## **SIEMENS**

## Data sheet

6ES7513-1AL00-0AB0



SIMATIC S7-1500, CPU 1513-1 PN, CENTRAL PROCESSING UNIT WITH WORKING MEMORY 300 KB FOR PROGRAM AND 1.5 MB FOR DATA, 1. INTERFACE, PROFINET IRT WITH 2 PORT SWITCH, 40 NS BIT-PERFORMANCE, SIMATIC MEMORY CARD NECESSARY

## Product type designation FS06 HW functional status Firmware version V1.7 Engineering with V13 SP1 • STEP 7 TIA Portal can be configured/integrated as of version Display Screen diagonal (cm) 3.45 cm Control elements Number of keys 6 Mode selector switch 1 Supply voltage Type of supply voltage 24 V DC permissible range, lower limit (DC) 19.2 V permissible range, upper limit (DC) 28.8 V Reverse polarity protection Yes Mains buffering 5 ms • Mains/voltage failure stored energy time Input current Current consumption (rated value) 0.7 A Inrush current, max. 1.9 A; nominal I<sup>2</sup>t 0.02 A<sup>2</sup>·s

Power	
Power consumption from the backplane bus	5.5 W
(balanced)	
Infeed power to the backplane bus	10 W
Power losses	
Power loss, typ.	5.7 W
Memory	
SIMATIC Memory Card required	Yes
Work memory	
• integrated (for program)	300 kbyte
• integrated (for data)	1.5 Mbyte
Load memory	
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	
• maintenance-free	Yes
CPU processing times	
for bit operations, typ.	40 ns
for word operations, typ.	48 ns
for fixed point arithmetic, typ.	64 ns
for floating point arithmetic, typ.	256 ns
CPU-blocks	
0. 0 0.00 NO	
Number of elements (total)	2 000; In addition to blocks such as DBs, FBs and FCs, UDTs, global constants, etc. are also regarded as elements
Number of elements (total)	
Number of elements (total)  DB	global constants, etc. are also regarded as elements
Number of elements (total)  DB  • Number range	global constants, etc. are also regarded as elements  1 65 535  1.5 Mbyte; For non-optimized block accesses, the max. size of the
Number of elements (total)  DB  Number range Size, max.	global constants, etc. are also regarded as elements  1 65 535  1.5 Mbyte; For non-optimized block accesses, the max. size of the
Number of elements (total)  DB  • Number range • Size, max.  FB	global constants, etc. are also regarded as elements  1 65 535  1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB
Number of elements (total)  DB  Number range Size, max.  FB  Number range	global constants, etc. are also regarded as elements  1 65 535  1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB  1 65 535  300 kbyte
Number of elements (total)  DB  Number range Size, max.  FB  Number range Size, max.	global constants, etc. are also regarded as elements  1 65 535  1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB  1 65 535
Number of elements (total)  DB  Number range Size, max.  FB  Number range Size, max.  FC	global constants, etc. are also regarded as elements  1 65 535  1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB  1 65 535  300 kbyte
Number of elements (total)  DB  Number range Size, max.  FB  Number range Size, max.  FC  Number range	global constants, etc. are also regarded as elements  1 65 535  1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB  1 65 535  300 kbyte  1 65 535
Number of elements (total)  DB  Number range Size, max.  FB  Number range Size, max.  FC  Number range Size, max.	global constants, etc. are also regarded as elements  1 65 535  1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB  1 65 535  300 kbyte  1 65 535
Number of elements (total)  DB  Number range Size, max.  FB  Number range Size, max.  FC  Number range Size, max.  OB	global constants, etc. are also regarded as elements  1 65 535  1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB  1 65 535 300 kbyte  1 65 535 300 kbyte
Number of elements (total)  DB  Number range Size, max.  FB  Number range Size, max.  FC  Number range Size, max.  OB  Size, max.	global constants, etc. are also regarded as elements  1 65 535  1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB  1 65 535 300 kbyte  1 65 535 300 kbyte
