SIEMENS

Data sheet

6ES7511-1FK02-0AB0



SIMATIC S7-1500F, CPU 1511F-1 PN, CENTRAL PROCESSING UNIT WITH WITH WORKING MEMORY 225 KB FOR PROGRAM AND 1 MB FOR DATA, 1. INTERFACE: PROFINET IRT WITH 2 PORT SWITCH, 60 NS BIT-PERFORMANCE, SIMATIC MEMORY CARD NECESSARY

General information	
Product type designation	CPU 1511F-1 PN
HW functional status	FS03
Firmware version	V2.8
Product function	
 I&M data 	Yes; I&M0 to I&M3
Isochronous mode	Yes; Distributed and central; with minimum OB 6x cycle of 625 μs (distributed) and 1 ms (central)
Engineering with	
 STEP 7 TIA Portal configurable/integrated from version 	V16 (FW V2.8) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7511-1FK01-0AB0
Configuration control	
via dataset	Yes
Display	
Screen diagonal [cm]	3.45 cm
Control elements	
Number of keys	8
Mode buttons	2
Supply voltage	
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Mains buffering	
 Mains/voltage failure stored energy time 	5 ms
Repeat rate, min.	1/s
Input current	
Current consumption (rated value)	0.7 A
Current consumption, max.	0.95 A
Inrush current, max.	1.9 A; Rated value
l²t	0.02 A ² ·s
Power	
Infeed power to the backplane bus	10 W
Power consumption from the backplane bus (balanced)	5.5 W
Power loss	
Power loss, typ.	5.7 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	
 integrated (for program) 	225 kbyte

 integrated (for data) 	1 Mbyte
Load memory	T Mbyte
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	
maintenance-free	Yes
CPU processing times	
for bit operations, typ.	60 ns
for word operations, typ.	72 ns
for fixed point arithmetic, typ.	96 ns
for floating point arithmetic, typ.	384 ns
CPU-blocks	
Number of elements (total)	2 000; 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.	1 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	
Number range	0 65 535
• Size, max.	150 kbyte
FC Number range	0 65 535
 Number range Size, max. 	0 65 535 150 kbyte
• Size, max. OB	100 NJ/10
• Size, max.	150 kbyte
Number of free cycle OBs	100
Number of time alarm OBs	20
 Number of delay alarm OBs 	20
Number of cyclic interrupt OBs	20; 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 	2
 Number of technology synchronous alarm OBs 	2
 Number of startup OBs 	100
 Number of asynchronous error OBs 	4
 Number of synchronous error OBs 	2
Number of diagnostic alarm OBs	1
Nesting depth	
per priority class	24; Up to 8 possible for F-blocks
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
Retentivity	Ver
— adjustable	Yes
IEC counter • Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
S7 times	
Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	
• Number	Any (only limited by the main memory)
Retentivity	
— 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. Flag	1 Mbyte; When using PS 6 0W 24/48/60 V DC HF
• Size, max.	16 kbyte
Size, max. Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
	o, o stok 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	1 024; 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	8 khyte
— Inputs (volume) — Outputs (volume)	8 kbyte 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	4; A maximum of 4 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can
Number of IO Controllers	be inserted in total
Number of IO Controllers • integrated	1
Via CM	4; A maximum of 4 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	
• Туре	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
• in AS, master	Yes
• in AS, slave	Yes
on Ethernet via NTP	Yes
Interfaces	
Number of PROFINET interfaces	1
1. Interface	
Interface types	
• RJ 45 (Ethernet)	Yes; X1
Number of ports	2
integrated switch	Yes
Protocols IP protocol	Yes; IPv4
PROFINET IO Controller	Yes
PROFINET IO Controller PROFINET IO Device	Yes
SIMATIC communication	Yes
Open IE communication	Yes; Optionally also encrypted
Web server	Yes
Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO Controller	

