6ES7515-2AN03-0AB0

Data sheet



SIMATIC S7-1500, CPU 1515-2 PN, central processing unit with work memory 1 MB for program and 4.5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 6 ns bit performance, SIMATIC Memory Card required *** approvals and certificates according to entry 109817466 at support.industry.siemens.com to be considered! ***

General information	
Product type designation	CPU 1515-2 PN
HW functional status	FS01
Firmware version	V3.0
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes; Distributed and central; with minimum OB 6x cycle of 375 μs (distributed) and 1 ms (central)
Engineering with	
STEP 7 TIA Portal configurable/integrated from version	V18 (FW V3.0); with older TIA Portal versions configurable as 6ES7515-2AM02-0AB0
Configuration control	
via dataset	Yes
Display	
Screen diagonal [cm]	6.1 cm
Control elements	
Number of keys	8
Mode buttons	2
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)	0.83 A
Current consumption, max.	1.03 A
Inrush current, max.	1.15 A; Rated value
I²t	0.6 A²·s
Power	
Infeed power to the backplane bus	12 W
Power consumption from the backplane bus (balanced)	6.2 W
Power loss	
Power loss, typ.	7.9 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	

integrated (for program)	1 Mbyte
integrated (for program) integrated (for data)	4.5 Mbyte
Load memory	T.O HILLYCO
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	02 00,0
maintenance-free	Yes
CPU processing times	
for bit operations, typ.	6 ns
for word operations, typ.	7 ns
for fixed point arithmetic, typ.	9 ns
for floating point arithmetic, typ.	37 ns
CPU-blocks	
Number of elements (total)	8 000; 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.	4.5 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 250 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
Counters, timers and their retentivity	
S7 counter	
Number	2 048
Retentivity	
— adjustable	Yes
IEC counter	
Number	Any (only limited by the main memory)
Retentivity	, (,
— adjustable	Yes
S7 times	
Number	2 048
Retentivity	
— adjustable	Yes
IEC timer	165
Number	Any (only limited by the main memory)
Retentivity	Any (only limited by the main memory)
— adjustable	Yes
·	160
Data areas and their retentivity	F12 khyto: In total: available retentive memory for hit managing firmers
Retentive data area (incl. timers, counters, flags), max.	512 kbyte; In total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 472 KB
Extended retentive data area (incl. timers, counters, flags), max.	4.5 Mbyte; When using PS 6 0W 24/48/60 V DC HF
Flag	
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	o mayte, max. To the per block
Number of IO modules	9.100; may number of modules / submodules
	8 192; max. number of modules / submodules
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
Outputs	32 kbyte; All outputs are in the process image
per integrated IO subsystem	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
per CM/CP	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
Subprocess images	
Number of subprocess images, max.	32
Hardware configuration	
Number of distributed IO systems	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	
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be
N 1 (10 0 1 iii	inserted in total
Number of IO Controllers	
• integrated	2
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be
Dools	inserted in total
Rack	20. CDLL 24 modules
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	31013
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
• in AS, master	Yes
• in AS, slave	Yes
on Ethernet via NTP	Yes
Interfaces	
Number of PROFINET interfaces	2
1. Interface	
Interface types	V V
• RJ 45 (Ethernet)	Yes; X1
 Number of ports 	2
integrated switch	Yes
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	Yes
PROFINET IO Controller	
Services	
 PG/OP communication 	Yes
— Isochronous mode	Yes
 Direct data exchange 	Yes; Requirement: IRT and isochronous mode (MRPD optional)
— IRT	Yes
— PROFlenergy	Yes; per user program
— Prioritized startup	Yes; Max. 32 PROFINET devices
 Number of connectable IO Devices, max. 	256; 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. 	256
— of which in line, max.	256
 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	$250~\mu s$ to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 375 μs of the isochronous OB is decisive
— 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
— Isochronous mode	No
— IRT	Yes
— 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	Von: V2
RJ 45 (Ethernet) Number of parts	Yes; X2
Number of ports integrated switch	1 No
integrated switch Protocols	No
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	No
PROFINET IO Controller	110
Services	
— PG/OP communication	Yes
—1 G/OT communication	165

- Isokin funds a exchange - Dred data exchange - RT - PROFilenery - Priorized starty - Number of connectable IO Devices, max Number of connectable IO Devices for RT, max Number of connectable IO Devices for RT, max Number of IO Devices start can be simultaneously activated described, max Number of IO Devices start can be simultaneously activated described, max Number of IO Devices per IoO, max Usdating times - Number of IO Devices per IoO, max Usdating times - Number of IO Devices per IoO, max Usdating times - Number of IO Devices per IoO, max Usdating times - Number of IO Devices per IoO, max Usdating times - Number of IO Devices per IoO, max In the Institution of IoO devices, and on the quantity of Institution of IoO devices,	— Isochronous mode	No