Number of elements (total)  DB  Number range Size, max.  FB  Number range Size, max.  FC  Number range Size, max.  OB  Size, max.  Number of free cycle OBs	global constants, etc. are also regarded as elements  1 65 535 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB  1 65 535 300 kbyte  1 65 535 300 kbyte  300 kbyte
Number of elements (total)  DB  Number range Size, max.  FB  Number range Size, max.  FC  Number range Size, max.  OB  Size, max.  Number of free cycle OBs Number of time alarm OBs	global constants, etc. are also regarded as elements  1 65 535 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB  1 65 535 300 kbyte  1 65 535 300 kbyte  300 kbyte  100 20
Number of elements (total)  DB  Number range Size, max.  FB  Number range Size, max.  FC  Number range Size, max.  OB  Size, max.  Number of free cycle OBs Number of time alarm OBs Number of delay alarm OBs	global constants, etc. are also regarded as elements  1 65 535 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB  1 65 535 300 kbyte  1 65 535 300 kbyte  300 kbyte  20 20
Number of elements (total)  DB  Number range Size, max.  FB  Number range Size, max.  FC  Number range Size, max.  OB  Size, max.  OB  Number of free cycle OBs Number of time alarm OBs Number of delay alarm OBs Number of time interrupt OBs	global constants, etc. are also regarded as elements  1 65 535 1.5 Mbyte; For non-optimized block accesses, the max. size of the DB is 64 KB  1 65 535 300 kbyte  1 65 535 300 kbyte  300 kbyte  20 20 20

<ul> <li>Number isochronous mode OBs</li> </ul>	1
<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	
— can be set	Yes
IEC counter	
Number	Any (only limited by the main memory)
Retentivity	
— can be set	Yes
S7 times	
• Number	2 048
Retentivity	
— can be set	Yes
IEC timer	
• Number	Any (only limited by the main memory)
Retentivity	
— can be set	Yes
Data areas and their retentivity	
retentive data area in total (incl. times, counters, flags), max.	128 kbyte; In total; available retentive memory for bit memories, timers, counters, DBs, and technology data (axes): 88 KB
Flag	
Number, max.	16 kbyte
<ul> <li>Number of clock memories</li> </ul>	8
Data blocks	
Retentivity adjustable	Yes
<ul> <li>Retentivity preset</li> </ul>	No
Local data	
• per priority class, max.	64 kbyte; max. 16 KB per block
Address area	
Number of IO modules	2 048; max. number of modules / submodules
I/O address area	CO Library All investment in the con-
• Inputs	32 kbyte; All inputs are in the process image
Outputs	32 kbyte; All outputs are in the process image

Can be inserted in total  Number of IO Controllers  Integrated  via CM  6; A maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherne can be inserted in total  Rack  Modules per rack, max.  Rack, number of rows, max.  PtP CM		
Outputs (volume) per CM/CP Inputs (volume) Outputs (volume) Skbyte Skbyte Subprocess images Number of subprocess images, max.  Subprocess images Number of bierarchical IO systems Via CM Subprocess images Number of DP masters Via CM Subprocess images Number of IO Controllers Integrated Via CM Subprocess images, max Subprocess images Number of IO Controllers Subprocess images, max Subprocess images Number of IO Controllers Subprocess images Subproces	per integrated IO subsystem	
per CM/CP — Inputs (volume) — Outputs (volume) — Outputs (volume) 8 kbyte  Subprocess images • Number of subprocess images, max.  132  Hardware configuration Number of hierarchical IO systems 9 via CM  Sumber of DP masters • via CM  Can be inserted in total  Number of IO Controllers • Integrated • via CM  Rack • Modules per rack, max. • Rack, number of rows, max.  PIP CM • Number of PIP CMs  Number of PIP CMs  • Type  Deviation per day, max. • Backup time  Operating hours counter • Number • Number • Number • Deviation per day, max. • Backup time  Operating hours counter • Number • Number • Supported • in AS, slave • in AS, slave • on Ethernet via NTP  Iterfaces  Interfaces	— Inputs (volume)	8 kbyte
Inputs (volume) Outputs (volume) Outpu	— Outputs (volume)	8 kbyte