PCICP communication Yes - Bochronous mode Yes - Direct data exchange Yes, Requirement: IRT and isochronous mode (MRPD options)) - RFOF-Interry Yes, Mxx. 32 PROFINET devices - PROFIcencry Yes, Mxx. 32 PROFINET devices - Provide data exchange Yes, Mxx. 32 PROFINET devices - Of which in devices with IRT, max. 64 - Number of connectable ID Devices (RT, max. 128 - Number of Connectable ID Devices (RT, max. 128 - Number of Dovices per tool, max. 128 - Number of Dovices per tool, max. 128 - Number of Dovices per tool, max. 128 - Indiating times The maintain value of the updata time also depends on communication to the opticata time also depends on communication to the opticata time also depends on communication to the opticata time for IRT - Or and cycle of 250 µs 20 µs to 4 ms; Notice of the updata time also depends on communication to the opticata time for IRT - for send cycle of 250 µs 20 µs to 4 ms; Notice of the updata time also depends on communication to the opticata t	Services	
- Direct data exchange - Series Requirement: IRT and isochronous mode (MRPD optional) - IRT - Ves - PROFILE and start - PROFILE data exchange - PROFILE data exchange - Number of connectable ID Devices, max. - Series - Of which ID devices with IRT, max. - Updefing times - For other of connectable ID Devices that can be amax. - Updefing times - For other of Devices per tool, max. - Updefing times - For each cycle of 250 µs - For each c	— PG/OP communication	Yes
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Number of connectable 10 Devices, max. 128; In total: up to 256 distributed 10 devices can be connected via AS: I, PROFINET Of which 10 devices with IRT, max. 64 Number of connectable 10 Devices for RT, max. 128 Of which in line, max. 128 Number of 10 Devices that can be simultaneously activated/devices/max. 8 Number of 10 Devices per tool, max. 8 Updating times 8 Updating times 8 for send cycle of 250 µs 500 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive 500 µs to 5 ms. Note: In the case of IRT with isochronous OB is decisive for send cycle of 2 ns for send cycle of 20 µs 1 ms to 16 ms for send cycle of 20 µs 1 ms to 16 ms for send cycle of 20 µs 250 µs to 4 ms; Note: In the case of IRT with isochronous OB is decisive minimum update time of 625 µs of the isochronous OB is decisive for send cycle of 2 ns for send cycle of 20 µs 250 µs to 258 ms -for send cycle of 500 µs 500 µs to 258 ms -for send cycle of 20 µs 250 µs to 258 ms -for send cycle of 20 µs 250 µs to 258 ms -for send cycle of 4 ms 4 ms to 512 ms -for send cycle of 4 ms 2 ms to 512 ms -for send cycle of 4 ms 2 ms to 512 ms -for send cycle of 4 ms 2 ms		
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		100
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2. Interface PROFINET IO Device Services - PG/OP communication - Isochronous mode - Isochronous mode - IRT - PROFlenergy - Prioritized startup - Shared device - Number of IO Controllers with shared device, max. - Asset management record Interface types RJ 45 (Ethernet) • 100 Mbps Yes • Autonegotiation Yes • Autocrossing • Industrial Ethernet status LED Yes		Yes: per user program
PROFINET IO Device Services — PG/OP communication Yes — Isochronous mode No — IRT No — PROFlenergy Yes; per user program — Prioritized startup No — Shared device Yes — Number of IO Controllers with shared device, max. 4 — Asset management record Yes; per user program Interface types Yes RJ 45 (Ethernet) Yes • Autonegotiation Yes • Autoerossing Yes • Industrial Ethernet status LED Yes Protocols Yes		· •••, p•• ••••. p•••g••
Services - PG/OP communication Yes - Isochronous mode No - IRT No - PROFlenergy Yes; per user program - Prioritized startup No - Shared device Yes - Number of IO Controllers with shared device, max. 4 - Asset management record Yes; per user program Interface types Interface types RJ 45 (Ethernet) Yes • Autonegotiation Yes • Autorossing Yes • Industrial Ethernet status LED Yes Protocols Yes		
PG/OP communication Yes		
Isochronous modeNo IRTNo PROFlenergyYes; per user program Prioritized startupNo Shared deviceYes Number of IO Controllers with shared device, max.4 Asset management recordYes; per user programInterface typesRJ 45 (Ethernet) 100 MbpsYes- AutonegotiationYes- AutocrossingYes- Industrial Ethernet status LEDYesProtocolsYes		Yes
- PROFlenergyYes; per user program- Prioritized startupNo- Shared deviceYes- Number of IO Controllers with shared device, max.4- Asset management recordYes; per user programInterface typesRJ 45 (Ethernet)• 100 MbpsYes• AutonegotiationYes• AutorossingYes• Industrial Ethernet status LEDYesProtocolsYes		
 Prioritized startup Shared device Shared device Number of IO Controllers with shared device, max. Asset management record Yes; per user program Interface types RJ 45 (Ethernet) • 100 Mbps Yes • Autonegotiation Yes • Autorossing Yes • Industrial Ethernet status LED Yes Protocols Yes		No
Shared device Yes Number of IO Controllers with shared device, max. 4 Asset management record Yes; per user program Interface types RJ 45 (Ethernet) • 100 Mbps Yes • Autonegotiation Yes • Autocrossing Yes • Industrial Ethernet status LED Yes	— PROFlenergy	Yes; per user program
 Number of IO Controllers with shared device, max. Asset management record Yes; per user program Interface types RJ 45 (Ethernet) 100 Mbps Autonegotiation Autocrossing Industrial Ethernet status LED Yes Protocols 		
max. Yes; per user program Interface types RJ 45 (Ethernet) • 100 Mbps Yes • Autonegotiation Yes • Autocrossing Yes • Industrial Ethernet status LED Yes	— Shared device	Yes
Asset management record Yes; per user program Interface types RJ 45 (Ethernet) • 100 Mbps Yes • Autonegotiation Yes • Autocrossing Yes • Industrial Ethernet status LED Yes Protocols Yes		4
Interface types RJ 45 (Ethernet) • 100 Mbps Yes • Autonegotiation Yes • Autocrossing Yes • Industrial Ethernet status LED Yes Protocols Yes		N .
RJ 45 (Ethernet) • 100 Mbps Yes • Autonegotiation Yes • Autocrossing Yes • Industrial Ethernet status LED Yes Protocols Yes	-	Yes; per user program
• 100 Mbps Yes • Autonegotiation Yes • Autocrossing Yes • Industrial Ethernet status LED Yes		
Autonegotiation Yes Autocrossing Industrial Ethernet status LED Yes Protocols		
Autocrossing Yes Industrial Ethernet status LED Yes Protocols		
Industrial Ethernet status LED Yes Protocols	-	
Protocols	-	
PROFisate Yes		
	PROFIsate	Yes

