Data sheet

6ES7518-4FP00-0AB0



SIMATIC S7-1500F, CPU 1518F-4 PN/DP, central processing unit with 9 MB work memory for program and 60 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 3rd interface: PROFINET basic services, 4th interface: PROFIBUS, 1 ns bit-performance, SIMATIC Memory Card required

General information	
Product type designation	CPU 1518F-4PN/DP
HW functional status	FS10
Firmware version	V2.9
Product function	
● I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes; Distributed and central; with minimum OB 6x cycle of 125 μs (distributed) and 1 ms (central)
Engineering with	
 STEP 7 TIA Portal configurable/integrated from version 	V17 (FW V2.9) / V13 (FW V1.5) or higher
Configuration control	
via dataset	Yes
Display	
Screen diagonal [cm]	6.1 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
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)	1.55 A
Inrush current, max.	2.4 A; Rated value
l²t	0.02 A ² ·s
Power	
Infeed power to the backplane bus	12 W
Power consumption from the backplane bus (balanced)	30 W
Power loss	
Power loss, typ.	24 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	

e integrated (for program)	0 Mbuto
• integrated (for program)	9 Mbyte
• integrated (for data)	60 Mbyte
■ Load memory ■ Plug-in (SIMATIC Memory Card), max.	22 Chuto
Backup	32 Gbyte
maintenance-free	Yes
	Tes
CPU processing times	
for bit operations, typ.	1 ns
for word operations, typ.	2 ns
for fixed point arithmetic, typ.	2 ns
for floating point arithmetic, typ.	6 ns
CPU-blocks	
Number of elements (total)	20 000; 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.	16 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	
 Number range 	0 65 535
• Size, max.	1 Mbyte
FC	
Number range	0 65 535
• Size, max.	1 Mbyte
OB	
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 synchronous error obs Number of diagnostic alarm OBs	1
	1
Nesting depth	24
per priority class	24
Counters, timers and their retentivity	
S7 counter	0.040
• Number	2 048
Retentivity	
— adjustable	Yes
IEC counter	
Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
S7 times	
Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	
Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
Data areas and their retentivity	
Retentive data area (incl. timers, counters, flags), max.	768 kbyte; In total; available retentive memory for bit memories, timers,
	counters, DBs, and technology data (axes): 700 KB

Extended retentive data area (incl. timers, counters, flags),	20 Mbyte: When using PS 6 0W 24/48/60 V DC HF
max.	20 Mayte, When doing 1 0 0 000 24/40/00 V DOTTI
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	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)	32 kbyte; max. 32 KB via X1; max. 8 KB via X2 or X4
— Outputs (volume)	32 kbyte; max. 32 KB via X1; max. 8 KB via X2 or X4
per CM/CP	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
Subprocess images	
 Number of subprocess images, max. 	32
lardware 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	2
Via CM	8; A maximum of 8 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
• to DP, master	Yes
• in AS, master	Yes
• in AS, slave	Yes
 on Ethernet via NTP 	Yes
nterfaces	
Number of PROFINET interfaces	3
Number of PROFIBUS interfaces	1
1. Interface	
Interface types	
RJ 45 (Ethernet)	Yes; X1
TO TO (Eulernet)	100,701

- Number of part	
Number of ports integrated quiteb	2
• integrated switch	Yes
Protocols	V ID-4
IP protocol IP protocol IP protocol	Yes; IPv4
PROFINET IO Controller	Yes
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	
Services	Ven
— PG/OP communication	Yes Yes
Isochronous mode Direct data evaluation	
— Direct data exchange	Yes; Requirement: IRT and isochronous mode (MRPD optional)
— IRT	Yes Yes not user program
— PROFlenergy	Yes; per user program
— 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 via AS-i, PROFIBUS or PROFINET
Of which IO devices with IRT, max.	64
 Number of connectable IO Devices for RT, max. 	512
— of which in line, max.	512
Number of IO Devices that can be	8; in total across all interfaces
simultaneously activated/deactivated, max.	-,3.6. 00.000 0
 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 125 μs	125 µs
— for send cycle of 187.5 μs	187.5 μs
— 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	Update time = set "odd" send clock (any multiple of 125 μs: 375 μs, 625
cycles	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	
— PG/OP communication	Yes
 Isochronous mode 	No
— IRT	Yes; Minimum send cycle of 250 µs
— PROFlenergy	Yes; per user program
— Shared device	Yes
 Number of IO Controllers with shared device, max. 	4
 activation/deactivation of I-devices 	Yes; per user program
 Asset management record 	Yes; per user program