- Outputs (volume)  Subprocess images  Number of subprocess images, max.  Per Controllers  Integrated  Via CM  Number of Integrated  Via CM  Number of North Controllers  Integrated  Via CM  Number of PtP CMs  Number of PtP CMs  Number of PtP CMs  Time of day  Clock  Time of day  Clock  Packup time  Packup time  Number  Number  Time of day  Clock  Time of day  Clock  Time of day  Clock  Time of Sarch Canada  Number  Num	per CM/CP	
Subprocess images  Number of subprocess images, max.  Hardware configuration  Number of hierarchical IO systems  via CM  Standard PROFINET, Ethermore can be inserted in total  Number of IO Controllers  Integrated  via CM  Standard PROFINET, Ethermore can be inserted in total  Number of IO Controllers  Integrated  Number of IO Controllers  Integrated  Number of ROFP (PROFIBUS, PROFINET, Ethermore can be inserted in total  Rack  Modules per rack, max.  Rack, number of rows, max.  PIP CM  Number of PtP CMs  Integrated	— Inputs (volume)	8 kbyte
Number of subprocess images, max.  Hardware configuration Number of hierarchical IO systems  via CM  can be inserted in total  Number of IO Controllers  integrated  via CM  can be inserted in total  Number of IO Controllers  integrated  via CM  can be inserted in total  Rack  Modules per rack, max. Rack, number of rows, max.  PEP CM  Number of PtP CMs  Number of PtP CMs  the number of connectable PtP CMs is only limited by the number of available slots  Time of day  Clock  Type  Deviation per day, max. Backuptime  Operating hours counter  Number  Number  Number  Number  Pte Clock synchronization  supported  in AS, master  in AS, slave  on Ethernet via NTP  Number of PROFINET interfaces  Interface  Interface  Interface  Interface  Interface  Interface  Interfaces  Interface  Interfaces  Interface  Interfaces  Interface Interfa	— Outputs (volume)	8 kbyte
Number of DP masters  • via CM  • via CM  • (s, A maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherns can be inserted in total)  Number of IO Controllers  • Integrated  • via CM  • (s, A maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherns can be inserted in total)  **Rack  • Modules per rack, max.  • Rack, number of rows, max.  • Rack, number of rows, max.  • Number of PtP CMs  • Number of PtP CMs  • Deviation per day, max.  • Backup time  • Number  • Number  • Number  • Number  • Operating hours counter  • Number  • Number  • Integrated  • In S, Slave  • on Ethernet via NTP  **Yes  **Interfaces  Number of PROFINET interfaces  Interface  Interfa	Subprocess images	
Number of hierarchical IO systems  Via CM  Standard Stand	Number of subprocess images, max.	32
Number of DP masters  • via CM  6; A maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Ethernocan be inserted in total  Number of IO Controllers  • Integrated  • via CM  6; A maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Ethernocan be inserted in total  Rack  • Modules per rack, max.  • Rack, number of rows, max.  • PIP CM  • Number of PtP CMs  • Number of PtP CMs  • Type  • Deviation per day, max.  • Backup time  Operating hours counter  • Number  • Number  • Supported  • In AS, master  • in AS, slave  • on Ethernet via NTP  Interfaces  Number of PROFINET interfaces  1 st interface  Interface lypes	Hardware configuration	
via CM     6; A maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherns can be inserted in total  Number of IO Controllers      Integrated     via CM     6; A maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherns can be inserted in total  Rack     Modules per rack, max.     Rack, number of rows, max.  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     Deviation per day, max.     Backup time     Operating hours counter     Number     Number     Number     Number     Tolock synchronization     supported     in AS, master     in AS, slave     on Ethernet via NTP  Interfaces  Number of PROFINET interfaces  1 st interface  Interface ypes	Number of hierarchical IO systems	20
can be inserted in total  Number of IO Controllers  Integrated  In	Number of DP masters	
