## **SIEMENS**

## Data sheet

6ES7510-1DJ00-0AB0



\*\*\*SPARE PART\*\*\* SIMATIC DP, CPU 1510SP-1 PN FOR ET 200SP, CENTRAL PROCESSING UNIT WITH WORKING MEMORY 100 KB FOR PROGRAM AND 750 KB FOR DATA, 1. INTERFACE, PROFINET IRT WITH 3 PORT SWITCH, 72 NS BIT-PERFORMANCE, SIMATIC MEMORY CARD NECESSARY, BUSADAPTER NECESSARY FOR PORT 1 AND 2

General information	
Product type designation	CPU 1510SP-1 PN
HW functional status	FS04
Firmware version	V1.8
Engineering with	
<ul> <li>STEP 7 TIA Portal configurable/integrated as of version</li> </ul>	V13 SP1 Update 4
Configuration control	
via dataset	Yes
Control elements	
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	
Mains/voltage failure stored energy time	5 ms

Input current	
Current consumption (rated value)	0.6 A
Inrush current, max.	4.7 A; Rated value
l²t	0.14 A <sup>2</sup> ·s
Power	
Infeed power to the backplane bus	8.75 W
· ·	
Power loss	5000
Power loss, typ.	5.6 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes
Work memory	
• integrated (for program)	100 kbyte
• integrated (for data)	750 kbyte
Load memory	
Plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	
maintenance-free	Yes
CPU processing times	
for bit operations, typ.	72 ns
for word operations, typ.	86 ns
for fixed point arithmetic, typ.	115 ns
for floating point arithmetic, typ.	461 ns
CPU-blocks	
Number of elements (total)	2 000; Blocks (OB, FB, FC, DB) and UDTs
DB	
Number range	1 60 999; subdivided into: number range that can be used by the user: 1 59 999, and number range of DBs created via SFC 86: 60 000 60 999
• Size, max.	750 kbyte; For DBs with absolute addressing, the max. size is 64 KB
FB	
Number range	0 65 535
• Size, max.	100 kbyte
FC	
Number range	0 65 535
• Size, max.	100 kbyte
ОВ	
• Size, max.	100 kbyte
Number of free cycle OBs	100
Number of time alarm OBs	20

<ul> <li>Number of delay alarm OBs</li> </ul>	20
<ul> <li>Number of cyclic interrupt OBs</li> </ul>	20
<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>	1
Number of technology synchronous alarm OBs	2
Number of startup OBs	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
Retentivity	
— adjustable	Yes
IEC timer	
• Number	Any (only limited by the main memory)
Retentivity	
— adjustable	Yes
Data areas and their retentivity	
Flag	
<ul><li>Number, max.</li></ul>	16 kbyte
Number of clock memories	8; 8 clock memory bits, grouped into one clock memory byte
Data blocks	
Retentivity adjustable	Yes
Retentivity preset	No
Local data	
• per priority class, max.	64 kbyte; max. 16 KB per block
Address area	
Number of IO modules	1 024; max. number of modules / submodules