2. Interface	
Interface types	
RJ 45 (Ethernet)	Yes; X2
Number of ports	1
integrated switch	No

Protocols	
IP protocol	Yes; IPv4
PROFINET IO Controller	Yes
PROFINET IO Device	Yes
SIMATIC communication	Yes
Open IE communication	Yes; Optionally also encrypted
Web server	Yes
Media redundancy	No
PROFINET IO Controller	····
Services	
— PG/OP communication	Yes
— Isochronous mode	No
Direct data exchange	No
— IRT	No
— PROFlenergy	Yes; per user program
Prioritized startup	No
Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via
Number of connectable IO Devices for RT,	AS-i, PROFIBUS or PROFINET
max.	120
— of which in line, max.	128
Number of IO Devices that can be	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 RT	
— for send cycle of 1 ms	1 ms to 512 ms
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
 activation/deactivation of I-devices 	Yes; per user program
 Asset management record 	Yes; per user program
3. Interface	
Interface types	
RJ 45 (Ethernet)	Yes; X3
Number of ports	1
• integrated switch	No
Protocols	
IP protocol	Yes; IPv4
PROFINET IO Controller	No
PROFINET IO Device	No
SIMATIC communication	Yes
Open IE communication	Yes
Web server	Yes
4. Interface	
Interface types	
• RS 485	Yes; X4
Number of ports	1
Protocols	
PROFIBUS DP master	Yes
PROFIBUS DP slave	No
SIMATIC communication	Yes
- Onto the Communication	

PROFIBUS DP master	
Number of connections, max.	48; for the integrated PROFIBUS DP interface
Number of DP slaves, max.	125; In total, up to 1 000 distributed I/O devices can be connected via
Transcrot Dr. Glaves, max.	AS-i, PROFIBUS or PROFINET
Services	
 PG/OP communication 	Yes
— Equidistance	Yes
— Isochronous mode	Yes
 Activation/deactivation of DP slaves 	Yes
Interface types	
RJ 45 (Ethernet)	
• 100 Mbps	Yes
• 1000 Mbps	Yes; Only possible at the X3 interface of the CPU 1518
 Autonegotiation 	Yes
Autocrossing	Yes
Industrial Ethernet status LED	Yes
RS 485	
Transmission rate, max.	12 Mbit/s
Protocols	
PROFIsafe	Yes; V2.4 / V2.6
Number of connections	100, 72.77 72.0
Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs / CMs
Number of connections reserved for ES/HMI/web	10
Number of connections reserved for Es/Finishweb Number of connections via integrated interfaces	320
Number of S7 routing paths	64; in total, only 16 S7-Routing connections are supported via
• Number of 37 Touting paths	PROFIBUS
Redundancy mode	
H-Sync forwarding	Yes
Media redundancy	
Media redundancy	only via 1st interface (X1)
— MRP	Yes; as MRP redundancy manager and/or MRP client
 MRP interconnection, supported 	Yes; as ring node according to IEC 62439-2 Edition 2.0
— 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	
S7 routing	Yes
Data record routing	Yes
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	Coo dimino noip (or communication, door date of the
• TCP/IP	Yes
— Data length, max.	64 kbyte
several passive connections per port,	Yes
supported	
• 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; 128 multicast circuits (of which max. 5 via X1)
• DHCP	Yes
• DNS	Yes
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
	Yes; Optional
• Encryption	, op
Encryption Web server	
Web server	Yes: Standard and user pages
	Yes; Standard and user pages Yes; Standard and user pages

OPC UA Client Application authentication Security policies User authentication Number of connections, max. Number of nodes of the client interfaces, max. Number of security node certain the client interfaces, max. Number of security node client interfaces, max. Number of nodes of the client interfaces, max. Number of security node client interfaces, max. Number of security node client interfaces, max. Number of nodes for one call of OPC_UA, Method Cell, max. Number of nodes for one call of OPC_UA, Method Cell, max. Number of nodes for nodes, max. Number of registerable nodes, max. Number of registerable nodes, max. Number of nodes for user-defined server interfaces, max. Number of nodes for user-defined server interfaces,	Puntimo liconeo required	Yes
- Application authentication - Security policies - Security policies Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic	Runtime license required ODC HA Client	
- Security policies - User authentication - Number of rodes of the client interfaces, max Number of connections, max Number of clienters for one call of OPC_UA_Nedecelethrandiscribed_List, max Number of leterness for one call of OPC_UA_Nedecelethrandiscribed_List, max Number of leterness for one call of OPC_UA_Nedecelethrandiscribed_List, max Number of sever interfaces, max Number of sessions, max Number of sever interfaces, max Number of one sever interfaces, max Number of one sever interfaces, max Number of sever interfaces, max Number of one sever interfaces, max Number of one sever interfaces, max Number of one sever interfaces, max Number of sever interfaces, max		