Number of connections	
Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs
Number of connections, max. Number of connections reserved for ES/HMI/web	10
Number of connections via integrated interfaces	64
Number of Connections via integrated interfaces Number of S7 routing paths	16
Redundancy mode	10
H-Sync forwarding	Yes
Media redundancy	
- MRP	Vec: on MPP redundancy manager and/or MPP alight: may number of
	Yes; as MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
— MRPD	Yes; Requirement: IRT
— Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
— Number of stations in the ring, max.	50
SIMATIC communication	50
S7 routing	Yes
 S7 routing S7 communication, as server 	Yes
	Yes
S7 communication, as client	
User data per job, max.	See online help (S7 communication, user data size)
Open IE communication	N
• TCP/IP	Yes
— Data length, max.	64 kbyte
 — several passive connections per port, 	Yes
supported	Vee
• 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
• HTTP • HTTPS	Yes; Standard and user pages Yes; Standard and user pages
• HTTPS	
• HTTPS OPC UA	Yes; Standard and user pages
HTTPS OPC UA • Runtime license required	Yes; Standard and user pages Yes
HTTPS OPC UA Runtime license required OPC UA Client	Yes; Standard and user pages Yes Yes
HTTPS OPC UA Runtime license required OPC UA Client — Application authentication	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15,
HTTPS OPC UA Runtime license required OPC UA Client — Application authentication — Security policies	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
HTTPS OPC UA Runtime license required OPC UA Client — Application authentication — Security policies — User authentication	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password
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, recommended max.	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 4 1 000
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,	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 4
 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, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max. Number of elements for one call of 	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 4 1 000
 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, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of elements for one call of 	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 4 1 000 300
 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, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/Omax. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of elements for one call of OPC_UA_MethodGetHandleList, max. number of simultaneous calls of the client instructions for session management, per 	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 4 1 000 300
 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, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/Omax. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of elements for one call of OPC_UA_MethodGetHandleList, max. number of simultaneous calls of the client instructions for session management, per connection, max. 	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 4 1 000 300 20 100
 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, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/Omax. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of elements for one call of OPC_UA_MethodGetHandleList, max. number of simultaneous calls of the client instructions for session management, per connection, max. number of simultaneous calls of the client 	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 4 1 000 300 20
 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, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/Omax. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of elements for one call of OPC_UA_MethodGetHandleList, max. number of simultaneous calls of the client instructions for session management, per connection, max. 	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 4 1 000 300 20 100 5
 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, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/Omax. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of elements for one call of OPC_UA_MethodGetHandleList, max. number of simultaneous calls of the client instructions for session management, per connection, max. number of simultaneous calls of the client instructions for data access, per connection, max. Number of registerable nodes, max. 	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 4 1 000 300 20 100 5 5 000
 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, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/Omax. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of simultaneous calls of the client instructions for session management, per connection, max. number of simultaneous calls of the client instructions for data access, per connection, max. Number of registerable method calls of 	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 4 1 000 300 20 100 5
 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, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of simultaneous calls of the client instructions for session management, per connection, max. number of simultaneous calls of the client instructions for data access, per connection, max. Number of registerable method calls of OPC_UA_MethodCall, max. Number of inputs/outputs when calling 	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 4 1 000 300 20 100 5 5 000
 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, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/Omax. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of elements for one call of OPC_UA_MethodGetHandleList, max. number of simultaneous calls of the client instructions for session management, per connection, max. Number of registerable nodes, max. Number of registerable method calls of OPC_UA_MethodCall, max. Number of inputs/outputs when calling OPC_UA_MethodCall, max. 	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 4 1 000 300 20 100 1 5 5 000 100 20
 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, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C max. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of simultaneous calls of the client instructions for session management, per connection, max. number of simultaneous calls of the client instructions for data access, per connection, max. Number of registerable method calls of OPC_UA_MethodCall, max. Number of inputs/outputs when calling 	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 4 1 000 300 20 100 1 5 5 000 100 20 Yes; Data access (read, write, subscribe), method call, custom address
 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, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/Omax. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of elements for one call of OPC_UA_MethodGetHandleList, max. number of simultaneous calls of the client instructions for session management, per connection, max. Number of registerable nodes, max. Number of registerable method calls of OPC_UA_MethodCall, max. Number of inputs/outputs when calling OPC_UA_MethodCall, max. 	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 4 1 000 300 20 100 1 5 5 000 100 20
 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, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/Omax. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of elements for one call of OPC_UA_MethodGetHandleList, max. number of simultaneous calls of the client instructions for session management, per connection, max. Number of registerable nodes, max. Number of registerable method calls of OPC_UA_MethodCall, max. Number of inputs/outputs when calling OPC_UA_MethodCall, max. OPC UA Server Application authentication 	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 4 1 000 300 20 100 1 5 5 000 100 20 Yes; Data access (read, write, subscribe), method call, custom address space Yes
 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, recommended max. Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/Omax. Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max. Number of elements for one call of OPC_UA_MethodGetHandleList, max. number of simultaneous calls of the client instructions for session management, per connection, max. Number of registerable nodes, max. Number of registerable method calls of OPC_UA_MethodCall, max. Number of inputs/outputs when calling OPC_UA_MethodCall, max. 	Yes; Standard and user pages Yes Yes Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 "anonymous" or by user name & password 4 1 000 300 20 100 1 5 5 000 100 20 Yes; Data access (read, write, subscribe), method call, custom address space

