## **Data sheet**

6ES7516-3AN02-0AB0



SIMATIC S7-1500, CPU 1516-3 PN/DP, central processing unit with 1 MB work memory for program and 5 MB for data, 1st interface: PROFINET IRT with 2-port switch, 2nd interface: PROFINET RT, 3rd interface: PROFIBUS, 10 ns bit performance, SIMATIC Memory Card required

General information	
Product type designation	CPU 1516-3 PN/DP
HW functional status	FS01
Firmware version	V2.9
Product function	
<ul> <li>I&amp;M data</li> </ul>	Yes; I&M0 to I&M3
Isochronous mode	Yes; Distributed and central; with minimum OB 6x cycle of 375 $\mu s$ (distributed) and 1 ms (central)
Engineering with	
<ul> <li>STEP 7 TIA Portal configurable/integrated from version</li> </ul>	V17 (FW V2.9) / V16 (FW V2.8) or higher; with older TIA Portal versions configurable as 6ES7516-3AN01-0AB0
Configuration control	
via dataset	Yes
Display	
Screen diagonal [cm]	6.1 cm
Control elements	
Number of keys	8
Mode buttons	2
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Mains buffering	
<ul> <li>Mains/voltage failure stored energy time</li> </ul>	5 ms
<ul> <li>Repeat rate, min.</li> </ul>	1/s
Input current	
Current consumption (rated value)	0.85 A
Current consumption, max.	1.1 A
Inrush current, max.	2.4 A; Rated value
l²t	0.02 A <sup>2</sup> ·s
Power	
Infeed power to the backplane bus	12 W
Power consumption from the backplane bus (balanced)	6.7 W
Power loss	
Power loss, typ.	7 W
Memory	
Number of slots for SIMATIC memory card	1
SIMATIC memory card required	Yes

# integrated for programy	Wednesday	
Murber (for data)	· · · · · · · · · · · · · · · · · · ·	4 Mb do
Load memory  * Plug in (SIMATIC Memory Card), max.  Backup  * maintenance-free  * Yes  * Maintenance-free  * Number of elements (total)  * Size, max.  * Maintenance-free  * Number range  * Size, max.  * May the size of th		
■ Plug-in (SIMATIC Memory Card), max  ■ maintenance-free  Processing times  For word operations, typ. 10 ns  for word operations, typ. 11 ns  for fixed point arithmetic, typ. 20 ns  For bit operations, typ. 30 ns  For bit operations, typ. 30 ns  For bit operations, typ. 40 ns  For bit operations, typ. 50 ns  For bit operations, typ. 51 ns  For bit operations, typ. 52 ns  For bit operations, typ. 52 ns  For bit operations, typ. 53 ns  For bit operations, typ. 54 ns  For bit operations, typ. 54 ns  For bit operations, typ. 55 ns  For priority class 57 counter  F		5 Mbyte
# naintenance free Possible processing times for bit operations, typ. for fixed point arithmetic, typ. possible process and a pr	•	00 Ob. 4-
maintenance-free		32 Gbyte
CPU processing times         10 ns           for bit operations, typ.         12 ns           for fixed point arithmetic, typ.         16 ns           CPU-blocks         8 8000; Blocks (OB, FB, FC, DB) and UDTs           Number of elements (lotal)         8 8000; 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 95 999, and number range at DBs created via SFC 86; 60 000 66 535           FB         • Number range         0 65 535           • Size, max.         1 Mbyte           FC         • Number range         0 65 535           • Size, max.         1 Mbyte           FC         • Number range         0 65 535           • Size, max.         1 Mbyte           FC         • Number arage         0 65 535           • Size, max.         1 Mbyte           FD         100           • Number of fee cycle OBs         100           • Number of fee cycle OBs         100           • Number of delay alarm OBs         20           • Number of redeay alarm OBs         20           • Number of redeay alarm OBs         3           • Number of retenhology synchronous arror OBs         2           • Number of spectrolop	·	Van
for its operations, typ.  for world operations, typ.  for world operations, typ.  for fived point arithmetic, typ.  for floating point arithmetic, typ.  PCPU-blocks  Number of elements (total)  8 000; Blocks (OB, FB, FC, DB) and UDTS  B  * Number range  • Number range  • Size, max.  1 69 999; subdivided into: number range that can be used by the user 1 59 999, and number range of DBs created via SFC 66: 60 000 60 593   • Size, max.  5 Mbyte, For DBs with absolute addressing, the max_size is 64 KB  FB  • Number range  • Size, max.  1 Mbyte  CB  • Number range  • Size, max.  1 Mbyte  Size, max.  1 Mb		Yes
Torword operations, typ.   12 ns   16 ns   1		
for fixed point arithmetic, typ.   64 ns		
Mumber of elegand by the company of the company o		