User authentication Number of connections, max. Number of nodes of the stent interfaces, max. Number of elements for one call of OPC, UA, Node-dethandel, Birt OPC, UA, ReadList OPC, UA, Method-dethandel, st, max. Number of elements for one call of OPC, UA, Method-dethandel, st, max. Number of simultaneous calls of the client instructions per connection (except OPC, UA, ReadList OPC, UA, WriteList, OPC, UA, Method-dell, max. Number of injunitaneous calls of the client instructions OPC, UA, Method-dell, max. Number of registerable nodes, max. Number of registerable method calls of OPC, UA, Method-dell, max. Number of registerable method calls of OPC, UA, Method-dell, max. Number of registerable nodes, max. Number of accessible variables, max. Number of accessible variables, max. Number of accessible variables, max. Number of subscriptions per session, max. Number of sever interfaces, max. Number of accessible variables, max. Number of loads for user-defined server inte	• •	
- Number of condections, max Number of elements for one call of OPC_UA_NodeSecHandeListOPC_UA_ReadListOPC_UA_NodeSecHandeListOPC_UA_No	— Security policies	Basic256Sha256
- Number of nodes of the client interfaces, max Number of elements for one call of OPC_UA_NodeSetHandleListVOPC_UA_ReadListVC max Number of elements for one call of OPC_UA_NemespaceSetIndexList max Number of elements for one call of OPC_UA_NemespaceSetIndexList max Number of simultaneous calls of the client instructions per connection (except OPC_UA_ReadList_OPC_UA_WriteList_OPC_UA_M max Number of simultaneous calls of the client instructions per connection (except OPC_UA_ReadList_OPC_UA_WriteList_OPC_UA_M max Number of registerable nodes, max Number of registerable nodes, max Number of registerable nodes, max Number of propulsory the second of the client instructions open connection of the client instructions open connection ope	 User authentication 	"anonymous" or by user name & password
- Number of elements for one call of OPC_UA_NodesGel+randel.stVOPC_UA_ReadListVC max Number of elements for one call of OPC_UA_NameSpaceSetIndex.list. max Number of elements for one call of OPC_UA_MethodGelHandleList, max Number of simultaneous calls of the client instructions per connection (except of OPC_UA_ReadList,OPC_UA_Minter.) - Number of simultaneous calls of the client instructions - OPC_UA_ReadList,OPC_UA_WriteList,OPC_UA_Minter Number of registerable method calls of OPC_UA_MethodGall, max Number of programations - Application authentication - Security policies - User authentication - Number of sessions, max Number of sessions, max Number of registerable nodes, max Number of server methods, max Number of server methods, max Number of server methods, max Number of program alarms - Number of program alarms - Number of program alarms - Number of program messages in RUN, max Number of login stations for ressage functions, max Number of login stations for ressage in RUN, max Number of login stations for ressage functions, max Number of simultaneously active program alarms - Number of login stations fo	·	40
OPC_UA_NedeGelHandeList/OPC_UA_ReadList/C max. — Number of elements for one call of OPC_UA_NameSpaceGelIndexList, max. — Number of elements for one call of OPC_UA_NameSpaceGelIndexList, max. — Number of simultaneous calls of the client instructions per connection (except OPC_UA_WinteList, OPC_UA_M max. — Number of simultaneous calls of the client instructions OPC_UA_ReadList,OPC_UA_WinteList, oPC_UA_M max. — Number of simultaneous calls of the client instructions OPC_UA_ReadList,OPC_UA_WinteList and OPC_UA_MethodCall, max. — Number of registerable nodes, max. — Number of registerable nodes, max. — Number of registerable nodes, max. — Number of protection authentication — Security policies — Security policies — User authentication — Number of accessible variables, max. — Number of registerable nodes, max. — Number of sever methods, max. — Number of inputs/outputs per session, max. — Number of inputs/outputs per server method, max. — Number of ondes for user-defined server interfaces, max. — Number of alams for system diagnostics — Number of forgina malams — Number of orgina malams — Number of orgina malams — Number of orgina malams — Number of login stations for message functions, max. — Number of forgina stations for messages, max. Number of indictations makes per forgina malams — Number of forginam messages, max. Number of indictations makes per forgina malams — Number of orginams alemas — Number of orginams alemas — Number of program al	 Number of nodes of the client interfaces, max. 	5 000