Inputs Outputs Outputs Outputs Outputs Outputs (volume)  - Unputs (volume)  - Outputs (volume)  - Robust (volume)  - Outputs (volume)  - Robust (volume)	I/O address area	
Outputs (volume) 8 kbyte   All outputs are in the process image   Per integrated IO subsystem   Inputs (volume) 8 kbyte   Albert (volume) 8 kbyte   Per CM/CP   Albert (volume) 8 kbyte   Albert (volume) 9 kbyte   Albert (volum	• Inputs	32 kbyte; All inputs are in the process image
per integrated IO subsystem  - Inputs (volume)     - Outputs (volume)     - Number of subprocess images, max.  • Number of subprocess images, max.  • Address space per module  • Address space per module  • Address space per module, max.  • Address space per station  • Address space per station, max.  • 1 280 byte; for central inputs and outputs; depending on configuration  Number of distributed IO systems  • Via CM  Number of IDP masters  • Via CM  • Integrated     - Integrated     - Via CM  • Modules per rack, max.  • Modules per rack, max.  • Modules per rack, max.  • Number of lines, max.  1  PIP CM  • Number of Ines, max.  1  PIP CM  • Number of PP CMs  • Number of PP CMs  • Number of PP CMs  • Number of Lease and the number of connectable PIP CMs is only limited by the number of available slots  Time of day  Clock  • Type  • Backup time • Deviation per day, max.  Operating hours counter  • Number  • Poeviation per day, max.  Operating hours counter  • Number  • Number  • Supported • Sys, Via CM DP module • Ves, Via CM DP module		
Inputs (volume) 8 kbyte  - Outputs (volume) 8 kbyte  per CM/CP  Inputs (volume) 8 kbyte  Outputs (volume) 8 kbyte  Outputs (volume) 8 kbyte  Subprocess images  • Number of subprocess images, max.  Address space per module  • Address space per module, max.  Address space per module, max.  • Address space per station  • Address space per station, max.  1 280 byte; for central inputs and output; depending on configuration  Number of distributed IO systems  • Via CM  Number of IO Controllers  • Integrated • Via CM  • Number of Ines, max.  • Modules per rack, max.  • Modules per rack, max.  • Modules per rack, max.  • Number of IPP CMs  • Number of IPP CMs  • Number of PtP CMs  • Number of PtP CMs  • Hardware clock • Backup time • Beakup time • Deviation per day, max.  Operating hours counter  • Number • Number • Deviation per day, max.  Operating hours counter • Number • Supported • System • Yes • Via CM DP module • Ves • Via CM DP module	•	
- Outputs (volume) per CM/CP - Inputs (volume) - Outputs (volume) - Outputs (volume) - Outputs (volume) - Skbyte  8 kbyte  8 kbyte  9 Number of subprocess images, max.  9 Xaddress space per module • Address space per module, max.  Address space per station • Address space per station  1 280 byte; for central inputs and outputs; depending on configuration  Hardware configuration  Number of Den masters • Via CM  1 Number of Integrated • Via CM  • Number of Ines, max.  • Modules per rack, max. • Modules per rack, max. • Number of lines, max.  1 PIP CM • Number of PIP CMs  • Number of Device in the number of connectable PIP CMs is only limited by the number of available slots  **Time of day**  Clock • Type • Backup time • Deviation per day, max.  10 Cipype • Backup time • Deviation per day, max.  10 Cipype • Backup time • Deviation per day, max.  10 Cipype Type: 2 s  Operating hours counter • Number • Deviation per day, max.  10 Cipype Type: 2 s  Operating hours counter • Number • Deviation per day, max.  10 Cipype Type: 2 s  Operating hours counter • Number • Operating hours counter • Number • Operating hours counter • Supported • Supported • Supported • Supported • Supported • Operating hourse •		8 kbyte
per CM/CP - Inputs (volume) 8 kbyte - Outputs (volume) 8 kbyte  Subprocess images      Number of subprocess images, max. 32  Address space per module      Address space per module      Address space per station     Address space per station      Address space per station, max. 1280 byte; for central inputs and output; depending on configuration  Hardware configuration  Number of distributed IO systems 20  Number of IO Controllers      integrated 1     via CM 0  Rack      Modules per rack, max. 64; CPU + 64 modules + server module (mounting width max. 1 m)      Number of Ines, max. 1  PIP CM      Number of PIP CMs the number of connectable PIP CMs is only limited by the number of available slots  Time of day  Clock      Type		
Inputs (volume) Outputs (volume) Outputs (volume) Outputs (volume) Outputs (volume) Robrocess images Number of subprocess images, max.  Address space per module Address space per module, max Address space per station Address space per station Address space per station, max Via CM Via		,
- Outputs (volume)  Subprocess images  Number of subprocess images, max.  Address space per module, max.  Address space per station  Address space per station, max.  1 280 byte; for central inputs and outputs; depending on configuration  Burnber of distributed IO systems  Via CM  Number of ID P masters  Via CM  1  Number of IO Controllers  integrated  Via CM  Address space per station, max.  Address space per station, max.  Address space per station  1  Number of ID P masters  Via CM  Aumber of ID P masters  Integrated  Via CM  Address space per station  Address space per station  Address space per station  1  Number of ID P masters  Via CM  Address space per station  Address space per station  1  Address space per station  Address space per station  1  20  Number of ID P masters  Address space per station  Address space per station  1  20  Number of ID P module  Address space per station  32 byte; For input and output data respectively  Address space per station  1  28 byte; For input and output data respectively  Address space per station  1  28 byte; For input and output data respectively  10  Address space per station  1  28 byte; For input and output data respectively  4 kodress space per station  Address space per station  1 280 byte; For input and output data respectively  4 kodress space per station  Address space per station  Address space per station  1 280 byte; For input and output data respectively  Address space per station  1 280 byte; For input and output state spectively  1 280 byte; For input and output state spectively  1 280 byte; For input and output state spectively  1 280 byte; For input and output state spectively  1 280 byte; For input and output states per server module  Address space per station  Address space per stati		8 kbyte
Subprocess images  Number of subprocess images, max.  Address space per module  Address space per module, max.  Address space per station  Address space per station  Address space per station, max.  1 280 byte; For input and output data respectively  Address space per station, max.  1 280 byte; for central inputs and outputs; depending on configuration  Hardware configuration  Number of distributed IO systems  Via CM  In  Number of IO Controllers  integrated  Via CM  Address space per station, max.  64; CPU + 64 modules + server module (mounting width max. 1 m)  Number of lines, max.  PHP CM  Number of PtP CMs  the number of connectable PtP CMs is only limited by the number of available slots  Time of day  Clock  Time of day  Clock  Type  Backup time  Deviation per day, max.  10 s; Typ.: 2 s  Operating hours counter  Number  Number  16 Clock synchronization  Supported  Yes  Yes  Via CM DP module		
Number of subprocess images, max.  Address space per module  Address space per module, max.  Address space per station  Address space per station  Address space per station, max.  1 280 byte; for central inputs and outputs; depending on configuration  Hardware configuration  Number of distributed IO systems  Via CM  Number of IO Controllers  integrated  Via CM  Address pace per rack, max.  Modules per rack, max.  Modules per rack, max.  Number of lines, max.  PIP CM  Number of PtP CMs  Time of day  Clock  Type  Backup time  Deviation per day, max.  Deviation per day, max.  Operating hours counter  Number  Number  Number  Number  Pip CM  Pup Hardware clock  Suckup time  Deviation per day, max.  Deprating hours counter  Number  Number  Number  Pip Clock synchronization  Supported  Supported  Yes  Via CM DP module		
Address space per module  Address space per module, max.  Address space per station  Address space per station  Address space per station, max.  1 280 byte; for central inputs and outputs; depending on configuration  Hardware configuration  Number of distributed IO systems  Via CM  Number of IO Controllers  integrated  Via CM  Modules per rack, max.  Modules per rack, max.  Number of lines, max.  Number of lines, max.  PtP CM  Number of PtP CMs  Time of day  Clock  Type  Backup time  Deviation per day, max.  PtP CM  Number  Number  Time of Deviation per day, max.  Deparating hours counter  Number  Number  Number  Number  Pto Pown  Number  Pto Hardware clock  Sackup time  Deviation per day, max.  Deparating hours counter  Number  Number  Number  Number  Pto Pown  Pto Pown  Number  Pto Pown  Pto Pown  Number  Pto Pown  Number  Pto Pown  Pto Pown  Number  Pto Pown  Pto Pown  Pto Pown  Pto Pown  Pto Pown  Pto Pown  Number  Pto Pown  Pto P		32