Integrated  Via CM  Signary (Can be inserted in total)  Rack  Modules per rack, max.  Rack  Number of PtP CM  Number of PtP CMs  Time of day  Clock  Type Deviation per day, max.  Backup time Sackup time Number  Number  Number  Per Colock synchronization  Supported  Number  Namster  Number  Namster  Namster  Ness  Namster  Number  Number of PROFINET interfaces  1 st interface  Interface interface interface in total  Rack maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherne can be inserted in total  Rack maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherne can be inserted in total  Rack maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherne can be inserted in total  Rack maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherne can be inserted in total  Rack maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherne can be inserted in total  Rack maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherne can be inserted in total  Rack maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherne can be inserted in total  Rack maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherne can be inserted in total  Rack maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherne can be inserted in total  Rack maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherne can be inserted in total  Rack maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherne can be inserted in total  Rack maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherne can be inserted in total  Rack maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherne can be inserted in total  Rack maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Etherne can be inserted in total  Rack maximum of 6 CMs/CPs (PROFIBUS, PROFIBUS,	● via CM	6; A maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
via CM     6; A maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Ethernocan be inserted in total)  Rack     Modules per rack, max.     Rack, number of rows, max.  PtP CM     Number of PtP CMs     the number of connectable PtP CMs is only limited by the numb of available slots  Time of day Clock     Type     Hardware clock     Deviation per day, max.     Backup time     6 wk; At 40 °C ambient temperature, typically  Operating hours counter     Number     Number     Clock synchronization     supported     in AS, master     in AS, slave     on Ethernet via NTP  Interfaces Number of PROFINET interfaces  Interface linterface Interface types	Number of IO Controllers	
can be inserted in total  Rack  Modules per rack, max. Rack, number of rows, max.  PtP CM  Number of PtP CMs  the number of connectable PtP CMs is only limited by the numb of available slots  Time of day  Clock  Type Deviation per day, max. Backup time Operating hours counter  Number  Number  Rack, number of connectable PtP CMs is only limited by the numb of available slots  Time of day  Clock  Type Ardware clock We are clock We a	Integrated	1.
Modules per rack, max.     Rack, number of rows, max.  PtP CM  Number of PtP CMs  the number of connectable PtP CMs is only limited by the numb of available slots  Time of day  Clock  Type Deviation per day, max. Backup time  Operating hours counter  Number  Number  Time of day  Clock  Type Part of way, max. Backup time  Operating hours counter  Number  Number  Time of day  Time of day  Time of day  Clock  Type Ard of available slots  Time of day  Toke of way, max.  Toke of way, At 40 °C ambient temperature, typically  Toke of way, At 40 °C ambient temperature, typically	• via CM	6; A maximum of 6 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Rack, number of rows, max.  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 Deviation per day, max. Backup time  Operating hours counter  Number  Number  Time of day  Clock  Type Ard At 40 °C ambient temperature, typically  Operating hours counter  Number  Number  Time of day  Type: 2 s We with a time of available slots  Time of day  Time of day  Type	Rack	