- Number of elements for one call of OPC_UA_NamespaceGenitheductist, max Number of elements for one call of OPC_UA_NethooGetHandeList, max Number of elements for one call of OPC_UA_NethooGetHandeList, max Number of simultaneous calls of the client instructions per connection (excess calls of the client instructions of the client instruction of the	OPC_UA_NodeGetHandleList/OPC_UA_ReadList/C	
OPC_UA_MethodGetHandle.lst, max. — Number of simultaneous calls of the client instructions per connection (except) OPC_UA_ReadList,OPC_UA_WriteList,OPC_UA_M max. — Number of simultaneous calls of the client instructions OPC_UA_ReadList,OPC_UA_WriteList and OPC_UA_MethodCall, max. — Number of registerable method calls of OPC_UA_MethodCall, max. — Number of registerable method calls of OPC_UA_MethodCall, max. — Number of registerable method calls of OPC_UA_MethodCall, max. — Number of registerable method calls of OPC_UA_MethodCall, max. — Number of registerable method calls of OPC_UA_MethodCall, max. — Number of registerable method calls of OPC_UA_MethodCall, max. — OPC UA_Server — Application authentication — Security policies — User authentication — Number of sessions, max. — Number of sessions, max. — Number of sessions was. — Number of userseible variables, max. — Number of userseible variables, max. — Number of server methods, max. — Number of server methods, max. — Number of monitored items, max. — Number of monitored items, max. — Number of program alarms — Number of program alarms — Number of program alarms — Number of program messages in RUN, max. Popplications Number of logistations Number of logignuable program messages in RUN, max. Number of simultaneously active program alarms • Number of program alarms — Number of fologram messages in RUN, max. Number of simultaneously active program alarms • Number of program alarms • Number of program messages in RUN, max. Number of simultaneously active program alarms • Number of program al	Number of elements for one call of	20
instructions proconnection (except OPC_UA_Redulst,OPC_UA_WriteList,OPC_UA_WriteList,OPC_UA_WriteList,OPC_UA_WriteList,OPC_UA_WriteList and OPC_UA_Readulst,OPC_UA_WriteList and OPC_UA_Readulst,OPC_UA_WriteList and OPC_UA_MethodCall, 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_MethodCall, max. - OPC UA_MethodCall, max. - OPC UA_MethodCall, max. - OPC_UA_MethodCall,		100
instructions OPC_UA, ReadList.OPC_UA, WriteList and OPC_UA, ReadhodCall, max. — Number of registerable method calls of OPC_UA, MethodCall, max. — Number of inguistoruptus when calling OPC_UA, MethodCall, max. • OPC UA, MethodCall, max. • OPC UA, Server — Application authentication — Security policies — Application authentication — Security policies — User authentication — Number of sessions, max. — Number of sessions, max. — Number of sessions, max. — Number of sessions per session, max. — Number of subscriptions per session, max. — Number of subscriptions per session, max. — Publishing interval, min. — Publishing interval, min. — Number of server methods, max. — Number of server methods, max. — Number of server methods, max. — Number of server interfaces, max. — Number of or user-defined server interfaces, max. • Alarms and Conditions — Number of program alarms — Number of program alarms — Number of originations or system diagnostics • MODBUS • MODBUS • MODBUS • Yes; MODBUS TCP ochronous mode Equidistance • Number of londable program messages, max. Number of simultaneously active program alarms • Number of simultaneously active progr	instructions per connection (except OPC_UA_ReadList,OPC_UA_WriteList,OPC_UA_M	
OPC_UA_MethodCall, max. - Number of registerable method calls of OPC_UA_MethodCall, max. - Number of fregisterable method calls of OPC_UA_MethodCall, max. - Number of inputs/outputs when calling OPC_UA_MethodCall, max. • OPC UA_Server - Application authentication - Security policies - User authentication - Number of sessions, max. - Number of subscriptions per session, max. - Number of subscriptions per session, max. - Number of subscriptions per session, max. - Number of server methods, max. - Number of server methods, max. - Number of server methods, max. - Number of monitored items, max. - Number of monitored items, max. - Number of or user-defined server interfaces, max. - Number of program alarms - Number of program alarms - Number of program sessage functions, max. - Number of oling itstations for message in RUN, max. - Whomer of londsbile program messages, max. - Number of simultaneously active program alarms • Number	instructions	5