Address space per module, max.  Address space per station  Address space per station  Address space per station, max.  1 280 byte; for central inputs and outputs; depending on configuration  Number of distributed IO systems  Via CM  Number of IO Controllers  integrated  Via CM  Address per rack, max.  Modules per rack, max.  Number of lines, max.  Number of lines, max.  Number of PtP CMs  Number of PtP CMs  Address space per station, max.  1  PtP CM  Number of IO Controllers  Address space per station, max.  Address space per station and outputs depending on configuration  Address space per station, max.  Address space per station, max.  Address space per station and outputs depending on configuration  Address space per station and outputs depending on configuration  Address space per station and outputs depending on configuration  Address space per station and output space per station and outputs depending on configuration  Address space per station and outputs depending on configuration  Address space per station and outputs depending on configuration  Address space per station and outputs depending on configuration  Address space per station and outputs depending on configuration  Address space per station and outputs depending on configuration  Address space per station  Address space per station and outputs space per station and outpu	·	<u></u>
Address space per station  Address space per station, max.  1 280 byte; for central inputs and outputs; depending on configuration  Number of distributed IC systems  Via CM  Number of IO Controllers  integrated  Via CM  Address per rack, max.  Modules per rack, max.  Number of lines, max.  Number of lines, max.  Address per rack, max.  Number of IO Controllers  Address per rack, max.  Address pace per station, max.  1  Address pace per station, max.  4  Address pace per station, max.  1  Address pace per station, max.  1  Address pace per station per doughting on configuration  Address pace per station per day, max.  1  Address pace per station per day per day.  Address pace per set per day.  Address pace per		32 byte: For input and output data respectively
Address space per station, max.  1 280 byte; for central inputs and outputs; depending on configuration  Hardware configuration  Number of distributed IO systems  Via CM  Number of IO Controllers  integrated Via CM  Nounder of IO Controllers  integrated Via CM  Number of IO Controllers  integrated Via CM  Number of Ines, max.  64; CPU + 64 modules + server module (mounting width max. 1 m)  Number of lines, max.  1  PIP 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 Backup time Deviation per day, max.  Operating hours counter  Number  Number  Number  16  Clock synchronization  supported Yes Via CM DP module  Yes; Via CM DP module  Yes; Via CM DP module	· · ·	
Number of distributed IO systems  Via CM  Number of IO Controllers  integrated Via CM  Modules per rack, max.  Modules per rack, max.  Number of lines, max.  Number of PtP CMs  Number of PtP CMs  Number of PtP CMs  Number of PtP CMs  Number of Oxentrollers  Ithe number of connectable PtP CMs is only limited by the number of available slots  Number of Oxentrollers		
Number of DP masters  • Via CM  Number of IO Controllers  • integrated • Via CM  Rack  • Modules per rack, max. • Number of lines, max.  • Number of lines, max.  • Number of lines, max.  • Number of PtP CMs  • Number of PtP CMs  • Number of PtP CMs  • Number of Qay  Clock  • Type • Backup time • Deviation per day, max.  Deviation per day, max.  Operating hours counter  • Number • Number • Supported • supported • to DP, master • to DP, slave  1  1  1  1  1  1  1  1  1  1  1  1  1	Hardware configuration	
Via CM  Number of IO Controllers  integrated Via CM  Number of Low CM  Number of Low CM  Number of Lines, max.  Number of Lines, max.  Number of Lines, max.  Number of Lines, max.  Number of PtP CMs  Number of PtP CMs  Number of PtP CMs  Number of Lines, max.  Time of day  Clock  Type  Backup time New Counting width max. 1  Hardware clock  Wighter Counting Width max. 1  Mighter Counting Width Max. 1	Number of distributed IO systems	20
Number of IO Controllers  • integrated • Via CM  Rack  • Modules per rack, max. • Number of lines, max.  • Number of PtP CMs • Number of PtP CMs  • Number of PtP CMs  • Type • Backup time • Deviation per day, max.  Operating hours counter • Number • Number • Supported • Supported • Supported • Supported • Supported • to DP, master • to DP, slave  1  1  1  64; CPU + 64 modules + server module (mounting width max. 1 m)  64; CPU + 64 modules + s	Number of DP masters	
integrated Via CM Via CM  Rack  Modules per rack, max.  Number of lines, max.  Number of PtP CMs  Number of PtP CMs  Number of PtP CMs  Hardware clock Sackup time Deviation per day, max.  Operating hours counter  Number  Number  Number  Number  PtP CM  Hardware clock Sackup time Sackup time Clock Supported Yes; Via CM DP module Yes; Via CM DP module  Yes; Via CM DP module	• Via CM	1
Via CM  Rack  Modules per rack, max.  Modules per rack, max.  Number of lines, max.  Number of PtP CMs  Number of PtP CMs  Number of PtP CMs  Time of day  Clock  Type  Backup time  Deviation per day, max.  Deviation per day, max.  Operating hours counter  Number  Number  Number  Number  PtP CMs  Hardware clock  Wight At 40 °C ambient temperature, typically  Stryp.: 2 s  Operating hours counter  Number  Number  Time of day  Clock  Yes  Ves; Via CM DP module  Yes; Via CM DP module  Yes; Via CM DP module	Number of IO Controllers	
Rack  Modules per rack, max.  64; CPU + 64 modules + server module (mounting width max. 1 m)  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  Sackup time  Mumber  Server module (mounting width max. 1 m)  Hardware of connectable PtP CMs is only limited by the number of available slots  Time of day  Clock  Type  Hardware clock  Sw; At 40 °C ambient temperature, typically  Deviation per day, max.  Deviation per day, max.  10 s; Typ.: 2 s  Operating hours counter  Number  Number  TeleClock synchronization  Yes; Via CM DP module  Yes; Via CM DP module	● integrated	1
Modules per rack, max.  64; CPU + 64 modules + server module (mounting width max. 1 m)  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 Backup time Subject of the period of the peri	• Via CM	0
m)  Number of lines, 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  Backup time  Backup time  What is a connectable PtP CMs is only limited by the number of available slots  Time of day  Clock  A type  Backup time  What is a connectable PtP CMs is only limited by the number of available slots  Time of day  Clock  Time of day  Clock  A type  Backup time  What is a connectable PtP CMs is only limited by the number of available slots  Time of day  Clock  Time of day  Clock  Backup time  Backu	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  Hardware clock  Suckup time  Deviation per day, max.  Operating hours counter  Number  Number  16  Clock synchronization  supported  supported  to DP, master  to DP, slave  Yes; Via CM DP module  Yes; Via CM DP module	Modules per rack, max.	
<ul> <li>Number of PtP CMs</li> <li>the number of connectable PtP CMs is only limited by the number of available slots</li> </ul> Time of day Clock <ul> <li>Type</li> <li>Backup time</li> <li>6 wk; At 40 °C ambient temperature, typically</li> <li>Deviation per day, max.</li> <li>10 s; Typ.: 2 s</li> </ul> Operating hours counter <ul> <li>Number</li> <li>Clock synchronization</li> <li>supported</li> <li>to DP, master</li> <li>to DP, slave</li> </ul> The CMS is only limited by the number of available slots <ul> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes; Via CM DP module</li> <li>Yes; Via CM DP module</li> </ul> Yes; Via CM DP module	<ul> <li>Number of lines, max.</li> </ul>	1
Time of day  Clock  Type  Backup time  Deviation per day, max.  Operating hours counter  Number  Number  Clock synchronization  supported  to DP, master  to DP, slave  of available slots  Hardware clock  6 wk; At 40 °C ambient temperature, typically  10 s; Typ.: 2 s  Fig. 16  Concept of the	PtP CM	
Clock  Type  Backup time  When the properties of	Number of PtP CMs	
Clock  Type  Backup time  When the properties of	Time of day	
<ul> <li>Backup time</li> <li>Deviation per day, max.</li> <li>Operating hours counter</li> <li>Number</li> <li>Clock synchronization</li> <li>supported</li> <li>to DP, master</li> <li>to DP, slave</li> <li>6 wk; At 40 °C ambient temperature, typically</li> <li>10 s; Typ.: 2 s</li> <li>16</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes; Via CM DP module</li> <li>Yes; Via CM DP module</li> </ul>	•	
<ul> <li>Deviation per day, max.</li> <li>Operating hours counter</li> <li>Number</li> <li>Clock synchronization</li> <li>supported</li> <li>to DP, master</li> <li>to DP, slave</li> <li>10 s; Typ.: 2 s</li> <li>16</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes; Via CM DP module</li> <li>Yes; Via CM DP module</li> </ul>	• Type	Hardware clock
Operating hours counter  • Number 16  Clock synchronization  • supported Yes  • to DP, master Yes; Via CM DP module  • to DP, slave Yes; Via CM DP module	Backup time	6 wk; At 40 °C ambient temperature, typically
<ul> <li>Number 16</li> <li>Clock synchronization</li> <li>supported Yes</li> <li>to DP, master Yes; Via CM DP module</li> <li>to DP, slave Yes; Via CM DP module</li> </ul>	<ul> <li>Deviation per day, max.</li> </ul>	10 s; Typ.: 2 s
Clock synchronization  • supported  • to DP, master  • to DP, slave  Yes; Via CM DP module  Yes; Via CM DP module	Operating hours counter	
<ul> <li>supported</li> <li>to DP, master</li> <li>to DP, slave</li> <li>Yes; Via CM DP module</li> <li>Yes; Via CM DP module</li> </ul>	Number	16
<ul> <li>to DP, master</li> <li>to DP, slave</li> <li>Yes; Via CM DP module</li> <li>Yes; Via CM DP module</li> </ul>	Clock synchronization	
• to DP, slave  Yes; Via CM DP module	• supported	Yes
	• to DP, master	Yes; Via CM DP module
• in AS, master	• to DP, slave	Yes; Via CM DP module
	• in AS, master	Yes

● in AS, slave	Yes
• on Ethernet via NTP	Yes
Interfaces  Number of PROFINET interfaces	1
Number of PROFIBUS interfaces	1; Via CM DP module
Number of Fixor ibod interfaces	i, via divi di illodule
1. Interface	
Interface types	
<ul><li>Number of ports</li></ul>	3; 1. integr. + 2. via BusAdapter
<ul><li>integrated switch</li></ul>	Yes
• RJ 45 (Ethernet)	Yes; X1
<ul><li>BusAdapter (PROFINET)</li></ul>	Yes; Applicable BusAdapter: BA 2x RJ45, BA 2x FC
Functionality	
PROFINET IO Controller	Yes
<ul> <li>PROFINET IO Device</li> </ul>	Yes
<ul> <li>SIMATIC communication</li> </ul>	Yes
Open IE communication	Yes
Web server	Yes
Media redundancy	Yes
2. Interface	
Interface types	
Number of ports	1
• RS 485	Yes; Via CM DP module
Functionality	
PROFIBUS DP master	Yes
PROFIBUS DP slave	Yes
SIMATIC communication	Yes
Interface types	
RJ 45 (Ethernet)	
• 100 Mbps	Yes
<ul><li>Autonegotiation</li></ul>	Yes
Autocrossing	Yes
Industrial Ethernet status LED	Yes
RS 485	
Transmission rate, max.	12 Mbit/s
Protocols	
Number of connections	
Number of connections, max.	64
<ul> <li>Number of connections reserved for ES/HMI/web</li> </ul>	10

Number of connections via integrated	64
interfaces	
<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>	64; In total, up to 189 distributed I/O devices can be connected via PROFIBUS or PROFINET
— Of which IO devices with IRT, max.	64
<ul> <li>Number of connectable IO Devices for RT, max.</li> </ul>	64
— of which in line, max.	64
<ul> <li>Number of IO Devices that can be simultaneously activated/deactivated, max.</li> </ul>	8
— 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 625 $\mu s$ of the isochronous OB is decisive
— for send cycle of 500 μs	$500~\mu s$ to $8$ ms; Note: In the case of IRT with isochronous mode, the minimum update time of $625~\mu s$ of the isochronous OB is decisive
— 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"	Update time = set "odd" send clock (any multiple of 125 $\mu$ s: 375
send cycles	μs, 625 μs 3 875 μs)
Update time for RT	
— for send cycle of 250 μs	250 μs to 128 ms
— for send cycle of 500 μs	500 μs to 256 ms
— for send cycle of 1 ms	1 ms to 512 ms
— for send cycle of 2 ms	2 ms to 512 ms
— for send cycle of 4 ms	4 ms to 512 ms

PROFINET IO Device	
Services	
<ul><li>— PG/OP communication</li></ul>	Yes
— S7 routing	Yes
<ul><li>— Isochronous mode</li></ul>	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</li> </ul>	4
device, max.	
SIMATIC communication	
<ul> <li>S7 communication, as server</li> </ul>	Yes
<ul> <li>S7 communication, as client</li> </ul>	Yes
<ul><li>User data per job, max.</li></ul>	See online help (S7 communication, user data size)
Open IE communication	
• TCP/IP	Yes
— Data length, max.	64 kbyte
<ul> <li>several passive connections per port, supported</li> </ul>	Yes
• 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
PROFIBUS DP master	
Number of connections, max.	48
Services	
— PG/OP communication	Yes
— S7 routing	Yes
<ul> <li>Data record routing</li> </ul>	Yes
— Isochronous mode	No
— Equidistance	No
— Number of DP slaves	125
<ul> <li>Activation/deactivation of DP slaves</li> </ul>	Yes

Further protocols	
• MODBUS	Yes; MODBUS TCP
Media redundancy	
Switchover time on line break, typ.	200 ms
<ul><li>Number of stations in the ring, max.</li></ul>	50
Isochronous mode	
Isochronous mode Isochronous operation (application synchronized up	Yes; Only with PROFINET; with minimum OB 6x cycle of 625 μs
to terminal)	, , , , , , , , , , , , , , , , , , , ,
S7 message functions	
Number of login stations for message functions, max.	32
Block related messages	Yes
Number of configurable alarms, max.	5 000
Number of simultaneously active alarms in alarm pool	
<ul> <li>Number of reserved user alarms</li> </ul>	300
<ul> <li>Number of reserved alarms for system diagnostics</li> </ul>	100
<ul> <li>Number of reserved alarms for Motion Control technology objects</li> </ul>	80
Test commissioning functions	
Joint commission (Team Engineering)	Yes; Parallel online access possible for up to 3 engineering systems
Status block	Yes; Up to 8 simultaneously (in total across all ES clients)
Single step	No
Status/control	
Status/control variable	Yes
<ul><li>Variables</li></ul>	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
<ul><li>Number of variables, max.</li></ul>	
<ul><li>of which status variables, max.</li></ul>	200; per job
— of which control variables, max.	200; per job
Forcing	
• Forcing	Yes
Forcing, variables	Peripheral inputs/outputs
<ul> <li>Number of variables, max.</li> </ul>	200
Diagnostic buffer	
• present	Yes
<ul> <li>Number of entries, max.</li> </ul>	1 000
— of which powerfail-proof	500
Traces	
Number of configurable Traces	4; Up to 512 KB of data per trace are possible
Interrupts/diagnostics/status information	

