SIEMENS

Product data sheet 6ES7516-3AN00-0AB0

SIMATIC S7-1500, CPU 1516-3 PN/DP,
CENTRAL PROCESSING UNIT WITH WORKING MEMORY
1 MB FOR PROGRAM AND 5 MB FOR DATA,
1. INTERFACE,
PROFINET IRT WITH 2 PORT SWITCH,
2. INTERFACE, ETHERNET, 3. INTERFACE,
PROFIBUS, 10 NS BIT-PERFORMANCE,
SIMATIC MEMORY CARD NECESSARY

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General information	
Hardware product version	FS04
Display	
with display	Yes
Screen diagonal (cm)	6.1 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
Input current	
Current consumption (rated value)	0.85 A
Inrush current, max.	2.4 A ; Rated value
I²t	0.02 A²·s
Power	
Power consumption from the backplane bus (balanced)	6.7 W

Infeed power to the backplane bus	12 W
Power loss	
Power loss, typ.	7 W
Memory	
SIMATIC Memory Card required	Yes
Work memory	
integrated (for program)	1 Mbyte
integrated (for data)	5 Mbyte
Load memory	
plug-in (SIMATIC Memory Card), max.	32 Gbyte
Backup	
maintenance-free	Yes
CPU processing times	
for bit operations, typ.	10 ns
for word operations, typ.	12 ns
for fixed point arithmetic, typ.	16 ns
for floating point arithmetic, typ.	64 ns
CPU-blocks	
Number of blocks (total)	6000
DB	
Number, max.	6000 ; Number range: 1 to 65535
Size, max.	5 Mbyte
FB	
Number, max.	5998 ; Number range: 1 to 65535
Size, max.	512 kbyte
FC	
Number, max.	5999 ; Number range: 1 to 65535
Size, max.	512 kbyte
OB	
Size, max.	512 kbyte
Number of free cycle OBs	100
Number of time alarm OBs	20
Number of delay alarm OBs	20
Number of time interrupt OBs	20
Number of process alarm OBs	50
Number of DPV1 alarm OBs	3
Number of isochronous mode OBs	2
Number of technology synchronous alarm OBs	2

Number of startup OBs	100
Number of asynchronous error OBs	4
Number of synchronous error OBs	2
Number of diagnostic alarm OBs	1
Nesting depth	
per priority class	24
Counters, timers and their retentivity	
S7 counter	
Number	2048
Retentivity	
adjustable	Yes
IEC counter	
Number	Any (only limited by the main memory)
Retentivity	
adjustable	Yes
S7 times	
Number	2048
Retentivity	
adjustable	Yes
IEC timer	
Number	Any (only limited by the main memory)
Retentivity	
adjustable	Yes
Data areas and their retentivity	
retentive data area in total (incl. times, counters, flags), max.	512 kbyte
Flag	
Number, max.	16 kbyte
Number of clock memories	8
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	8192
I/O address area	
Inputs	32 kbyte ; All inputs are in the process image
Outputs	32 kbyte ; All outputs are in the process image

per integrated IO subsystem	
Inputs (volume)	8 kbyte
Outputs (volume)	8 kbyte
per CM/CP	
Inputs (volume)	8 kbyte
Outputs (volume)	8 kbyte
Subprocess images	
Number of subprocess images, max.	32
Address space per module	
Number of IO subsystems	10
Hardware configuration	
Number of DP masters	
integrated	1
via CM	8 ; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Number of IO Controllers	
integrated	1
via CM	8 ; A maximum of 8 CMs/CPs (PROFIBUS, PROFINET, Ethernet) can be inserted in total
Rack	
Modules per rack, max.	32 ; CPU + 31 modules
Rack, number of rows, 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
Deviation per day, max.	10 s ; Typ.: 2 s
Backup time	6 wk ; At 40 °C ambient temperature, typically
Operating hours counter	
Number	8
Clock synchronization	
supported	Yes
to DP, master	Yes
in AS, master	Yes
in AS, slave	Yes
on Ethernet via NTP	Yes
Interfaces	

Number of industrial Ethernet interfaces	2
Number of PROFINET interfaces	2
Number of PROFIBUS interfaces	1
Number of RS 485 interfaces	1
1. Interface	
Interface types	
Number of ports	2
integrated switch	Yes
RJ 45 (Ethernet)	Yes
Protocols	
PROFINET IO Controller	Yes
PROFINET IO Device	Yes
SIMATIC communication	Yes
Open IE communication	Yes
Web server	Yes
Media redundancy	Yes
2. Interface	
Interface types	
Number of ports	1
integrated switch	No
RJ 45 (Ethernet)	Yes
Protocols	
PROFINET IO Controller	No
PROFINET IO Device	No
SIMATIC communication	Yes
Open IE communication	Yes
Web server	Yes
3. Interface	
Interface types	
Number of ports	1
RS 485	Yes
Protocols	
SIMATIC communication	Yes
PROFIBUS DP master	Yes
PROFIBUS DP slave	No
Interface types	
RJ 45 (Ethernet)	
100 Mbps	Yes