- 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 - Security policies - Application authentication - Security policies - Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 - User authentication - Number of sessions, max Number of sessions, max Number of registerable nodes, max Number of registerable nodes, max Number of subscriptions per session, max Number of subscriptions per session, max Number of subscriptions per session, max Number of subscriptions per server method, max Number of inputs/outputs per server method, max Number of server interfaces, max Number of server interfaces, max Number of server interfaces, max Number of nodes for user-defined server interfaces, max Number of program alarms - Number of program alarms - Number of program diarms - Number of lastms for system diagnostics - MODBUS - Yes; MODBUS TCP - Modable program message functions, max Yes - Tomessage functions - Number of loadable program messages, max Number of loadable program messages in RUN, max Number of insmultaneously active program alarms - Number of program alarms - Number of program alarms - Number of program messages in RUN, max Number of program alarms - Num	OPC_UA_MethodCall, max.	
OPC_UA_MethodCall, max. - Number of inputs/outputs when calling OPC_UA_MethodCall, max. • OPC UA Server Yes; Data access (read, write, subscribe), method call, custom address space - Application authentication Yes - Security policies Basic256Sha256 - User authentication "anonymous" or by user name & password - Number of sessible variables, max Number of subscriptions per session, max Number of subscriptions per session, max Sampling interval, min Publishing interval, min Number of server methods, max Number of inputs/outputs per server method, max Number of nodes for user-defined server interfaces, max Number of server interfaces, max Alarms and Conditions - Number of program alarms - Number of program alarms - Ves - MODBUS - Yes; MODBUS TCP - Topsgram message functions, max Ves - Program alarms - Ves - Number of loadable program messages, max Number of loadable program messages in RUN, max Number of loadable program messages in RUN, max Number of program alarms - Number of program alarms - Number of program messages in RUN, max Number of program alarms - Number of program alarms - Number of program messages in RUN, max Number of program alarms - Number of program a	-	5 000
OPC UA_MethodCall, max. OPC UA Server Application authentication Security policies Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256 User authentication Number of sessions, max. Number of secssible variables, max. Number of registerable nodes, max. Number of subscriptions per session, max. Number of subscriptions per session, max. Number of inputs/outputs per server method, max. Number of inputs/outputs per server method, max. Number of inputs/outputs per server method, max. Number of monitored items, max. Number of server interfaces, max. Number of nodes for user-defined server interfaces, max. Alarms and Conditions Number of loadable program messages max. Ves MODBUS Yes; MODBUS TCP Touch of loadable program messages in RUN, max. Number of loadable program messages in RUN, max. Number of loadable program alarms Number of loadable program messages in RUN, max. Number of program alarms		100
- Application authentication - Security policies - Security policies - Security policies - Security policies - User authentication - Number of sessions, max Number of sessions, max Number of sessions, max Number of registerable nodes, max Number of registerable nodes, max Number of subscriptions per session, max Sampling interval, min Publishing interval, min Publishing interval, min Number of server methods, max Number of server methods, max Number of inputs/outputs per server method, max Number of monitored items, max Number of monitored items, max Number of server interfaces, max Number of program alarms - Number of program alarms - Number of program diarms of system diagnostics - MODBUS - MODBUS - Tessage functions - Number of login stations for message functions, max Number of login stations for messages in RUN, max Number of loadable program messages in RUN, max Number of simultaneously active program alarms - Number of program alarms - Number of program alarms - Number of simultaneously active program alarms - Number of simultaneously active program alarms - Number of simultaneously active program alarms - Number of program alarms		20
Security policies Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic26Rsa15, Basic256Rsa15, Basic26Rsa15, Basic26Rsa15, Basic26Rsa15, Basic26Rsa15, Basic26Rsa15, Basic26Rsa15, Basica16, Basica16, Basica16, Basica16, Basica16,	OPC UA Server	