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  Deviation per day, max.  Backup time  When the number of connectable PtP CMs is only limited by the number of available slots  Hardware clock  When the number of connectable PtP CMs is only limited by the number of available slots  Time of day  Clock  Hardware clock  When the number of available slots  When the number of available slots  When the number of available slots  Time of day  The number of process only limited by the number of available slots  Time of day  The number of process only limited by the number of available slots  Time of day  Time of day  The number of process only limited by the number of available slots  Time of day  The number of process only limited by the number of process only limited by the number of available slots  Time of day  The number of process only limited by the number of process only limited by the number of available slots  Time of day  The number of process only limited by the number of available slots  Time of day  The number of process only limited by the number of available slots  Time of day  The number of process only limited by the number of available slots  Time of day  The number of process only limited by the number of available slots  The number of process only limited by the number of available slots  Time of day  The number of process only limited by the number of available slots  Time of day  The number of process only limited by the number of available slots  The number of pro	Modules per rack, max.	32; CPU + 31 modules
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     Deviation per day, max.     Backup time     6 wk; At 40 °C ambient temperature, typically  Operating hours counter     Number     16  Clock synchronization      supported     in AS, master     in AS, slave     on Ethernet via NTP  Interfaces  Number of PROFINET interfaces  Interface types	<ul> <li>Rack, number of rows, max.</li> </ul>	1
Time of day  Clock  Type Deviation per day, max. Backup time What is a supported Interfaces  Number of PROFINET interfaces  Time of day  Hardware clock  10 s; Typ.: 2 s  6 wk; At 40 °C ambient temperature, typically  Operating hours counter  16  Clock synchronization  Yes  Yes  in AS, master Yes  Interfaces  Number of PROFINET interfaces  Interface  Interface types	PtP CM	
Clock  • Type  • Deviation per day, max.  • Backup time  6 wk; At 40 °C ambient temperature, typically  Operating hours counter  • Number  16  Clock synchronization  • supported  • in AS, master  • in AS, slave  • in AS, slave  • on Ethernet via NTP  Interfaces  Number of PROFINET interfaces  Interface types	Number of PtP CMs	the number of connectable PtP CMs is only limited by the number of available slots
<ul> <li>Type</li> <li>Deviation per day, max.</li> <li>Backup time</li> <li>6 wk; At 40 °C ambient temperature, typically</li> </ul> Operating hours counter <ul> <li>Number</li> <li>Clock synchronization</li> <li>supported</li> <li>in AS, master</li> <li>in AS, slave</li> <li>on Ethernet via NTP</li> </ul> Interfaces Number of PROFINET interfaces <ul> <li>Interface types</li> </ul> Interface types <ul> <li>Interface types</li> </ul>	Time of day	
Deviation per day, max. Backup time  Operating hours counter  Number  Number  16  Clock synchronization  supported in AS, master in AS, slave on Ethernet via NTP  Interfaces  Number of PROFINET interfaces  Interface types  10 s; Typ.: 2 s 6 wk; At 40 °C ambient temperature, typically 7 cambient temperature, typically 8 cambient temperature, typically 9 cambient temperature, ty		
Backup time  6 wk; At 40 °C ambient temperature, typically  Operating hours counter  Number  16  Clock synchronization  supported  in AS, master  in AS, slave  on Ethernet via NTP  Ves  Interfaces  Number of PROFINET interfaces  Interface types	• Type	
Operating hours counter  Number  16  Clock synchronization  supported  in AS, master  in AS, slave  on Ethernet via NTP  Interfaces  Number of PROFINET interfaces  Interface  Interface types	<ul><li>Deviation per day, max.</li></ul>	
<ul> <li>Number</li> <li>Clock synchronization</li> <li>supported</li> <li>in AS, master</li> <li>in AS, slave</li> <li>on Ethernet via NTP</li> <li>Interfaces</li> <li>Number of PROFINET interfaces</li> <li>Interface types</li> </ul>	Backup time	6 wk; At 40 °C ambient temperature, typically
