Open IE communication 	Yes
• Web server	Yes
Media redundancy	No
PROFINET IO Controller	
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	No
Open IE communication	Yes
— IRT	No
— MRP	No
— MRPD	No
— PROFlenergy	Yes
— Prioritized startup	No
— Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
 Number of connectable IO Devices for RT, max. 	128
— of which in line, max.	128
 Number of IO Devices that can be simultaneously activated/deactivated, max. 	8; in total across all interfaces
 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 RT	
— for send cycle of 1 ms	1 ms to 512 ms
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— S7 routing	Yes

— Isochronous mode	No
— Open IE communication	Yes
— IRT	No
— MRP	No
— MRPD	No
— PROFlenergy	Yes; per user program
— Prioritized startup	No
— Shared device	Yes
Number of IO Controllers with shared	4
device, max.	
Asset management record	Yes; per user program

3. Interface	
Interface types	
Number of ports	1
• RS 485	Yes; X3
Protocols	
PROFIBUS DP master	Yes
PROFIBUS DP slave	No
 SIMATIC communication 	Yes

• SIMATIO COMMUNICATION	100
Interface types	
RJ 45 (Ethernet)	
• 100 Mbps	Yes
 Autonegotiation 	Yes
 Autocrossing 	Yes
 Industrial Ethernet status LED 	Yes
RS 485	
Transmission rate, max.	12 Mbit/s

Protocols	
Number of connections	
Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs / CMs
 Number of connections reserved for ES/HMI/web 	10
 Number of connections via integrated interfaces 	160
Number of S7 routing paths	64; in total, only 16 S7-Routing connections are supported via PROFIBUS
Redundancy mode	
H-Sync forwarding	Yes
SIMATIC communication	
S7 communication, as server	Yes

 S7 communication, as client 	Yes
User data per job, max.	See online help (S7 communication, user data size)
Open IE communication	
• TCP/IP	Yes
— Data length, max.	64 kbyte
 several passive connections per port, supported 	Yes
• ISO-on-TCP (RFC1006)	Yes
— Data length, max.	64 kbyte
• UDP	Yes
— Data length, max.	2 kbyte; 1 472 bytes for UDP broadcast
— UDP multicast	Yes; Max. 5 multicast circuits
• DHCP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Web server	
• HTTP	Yes; Standard and user pages
• HTTPS	Yes; Standard and user pages
PROFIBUS DP master	
Number of connections, max.	48; for the integrated PROFIBUS DP interface
Services	
— PG/OP communication	Yes
— S7 routing	Yes
 Data record routing 	Yes
— Isochronous mode	Yes
— Equidistance	Yes
— Number of DP slaves	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Activation/deactivation of DP slaves	Yes
OPC UA	
Runtime license required	Yes
OPC UA client	Yes
 Application authentication 	Yes
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
— User authentication	"anonymous" or by user name & password
— Number of connections, max.	40
 Number of nodes of the client interfaces, max. 	5 000

 Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_Rea dList/OPC_UA_WriteList, max. 	300
 Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. 	20
 Number of elements for one call of OPC_UA_MethodGetHandleList, max. 	100
 Number of simultaneous calls of the client instructions per connection (except OPC_UA_ReadList,OPC_UA_WriteList,OPC_ UA_MethodCall), max. 	1
 Number of simultaneous calls of the client instructions OPC_UA_ReadList,OPC_UA_WriteList and OPC_UA_MethodCall, max. 	5
 Number of registerable nodes, max. 	5 000
 Number of registerable method calls of OPC_UA_MethodCall, max. 	100
— Number of inputs/outputs when calling OPC_UA_MethodCall, max.	20
OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space
 Application authentication 	Yes
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
 User authentication 	"anonymous" or by user name & password
Number of sessions, max.	64
 Number of accessible variables, max. 	200 000
 Number of registerable nodes, max. 	50 000
 Number of subscriptions per session, max. 	20
— Sampling interval, min.	10 ms
— Publishing interval, min.	10 ms
Number of server methods, max.	100
 Number of inputs/outputs per server method, max. 	20
 Number of monitored items, max. 	10 000; for 1 s sampling interval and 1 s send interval
 Number of server interfaces, max. 	10
 Number of nodes for user-defined server interfaces, max. 	30 000
Further protocols	
• MODBUS	Yes; MODBUS TCP
Media redundancy	
 Switchover time on line break, typ. 	200 ms; For MRP, bumpless for MRPD
Number of stations in the ring, max.	50