Basic256Sha256 - User authentication - Number of sessions, max Number of registerable nodes, max Number of registerable nodes, max Number of subscriptions per session, max Sampling interval, min Publishing interval, min Number of server methods, max Number of inputs/outputs per server method, max Number of inputs/outputs per server method, max Number of server interfaces, max Number of server interfaces, max Number of server interfaces, max Number of nodes for user-defined server interfaces, max Alarms and Conditions - Number of program alarms - Number of program alarms - MODBUS - MODBUS - MODBUS - Yes; MODBUS TCP - Number of login stations for message functions, max Ves - Number of login stations for messages functions, max Mumber of loadable program messages, max Number of loadable program messages in RUN, max Number of simultaneously active program alarms - Number of simultaneously active program alarms - Number of simultaneously active program alarms - Number of program alarms	 Application authentication 	Yes
- Number of sessions, max Number of accessible variables, max Number of registerable nodes, max Number of subscriptions per session, max Sampling interval, min Publishing interval, min Number of server methods, max Number of inputs/outputs per server method, max Number of inputs/outputs per server method, max Number of innitored items, max Number of server interfaces, max Number of program alarms - MODBUS - MODBUS - Yes; MODBUS TCP - Models of the type "Reference namespace" - Yes - Models of the type "Reference namespace" - Number of program alarms - Models of the type "Reference namespace" - Models of the type "Reference name	— Security policies	
- Number of accessible variables, max Number of registerable nodes, max Number of subscriptions per session, max Sampling interval, min Publishing interval, min Number of server methods, max Number of inputs/outputs per server method, max Number of inputs/outputs per server method, max Number of monitored items, max Number of monitored items, max Number of server interfaces, max Number of nodes for user-defined server interfaces, max Alarms and Conditions - Number of program alarms - Number of alarms for system diagnostics - MODBUS - Wes; MODBUS TCP - MODBUS - Yes; MODBUS TCP - Moderations To message functions, max Program alarms - Yes - Number of login stations for message functions, max Program alarms - Number of loadable program messages in RUN, max Number of simultaneously active program alarms - Number of program alarms	 User authentication 	"anonymous" or by user name & password
- Number of registerable nodes, max Number of subscriptions per session, max Sampling interval, min Publishing interval, min Number of server methods, max Number of inputs/outputs per server method, max Number of inputs/outputs per server method, max Number of monitored items, max Number of server interfaces, max Number of nodes for user-defined server interfaces, max Alarms and Conditions - Number of program alarms - Number of alarms for system diagnostics - Number of alarms for system diagnostics - MODBUS - Ves; MODBUS TCP - Ves - Toessage functions - Number of login stations for message functions, max Program alarms - Number of loadable program messages, max Number of loadable program messages in RUN, max Number of simultaneously active program alarms - Number of program alarms	Number of sessions, max.	64
- Number of subscriptions per session, max Sampling interval, min Publishing interval, min Number of server methods, max Number of inputs/outputs per server method, max Number of inputs/outputs per server method, max Number of monitored items, max Number of server interfaces, max Number of server interfaces, max Number of server interfaces, max Number of nodes for user-defined server interfaces, max Alarms and Conditions - Number of program alarms - Number of program alarms - Number of server interfaces alarms for system diagnostics - Number of laarms for system diagnostics - MODBUS - MODBUS - Yes; MODBUS TCP - Yes - Othronous mode - Equidistance - Yes - Othronous mode - Equidistance - Yes - Othronous mode - Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace" - 30 000 - Number of login stations - Number of login stations for message functions, max Hodistance - Yes - Othronous mode - Yes - Othronous mode - Yes - Othronous mode - Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace" - 30 000 - Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace" - 30 000 - Server interfaces / "Companion specification" type and 20 of the type "Reference namespace" - Number of loging alarms - 400 - Number of loging alarms - 400 - Number of loging alarms - 400 - Number of loging stations for messages, max 400 - Number of loging stations for messages, max 400 - 4	 Number of accessible variables, max. 	200 000