— User authentication	"anonymous" or by user name & password
— Number of sessions, max.	32
 Number of accessible variables, max. 	50 000
 Number of registerable nodes, max. 	10 000
 Number of subscriptions per session, max. 	20
— Sampling interval, min.	100 ms
— Publishing interval, min.	500 ms
— Number of server methods, max.	20
 — Number of inputs/outputs per server method, max. 	20
 – number of monitored items, recommended 	1 000; for 1 s sampling interval and 1 s send interval
max.	····, · · · · · · · · · · · · · · · · ·
 — Number of server interfaces, max. 	10
 Number of nodes for user-defined server 	1 000
interfaces, max.	
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"
Number of loadable program measures in DUNL may	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 plogram alarns Number of alarms for system diagnostics 	100
Number of alarms for system diagnostics Number of alarms for motion technology objects	80
Test commissioning functions	00
	Vee Develle entire exercise receible for up to 5 engine eving evidence
Joint commission (Team Engineering) Status block	Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients)
Single step	No
Number of breakpoints	8
Status/control	•
Status/control variable	Yes; without fail-safe
Variables	inputs/outputs, bit memories, DBs, peripheral I/Os (without fail-safe),
	times, counters
 Number of variables, max. 	
 — of which status variables, max. 	200; per job
— of which control variables, max.	200; per job
Forcing	
• Forcing	Yes; without fail-safe
Forcing, variables	peripheral inputs/outputs (without fail-safe)
Number of variables, max.	200
Diagnostic buffer	Vee
 present Number of entries max 	Yes 1 000
 Number of entries, max. — 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	
Diagnostics indication LED • RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	Yes
STOP ACTIVE LED	Yes
Connection display LINK TX/RX	Yes
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of
	the PLC program; selection guide via the TIA Selection Tool
 Number of available Motion Control resources for 	15 360
technology objects	
 Required Motion Control resources 	