CPU-blocks  Number of elements (total)  8 000; Blocks (OB, FB, FC, DB) and UDTs  B  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.  5 Mbyte; For DBs with absolute addressing, the max. size is 64 KB  FB  • Number range  • Size, max.  1 Mbyte  OB  8 Size, max.  1 Mbyte  OB  8 Size, max.  1 Mbyte  OB  9 Size, max.  1 Mbyte  OB  1 Mumber of free cycle OBs  • Number of time alarm OBs  • Number of of cellay alarm OBs  • Number of cyclic interrupt OBs  • Number of process alarm OBs  • Number of process alarm OBs  • Number of process alarm OBs  • Number of bechnology synchronous alarm OBs  • Number of startup OBs  • Number of suphronous error OBs  • Number of suphronous e		
Number of elements (total)  8 000; Blocks (OB, FB, FC, DB) and UDTs  8 Number range  • Number range  • Size, max.  • Size, max.  • Number range  • Size, max.  • Number range  • Size, max.  • Size, max.  • Number range  • Size, max.  • Number of leady alarm OBs  • Number of time alarm OBs  • Number of process alarm OBs  • Number of socknonous mode OBs  • Number of socknonous error OBs  • Number of asynchronous error OBs  • Number of alagnostic alarm OBs  • Number of alagnostic alarm OBs  • Number of socknonous mode OBs  • Number of socknonous mode OBs  • Number of alagnostic alarm OBs  • Number of alagnostic alarm OBs  • Number of alagnostic alarm OBs  • Number of synchronous error OBs  • Number of alagnostic alarm OBs  • Number of synchronous error OBs  • Number of synchronous error OBs  • Number of synchronous error OBs  • Number of alagnostic alarm OBs  • Number of synchronous error OBs  • Number of sync		64 NS
Number range		0.000 PL 1 (OD ED EO DD) 11/DT
Number range		8 000; Blocks (OB, FB, FC, DB) and UD1s
user 1 59 999, and number range of DBs created via SFC 86: 60 000 60 999     • Size, max.		4 00 000 - 16 divided into much a great that are by used by the
Number range   0 65 535	Number range	user: 1 59 999, and number range of DBs created via SFC 86: 60 000
• Number range • Size, max.  1 Mbyte  • Number range • Size, max.  1 Mbyte  • Size, max.  1 Muber Any (only limited by the main memory)  • Retentivity  • Agustable  • Number Any (only limited by the main memory)  • Size, max.  •	• Size, max.	5 Mbyte; For DBs with absolute addressing, the max. size is 64 KB
• Size, max. 1 Mbyte  FC  • Number range • Size, max. 1 Mbyte  • Size, max. 100  • Number of free cycle OBs 100 • Number of time alarm OBs 20 • Number of delay alarm OBs 20 • Number of cyclic interrupt OBs 20, With minimum OB 3x cycle of 250 µs • Number of process alarm OBs 50 • Number of process alarm OBs 3 • Number of IbrV1 alarm OBs 3 • Number of technology synchronous alarm OBs 2 • Number of startup OBs 100 • Number of startup OBs 100 • Number of synchronous error OBs 4 • Number of synchronous error OBs 2 • Number of diagnostic alarm OBs 1 • Number of synchronous error OBs 2 • Number 0 (and in their retentivity  — adjustable Yes  FC counter • Number 2 048  Retentivity — adjustable Yes  FI times • Number 2 048  Retentivity — adjustable Yes  FE Climer • Number 2 048  Retentivity — adjustable Yes  FE Climer • Number 3 (and your jumited by the main memory)  Retentivity — adjustable Yes  FE Climer • Number 4 (and your jumited by the main memory)  Retentivity — adjustable Yes	FB	
FC  • Number range • Size, max.  1 Mbyte  OB  • Size, max.  1 Mbyte  • Number of free cycle OBs • Number of firee cycle OBs • Number of time alarm OBs • Number of cyclic interrupt OBs • Number of cyclic interrupt OBs • Number of process alarm OBs • Number of process alarm OBs • Number of Interrupt OBs • Number OBs •	Number range	0 65 535
• Number range • Size, max.  OB  • Size, max.  1 Mbyte  • Number of free cycle OBs 100  • Number of fime atarm OBs 20 • Number of delay alarm OBs 20 • Number of delay alarm OBs 20 • Number of process alarm OBs 50 • Number of process alarm OBs 50 • Number of Indiana OBs 50 • Number of Size, max.  • Number of Indiana OBs 50 • Number of Size, max.  • Number of Indiana OBs 50 • Number of Indiana OBs 50 • Number of Indiana OBs 50 • Number of Indiana OBs 60 • Number	• Size, max.	1 Mbyte
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OB	Number range	0 65 535
Size, max. Number of free cycle OBs Number of fime alarm OBs Number of delay alarm OBs Number of delay alarm OBs Number of cyclic interrupt OBs Number of pyclic interrupt OBs Number of pycess alarm OBs Number of pycess alarm OBs Number of pycess alarm OBs Number of pych alarm OBs Number of sochronous mode OBs Number of sochronous mode OBs Number of startup OBs Number of startup OBs Number of saynchronous alarm OBs Number of asynchronous error OBs Number of alaynchronous error OBs Number of diagnostic alarm OBs Number of diagnostic alarm OBs Number of delaynchronous error OBs Number of diagnostic alarm OBs Number of delaynchronous error OBs Number of diagnostic alarm OBs Number of delay	• Size, max.	1 Mbyte