Autonegotiation	Yes
Autocrossing	Yes
Industrial Ethernet status LED	Yes
RS 485	
Transmission rate, max.	12 Mbit/s
Protocols	
Number of connections	
Number of connections, max.	256 ; via integrated interfaces of the CPU and connected CPs / CMs
Number of connections reserved for ES/HMI/web	10
Number of connections via integrated interfaces	128
Number of S7 routing paths	16
PROFINET IO Controller	
Services	
PG/OP communication	Yes
S7 routing	Yes
Isochronous mode	Yes
Open IE communication	Yes
IRT	Yes
MRP	Yes ; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
PROFIenergy	Yes
Prioritized startup	Yes
Number of connectable IO Devices, max.	256 ; In total, up to 768 distributed I/O devices can be connected via PROFIBUS or PROFINET
Number of connectable IO Devices for RT, max.	256
of which in line, max.	256
Number of IO Devices with IRT and the option "high performance", max.	64
Number of IO Devices that can be simultaneously activated/deactivated, max.	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
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
for IRT with the "high performance" option and parameter assignment for so-called "odd-numbered" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3.875 µs)
PROFINET IO Device	
Services	
PG/OP communication	Yes
S7 routing	Yes
Isochronous mode	No
Open IE communication	Yes
IRT, supported	Yes
MRP, supported	Yes
PROFIenergy	Yes
Shared device	Yes
Number of IO Controllers with shared device, max.	4
SIMATIC communication	
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
several passive connections per port, supported	Yes
ISO-on-TCP (RFC1006)	Yes
Data length, max.	64 kbyte
UDP	Yes
Data length, max.	1472 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	

Services	
PG/OP communication	Yes
S7 routing	Yes
Isochronous mode	Yes
Equidistance	Yes
Number of DP slaves	125 ; In total, up to 768 distributed I/O devices can be connected via PROFIBUS or PROFINET
Activation/deactivation of DP slaves	Yes
PROFIBUS DP master	
Number of connections, max.	48 ; for the integrated PROFIBUS DP interface
Further protocols	
MODBUS	Yes ; MODBUS TCP
Media redundancy	
Switchover time on line break, typ.	200 ms
Number of stations in the ring, max.	50
Isochronous mode	
Isochronous mode (application synchronized up to terminal)	Yes
Equidistance	Yes
S7 message functions	
Number of login stations for message functions, max.	32
Block related messages	Yes
Number of configurable alarms, max.	10000
Number of simultaneously active alarms in alarm pool	
Number of reserved user alarms	580
Number of reserved alarms for system diagnostics	200
Number of reserved alarms for motion technology objects	160
Test commissioning functions	
Status block	Yes
Single step	No
Status/control	
Status/control variable	Yes
Variables	Inputs, outputs, memory bits, DB, times, counters
of which status variables, max.	200 ; per job
of which control variables, max.	200 ; per job
Forcing	
Forcing, variables	Inputs, outputs
Number of variables, max.	200
Diagnostic buffer	
present	Yes

Number of entries, max.	3200
of which powerfail-proof	500
Traces	
Number of configurable Traces	4
Interrupts/diagnostics/status information	
Diagnostics indication LED	
RUN/STOP LED	Yes
ERROR LED	Yes
MAINT LED	Yes
Connection display LINK TX/RX	Yes
supported technology objects	
Motion	Yes
Speed-controlled axis	
Number of speed-controlled axes, max.	30
Positioning axis	
Number of positioning axes, max.	30
external encoders	
Number of external encoders, max.	30
Controller	
PID_Compact	Yes ; Universal PID controller with integrated optimization
PID_3Step	Yes ; PID controller with integrated optimization for valves
Counting and measuring	
High-speed counter	Yes
Ambient conditions	
Operating temperature	
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
Block protection	Yes
Access protection	
Password for display	Yes
Protection level: Write protection	Yes
Protection level: Read/write protection	Yes
Protection level: Complete protection	Yes
Cycle time monitoring	
lower limit	adjustable minimum cycle time
upper limit	adjustable maximum cycle time
Dimensions	
Width	70 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	845 g
Status	Jul 21, 2014