- Sampling interval, min Publishing interval, min Number of server methods, max Number of inputs/outputs per server method, max Number of monitored items, max Number of server interfaces, max Number of server interfaces, max Number of nodes for user-defined server interfaces, max Number of program alarms - Number of program alarms - Number of alarms for system diagnostics - MODBUS - MODBUS - Wes; MODBUS TCP - Modes functions - Wes - Modes functions - Wes - Modes functions - Mumber of login stations for message functions, max Mumber of login stations for messages, max Mumber of loadable program messages, max Number of loadable program messages in RUN, max Number of simultaneously active program alarms - Number of program alarms	 Number of registerable nodes, max. 	50 000
— Publishing interval, min. — Number of server methods, max. — Number of inputs/outputs per server method, max. — Number of monitored items, max. — Number of server interfaces, max. — Number of server interfaces, max. — Number of nodes for user-defined server interfaces, max. • Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics • MODBUS • MODBUS • MODBUS Otheronous mode Equidistance Tyes Tyes Number of login stations for message functions, max. Program alarms Wumber of configurable program messages, max. • Number of loadable program messages in RUN, max. Number of simultaneously active program alarms • Number of program alarms 4 000	 Number of subscriptions per session, max. 	20
- Number of server methods, max Number of inputs/outputs per server method, max Number of monitored items, max Number of server interfaces, max Number of server interfaces, max Number of nodes for user-defined server interfaces, max Number of nodes for user-defined server interfaces, max Alarms and Conditions - Number of program alarms - Number of alarms for system diagnostics - MODBUS - MODBUS - MODBUS - MODBUS - MODBUS - Modes - Ves; MODBUS TCP - Ves; MODBUS TCP - Ves - Modes for message functions, max Ves - Mumber of login stations for message functions, max Mumber of login stations for messages, max Mumber of loadable program messages, max Number of loadable program messages in RUN, max Number of simultaneously active program alarms - Number of program alarms	— Sampling interval, min.	10 ms
- Number of server methods, max Number of inputs/outputs per server method, max Number of monitored items, max Number of server interfaces, max Number of server interfaces, max Number of nodes for user-defined server interfaces, max Number of nodes for user-defined server interfaces, max Alarms and Conditions - Number of program alarms - Number of alarms for system diagnostics - MODBUS - MODBUS - MODBUS - MODBUS - Yes; MODBUS TCP - Mod		10 ms
— Number of inputs/outputs per server method, max. — Number of monitored items, max. — Number of server interfaces, max. — Number of server interfaces, max. — Number of nodes for user-defined server interfaces, max. • Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics — Number of alarms for system diagnostics — WODBUS — WODBUS — Yes; MODBUS TCP — Ves **T message functions** Number of login stations for message functions, max. — Program alarms — Ves **Number of configurable program messages, max. **Number of loadable program messages in RUN, max. Number of simultaneously active program alarms • Number of program alarms 4 000	•	
— Number of monitored items, max. — Number of server interfaces, max. — Number of server interfaces, max. — Number of nodes for user-defined server interfaces, max. ■ Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics ■ MODBUS ■ MODBUS Trespect of login stations for message functions, max. Number of login stations for messages, max. Number of configurable program messages, max. ■ Number of simultaneously active program alarms ■ Number of simultaneously active program alarms ■ Number of simultaneously active program alarms ■ Number of program alarms	 Number of inputs/outputs per server method, 	
— Number of server interfaces, max. — Number of nodes for user-defined server interfaces, max. — Number of nodes for user-defined server interfaces, max. ■ Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics ■ MODBUS ■ MODBUS ■ Yes; MODBUS TCP ■ Modera of Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. ■ 10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace" 30 000 30 000 ■ Yes; MODBUS ■ Yes; MODBUS TCP ■ Yes ■ Modera of Nodera	 Number of monitored items. max. 	10 000: for 1 s sampling interval and 1 s send interval