Number of free cycle OBs Number of delay alarm OBs Number of oyclic interrupt OBs Number of process alarm OBs Number of isochronous mode OBs Number of isochronous mode OBs Number of startup OBs Number of startup OBs Number of startup OBs Number of startup OBs Number of synchronous error OBs Number of alaynchronous error OBs Number of diagnostic alarm OBs Number of diagnostic alarm OBs Number of diagnostic alarm OBs Nesting depth per priority class Counters Number Nu	OB	
Number of time alarm OBs Number of delay alarm OBs Number of cyclic interrupt OBs Number of process alarm OBs Number of DPV1 alarm OBs Number of DPV1 alarm OBs Number of IDPV1 alarm OBs Number of IDPV1 alarm OBs Number of technology synchronous alarm OBs Number of stochronous mode OBs Number of stochronous error OBs Number of synchronous error OBs Number of aynchronous error OBs Number of diagnostic alarm OBs Number of diagnostic alarm OBs Number of diagnostic alarm OBs Nesting depth per priority class Counters, timers and their retentivity  ST counter Number Number Number Number Any (only limited by the main memory) Retentivity — adjustable Yes  IEC timer Number Any (only limited by the main memory) Retentivity — adjustable Yes  IEC timer Number Any (only limited by the main memory) Retentivity — adjustable Yes  IEC timer Number Any (only limited by the main memory) Retentivity — adjustable Yes  IEC timer Number Any (only limited by the main memory) Retentivity — adjustable Yes  IEC timer Number Any (only limited by the main memory) Retentivity — adjustable Yes  IEC timer Number Any (only limited by the main memory) Retentivity — adjustable Yes  IEC timer Number Any (only limited by the main memory) Retentivity — adjustable Yes	• Size, max.	1 Mbyte
Number of delay alarm OBs Number of cyclic interrupt OBs Number of process alarm OBs Number of DPV1 alarm OBs Number of isochronous mode OBs Number of isochronous mode OBs Number of technology synchronous alarm OBs Number of technology synchronous alarm OBs Number of savrup OBs Number of asynchronous error OBs Number of synchronous error OBs Number of diagnostic alarm OBs Number of diagnostic alarm OBs Number of diagnostic alarm OBs Nesting depth per priority class Qualified Synchronous error OBs Number of diagnostic alarm OBs Nesting depth Per priority class Qualified Synchronous error OBs Number Per priority class Qualified Synchronous error OBs Number Num	<ul> <li>Number of free cycle OBs</li> </ul>	100
Number of cyclic interrupt OBs Number of process alarm OBs Number of process alarm OBs Number of DPV1 alarm OBs Number of iscohronous mode OBs Number of technology synchronous alarm OBs Number of startup OBs Number of startup OBs Number of synchronous error OBs Number of aynchronous error OBs Number of aynchronous error OBs Number of diagnostic alarm OBs Number Per priority class 24  Counter Number Number Number Number And (only limited by the main memory) Retentivity And (only limited by the main memory)	<ul> <li>Number of time alarm OBs</li> </ul>	20
Number of process alarm OBs Number of DPV1 alarm OBs Number of isochronous mode OBs Number of technology synchronous alarm OBs Number of startup OBs Number of saynchronous error OBs Number of asynchronous error OBs Number of synchronous error OBs Number of diagnostic alarm OBs Number of signostic alarm OBs Number of synchronous error OBs Number of diagnostic alarm OBs Nesting depth  per priority class  24  Counters, timers and their retentivity  7 counter Number Number Any (only limited by the main memory) Retentivity — adjustable  Number Number Number Number Any (only limited by the main memory) Retentivity — adjustable  Yes  7 times Number Number Any (only limited by the main memory) Retentivity — adjustable Yes  1 Counter Number Any (only limited by the main memory) Retentivity — adjustable Yes  8 Number Any (only limited by the main memory) Retentivity — adjustable Any (only limited by the main memory) Retentivity — adjustable Any (only limited by the main memory) Retentivity — adjustable Yes  1 EC timer Any (only limited by the main memory) Retentivity — adjustable Yes  1 EC timer Any (only limited by the main memory) Retentivity — adjustable Yes	<ul> <li>Number of delay alarm OBs</li> </ul>	20