- IRT - PROFilemeny - Prointized startup - Number of connectable IO Devices, max Number of connectable IO Devices for RT, max Symbol In the provided startup - Number of connectable IO Devices for RT, max Symbol In the provided III of the		
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- Prioritized startup - Number of connectable IO Devices, max Number of connectable IO Devices for RT, max Number of connectable IO Devices for RT, max Of which in line, max Number of IO Devices that can be simultaneously activate-diseactivated, max Number of IO Devices that can be simultaneously activate-diseactivated, max Number of IO Devices that can be simultaneously activate-diseactivated, max Number of IO Devices that can be simultaneously activate-diseactivated, max Number of IO Devices that can be simultaneously activate-diseactivated, max Updating times - For send cycle of 1 ms - For send cycle - For send cycle of 1 ms - For s		
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		PROFIBUS or PROFINET
- Number of IO Devices that can be simultaneously achaledideachedate. An extraction of the production		
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- Number of IO Devices per tool, max. - Updating times - Updating times - Updating times - The minimum value of the update fime also depends on communication share set for PROFINET IO), on the number of IO devices, and on the quantity of configured user data - Francisco dycle of 1 ms - PROFINET IO Bevice - PROFICE communication - IRT - PROFICE communication - IRT - PROFICE dycle of 1 ms - PROFICE dyc		8; in total across all interfaces
	,	8
Set for PRCFINET IC), on the number of IO devices, and on the quantity of configured user data Update time for RT — for send cycle of 1 ms PROFINET IC) Device Services — PGOP communication — IRT — No — IRT — PROFInenery — Prointized startup — No — Shared device — Number of IO Controllers with shared device, max — activation/deachivation of Heavices — Asset management record Interface by yes — Autocrossing — Into Ombps — Ves — Autocrossing — Industrial Ehemet status LED Protocols PROFIciale No No No No No No No Nounder of connections, max. — Interface by yes — Industrial Ehemet status LED — Yes Protocols PROFIciale No No No Nounder of connections, max. — Number of connections reserved for ESH-MI/web — Number of connections reserved for ESH-MI/web — Number of connections us integrated interfaces — Number of connections and interfaces — Number of connections are reserved for ESH-MI/web — Number of connections are reserved for ESH-MI/web — Number of connections in the ring max. Interface (X1) — Media redundancy — Media redundancy — Media redundancy — MRP — Media redundancy — MRP — Wes as MRP ring node according to IEC 62439-2 Edition 2.0, MRP Manager, MRP Client — WRP Client — Set Normanication, as server — So routing — So communication — PCIOP com	•	
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PROFINETIO Device	Update time for RT	
Services - PG/OP communication - Isochronous mode - IRT - PROFlenergy - Prioritized startup - PROFlenergy - Prioritized startup - Shared device - Number of IO Controllers with shared device, max activation/deactivation of I-devices - Number of IO Controllers with shared device, max activation/deactivation of I-devices - Asset management record - Asset management record - Yes; per user program - Asset management record - Yes; per user program - Indevided Ethernet - 100 Mbps - Autornegotation - Yes - Autocrossing - Industrial Ethernet status LED - Yes - Autocrossing - Industrial Ethernet status LED - Yes - Industrial Ethernet status LED - Yes - Number of connections, max Number of connections, max Number of connections, max Number of connections is integrated interfaces - Number of Strouting paths - Number of Strouting paths - H-Sync forwarding - MRP - MRP - MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; - MRP Interconnection, supported - MRP interconnection, supported - MRP interconnection, supported - MRP interconnection, supported - MRP interconnection in the ring, max PG/OP communication - PG/OP communication - PG/OP communication - Strouting - Data record routing - Strouting - Stro	— for send cycle of 1 ms	1 ms to 512 ms
- PG/OP communication Yes - Isochronous mode No	PROFINET IO Device	
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- PROFlenergy Yes; per user program - Prioritized startup No - Shared device - Number of IO Controllers with shared device, max activation/deactivation of I-devices Yes; per user program - Asset management record - Asset management record - Asset management record - Yes - Autorcrossing - Yes - Autorcrossing - Yes - Number of connections - Number of connections - Number of connections - Number of connections, max Number of connections, max Number of connections, max Number of connections was integrated interfaces of the CPU and connected CPs / CMs - Number of connections was integrated interfaces of the CPU and connected CPs / CMs - Number of connections was integrated interfaces of the CPU and connected CPs / CMs - Number of connections was integrated interfaces of the CPU and connected CPs / CMs - Number of connections was integrated interfaces of the CPU and connected CPs / CMs - Number of connections was integrated interfaces of the CPU and connected CPs / CMs - Number of connections was integrated interfaces of the CPU and connected CPs / CMs - Number of storing yes - MRP	— Isochronous mode	No
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Shared device	— PROFlenergy	Yes; per user program
- Number of IO Controllers with shared device, max activation/deactivation of I-devices - Asset management record Interface types RJ 45 (Ethernet) 100 Mbps	·	No
	— Shared device	Yes
- 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 PROFisafe No Number of connections, max. • Number of connections, max. • Number of connections reserved for ES/HMI/web 10 • Number of connections reserved for ES/HMI/web 10 • Number of strong the paths 16 Redundancy mode • H-Sync forwarding Yes Media redundancy - Media redundancy - MRP - MRP interconnection, supported Yes; as MRP automanager according to IEC 62439-2 Edition 2.0, MRP Manager, MRP Client - MRP Or Strouting and Strong MRPD - Switchover time on line break, typ Number of stations in the ring, max. SIMATIC communication • PG/OP communication • PG/OP communication • ST communication, as client Yes • ST communication, as client Yes • User data per job, max. Open IE communication • TCP/IP - Data length, max. 64 kbyte	 Number of IO Controllers with shared device, max. 	4
The companies of the CPU and connected CPs / CMs	 activation/deactivation of I-devices 	Yes; per user program
RJ 45 (Ethernet) • 100 Mbps	Asset management record	Yes; per user program
• 100 Mbps • Autonegotiation • Autocrossing • Autocrossing • Industrial Ethernet status LED Yes Protocols PROFIsafe No Number of connections, max. • Number of connections reserved for ES/HMI/web • Number of connections via integrated interfaces • Number of connections via integrated interfaces • Number of S7 routing paths • Number of S7 routing paths Redundancy mode • H-Sync forwarding Yes Media redundancy — Media redundancy — MRP interconnection, supported — MRP interconnection, supported — MRP interconnection, supported — Wish in the ring, max. SWIKINDER of Stations in the ring, max. SMATIC communication • PG/OP communication • PG/OP communication • S7 routing • S7 communication • S7 communication, as server • S7 communication, as elent • S7 communication, as elent • User data per job, max. Open IE communication • TCPIP — Data length, max. 64 kbyte	Interface types	
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Number of connections Number of connections, max. Number of connections, max. Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces Number of ST routing paths Number of ST routing Numb		
 Number of connections, max. Number of connections reserved for ES/HMI/web Number of connections via integrated interfaces Number of S7 routing paths H-Sync forwarding H-Sync forwarding Media redundancy Media redundancy MRP MRP (Sient NRP) MRP (Sie		No
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Number of connections via integrated interfaces Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy Media redundancy MRP MRP MRP MRP MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client MRP Client MRPD Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 MRPD Yes; Requirement: IRT Switchover time on line break, typ. Number of stations in the ring, max. SIMATIC communication PG/OP communication PG/OP communication Yes; encryption with TLS V1.3 pre-selected S7 routing Yes S7 communication, as server S7 communication, as server S7 communication, as client User data per job, max. See online help (S7 communication, user data size) Open IE communication TCP/IP Data length, max. 64 kbyte		
Number of S7 routing paths Redundancy mode H-Sync forwarding Media redundancy — Media redundancy — MRP — MRP		
Redundancy mode • H-Sync forwarding Media redundancy — Media redundancy — MRP MRP MRP MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client — MRP interconnection, supported — MRPD MRPD Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT — Switchover time on line break, typ. — Number of stations in the ring, max. SIMATIC communication • PG/OP communication • PG/OP communication • S7 routing • Data record routing • S7 communication, as server • S7 communication, as server • S7 communication, as client • User data per job, max. Open IE communication • TCP/IP — Data length, max. 64 kbyte		
H-Sync forwarding Media redundancy Media redundancy Media redundancy MRP MRP Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client MRP interconnection, supported Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 MRPD Yes; Requirement: IRT Switchover time on line break, typ. Number of stations in the ring, max. SIMATIC communication PG/OP communication PG/OP communication Yes; encryption with TLS V1.3 pre-selected S7 routing Yes Sr communication, as server Yes Sr communication, as server Yes Sr communication, as client Yes User data per job, max. See online help (S7 communication, user data size) Open IE communication TCP/IP Data length, max. 64 kbyte		16
Media redundancy — Media redundancy — MRP — MRP — MRP — MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client — MRP interconnection, supported — MRPD — MRPD — Switchover time on line break, typ. — Number of stations in the ring, max. SIMATIC communication • PG/OP communication • PG/OP communication • S7 routing • Data record routing • S7 communication, as server • S7 communication, as client • User data per job, max. Open IE communication • TCP/IP — Data length, max. only via 1st interface (X1) Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP D Yes; as MRP ring node according to IEC 62439-2 Edition 2.0, MRP Manager; MRP D Yes; Requirement: IRT Yes; encryption with TLS V1.3 pre-selected Yes; encryption with TLS V1.3 pre-selected Yes • S7 communication, as server Yes • S7 communication, user data size)	•	Vac
- Media redundancy - MRP - MRP - MRP - MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client - MRP interconnection, supported - MRPD - MRPD - Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 - MRPD - Yes; Requirement: IRT - Switchover time on line break, typ Number of stations in the ring, max. 50 SIMATIC communication - PG/OP communication - PG/OP communication - Yes; encryption with TLS V1.3 pre-selected - S7 routing - Data record routing - S7 communication, as server - S7 communication, as server - S7 communication, as client - User data per job, max. Open IE communication - TCP/IP - Data length, max. Only ia 1st interface (X1) - Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client - Yes; as MRP ring node according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client - Yes; as MRP ring node according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client - Yes; as MRP ring node according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client - Yes; as MRP ring node according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client - Yes; as MRP ring node according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client - Yes; as MRP ring node according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client - Yes; as MRP ring node according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client - Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 - MRP Client - Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 - Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 - MRP Manager; MRP Client - Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 - Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 - Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 - Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 - Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 - Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 - Yes; according to IEC 62439-2 Edition 3.0 - Yes; according to IEC 62439-2 Edition 3.0 - Y		100
- MRP - Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager; MRP Client - MRP interconnection, supported - MRPD - MRPD - Switchover time on line break, typ Number of stations in the ring, max. SIMATIC communication - PG/OP communication - PG/OP communication - PG state record routing - Data record routing - S7 communication, as server - S7 communication, as client - S8 communication, as client - S9 communication - TCP/IP - Data length, max See online help (S7 communication, user data size)	•	only via 1st interface (X1)
- MRP interconnection, supported - MRPD - MRPD - Switchover time on line break, typ Number of stations in the ring, max. SIMATIC communication • PG/OP communication • PG/OP communication • S7 routing - Data record routing - S7 communication, as server - S7 communication, as client - User data per job, max. See online help (S7 communication, user data size) Open IE communication - TCP/IP - Data length, max. Yes; as MRP ring node according to IEC 62439-2 Edition 3.0 Yes; Requirement: IRT - Yes; Requirement: IRT - Yes; encryption with TLS V1.3 pre-selected - Yes; encryption with TLS V1.3 pre-selected - Yes - S7 communication, as server - Yes - S7 communication, as server - Yes - See online help (S7 communication, user data size)	•	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager;
- MRPD - Switchover time on line break, typ Number of stations in the ring, max. SIMATIC communication • PG/OP communication • S7 routing • Data record routing • S7 communication, as server • S7 communication, as client • User data per job, max. Open IE communication • TCP/IP - Data length, max. Yes, Requirement: IRT 200 ms; For MRP, bumpless for MRPD 200 ms; For MRP, bumpless for MRPD 200 ms; For MRPD 200	— MRP interconnection, supported	
— Number of stations in the ring, max. SIMATIC communication ● PG/OP communication ● Yes; encryption with TLS V1.3 pre-selected ● S7 routing ● Data record routing ● S7 communication, as server ● S7 communication, as client ● User data per job, max. Open IE communication ● TCP/IP — Data length, max. 50 Yes; encryption with TLS V1.3 pre-selected Yes Yes Yes See online help (S7 communication, user data size)	**	
SIMATIC communication PG/OP communication Yes; encryption with TLS V1.3 pre-selected S7 routing Pes Data record routing S7 communication, as server S7 communication, as client User data per job, max. Pes User data per job, max. See online help (S7 communication, user data size) Open IE communication TCP/IP Data length, max. S4 kbyte	 Switchover time on line break, typ. 	200 ms; For MRP, bumpless for MRPD
 PG/OP communication Yes; encryption with TLS V1.3 pre-selected S7 routing Data record routing S7 communication, as server S7 communication, as client User data per job, max. Open IE communication TCP/IP Data length, max. Yes 64 kbyte 	 Number of stations in the ring, max. 	50
 S7 routing Data record routing S7 communication, as server S7 communication, as client S7 communication, as client User data per job, max. See online help (S7 communication, user data size) Open IE communication TCP/IP Data length, max. 64 kbyte 	SIMATIC communication	
Data record routing Yes S7 communication, as server S7 communication, as client Yes User data per job, max. Open IE communication TCP/IP Data length, max. Yes See online help (S7 communication, user data size) Yes See online help (S7 communication, user data size)	PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
 S7 communication, as server S7 communication, as client User data per job, max. Open IE communication TCP/IP Data length, max. Yes 64 kbyte 	S7 routing	Yes
 S7 communication, as client User data per job, max. See online help (S7 communication, user data size) Open IE communication TCP/IP Data length, max. 64 kbyte 	Data record routing	Yes
 User data per job, max. Open IE communication TCP/IP — Data length, max. See online help (S7 communication, user data size) Yes 64 kbyte 	 S7 communication, as server 	Yes
Open IE communication ● TCP/IP — Data length, max. Yes 64 kbyte	 S7 communication, as client 	Yes
TCP/IP	User data per job, max.	See online help (S7 communication, user data size)
— Data length, max. 64 kbyte	Open IE communication	
	• TCP/IP	Yes
— several passive connections per port, supported 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. 118 multicast circuits
• DHCP	Yes
• DNS	Yes
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Encryption Web server	Yes; Optional
Web server ◆ HTTP	Veg. Standard and user nages
• HTTPS	Yes; Standard and user pages Yes; Standard and user pages
OPC UA	res, Standard and user pages
Runtime license required	Yes; "Medium" license required
OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
Application authentication	Yes
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
 User authentication 	"anonymous" or by user name & password
— Number of connections, max.	10
 Number of nodes of the client interfaces, recommended max. 	2 000
 Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_I 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 for session management, per connection, max. 	1
 Number of simultaneous calls of the client instructions for data access, per connection, 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 Application authoritiestics	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition (A&C), Custom Address Space Yes
Application authentication Security policies	available security policies: None, Basic128Rsa15, Basic256Rsa15,
occurry policies	Basic256Sha256, Aes128Sha256RsaOaep, Aes256Sha256RsaPss
 User authentication 	"anonymous" or by user name & password
 — GDS support (certificate management) 	Yes
Number of sessions, max.	48
 Number of accessible variables, max. 	100 000
 Number of registerable nodes, max. 	20 000
 Number of subscriptions per session, max. 	50
— Sampling interval, min.	100 ms
— Publishing interval, min.	100 ms
 Number of server methods, max. 	50
 Number of inputs/outputs per server method, max. 	20
 Number of monitored items, recommended max. 	4 000; for 1 s sampling interval and 1 s send interval
Number of server interfaces, max.	10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace"
 Number of nodes for user-defined server interfaces, max. 	30 000
Alarms and Conditions	Yes
Number of program alarms	200
Number of program alarms Number of alarms for system diagnostics	100
Further protocols	

• MODBUS	Yes; MODBUS TCP
S7 message functions	100, 1100 2000 101
Number of login stations for message functions, max.	64
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	1 000
Number of alarms for system diagnostics	200
 Number of alarms for motion technology objects 	160
Test commissioning functions	
Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 8 engineering systems
Status block	Yes; Up to 8 simultaneously (in total across all ES clients)
Single step	No
Number of breakpoints	8
Status/control	
	Yes
Status/control variable Variables	
Variables Number of variables, max.	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Number of variables, max. of which status variables, max.	200: per jeh
— of which status variables, max.	200; per job
— of which control variables, max.	200; per job
Forcing	N.
• Forcing	Yes
Forcing, variables	Peripheral inputs/outputs
Number of variables, max.	200
Diagnostic buffer	
• present	Yes
 Number of entries, max. 	3 200
— of which powerfail-proof	500
Traces	
Number of configurable Traces	4; Up to 512 KB of data per trace are possible
Number of configurable Traces Interrupts/diagnostics/status information	4; Up to 512 KB of data per trace are possible
	4; Up to 512 KB of data per trace are possible
Interrupts/diagnostics/status information	4; Up to 512 KB of data per trace are possible Yes
Interrupts/diagnostics/status information Diagnostics indication LED	
Interrupts/diagnostics/status information Diagnostics indication LED • RUN/STOP LED	Yes
Interrupts/diagnostics/status information Diagnostics indication LED • RUN/STOP LED • ERROR LED	Yes Yes
Interrupts/diagnostics/status information Diagnostics indication LED • RUN/STOP LED • ERROR LED • MAINT LED	Yes Yes Yes
Interrupts/diagnostics/status information Diagnostics indication LED • RUN/STOP LED • ERROR LED • MAINT LED • STOP ACTIVE LED	Yes Yes Yes Yes Yes
Interrupts/diagnostics/status information Diagnostics indication LED • RUN/STOP LED • ERROR LED • MAINT LED • STOP ACTIVE LED • Connection display LINK TX/RX	Yes
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control	Yes
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects	Yes
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources	Yes
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis	Yes
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per positioning axis	Yes
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per positioning axis — per synchronous axis	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160 80
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources per speed-controlled axis per positioning axis per synchronous axis per external encoder per output cam	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160 80 20
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources per speed-controlled axis per positioning axis per synchronous axis per external encoder per output cam per cam track	Yes Yes Yes Yes Yes Yes Yes Yes Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160 80 20 160
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder — per output cam — per cam track — per probe	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160 80 20
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources per speed-controlled axis per positioning axis per synchronous axis per external encoder per output cam per cam track per probe Positioning axis Number of positioning axes at motion control cycle	Yes Yes Yes Yes Yes Yes Yes Yes Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160 80 20 160
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder — per output cam — per cam track — per probe Positioning axis — Number of positioning axes at motion control cycle of 4 ms (typical value) — Number of positioning axes at motion control cycle	Yes Yes Yes Yes Yes Yes Yes Yes Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160 80 20 160 40
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder — per output cam — per cam track — per probe Positioning axis — Number of positioning axes at motion control cycle of 4 ms (typical value)	Yes Yes Yes Yes Yes Yes Yes Yes Yes Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160 80 20 160 40 11
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per positioning axis — per synchronous axis — per external encoder — per output cam — per cam track — per probe Positioning axis — Number of positioning axes at motion control cycle of 4 ms (typical value) — Number of positioning axes at motion control cycle of 8 ms (typical value)	Yes Yes Yes Yes Yes Yes Yes Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool 2 400 40 80 160 80 20 160 40 11
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per positioning axis — per external encoder — per output cam — per cam track — per probe Positioning axis — Number of positioning axes at motion control cycle of 4 ms (typical value) — Number of positioning axes at motion control cycle of 8 ms (typical value) Controller PID_Compact	Yes
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources per speed-controlled axis per positioning axis per external encoder per output cam per cam track per probe Positioning axis Number of positioning axes at motion control cycle of 4 ms (typical value) Number of positioning axes at motion control cycle of 8 ms (typical value) Controller PID_Compact PID_Step	Yes
Interrupts/diagnostics/status information Diagnostics indication LED RUN/STOP LED ERROR LED MAINT LED STOP ACTIVE LED Connection display LINK TX/RX Supported technology objects Motion Control Number of available Motion Control resources for technology objects Required Motion Control resources — per speed-controlled axis — per positioning axis — per external encoder — per output cam — per cam track — per probe Positioning axis — Number of positioning axes at motion control cycle of 4 ms (typical value) — Number of positioning axes at motion control cycle of 8 ms (typical value) Controller PID_Compact	Yes

High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
horizontal installation, min.	-30 °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. 	-30 °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 / programming / header	
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
Know-how protection	
 User program protection/password protection 	Yes
Copy protection	Yes
Block protection	Yes
Access protection	
 protection of confidential configuration data 	Yes
 Password for display 	Yes
 Protection level: Write protection 	Yes
 Protection level: Read/write protection 	Yes
 Protection level: Write protection for Failsafe 	No
Protection level: Complete protection	Yes
programming / cycle time monitoring / header	
• lower limit	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time
Dimensions	
Width	70 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	456 g

last modified:

8/8/2023