Isochronous operation (application synchronized up to terminal) Equidistance Yes S7 message functions Number of login stations for messages functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Number of simultaneously active program alarms Number of alarms for system diagnostics Number of alarms for motion technology objects 1 000 Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Yes; Up to 16 simultaneously (in total across all ES clients) No Number of breakpoints Status/control Status/control Status/control Ves; Daralbes, max.	Isochronous mode	
to terminal) (distributed) and 1 ms (central) Equidistance Yes S7 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Number of loadable program messages in RUN, max. Number of simultaneously active program alarms Number of program alarms Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Yes; Up to 16 simultaneously (in total across all ES clients) Single step No Number of breakpoints 20 Status/control Status/control Status/control variable Variables Variables		Yes; Distributed and central: with minimum OB 6x cycle of 250 us
Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Number of simultaneously active program alarms Number of program alarms Number of alarms for system diagnostics Number of alarms for motion technology objects 1 000 Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Yes; Parallel online access possible for up to 10 engineering systems Status block Yes; Up to 16 simultaneously (in total across all ES clients) Single step No Number of breakpoints 20 Status/control Status/control Status/control Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters		
Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Number of simultaneously active program alarms Number of program alarms Number of alarms for system diagnostics Number of alarms for motion technology objects 1000 Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Yes; Parallel online access possible for up to 10 engineering systems Status block Yes; Up to 16 simultaneously (in total across all ES clients) No Number of breakpoints 20 Status/control Status/control variable Variables Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Equidistance	Yes
Program alarms Number of configurable program messages, max. Number of loadable program messages in RUN, max. Number of simultaneously active program alarms Number of program alarms Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Status block Yes; Parallel online access possible for up to 10 engineering systems Status block Yes; Up to 16 simultaneously (in total across all ES clients) No Number of breakpoints 20 Status/control Status/control Status/control variable Variables Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	S7 message functions	
Number of configurable program messages, max. 10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH	Number of login stations for message functions, max.	32
"Program_Alarm" block, ProDiag or GRAPH Number of loadable program messages in RUN, max. Number of simultaneously active program alarms • Number of program alarms • Number of alarms for system diagnostics • Number of alarms for motion technology objects 1 000 • Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Yes; Parallel online access possible for up to 10 engineering systems Status block Yes; Up to 16 simultaneously (in total across all ES clients) Single step No Number of breakpoints 20 Status/control • Status/control variable • Variables Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Program alarms	Yes
max. Number of simultaneously active program alarms Number of program alarms Number of program alarms Number of program alarms Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Yes; Parallel online access possible for up to 10 engineering systems Status block Yes; Up to 16 simultaneously (in total across all ES clients) Single step No Number of breakpoints 20 Status/control Status/control Status/control Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Number of configurable program messages, max.	
 Number of program alarms Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Yes; Parallel online access possible for up to 10 engineering systems Status block Yes; Up to 16 simultaneously (in total across all ES clients) Single step No Number of breakpoints Status/control Status/control variable Variables Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 		5 000
Number of alarms for system diagnostics Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Yes; Parallel online access possible for up to 10 engineering systems Status block Yes; Up to 16 simultaneously (in total across all ES clients) No Number of breakpoints Status/control Status/control Status/control variable Variables No Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Number of simultaneously active program alarms	
Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Yes; Parallel online access possible for up to 10 engineering systems Status block Yes; Up to 16 simultaneously (in total across all ES clients) Single step No Number of breakpoints 20 Status/control Status/control variable Ves Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Number of program alarms	1 000
 Number of alarms for motion technology objects Test commissioning functions Joint commission (Team Engineering) Yes; Parallel online access possible for up to 10 engineering systems Status block Yes; Up to 16 simultaneously (in total across all ES clients) Single step No Number of breakpoints Status/control Status/control variable Variables Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 	Number of alarms for system diagnostics	1 000
Joint commission (Team Engineering) Yes; Parallel online access possible for up to 10 engineering systems Status block Yes; Up to 16 simultaneously (in total across all ES clients) No Number of breakpoints 20 Status/control • Status/control variable • Variables Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters		160
Status block Yes; Up to 16 simultaneously (in total across all ES clients) No Number of breakpoints 20 Status/control • Status/control variable • Variables Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Test commissioning functions	
Single step No Number of breakpoints 20 Status/control • Status/control variable • Variables Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Joint commission (Team Engineering)	· · · · · · · · · · · · · · · · · · ·
Number of breakpoints Status/control Status/control variable Variables Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Status block	Yes; Up to 16 simultaneously (in total across all ES clients)
Status/control Status/control variable Variables Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters	Single step	No
 Status/control variable Variables Yes Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 	Number of breakpoints	20
 Variables Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters 	Status/control	
counters	Status/control variable	Yes
Number of variables, max.	• Variables	
	 Number of variables, max. 	
— of which status variables, max. 200; per job	— of which status variables, max.	200; per job
— of which control variables, max. 200; per job	— of which control variables, max.	200; per job
Forcing	Forcing	
• Forcing, variables Peripheral inputs/outputs	Forcing, variables	Peripheral inputs/outputs
Number of variables, max. 200	 Number of variables, max. 	200
Diagnostic buffer	Diagnostic buffer	
• present Yes	• present	Yes
• Number of entries, max. 3 200	 Number of entries, max. 	3 200
— of which powerfail-proof 1 000	— of which powerfail-proof	1 000
Traces	Traces	
• Number of configurable Traces 8; Up to 512 KB of data per trace are possible	Number of configurable Traces	8; Up to 512 KB of data per trace are possible
Interrupts/diagnostics/status information	Interrupts/diagnostics/status information	
Diagnostics indication LED	Diagnostics indication LED	
• RUN/STOP LED Yes	RUN/STOP LED	Yes
• ERROR LED Yes	• ERROR LED	Yes

MAINT LED
 Connection display LINK TX/RX
 Yes
 Yes

Supported technology objects	
Motion Control	Yes; Note: The number of axes affects the cycle time of the PLC
	program; selection guide via the TIA Selection Tool or SIZER
 Number of available Motion Control resources 	10 240
for technology objects (except cam disks)	
 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 	70
control cycle of 4 ms (typical value)	
 Number of positioning axes at motion 	128
control cycle of 8 ms (typical value)	
Controller	
PID_Compact	Yes; Universal PID controller with integrated optimization
● PID_3Step	Yes; PID controller with integrated optimization for valves
PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	

Ambient conditions		
Ambient temperature during operation		
horizontal installation, min.	0 °C	
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	
• vertical installation, min.	0 °C	
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	
Ambient temperature during storage/transportation		
• 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		

Programming

Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— GRAPH	Yes
Know-how protection	
User program protection/password protection	Yes
Copy protection	Yes
 Block protection 	Yes
Access protection	
Password for display	Yes
 Protection level: Write protection 	Yes
 Protection level: Read/write protection 	Yes
 Protection level: Complete protection 	Yes
Cycle time monitoring	
• lower limit	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 978 g
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