Diagnostics indication LED	
RUN/STOP LED	Yes
• ERROR LED	Yes
MAINT LED	Yes
<ul> <li>Monitoring of the supply voltage (PWR-LED)</li> </ul>	Yes
<ul> <li>Connection display LINK TX/RX</li> </ul>	Yes

<ul> <li>Monitoring of the supply voltage (PWR-LED)</li> </ul>	Yes		
<ul> <li>Connection display LINK TX/RX</li> </ul>	Yes		
Supported technology objects			
Motion Control	Yes		
<ul> <li>Speed-controlled axis</li> </ul>			
<ul> <li>Number of speed-controlled axes, max.</li> </ul>	6; Requirement: There must be no other motion technology objects created; note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool		
<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; note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool		
<ul> <li>Synchronized axes (relative gear synchronization)</li> </ul>			
— Number of axes, max.	3; Requirement: There must be no other motion technology objects created; note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool		
External encoders			
<ul> <li>Number of external encoders, max.</li> </ul>	6; Requirement: There must be no other motion technology objects created; note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool		
Controller			
<ul><li>PID_Compact</li></ul>	Yes; Universal PID controller with integrated optimization		
PID_3Step	Yes; PID controller with integrated optimization for valves		
PID-Temp	Yes; PID controller with integrated optimization for temperature		
Counting and measuring			
High-speed counter	Yes		
Ambient conditions			
Ambient temperature during operation			
horizontal installation, min.	0 °C		
<ul> <li>horizontal installation, max.</li> </ul>	60 °C		
<ul> <li>vertical installation, min.</li> </ul>	0 °C		
<ul> <li>vertical installation, max.</li> </ul>	50 °C		
Ambient temperature during storage/transportation			
• min.	-40 °C		
• max.	70 °C		
Configuration			

Configuration
Programming

Programming language	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— GRAPH	Yes
Know-how protection	
User program protection/password protection	Yes
<ul> <li>Copy protection</li> </ul>	Yes
<ul> <li>Block protection</li> </ul>	Yes
Access protection	
Protection level: Write protection	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	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	310 g
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