Clock synchronization  • supported Yes  • in AS, master Yes  • in AS, slave Yes  • on Ethernet via NTP  Interfaces  Number of PROFINET interfaces  Interface types	Operating hours counter	
<ul> <li>supported</li> <li>in AS, master</li> <li>in AS, slave</li> <li>on Ethernet via NTP</li> </ul> Interfaces Number of PROFINET interfaces Ist interface Interface types		16
<ul> <li>in AS, master</li> <li>in AS, slave</li> <li>on Ethernet via NTP</li> <li>Yes</li> <li>Interfaces</li> <li>Number of PROFINET interfaces</li> <li>1st interface</li> <li>Interface types</li> </ul>		
<ul> <li>in AS, slave</li> <li>on Ethernet via NTP</li> <li>Interfaces</li> <li>Number of PROFINET interfaces</li> <li>1st interface</li> <li>Interface types</li> </ul>	• supported	
on Ethernet via NTP     Yes  Interfaces  Number of PROFINET interfaces  1  1st interface Interface types		
Interfaces  Number of PROFINET interfaces  1  1st interface Interface types	• in AS, slave	Yes
Number of PROFINET interfaces 1  1st interface Interface types	• on Ethernet via NTP	Yes
1st interface Interface types		
Interface types		1
— Number of ports 2		
	·	
— Integrated switch Yes	<ul><li>Integrated switch</li></ul>	Yes

— RJ 45 (Ethernet)	Yes; X1
Protocols	
— PROFINET IO Controller	Yes
— PROFINET IO Device	Yes
<ul> <li>— SIMATIC communication</li> </ul>	Yes
<ul> <li>Open IE communication</li> </ul>	Yes
— Web server	Yes
— Media redundancy	Yes
Interface types	
RJ 45 (Ethernet)	
• 100 Mbps	Yes
<ul><li>Autonegotiation</li></ul>	Yes
<ul> <li>Autocrossing</li> </ul>	Yes
<ul> <li>Industrial Ethernet status LED</li> </ul>	Yes
Protocols	
Number of connections	
Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
<ul> <li>Number of connections reserved for ES/HMI/web</li> </ul>	10
<ul> <li>Number of connections via integrated interfaces</li> </ul>	88
<ul> <li>Number of S7 routing paths</li> </ul>	16
PROFINET IO Controller	
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	Yes
<ul> <li>Open IE communication</li> </ul>	Yes
— IRT	Yes
— MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
— PROFlenergy	Yes
<ul><li>— Prioritized startup</li></ul>	Yes; Max. 32 PROFINET devices
<ul> <li>Number of connectable IO devices, max.</li> </ul>	128; In total, up to 256 distributed I/O devices can be connected via PROFIBUS or PROFINET
— Of which IO devices with IRT and "high performance" option, max.	64
<ul> <li>Max. number of connectable IO devices for RT</li> </ul>	128
— of which in line, max.	128

<ul> <li>Maximum number of IO devices that can be activated/deactivated at the same time.</li> </ul>	8
<ul> <li>Number of IO devices per tool changer, 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
with 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
for IRT with the "high performance" option	
— 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
<ul> <li>For IRT with the "high performance" option and parameter assignment for so-called "odd- numbered" send cycles</li> </ul>	Update time = set "odd" send clock (any multiple of 125 $\mu$ s: 375 $\mu$ s, 625 $\mu$ s 3 875 $\mu$ s)
PROFINET IO Device	
Services	
— PG/OP communication	Yes
— S7 routing	Yes
— Isochronous mode	No
<ul><li>— Open IE communication</li></ul>	Yes
— IRT	Yes
— MRP	Yes
— PROFlenergy	Yes
— Shared device	Yes
<ul> <li>Number of IO controllers with shared device, max.</li> </ul>	4
SIMATIC communication	
S7 communication, as server	Yes
S7 communication, as client	Yes
<ul> <li>User data per job, max.</li> </ul>	See online help (S7 communication, user data size)
Open IE communication	See online help (S7 communication, user data size)
	See online help (S7 communication, user data size) Yes
Open IE communication	

• ISO-on-TCP (RFC1006)	Yes
— Data length, max.	64 kbyte
• UDP	Yes
— Data length, max.	1 472 byte
• DHCP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
Web server	
• HTTP	Yes; Standard and user-defined pages
• HTTPS	Yes; Standard and user-defined pages
Further protocols	
• MODBUS	Yes; MODBUS TCP
Media redundancy	
Switchover time on line break, typically	200 ms
Number of stations in the ring, max.	50
rumber of stations in the ring, max.	