Number of DPV1 alarm OBS Number of isochronous mode OBS Number of isochronous mode OBS Number of startup OBS Number of startup OBS Number of saynchronous error OBS Number of synchronous error OBS Number of diagnostic alarm OBS Nesting depth per priority class  Counters, timers and their retentivity  77 counter Number Numb	<ul> <li>Number of cyclic interrupt OBs</li> </ul>	20; With minimum OB 3x cycle of 250 μs
Number of isochronous mode OBs Number of technology synchronous alarm OBs Number of startup OBs Number of saynchronous error OBs Number of synchronous error OBs Number of diagnostic alarm OBs Number of diagnostic alarm OBs Nesting depth per priority class Counters, timers and their retentivity  Tounter Number Number Number Any (only limited by the main memory) Retentivity — adjustable Number Number Any (only limited by the main memory) Retentivity — adjustable Yes  File Cimer Number Any (only limited by the main memory) Retentivity — adjustable Yes  Times Any (only limited by the main memory) Retentivity — adjustable Yes  File Cimer Number Any (only limited by the main memory) Retentivity — adjustable Yes	<ul> <li>Number of process alarm OBs</li> </ul>	50
Number of technology synchronous alarm OBs Number of startup OBs Number of asynchronous error OBs Number of asynchronous error OBs Number of diagnostic alarm OBs Nesting depth per priority class  Counters, timers and their retentivity  S7 counter Number Retentivity  — adjustable Per priority  Any (only limited by the main memory)  Retentivity — adjustable Number Number Any (only limited by the main memory)  Retentivity — adjustable Yes  IEC timer Number Any (only limited by the main memory)  Retentivity — adjustable Yes  S7 times Number Any (only limited by the main memory)  Retentivity — adjustable Yes  Retentivity — adjustable Yes  IEC timer  Number Any (only limited by the main memory)  Retentivity — adjustable Yes  IEC timer  Number Any (only limited by the main memory)  Retentivity — adjustable Yes	<ul> <li>Number of DPV1 alarm OBs</li> </ul>	3
<ul> <li>Number of startup OBs</li> <li>Number of asynchronous error OBs</li> <li>Number of synchronous error OBs</li> <li>Number of diagnostic alarm OBs</li> <li>Nesting depth</li> <li>per priority class</li> <li>24</li> </ul> Counters, timers and their retentivity S7 counter <ul> <li>Number</li> <li>adjustable</li> <li>Yes</li> </ul> IEC counter <ul> <li>Number</li> <li>Any (only limited by the main memory)</li> </ul> Retentivity <ul> <li>adjustable</li> <li>Yes</li> </ul> S7 times <ul> <li>Number</li> <li>adjustable</li> <li>Yes</li> </ul> S7 times <ul> <li>Number</li> <li>adjustable</li> <li>Yes</li> </ul> Fetentivity <ul> <li>adjustable</li> <li>Yes</li> </ul> S7 times <ul> <li>Number</li> <li>adjustable</li> <li>Yes</li> </ul> Fetentivity <ul> <li>adjustable</li> <li>Yes</li> </ul> Fetentivity <ul> <li>Any (only limited by the main memory)</li> </ul> Retentivity <ul> <li>Any (only limited by the main memory)</li> </ul> Retentivity <ul> <li>Any (only limited by the main memory)</li> </ul> Retentivity <ul> <li>Any (only limited by the main memory)</li> </ul> Retentivity <ul> <li>Any (only limited by the main memory)</li> </ul> Retentivity <ul> <li>And (only limited by the main memory)</li> </ul> Retentivity <ul> <li>Any (only limited by the main memory)</li> </ul> Retentivity <ul> <li>Any (only limited by the main memory)</li> </ul> Retentivity <ul> <li>Any (only limited by the main memory)</li> </ul> Retentivity <ul> <li>Any (only limited by the main memory)</li> </ul> Retentivity <ul> <li>Any (only limited by the main memory)</li> </ul> Retentivity <ul> <li>Any (only limited by the main memory)</li> </ul> Any (only limited by the main memory) Yes <ul> <li>Data areas and their retentivity</li> </ul> Data areas and their retentivity	<ul> <li>Number of isochronous mode OBs</li> </ul>	3
<ul> <li>Number of asynchronous error OBs</li> <li>Number of synchronous error OBs</li> <li>Number of diagnostic alarm OBs</li> <li>Nesting depth</li> <li>per priority class</li> <li>24</li> <li>Counters, timers and their retentivity</li> <li>S7 counter</li> <li>Number</li> <li>2 048</li> <li>Retentivity</li> <li>— adjustable</li> <li>Yes</li> <li>IEC counter</li> <li>Number</li> <li>Any (only limited by the main memory)</li> <li>Retentivity</li> <li>— adjustable</li> <li>Yes</li> <li>S7 times</li> <li>Number</li> <li>A Number</li> <li>A Quality and their retentivity</li> <li>— adjustable</li> <li>Yes</li> <li>SF times</li> <li>Number</li> <li>A Number</li> <li>A Number</li> <li>Any (only limited by the main memory)</li> <li>Retentivity</li> <li>— adjustable</li> <li>Yes</li> <li>IEC timer</li> <li>Number</li> <li>Any (only limited by the main memory)</li> <li>Retentivity</li> <li>— adjustable</li> <li>Yes</li> </ul>	<ul> <li>Number of technology synchronous alarm OBs</li> </ul>	2