interfaces, max. • Alarms and Conditions — Number of program alarms — Number of alarms for system diagnostics 200 Further protocols • MODBUS • MODBUS Yes; MODBUS TCP ochronous mode Equidistance Yes 7 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. 10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH Number of simultaneously active program alarms • Number of program alarms • Number of program alarms • Number of program alarms 4 000		10 of each "Server interfaces" / "Companion specification" type and 20
— Number of program alarms — Number of alarms for system diagnostics 200 Further protocols ■ MODBUS Tyes; MODBUS TCP Ochronous mode Equidistance Yes Mumber 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 program alarms 4 000		30 000
— Number of alarms for system diagnostics ■ MODBUS ■ MODBUS Yes; MODBUS TCP **Cochronous mode Equidistance Yes **T 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 simultaneously active program alarms ■ Number of program alarms 4 000	 Alarms and Conditions 	
Further protocols • MODBUS Ochronous mode Equidistance Yes 7 message functions Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. 10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH Number of loadable program messages in RUN, max. Number of simultaneously active program alarms • Number of program alarms 4 000	 Number of program alarms 	400
Further protocols	 Number of alarms for system diagnostics 	200
Equidistance 7 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 simultaneously active program alarms Number of program alarms		Yes; MODBUS TCP
Equidistance 7 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 simultaneously active program alarms Number of program alarms	ochronous mode	
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		Yes
Number of login stations for message functions, max. Program alarms Number of configurable program messages, max. 10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH Number of loadable program messages in RUN, max. Number of simultaneously active program alarms Number of program alarms 4 000	·	
Program alarms Yes Number of configurable program messages, max. 10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH Number of loadable program messages in RUN, max. 5 000 Number of simultaneously active program alarms • Number of program alarms 4 000	-	64
Number of configurable program messages, max. 10 000; Program messages are generated by the "Program_Alarm" block, ProDiag or GRAPH Number of loadable program messages in RUN, max. 5 000 Number of simultaneously active program alarms Number of program alarms 4 000		
Number of loadable program messages in RUN, max. 5 000 Number of simultaneously active program alarms • Number of program alarms 4 000		10 000; Program messages are generated by the "Program_Alarm"
Number of simultaneously active program alarms • Number of program alarms 4 000	Number of loadable program messages in RLIN may	
Number of program alarms 4 000		
		4 000
	Number of program alarms Number of alarms for system diagnostics	1 000

est 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	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	
• present	Yes
Number of entries, max.	3 200
— of which powerfail-proof	1 000
Traces	
Number of configurable Traces	8; Up to 512 KB of data per trace are possible
terrupts/diagnostics/status information	
Diagnostics indication LED	
RUN/STOP LED	Yes
	Yes
ERROR LED MAINT LED	Yes
Connection display LINK TX/RX	Yes
upported 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 15 360
Required Motion Control resources	
— per speed-controlled axis	40
— per speed-controlled axis — 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 side of 4 ms (typical yells)	140
cycle of 4 ms (typical value) — Number of positioning axes at motion control	192
cycle of 8 ms (typical value)	
Controller	Vege Universal DID controller with internet 1 (1)
PID_Compact PID_3Ctor	Yes; Universal PID controller with integrated optimization
PID_3Step PID_T	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
tandards, 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 repart	air time of 100 hours)
Low demand mode: PFDavg in accordance	< 2.00E-05
with SIL3	

accordance with SIL3	
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 / header	
configuration / programming / header	
Programming language	
— LAD	Yes; incl. failsafe
— FBD	Yes; incl. failsafe
— 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; Specific write protection both for Standard and for Failsafe
 Protection level: Read/write protection 	Yes
 Protection level: Write protection for Failsafe 	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	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	1 988 g

4/1/2022

last modified: