## **SIEMENS**

## **Data sheet**



SIMATIC S7-1500T, CPU 1518T-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

Product type designation	General information	
Firmware version V3.0  Product function  • I&M data • Isochronous mode  • I&M data • Isochronous mode  Fingineering with • STEP 7 TIA Portal configurable/integrated from version  Configuration control  via dataset Ves  Display  Screen diagonal [cm]  Control elomots  Number of keys 6 Mode selector switch 1  Supply voltage  Rated value (DC) permissible range, lower limit (DC) permissible range, upper limit (DC) Permissible range, upper limit (DC) Alains buffering • Nains-Voltage failure stored energy time • Reverse polarity protection  Alains-Voltage failure stored energy time • Repeat rate, min.  1 Is  Input current  Current consumption (reted value)  Current consumption (reted value)  Current consumption, max.  In 9 A, Rated value  Pr  Infeed power to the backplane bus (balanced)  Power consumption from the backplane bus (balanced)  Power coss. yp.  24 W  Memory  Number of slots for SIMATIC memory card  1 SIMATIC memory card quired  Ves  Work memory	Product type designation	CPU 1518T-4 PN/DP
Product function  • I&M data • Isochronous mode  Engineering with • STEP 7 TIA Portal configurable/integrated from version  Configuration control  via dataset  Ves  Display  Screen diagonal [cm]  Control elements  Number of keys  Allow (DC)  permissible range, lower limit (DC)  permissible range, lower lim	HW functional status	FS11
• I&M data • Isochronous mode • STEP 7 TIA Portal configurable/integrated from version • STEP 7 TIA Portal configurable/integrated from version  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)  permissible range, lower limit (DC)  permissible range, uoper limit (DC)  permissible range, uoper limit (DC)  Reverse polarity protection  • Reverse polarity protection  • Repeat rate, min. • Mains/voltage failure stored energy time • Repeat rate, min.  Lourrent consumption (rated value)  Current consumption (rated value)  Lourent, max.  1.9 A  Inrush current, max.  1.9 A; Rated value  Prever consumption from the backplane bus (balanced)  Power consumptio	Firmware version	V3.0
Schronous mode  Yes; Distributed and central; with minimum OB 6x cycle of 125 µs (distributed) and 1 ms (central)  Figure and 1 ms (central)  V18 (FW V3.0) / V17 (FW V2.9) or higher  Configuration control  V18 (FW V3.0) / V17 (FW V2.9) or higher  Control eloments  Number of keys  6  Mode selector switch  1  Supply voltage  Rated value (DC)  permissible range, lower limit (DC)  19.2 V  permissible range, upper limit (DC)  Reverse polarity protection  Walans buffering  • Mains voltage failure stored energy time • Repeat rate, min.  Inust current.  Current consumption (rated value)  1.55 A  Current consumption (rated value)  1.9 A; Rated value  Power onsumption from the backplane bus  Power oussumption from the backplane bus (balanced)  Power loss, lyp.  Memory  Number of slots for SIMATIC memory card  SIMATIC memory card required  Work memory  V18 (FW V3.0) / V17 (FW V2.9) or higher  V18 (FW V3.0) / V18 (FW V3.0)  V18 (FW V3.0) / V17 (FW V2.9) or higher  V18 (FW V3.0) / V18 (FW V3.0)  V18 (FW V3.0) / V18 (FW V3.0)  V19 (FW V3.0) / V18 (FW V3.0)  V	Product function	
and 1 ms (central)  In STEP 7 TIA Portal configurable/integrated from version  Configuration control  via dataset  Yes  Display  Screen diagonal [cm]  Soreen diagonal [cm]  Sor	• I&M data	Yes; I&M0 to I&M3
• STEP 7 TIA Portal configurable/integrated from version  Configuration control  via dataset  Yes  Pisplay  Screen diagonal [cm]  6.1 cm  Control elements  Number of keys  6  Mode selector switch  1  Supply voltage  Rated value (DC)  permissible range, lower limit (DC)  permissible range, upper limit (DC)  permissible range, upper limit (DC)  permissible range, upper limit (DC)  Reverse polarity protection  Yes  Mains buffering  • Mains/voltage failure stored energy time  • Repeat rate, min.  Il/s  Input current  Current consumption (rated value)  Current consumption, max.  1.9 A  Linush current, max.  Power  Infeed power to the backplane bus  Power consumption from the backplane bus (balanced)  Power loss, typ.  Memory  Number of slots for SIMATIC memory card  SIMATIC memory card required  Ves  Work memory	• Isochronous mode	
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, lower 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  Current consumption, max. 1.9 A Inrush current, max. 1.9 A Inrush current, max. 1.9 A Reverse power to the backplane bus (balanced) 30 W Power consumption from the backplane bus (balanced) 30 W Power loss, typ. 24 W Memory  Number of slots for SIMATIC memory card 1  SIMATIC memory card required Yes Work memory	Engineering with	
Via dataset Yes    Display   Screen diagonal [cm]   6.1 cm	<ul> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	V18 (FW V3.0) / V17 (FW V2.9) or higher
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  Current consumption, max. 1.9 A Inrush current, max. 1.9 A; Rated value  Pt 0.4 A*s  Power  Infeed power to the backplane bus (balanced) 30 W  Power loss  Power loss  Power loss  Power of slots for SIMATIC memory card 1  SIMATIC memory card required Yes  Work memory	Configuration control	
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  Current consumption (max. 1.9 A Inrush current, max. 1.9 A; Rated value  Pt 0.4 A²-s  Power  Infeed power to 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	via dataset	Yes
Number of keys  Mode selector switch  Supply voltage  Rated value (DC)  permissible range, lower limit (DC)  permissible range, upper limit (DC)  permissible range, upper limit (DC)  Reverse polarity protection  **Mains buffering  **Mains/voltage failure stored energy time  **Repeat rate, min.  Input current  Current consumption (rated value)  Current consumption, max.  Inrush current, max.  Pt  **OA A²-s**  **Power*  Infeed power to the backplane bus  power loss, typ.  **Power loss, typ.  **Memory*  Number of slots for SIMATIC memory card  1 SIMATIC memory card required  Yes  Work memory  **Ves  **Automatical materials and supplies the supplies and supplies a	Display	
Number of keys  Mode selector switch  1  Supply voltage  Rated value (DC)  permissible range, lower limit (DC)  permissible range, upper limit (DC)  Reverse polarity protection  Yes  Mains buffering  • Mains/voltage failure stored energy time • Repeat rate, min.  Input current  Current consumption (rated value)  Current consumption, max.  Inrush current, max.  1.9 A  Inrush current, max.  Perower  Infeed power to the backplane bus  Power loss  Power loss  Power loss  Power of slots for SIMATIC memory card  SIMATIC memory card required  Yes  Work memory	Screen diagonal [cm]	6.1 cm
Mode selector switch  Supply voltage  Rated value (DC)  permissible range, lower limit (DC)  permissible range, upper limit (DC)  permissible range, upper limit (DC)  Reverse polarity protection  Mains buffering  • Mains/voltage failure stored energy time  • Repeat rate, min.  Input current  Current consumption (rated value)  Current consumption, max.  1.9 A  Inrush current, max.  1.9 A; Rated value  Pewer  Infeed power to the backplane bus  Power loss  Power loss  Power loss  Power loss typ.  Xery Supply voltage failure stored energy time  1 Supply voltage failure stored energy time  5 ms  5 ms  6 ms  7 ms  6 ms  7 ms  8 ms  7 ms  8 ms  8 ms  9 ms  9 ms  12 W  Power loss  Power loss  Power loss  Power loss typ.  1 Ms  1 M	Control elements	
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 Current consumption, max. 1.9 A Inrush current, max. 1.9 A; Rated value  It 0.4 A²-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	Number of keys	6
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 Current consumption, max. 1.9 A Inrush current, max. 1.9 A; Rated value  Pt 0.4 A²-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	Mode selector switch	1
permissible range, lower limit (DC) permissible range, upper limit (DC) Reverse polarity protection Yes  Mains buffering  • Mains/voltage failure stored energy time • Repeat rate, min.  Input current  Current consumption (rated value) Current consumption, max.  Inrush current, max.  Insubscript 1.9 A; Rated value  I*t  Power  Infeed power to the backplane bus Power consumption from the backplane bus (balanced)  Power loss Power loss, typ.  24 W  Memory  Number of slots for SIMATIC memory card  SIMATIC memory card required Work memory	Supply voltage	
permissible range, upper limit (DC)  Reverse polarity protection  Mains buffering  Mains/voltage failure stored energy time Repeat rate, min.  Input current  Current consumption (rated value)  Current consumption, max.  Inush current, max.  Inush current, max.  Ineed power to the backplane bus Power consumption from the backplane bus (balanced)  Power loss Power loss, typ.  Memory  Number of slots for SIMATIC memory card  SIMATIC memory card required Work memory  Yes  Ves	Rated value (DC)	24 V
Reverse polarity protection  Mains buffering  Mains/voltage failure stored energy time Repeat rate, min.  Input current  Current consumption (rated value)  Inrush current, max.  Inrush current, max.  Inest to the backplane bus Infeed power to the backplane bus Power consumption from the backplane bus (balanced)  Power loss Power loss, typ.  Memory  Number of slots for SIMATIC memory card  SIMATIC memory card required Work memory  Mains buffering  5 ms 5 ms 1/s  1.55 A  1.9 A 1.9 A 1.9 A; Rated value 1.9 A; Rated value 1.9 W 1.9 A; Rated value 1.9 W 1.9	permissible range, lower limit (DC)	19.2 V
Mains buffering  Mains/voltage failure stored energy time Repeat rate, min.  Input current  Current consumption (rated value)  Inrush current, max.  Inrush current, max.  Inrush current, max.  Infeed power to the backplane bus  Power consumption from the backplane bus (balanced)  Power loss  Power loss, typ.  Aumber of slots for SIMATIC memory card  SIMATIC memory card required  Ves  Work memory  Mains buffering  5 ms  5 ms  1/s  1/s  1/s  1.55 A  1.9 A  1.9 A; Rated value  1.9 A; Rated value  1.9 A; Rated value  3 0; W  2 4 W  Memory  Aumber of slots for SIMATIC memory card  1  SIMATIC memory card required  Yes  Work memory	permissible range, upper limit (DC)	28.8 V
Mains/voltage failure stored energy time Repeat rate, min.  Input current  Current consumption (rated value)  Current consumption, max.  Inrush current, max.  Inrush current, max.  If 0.4 A²-s  Power  Infeed power to the backplane bus Power consumption from the backplane bus (balanced)  Power loss Power loss, typ.  24 W  Memory  Number of slots for SIMATIC memory card SIMATIC memory card required Work memory  Wes  Work memory  5 ms 5 ms 5 ms 5 ms 6	Reverse polarity protection	Yes
● Repeat rate, min. 1/s  Input current  Current consumption (rated value) 1.55 A  Current consumption, max. 1.9 A  Inrush current, max. 1.9 A; Rated value  I²t 0.4 A²-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	Mains buffering	
Input current Current consumption (rated value)  Current consumption, max.  Inrush current, max.  Inrush current, max.  Infeed power to the backplane bus Infeed power to the backplane bus Incurrent, max.  Infeed power to the backplane bus Infee	Mains/voltage failure stored energy time	5 ms
Current consumption (rated value)  Current consumption, max.  1.9 A  Inrush current, max.  1.9 A; Rated value  I*t  0.4 A*2-s  Power  Infeed power to the backplane bus  Power consumption from the backplane bus (balanced)  Power loss  Power loss  Power loss, typ.  Memory  Number of slots for SIMATIC memory card  SIMATIC memory card required  Work memory  Ves  Work memory	Repeat rate, min.	1/s
Current consumption, max.  Inrush current, max.  1.9 A; Rated value  1²t  0.4 A²-s  Power  Infeed power to the backplane bus Power consumption from the backplane bus (balanced)  Power loss  Power loss, typ.  24 W  Memory  Number of slots for SIMATIC memory card  SIMATIC memory card required  Yes  Work memory	Input current	
Inrush current, max.  Inrush current, max.  Infeed power to the backplane bus Infeed power to the backplane bus Infeed power consumption from the backplane bus (balanced)  Power loss Power loss, typ.  Power loss, typ.  Infeed power to the backplane bus (balanced)  Infeed power to the backplane bus (balanced)  Infeed power to the backplane bus I	Current consumption (rated value)	1.55 A
Power	Current consumption, max.	1.9 A
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	Inrush current, max.	1.9 A; Rated value
Infeed power to the backplane bus  Power consumption from the backplane bus (balanced)  Power loss  Power loss, typ.  24 W  Memory  Number of slots for SIMATIC memory card  SIMATIC memory card required  Work memory  12 W  13 W  14 W  15 W  16 W  17 W  18 W  18 Work memory	l²t	0.4 A²·s
Power consumption from the backplane bus (balanced)  Power loss  Power loss, typ.  24 W  Memory  Number of slots for SIMATIC memory card  SIMATIC memory card required  Work memory	Power	
Power loss Power loss, typ. 24 W  Memory  Number of slots for SIMATIC memory card 1  SIMATIC memory card required Yes  Work memory	Infeed power to the backplane bus	12 W
Power loss, typ. 24 W  Memory  Number of slots for SIMATIC memory card 1  SIMATIC memory card required Yes  Work memory	Power consumption from the backplane bus (balanced)	30 W
Memory  Number of slots for SIMATIC memory card  SIMATIC memory card required  Yes  Work memory	Power loss	
Number of slots for SIMATIC memory card 1 SIMATIC memory card required Yes Work memory	Power loss, typ.	24 W
SIMATIC memory card required  Yes  Work memory	Memory	
Work memory	Number of slots for SIMATIC memory card	1
	SIMATIC memory card required	Yes
• integrated (for program) 9 Mbyte	Work memory	
	• integrated (for program)	9 Mbyte

• integrated (for data)	60 Mbyte
Load memory	oo mayac
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
	32 Gbyte
Backup	V
maintenance-free	Yes
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
- Cima may	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	0. 05 505
Number range	0 65 535
• Size, max.	1 Mbyte
FC	0. 05 505
Number range	0 65 535
• Size, max.	1 Mbyte
OB	
• Size, max.	1 Mbyte
<ul> <li>Number of free cycle OBs</li> </ul>	100
<ul> <li>Number of time alarm OBs</li> </ul>	20
<ul> <li>Number of delay alarm OBs</li> </ul>	20
<ul> <li>Number of cyclic interrupt OBs</li> </ul>	20; with minimum OB 3x cycle of 100 μs
<ul> <li>Number of process alarm OBs</li> </ul>	50
<ul> <li>Number of DPV1 alarm OBs</li> </ul>	3
<ul> <li>Number of isochronous mode OBs</li> </ul>	3
<ul> <li>Number of technology synchronous alarm OBs</li> </ul>	2
<ul> <li>Number of startup OBs</li> </ul>	100
<ul> <li>Number of asynchronous error OBs</li> </ul>	4
<ul> <li>Number of synchronous error OBs</li> </ul>	2
<ul> <li>Number of diagnostic alarm OBs</li> </ul>	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
	2 010
Retentivity	Vac
— adjustable	Yes
IEC timer	Any (only limited by the main recovery)
Number	Any (only limited by the main memory)
Retentivity	V
— 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), max.	20 Mbyte; When using PS 6 0W 24/48/60 V DC HF
	20 Millyre, Willell dolling F 0 0 0W 24/40/00 V DO FIF
Flag	16 khyto
Size, max.	16 kbyte



Number of clock memories	8; 8 clock memory bit, grouped into one clock memory byte
Number of clock memories  Data blocks	o, a clock memory bit, grouped into one clock memory byte
Retentivity adjustable	Yes
Retentivity adjustable     Retentivity preset	No
Local data	
per priority class, max.	64 kbyte; max. 16 KB per block
Address area	or hayte, max. To the per block
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
Hardware configuration	
Number of distributed IO systems	64; A distributed I/O system is characterized not only by the integration of distributed I/O via PROFINET or PROFIBUS communication modules, but also by the connection of I/O via AS-i master modules or links (e.g. IE/PB-Link)
Number of DP masters	
• integrated	1
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Number of IO Controllers	
• integrated	2
• Via CM	8; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Rack	
<ul> <li>Modules per rack, max.</li> </ul>	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	V
• supported	Yes
• to DP, master	Yes
• in AS, master	Yes
• in AS, slave	Yes
on Ethernet via NTP  Interfaces	Yes
Interfaces	2
Number of PROFINET interfaces	3
Number of PROFIBUS interfaces	1
1. Interface	
Interface types	Voc. V1
RJ 45 (Ethernet)      Number of parts	Yes; X1 2
Number of ports     integrated switch	Yes
integrated switch  Protocols	165
IP protocol	Yes; IPv4
PROFINET IO Controller	Yes Yes
PROFINET TO Controller      PROFINET TO Device	Yes
FI INOTHINE TO DEVICE	100



• 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) Yes - IRT 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. - Number of IO Devices that can be simultaneously 8: in total across all interfaces activated/deactivated, max. - Number of IO Devices per tool, max. 8 - Updating times The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data Update time for IRT — for send cycle of 125 µs 125 us - 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 cycles Update time = set "odd" send clock (any multiple of 125  $\mu$ s: 375  $\mu$ s, 625  $\mu$ s ... 3 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 Yes; IPv4 • IP protocol PROFINET IO Controller Yes • PROFINET IO Device Yes • SIMATIC communication Yes • Open IE communication Yes; Optionally also encrypted • Web server Yes Media redundancy Nο



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 AS-i,
Number of connectable IO Devices, max.	PROFIBUS or PROFINET  128
•	128
— of which in line, max.	
<ul> <li>Number of IO Devices that can be simultaneously activated/deactivated, max.</li> </ul>	8; in total across all interfaces
<ul> <li>Number of IO Devices per tool, max.</li> </ul>	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  3. Interface	Yes; per user program
Interface types	Voo: V2
RJ 45 (Ethernet)      Number of parts	Yes; X3
Number of ports	1 N-
• integrated switch	No
Protocols	
ID 1 1	V ID 4
• IP protocol	Yes; IPv4
PROFINET IO Controller	No
<ul><li>PROFINET IO Controller</li><li>PROFINET IO Device</li></ul>	No No
<ul><li>PROFINET IO Controller</li><li>PROFINET IO Device</li><li>SIMATIC communication</li></ul>	No No Yes
<ul><li>PROFINET IO Controller</li><li>PROFINET IO Device</li></ul>	No No Yes Yes; Optionally also encrypted
<ul> <li>PROFINET IO Controller</li> <li>PROFINET IO Device</li> <li>SIMATIC communication</li> <li>Open IE communication</li> <li>Web server</li> </ul>	No No Yes
<ul> <li>PROFINET IO Controller</li> <li>PROFINET IO Device</li> <li>SIMATIC communication</li> <li>Open IE communication</li> </ul>	No No Yes Yes; Optionally also encrypted
<ul> <li>PROFINET IO Controller</li> <li>PROFINET IO Device</li> <li>SIMATIC communication</li> <li>Open IE communication</li> <li>Web server</li> </ul>	No No Yes Yes; Optionally also encrypted
PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server  Interface	No No Yes Yes; Optionally also encrypted
PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server  Interface Interface types	No No Yes Yes; Optionally also encrypted Yes
PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server  Interface Interface types RS 485	No No Yes Yes; Optionally also encrypted Yes
PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server  Interface Interface types RS 485 Number of ports	No No Yes Yes; Optionally also encrypted Yes
PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server  Interface Interface types RS 485 Number of ports Protocols	No No Yes Yes; Optionally also encrypted Yes  Yes; X4
PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server  Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master	No No Yes Yes; Optionally also encrypted Yes  Yes; X4 1
PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server  Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave	No No Yes Yes; Optionally also encrypted Yes  Yes; X4 1  Yes No
PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server  Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication	No No Yes Yes; Optionally also encrypted Yes  Yes; X4 1  Yes No
PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server  Interface Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master	No No Yes Yes; Optionally also encrypted Yes  Yes; X4 1  Yes No Yes
PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server  Interface Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max.	No No Yes Yes; Optionally also encrypted Yes  Yes; X4 1  Yes No Yes  48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i,
PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server  Interface Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max.	No No Yes Yes; Optionally also encrypted Yes  Yes; X4 1  Yes No Yes  48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i,
PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server  Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max.  Services — PG/OP communication	No No Yes Yes; Optionally also encrypted Yes  Yes; X4 1  Yes No Yes  48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET  Yes
PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server  Interface Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max.  Services — PG/OP communication — Equidistance	No No Yes Yes; Optionally also encrypted Yes  Yes; X4 1  Yes No Yes  48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET  Yes Yes
PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server  Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max.  Services — PG/OP communication — Equidistance — Isochronous mode	No No Yes Yes; Optionally also encrypted Yes  Yes; X4 1  Yes No Yes  48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET  Yes Yes Yes Yes
PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server  Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max.  Services PG/OP communication Equidistance Isochronous mode Activation/deactivation of DP slaves	No No Yes Yes; Optionally also encrypted Yes  Yes; X4 1  Yes No Yes  48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET  Yes Yes
PROFINET IO Controller PROFINET IO Device SIMATIC communication Open IE communication Web server  Interface Interface types RS 485 Number of ports Protocols PROFIBUS DP master PROFIBUS DP slave SIMATIC communication PROFIBUS DP master Number of connections, max. Number of DP slaves, max.  Services — PG/OP communication — Equidistance — Isochronous mode	No No Yes Yes; Optionally also encrypted Yes  Yes; X4 1  Yes No Yes  48; for the integrated PROFIBUS DP interface 125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET  Yes Yes Yes Yes



• 100 Mbps	Yes
• 1000 Mbps	Yes; Only possible at the X3 interface of the CPU 1518
<ul> <li>Autonegotiation</li> </ul>	Yes
<ul> <li>Autocrossing</li> </ul>	Yes
Industrial Ethernet status LED	Yes
RS 485	
Transmission rate, max.	12 Mbit/s
Protocols	
PROFIsafe	No
Number of connections	
Number of connections, max.	384; via integrated interfaces of the CPU and connected CPs / CMs
Number of connections reserved for ES/HMI/web	10
<ul> <li>Number of connections via integrated interfaces</li> </ul>	320
Number of S7 routing paths	64; in total, only 16 S7-Routing connections are supported via PROFIBUS
Redundancy mode	o i, in total, only to or reducing oblineouslib and cappointed that it to induce
H-Sync forwarding	Yes
Media redundancy	
Media redundancy	only via 1st interface (X1)
— MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP Manager;
WILVE	MRP Client
- MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
— MRPD	Yes; Requirement: IRT
<ul> <li>Switchover time on line break, typ.</li> </ul>	200 ms; For MRP, bumpless for MRPD
<ul><li>— Number of stations in the ring, max.</li></ul>	50
SIMATIC communication	
PG/OP communication	Yes; encryption with TLS V1.3 pre-selected
• 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	oce offilite help (or confinitionation, user data size)
• TCP/IP	Yes
— Data length, max.	64 kbyte
— several passive connections per port, supported	Yes
ISO-on-TCP (RFC1006)	Yes
— Data length, max.	
— Data length, max.  ● UDP	64 kbyte 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
• Encryption	Yes; Optional
Web server	
• HTTP	Yes; Standard and user pages
• HTTPS	Yes; Standard and user pages
OPC UA	
Runtime license required	Yes; "Large" license required
OPC UA Client	Yes; Data Access (registered Read/Write), Method Call
<ul> <li>Application authentication</li> </ul>	Yes
— Security policies	Available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256
<ul> <li>User authentication</li> </ul>	"anonymous" or by user name & password
<ul> <li>Number of connections, max.</li> </ul>	40
<ul> <li>Number of nodes of the client interfaces, recommended max.</li> </ul>	5 000
<ul> <li>Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/OPC_I max.</li> </ul>	300



<ul> <li>Number of elements for one call of OPC_UA_NameSpaceGetIndexList, max.</li> </ul>	20
<ul> <li>Number of elements for one call of OPC_UA_MethodGetHandleList, max.</li> </ul>	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
<ul> <li>Number of registerable nodes, max.</li> </ul>	5 000
Number of registerable method calls of	100
OPC_UA_MethodCall, max.  — Number of inputs/outputs when calling	20
OPC_UA_MethodCall, max.  • OPC UA Server	Yes; Data Access (Read, Write, Subscribe), Method Call, Alarms & Condition
	(A&C), Custom Address Space
— Application authentication	Yes
— Security policies	available security policies: None, Basic128Rsa15, Basic256Rsa15, Basic256Sha256, Aes128Sha256RsaOaep, Aes256Sha256RsaPss
<ul> <li>User authentication</li> </ul>	"anonymous" or by user name & password
<ul> <li>— GDS support (certificate management)</li> </ul>	Yes
— Number of sessions, max.	64
<ul> <li>Number of accessible variables, max.</li> </ul>	200 000
<ul> <li>Number of registerable nodes, max.</li> </ul>	50 000
<ul> <li>Number of subscriptions per session, max.</li> </ul>	50
— Sampling interval, min.	10 ms
Publishing interval, min.	10 ms
Number of server methods, max.	100
Number of inputs/outputs per server method, max.	20
Number of imputs/outputs per server method, max.      Number of monitored items, recommended max.	
	24 000; for 1 s sampling interval and 1 s send interval
Number of server interfaces, max.	10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace"
<ul> <li>Number of nodes for user-defined server interfaces, max.</li> </ul>	30 000
<ul> <li>Alarms and Conditions</li> </ul>	Yes
<ul> <li>Number of program alarms</li> </ul>	400
Number of alarms for system diagnostics	200
Further protocols	
• MODBUS	Yes; MODBUS TCP
Isochronous mode	
Equidistance	Yes
S7 message functions	
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	
<ul> <li>Number of program alarms</li> </ul>	4 000
<ul> <li>Number of alarms for system diagnostics</li> </ul>	1 000
Number of alarms for motion technology objects	480
Test commissioning functions	
Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 10 engineering systems
Status block	Yes; Up to 16 simultaneously (in total across all ES clients)
Single step	No
Number of breakpoints	20
Status/control	
	Yes
Status/control variable     Variables	
• Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Number of variables, max.	
<ul><li>— of which status variables, max.</li></ul>	200; per job
— of which control variables, max.	200; per job
	200, po. 100
Forcing	200, ps. 100
• Forcing	Yes



E	8 : 1 : 1 : 1 : 1
Forcing, variables	Peripheral inputs/outputs
Number of variables, max.  Diagnostic buffer.	200
Diagnostic buffer	V
• present	Yes
Number of entries, max.	3 200
— of which powerfail-proof	1 000
Traces  • Number of configurable Traces	9. Up to E12 VD of data par trace are possible
Interrupts/diagnostics/status information	8; Up to 512 KB of data per trace are possible
Diagnostics indication LED	
RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT 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
<ul> <li>Number of available Motion Control resources for technology objects</li> </ul>	15 360
<ul> <li>Required Motion Control resources</li> </ul>	
— 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
<ul> <li>Number of available Extended Motion Control resources for technology objects</li> </ul>	512
<ul> <li>Required Extended Motion Control resources</li> </ul>	
<ul><li>per cam (1 000 points and 50 segments)</li></ul>	2
<ul><li>per cam (10 000 points and 50 segments)</li></ul>	20
— for each set of kinematics	30
<ul> <li>Per leading axis proxy</li> </ul>	3
<ul> <li>Positioning axis</li> </ul>	
<ul> <li>Number of positioning axes at motion control cycle of 4 ms (typical value)</li> </ul>	140
Number of positioning axes at motion control cycle of 8 ms (typical value)	192
Controller	V 11' 1819 1 11 11' 11' 11' 11' 11' 11' 11' 11'
PID_Compact  PID_20t  PID_20t	Yes; Universal PID controller with integrated optimization
PID_3Step  PID_Target	Yes; PID controller with integrated optimization for valves
PID-Temp  Counting and massuring.	Yes; PID controller with integrated optimization for temperature
Counting and measuring	Voo
High-speed counter  Ambient conditions	Yes
Ambient temperature during operation	0 °C
horizontal installation, min.     horizontal installation, may	
<ul> <li>horizontal installation, max.</li> </ul>	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	
<ul> <li>Installation altitude above sea level, max.</li> </ul>	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
configuration / header	
configuration / programming / header	
Programming language	
— LAD	Yes
— FBD	Yes



— STL	Yes
— SCL	Yes
— GRAPH	Yes
Know-how protection	
<ul> <li>User program protection/password protection</li> </ul>	Yes
<ul> <li>Copy protection</li> </ul>	Yes
Block protection	Yes
Access protection	
<ul> <li>protection of confidential configuration data</li> </ul>	Yes
<ul> <li>Password for display</li> </ul>	Yes
<ul> <li>Protection level: Write protection</li> </ul>	Yes
<ul> <li>Protection level: Read/write protection</li> </ul>	Yes
Protection level: Complete protection	Yes
programming / cycle time monitoring / header	
<ul> <li>lower limit</li> </ul>	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time
Dimensions	
Width	175 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	2 079 g

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