<ul> <li>Number of synchronous error OBs</li> <li>Number of diagnostic alarm OBs</li> <li>Nesting depth</li> <li>per priority class</li> <li>24</li> </ul> Counters, timers and their retentivity Fo counter <ul> <li>Number</li> <li>Augustable</li> <li>Pes</li> </ul> IEC counter <ul> <li>Number</li> <li>Any (only limited by the main memory)</li> </ul> Retentivity <ul> <li>adjustable</li> <li>Yes</li> </ul> S7 times <ul> <li>Number</li> <li>Any (only limited by the main memory)</li> </ul> Retentivity <ul> <li>adjustable</li> <li>Yes</li> </ul> S7 times <ul> <li>Number</li> <li>Augustable</li> <li>Yes</li> </ul> IEC timer <ul> <li>Number</li> <li>Any (only limited by the main memory)</li> </ul> Retentivity <ul> <li>adjustable</li> <li>Yes</li> </ul> IEC timer <ul> <li>Number</li> <li>Any (only limited by the main memory)</li> </ul> Retentivity <ul> <li>adjustable</li> <li>Yes</li> </ul> Data areas and their retentivity <ul> <li>Yes</li> </ul>	<ul> <li>Number of startup OBs</li> </ul>	100
Number of diagnostic alarm OBs     Nesting depth	<ul> <li>Number of asynchronous error OBs</li> </ul>	4
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  IEC timer  • Number Any (only limited by the main memory)  Retentivity — adjustable Yes  IEC timer  • Number Any (only limited by the main memory)  Retentivity — adjustable Yes  Data areas and their retentivity	<ul> <li>Number of synchronous error OBs</li> </ul>	2
per priority class  Counters, timers and their retentivity  S7 counter      Number     Number     2 048  Retentivity     — adjustable     Yes  IEC counter      Number     Any (only limited by the main memory)  Retentivity     — adjustable     Yes  S7 times      Number     Number     Number     Number     Number     Number     Number     Retentivity     — adjustable     Yes  IEC timer      Number     Any (only limited by the main memory)  Retentivity     — adjustable     Yes  IEC timer      Number     Any (only limited by the main memory)  Retentivity     — adjustable     Yes  Data areas and their retentivity	<ul> <li>Number of diagnostic alarm OBs</li> </ul>	1
Counters, timers and their retentivity  S7 counter  Number  Number  And justable  Pes  IEC counter  Number  Any (only limited by the main memory)  Retentivity  And justable  Yes  S7 times  Number  Number  Number  And justable  Yes  S7 times  Number  And justable  Yes  IEC timer  Number  And justable  Yes  IEC timer  And justable  Yes  IEC timer  And justable  Yes  IEC timer  And justable  Yes  Data areas and their retentivity	Nesting depth	
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)  Any (only limited by the main memory)  Yes	<ul> <li>per priority class</li> </ul>	24
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  IEC timer  • Number Any (only limited by the main memory)  Retentivity — adjustable Yes  Data areas and their retentivity	Counters, timers and their retentivity	
Retentivity  adjustable  Pes  IEC counter  Number Any (only limited by the main memory)  Retentivity adjustable  Number Any (only limited by the main memory)  Yes  S7 times  Number Any (only limited by the main memory)  Pes  IEC timer Any (only limited by the main memory)  Retentivity Any (only limited by the main memory)  Retentivity adjustable Yes  Data areas and their retentivity	S7 counter	
HEC counter  IEC counter  Number Any (only limited by the main memory) Retentivity — adjustable  Number Number Any (only limited by the main memory)  2 048 Retentivity — adjustable  Yes  IEC timer  Number Any (only limited by the main memory)  Retentivity — adjustable Yes  Data areas and their retentivity	Number	2 048
IEC counter	Retentivity	
<ul> <li>Number Any (only limited by the main memory)</li> <li>Retentivity         — adjustable Yes</li> <li>S7 times         <ul> <li>Number 2 048</li> <li>Retentivity</li> <li>— adjustable Yes</li> </ul> </li> <li>IEC timer         <ul> <li>Number Any (only limited by the main memory)</li> <li>Retentivity</li> <li>— adjustable Yes</li> </ul> </li> <li>Data areas and their retentivity</li> </ul>	— adjustable	Yes
Retentivity  adjustable  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	IEC counter	
— adjustable Yes   S7 times 2 048   Retentivity — adjustable   — adjustable Yes   IEC timer Any (only limited by the main memory)   Retentivity — adjustable   — adjustable Yes    Data areas and their retentivity	Number	Any (only limited by the main memory)
S7 times  Number  2 048  Retentivity  — adjustable  IEC timer  Number  Any (only limited by the main memory)  Retentivity  — adjustable  Yes  Data areas and their retentivity	Retentivity	
● Number 2 048  Retentivity  — adjustable Yes  IEC timer  ● Number Any (only limited by the main memory)  Retentivity — adjustable Yes  Data areas and their retentivity	— adjustable	Yes
Retentivity  — adjustable  Yes  IEC timer  • Number  Any (only limited by the main memory)  Retentivity  — adjustable  Yes  Data areas and their retentivity	S7 times	
— adjustable     Yes       IEC timer     Any (only limited by the main memory)       Retentivity     — adjustable       Pata areas and their retentivity	Number	2 048
IEC timer	· · · · · · · · · · · · · · · · · · ·	
● Number Any (only limited by the main memory)  Retentivity  — adjustable Yes  Data areas and their retentivity		Yes
Retentivity — adjustable  Yes  Data areas and their retentivity	IEC timer	
— adjustable Yes  Data areas and their retentivity		Any (only limited by the main memory)
Data areas and their retentivity	•	
		Yes
Retentive data area (incl. timers, counters, flags), max 512 kbyte. In total, available retentive memory for bit memories, timers	Data areas and their retentivity	
7.2 m2/10, m. coan, aranazio rotanti di menere, menere	Retentive data area (incl. timers, counters, flags), max.	512 kbyte; In total; available retentive memory for bit memories, timers,

	counters, DBs, and technology data (axes): 472 KB
Extended retentive data area (incl. timers, counters, flags), max.	5 Mbyte; When using PS 6 0W 24/48/60 V DC HF
Flag	
• Size, max.	16 kbyte
<ul> <li>Number of clock memories</li> </ul>	8; 8 clock memory bit, grouped into one clock memory byte
Data blocks	
Retentivity adjustable	Yes
Retentivity preset	No
Local data	
per priority class, max.	64 kbyte; max. 16 KB per block
Address area	
Number of IO modules	8 192; max. number of modules / submodules
I/O address area	6 132, max. number of modules / submodules
	20 khyto: All inputs are in the present image
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
per integrated IO subsystem	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
per CM/CP	
— Inputs (volume)	8 kbyte
— Outputs (volume)	8 kbyte
Subprocess images	
<ul> <li>Number of subprocess images, max.</li> </ul>	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	
<ul><li>integrated</li></ul>	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
<ul> <li>Number of lines, max.</li> </ul>	1
PtP CM	
Number of PtP CMs	the number of connectable PtP CMs is only limited by the number of available slots
Time of day	
Clock	
• Type	Hardware clock
Backup time	6 wk; At 40 °C ambient temperature, typically
Deviation per day, max.	10 s; Typ.: 2 s
Operating hours counter	
Number	16
Clock synchronization	
• supported	Yes
• to DP, master	Yes
• in AS, master	Yes
	Yes
• in AS, slave	
on Ethernet via NTP	Yes
Interfaces	
Number of PROFINET interfaces	2
Number of PROFIBUS interfaces	1
1. Interface	
Interface types	

DI 45 (5th arm al)	V V4
• RJ 45 (Ethernet)	Yes; X1
Number of ports     integrated quiteb	2 Voa
• integrated switch	Yes
Protocols  • IP protocol	Yes; IPv4
PROFINET IO Controller	Yes
PROFINET IO Device	Yes
SIMATIC communication	Yes
Open IE communication	Yes; Optionally also encrypted
Web server	Yes
Media redundancy	Yes
PROFINET IO Controller	
Services	
— PG/OP communication	Yes
— Isochronous mode	Yes
<ul> <li>Direct data exchange</li> </ul>	Yes; Requirement: IRT and isochronous mode (MRPD optional)
— IRT	Yes
— PROFlenergy	Yes; per user program
<ul> <li>Prioritized startup</li> </ul>	Yes; Max. 32 PROFINET devices
<ul> <li>Number of connectable IO Devices, max.</li> </ul>	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
<ul><li>Of which IO devices with IRT, max.</li></ul>	64
<ul> <li>Number of connectable IO Devices for RT, max.</li> </ul>	256
— of which in line, max.	256
<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 IRT	
— for send cycle of 250 μs	$250~\mu s$ to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 375 $\mu s$ of the isochronous OB is decisive
— for send cycle of 500 μs	500 μs to 8 ms
— for send cycle of 1 ms	1 ms to 16 ms
— for send cycle of 2 ms	2 ms to 32 ms
— for send cycle of 4 ms	4 ms to 64 ms
<ul> <li>With IRT and parameterization of "odd" 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)
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	Voc
— PG/OP communication	Yes
— Isochronous mode	No Voc
— IRT	Yes Vec: per user program
PROFlenergy     Shared device	Yes; per user program 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	100, por door program
Interface types	
• RJ 45 (Ethernet)	Yes; X2
Number of ports	1
integrated switch	No
- integrated switch	No

Protocols	
IP protocol	Yes; IPv4
PROFINET IO Controller	Yes
PROFINET IO Device	Yes
SIMATIC communication	Yes
Open IE communication	Yes; Optionally also encrypted
Web server	Yes
Media redundancy	No
PROFINET IO Controller	No
Services	
— PG/OP communication	Yes
— Isochronous mode	No
Direct data exchange	No
— IRT	No
— PROFlenergy	Yes; per user program
	No
<ul><li>— Prioritized startup</li><li>— Number of connectable IO Devices, max.</li></ul>	
	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
<ul> <li>Number of connectable IO Devices for RT, max.</li> </ul>	32
— of which in line, max.	32
<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
<ul> <li>Isochronous mode</li> </ul>	No
— IRT	No
— PROFlenergy	Yes; per user program
<ul> <li>Prioritized startup</li> </ul>	No
— Shared device	Yes
<ul> <li>Number of IO Controllers with shared device, max.</li> </ul>	4
<ul> <li>activation/deactivation of I-devices</li> </ul>	Yes; per user program
<ul> <li>Asset management record</li> </ul>	Yes; per user program
3. Interface	
Interface types	
• RS 485	Yes; X3
Number of ports	1
Protocols	
PROFIBUS DP master	Yes
PROFIBUS DP slave	No
SIMATIC communication	Yes
PROFIBUS DP master	
Number of connections, max.	
	48; for the integrated PROFIBUS DP interface
<ul> <li>Number of DP slaves, max.</li> </ul>	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
Number of DP slaves, max.  Services	125; In total, up to 1 000 distributed I/O devices can be connected via
	125; In total, up to 1 000 distributed I/O devices can be connected via
Services	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
Services — PG/OP communication	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET  Yes
Services  — PG/OP communication  — Equidistance	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET  Yes Yes
Services  — PG/OP communication  — Equidistance  — Isochronous mode  — Activation/deactivation of DP slaves	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET  Yes Yes Yes
Services  — PG/OP communication  — Equidistance  — Isochronous mode  — Activation/deactivation of DP slaves  Interface types	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET  Yes Yes Yes
Services  — PG/OP communication  — Equidistance  — Isochronous mode  — Activation/deactivation of DP slaves	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET  Yes Yes Yes

Autonomatication	Voc
Autoregotiation     Autorogoing	Yes
<ul> <li>Autocrossing</li> <li>Industrial Ethernet status LED</li> </ul>	Yes
RS 485	Yes
Transmission rate, max.	12 Mbit/s
Protocols	12 Inibio
PROFIsafe	No
Number of connections	110
Number of connections, max.	256; 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>	128
Number of S7 routing paths	16
Redundancy mode	
H-Sync forwarding	Yes
Media redundancy	
<ul> <li>Media redundancy</li> </ul>	only via 1st interface (X1)
— MRP	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0, MRP
	Manager; MRP Client
MRP interconnection, supported	Yes; as MRP ring node according to IEC 62439-2 Edition 3.0
— MRPD	Yes; Requirement: IRT
Switchover time on line break, typ.	200 ms; For MRP, bumpless for MRPD
— Number of stations in the ring, max.  SIMATIC communication	50
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	
• TCP/IP	Yes
— Data length, max.	64 kbyte
<ul> <li>several passive connections per port,</li> </ul>	Yes
supported	
• ISO-on-TCP (RFC1006)	Yes
— Data length, max.	64 kbyte
• UDP	Yes
— Data length, max.	2 kbyte; 1 472 bytes for UDP broadcast
— UDP multicast	Yes; Max. 5 multicast circuits
• DHCP	Yes
DNS     SNMP	Yes Yes
SNMP     DCP	Yes
• LLDP	Yes
• Encryption	Yes; Optional
Web server	. 55, 5 phonds
• HTTP	Yes; Standard and user pages
• HTTPS	Yes; Standard and user pages
OPC UA	
Runtime license required	Yes; "Medium" license required
OPC UA Client	Yes
<ul> <li>Application authentication</li> </ul>	Yes
<ul> <li>Security policies</li> </ul>	Available security policies: None, Basic128Rsa15, Basic256Rsa15,
	Basic256Sha256
— User authentication	"anonymous" or by user name & password
— Number of connections, max.	10
Number of nodes of the client interfaces, max.	2 000
<ul> <li>Number of elements for one call of OPC_UA_NodeGetHandleList/OPC_UA_ReadList/Omax.</li> </ul>	300
<ul> <li>Number of elements for one call of</li> </ul>	20

OPC_UA_NameSpaceGetIndexList, max.	
<ul> <li>Number of elements for one call of OPC_UA_MethodGetHandleList, max.</li> </ul>	100
<ul> <li>Number of simultaneous calls of the client</li> </ul>	1
instructions per connection (except OPC_UA_ReadList,OPC_UA_WriteList,OPC_UA_M max.	
<ul> <li>Number of simultaneous calls of the client</li> </ul>	5
instructions OPC_UA_ReadList,OPC_UA_WriteList and OPC_UA_MethodCall, max.	
Number of registerable nodes, max.	5 000
<ul> <li>Number of registerable method calls of OPC_UA_MethodCall, max.</li> </ul>	100
<ul> <li>Number of inputs/outputs when calling OPC_UA_MethodCall, max.</li> </ul>	20
OPC UA Server	Yes; Data access (read, write, subscribe), method call, custom address space
<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>— GDS support (certificate management)</li> </ul>	Yes
<ul><li>Number of sessions, max.</li></ul>	48
<ul> <li>Number of accessible variables, max.</li> </ul>	100 000
<ul> <li>Number of registerable nodes, max.</li> </ul>	20 000
<ul> <li>Number of subscriptions per session, max.</li> </ul>	20
<ul><li>— Sampling interval, min.</li></ul>	100 ms
— Publishing interval, min.	200 ms
<ul> <li>Number of server methods, max.</li> </ul>	50
<ul> <li>Number of inputs/outputs per server method, max.</li> </ul>	20
Number of monitored items, max.	2 000; for 1 s sampling interval and 1 s send interval
— Number of server interfaces, max.	10 of each "Server interfaces" / "Companion specification" type and 20 of the type "Reference namespace"
Number of nodes for user-defined server interfaces, max.	5 000
Alarms and Conditions	Yes
— Number of program alarms	200
Number of alarms for system diagnostics	100
Further protocols	V MODDIJO TOD
• 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	1,000
Number of program alarms     Number of plarms for system diagnostics	1 000 200
<ul> <li>Number of alarms for system diagnostics</li> <li>Number of alarms for motion technology objects</li> </ul>	160
6.7	100
Test commissioning functions	Voe: Parallel online access possible for up to 9 engineering systems
Joint commission (Team Engineering)  Status block	Yes; Parallel online access possible for up to 8 engineering systems
	Yes; Up to 8 simultaneously (in total across all ES clients) No
Single step  Number of breakpoints	8
Status/control	
Status/control variable	Yes
Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Number of variables, max.	inputoroutputo, momory otto, odo, alottibuted 1/O5, tillie15, coulite15
Trumber of variables, max.	

of which status variables, may	200: pariah
— of which status variables, max.	200; per job
— of which control variables, max.	200; per job
Forcing	Yes
Forcing     Forcing variables	
Forcing, variables     Number of variables, may	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	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
STOP ACTIVE LED	Yes
<ul> <li>Connection display LINK TX/RX</li> </ul>	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>	2 400
Required Motion Control resources	
— 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
Positioning axis	<del>1</del> 0
Number of positioning axes at motion control	7
cycle of 4 ms (typical value)	,
<ul> <li>Number of positioning axes at motion control cycle of 8 ms (typical value)</li> </ul>	14
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 during operation	
horizontal installation, min.	-25 °C; No condensation
horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
vertical installation, min.	-25 °C; No condensation
vertical installation, min.     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	40.00
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
configuration / header	
configuration / programming / header	
Programming language	
— LAD	Yes
— FBD	Yes

— STL	Yes
— SCL	Yes
— GRAPH	Yes
	Tes
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
<ul> <li>Protection level: Complete protection</li> </ul>	Yes
programming / cycle time monitoring / header	
<ul> <li>lower limit</li> </ul>	adjustable minimum cycle time
• upper limit	adjustable maximum cycle time
Dimensions	
Width	70 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	845 g

last modified:

4/1/2022