Isochronous mode	
Isochronous operation (application synchronized up	Yes; With minimum OB 6x cycle of 500 μs
to terminal)	
equidistance	Yes
07 ( );	
S7 message functions	
Number of login stations for message functions, max.	32
	32 Yes
Number of login stations for message functions, max.	
Number of login stations for message functions, max.  Block related messages	Yes
Number of login stations for message functions, max.  Block related messages  Number of configurable alarms, max.	Yes
Number of login stations for message functions, max.  Block related messages  Number of configurable alarms, max.  Number of simultaneously active alarms in alarm	Yes
Number of login stations for message functions, max.  Block related messages  Number of configurable alarms, max.  Number of simultaneously active alarms in alarm pool  • Number of reserved user alarms  • Number of reserved alarms for system	Yes 5 000
Number of login stations for message functions, max.  Block related messages  Number of configurable alarms, max.  Number of simultaneously active alarms in alarm pool  • Number of reserved user alarms  • Number of reserved alarms for system diagnostics	Yes 5 000 300 100
Number of login stations for message functions, max.  Block related messages  Number of configurable alarms, max.  Number of simultaneously active alarms in alarm pool  • Number of reserved user alarms  • Number of reserved alarms for system diagnostics  • Number of reserved alarms for motion	Yes 5 000 300
Number of login stations for message functions, max.  Block related messages  Number of configurable alarms, max.  Number of simultaneously active alarms in alarm pool  • Number of reserved user alarms  • Number of reserved alarms for system diagnostics	Yes 5 000 300 100
Number of login stations for message functions, max.  Block related messages  Number of configurable alarms, max.  Number of simultaneously active alarms in alarm pool  • Number of reserved user alarms  • Number of reserved alarms for system diagnostics  • Number of reserved alarms for motion	Yes 5 000 300 100
Number of login stations for message functions, max.  Block related messages  Number of configurable alarms, max.  Number of simultaneously active alarms in alarm pool  • Number of reserved user alarms  • Number of reserved alarms for system diagnostics  • Number of reserved alarms for motion technology objects	Yes 5 000 300 100
Number of login stations for message functions, max.  Block related messages  Number of configurable alarms, max.  Number of simultaneously active alarms in alarm pool  • Number of reserved user alarms  • Number of reserved alarms for system diagnostics  • Number of reserved alarms for motion technology objects  Test commissioning functions	Yes 5 000  300 100 80  Yes; Parallel online access possible for up to 5 engineering
Number of login stations for message functions, max.  Block related messages  Number of configurable alarms, max.  Number of simultaneously active alarms in alarm pool  • Number of reserved user alarms  • Number of reserved alarms for system diagnostics  • Number of reserved alarms for motion technology objects  Test commissioning functions  Joint commission (Team Engineering)	Yes 5 000  300 100 80  Yes; Parallel online access possible for up to 5 engineering systems
Number of login stations for message functions, max.  Block related messages  Number of configurable alarms, max.  Number of simultaneously active alarms in alarm pool  • Number of reserved user alarms  • Number of reserved alarms for system diagnostics  • Number of reserved alarms for motion technology objects  Test commissioning functions  Joint commission (Team Engineering)	Yes 5 000  300 100 80  Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients)
Number of login stations for message functions, max.  Block related messages  Number of configurable alarms, max.  Number of simultaneously active alarms in alarm pool  • Number of reserved user alarms  • Number of reserved alarms for system diagnostics  • Number of reserved alarms for motion technology objects  Test commissioning functions  Joint commission (Team Engineering)  Status block  Single step	Yes 5 000  300 100  80  Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients)