	10
 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
 Number of available Extended Motion Control resources for technology objects 	512
Required Extended Motion Control resources	
— per cam (1 000 points and 50 segments)	2
— per cam (10 000 points and 50 segments)	20
— for each set of kinematics	30
— Per leading axis proxy	3
Positioning axis	
— Number of positioning axes at motion control	140
cycle of 4 ms (typical value)	טדו
 — Number of positioning axes at motion control cycle of 8 ms (typical value) 	192
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	i co, i ib controllor mar integrated optimization for temperature
High-speed counter	Yes
5 1	
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
 Performance level according to ISO 13849-1 	PLe
SIL acc. to IEC 61508	SIL 3
Probability of failure (for service life of 20 years and repa	
 Low demand mode: PFDavg in accordance with SIL3 	< 2.00E-05
 — High demand/continuous mode: PFH in accordance with SIL3 	< 1.00E-09
Ambient conditions	
Ambient temperature during operation	
 horizontal installation, min. 	-25 °C; No condensation
 horizontal installation, max. 	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the
	display is switched off
 vertical installation, min. 	-25 °C; No condensation
 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 / header	
configuration / header	
configuration / programming / header	
configuration / programming / header Programming language	Yes; incl. failsafe
configuration / programming / header Programming language — LAD	Yes; incl. failsafe Yes: incl. failsafe
configuration / programming / header Programming language — LAD — FBD	Yes; incl. failsafe
configuration / programming / header Programming language — LAD — FBD — STL	Yes; incl. failsafe Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL	Yes; incl. failsafe Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH	Yes; incl. failsafe Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection	Yes; incl. failsafe Yes Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection	Yes; incl. failsafe Yes Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection	Yes; incl. failsafe Yes Yes Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection	Yes; incl. failsafe Yes Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection Access protection	Yes; incl. failsafe Yes Yes Yes Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Block protection • Block protection • Password for display	Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Copy protection • Block protection • Password for display • Protection level: Write protection	Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes Yes
configuration / programming / header Programming language — LAD — FBD — STL — SCL — GRAPH Know-how protection • User program protection/password protection • Block protection • Block protection • Password for display	Yes; incl. failsafe Yes Yes Yes Yes Yes Yes Yes

 Protection level: Complete protection 	Yes
programming / cycle time monitoring / header	
lower limit	adjustable minimum cycle time
upper limit	adjustable maximum cycle time
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	405 g
last modified:	4/1/2022 🖸

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