Number of login stations for message functions, max.  Block related messages  Number of configurable alarms, max.  Number of simultaneously active alarms in alarm pool  Number of reserved user alarms  Number of reserved alarms for system diagnostics  Number of reserved alarms for motion technology objects  Test commissioning functions  Joint commission (Team Engineering)  Status block  Single step  Status/control	Yes 5 000  300 100 80  Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No
Number of login stations for message functions, max.  Block related messages  Number of configurable alarms, max.  Number of simultaneously active alarms in alarm pool  • Number of reserved user alarms  • Number of reserved alarms for system diagnostics  • Number of reserved alarms for motion technology objects  Test commissioning functions  Joint commission (Team Engineering)  Status block  Single step  Status/control  • Status/control variable	Yes 5 000  300 100 80  Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No Yes
Number of login stations for message functions, max.  Block related messages  Number of configurable alarms, max.  Number of simultaneously active alarms in alarm pool  Number of reserved user alarms  Number of reserved alarms for system diagnostics  Number of reserved alarms for motion technology objects  Test commissioning functions  Joint commission (Team Engineering)  Status block  Single step  Status/control  Status/control variable  Variables  Number of variables, max.	Yes 5 000  300 100 80  Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No Yes
Number of login stations for message functions, max.  Block related messages  Number of configurable alarms, max.  Number of simultaneously active alarms in alarm pool  Number of reserved user alarms  Number of reserved alarms for system diagnostics  Number of reserved alarms for motion technology objects  Test commissioning functions  Joint commission (Team Engineering)  Status block  Single step  Status/control  Status/control variable  Variables	Yes 5 000  300 100 80  Yes; Parallel online access possible for up to 5 engineering systems Yes; Up to 8 simultaneously (in total across all ES clients) No  Yes Inputs, outputs, memory bits, DB, times, counters

Forcing	
• Force, variables	Inputs, outputs
Number of variables, max.	200
Diagnostic buffer	
• present	Yes
Number of entries, max.	1 000
Of which powerfail-proof	500
Traces	
Number of configurable Traces	4; Up to 512 KB of data per trace are possible
- Number of configurable fraces	1, op to 012 ND of data per trace are possible
Interrupts/diagnostics/status information	
Diagnostics indication LED	
• RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	Yes
<ul> <li>Connection display LINK TX/RX</li> </ul>	Yes
supported technology objects	
Motion	Yes
<ul> <li>Speed-controlled axis</li> </ul>	
— Number of speed-controlled axes, max.	6; Requirement: There must be no other motion technology objects created
<ul> <li>Positioning axis</li> </ul>	
<ul> <li>Number of positioning axes, max.</li> </ul>	6; Requirement: There must be no other motion technology objects created
<ul> <li>Synchronized axes (relative gear synchronization)</li> </ul>	
— Number of axes, max.	3; Requirement: There must be no other motion technology objects created
<ul> <li>External encoders</li> </ul>	
<ul> <li>Number of external encoders, max.</li> </ul>	6; Requirement: There must be no other motion technology objects created
Controller	
<ul><li>PID_Compact</li></ul>	Yes; Universal PID controller with integrated optimization
<ul><li>PID_3Step</li></ul>	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
High-speed counter	Yes
Ambient conditions	
Ambient temperature in 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

Configuration	
programming	
Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— GRAPH	Yes
Know-how protection	
User program protection	Yes
Copy protection	Yes
<ul> <li>Block protection</li> </ul>	Yes
Access protection	
Password for display	Yes
<ul> <li>Protection level: Write protection</li> </ul>	Yes
<ul> <li>Protection level: Read/write protection</li> </ul>	Yes
<ul> <li>Protection level: Complete protection</li> </ul>	Yes
Cycle time monitoring	
• lower limit	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	430 g
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