

Siemens 6ES7416-3XS07-0AB0 Manual

Brand	Siemens
Product Series	Siemens
Product Type	designation CPU 416-3

Description

6ES7416-3XS07-0AB0

CPU 416-3, 16 MB, 3 INTERFACES

SIMATIC S7-400, CPU 416-3, Central processing unit with: Work memory 16 MB, (8 MB code, 8 MB data), 1st interface MPI/DP 12 Mbit/s, 2nd interface PROFIBUS DP, 3rd interface plug-in IFM module

Packaging dimensions (L x W x H)

30.30 x 23.30 x 6.60 cm

Net weight

1.031 Kg

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SIMATIC S7-400, CPU 416-3, Central processing unit with: Work memory 16 MB, (8 MB code, 8 MB data), 1st interface MPI/DP 12 Mbit/s, 2nd interface PROFIBUS DP, 3rd interface plug-in IFM module

General information

Product type designation CPU 416-3

HW functional status 01

Firmware version V7.0

Product function

- Isochronous mode Yes; For PROFIBUS only

Engineering with

- Programming package STEP 7 V5.4 or higher with HSP 261

CiR - Configuration in RUN

CiR synchronization time, basic load 100 ms

CiR synchronization time, time per I/O byte 10 µs

Supply voltage

Rated value (DC) Power supply via system power supply

Input current

from backplane bus 5 V DC, typ. 1.1 A

from backplane bus 5 V DC, max. 1.3 A

from backplane bus 24 V DC, max. 450 mA; 150 mA per DP interface

from interface 5 V DC, max. 90 mA; At each DP interface

Power loss

Power loss, typ. 5.5 W

Power loss, max. 6.5 W

Memory

Type of memory RAM

Work memory

- integrated 16 Mbyte
- integrated (for program) 8 Mbyte
- integrated (for data) 8 Mbyte
- expandable No

Load memory

- expandable FEPROM Yes; with Memory Card (FLASH)
- expandable FEPROM, max. 64 Mbyte
- integrated RAM, max. 1 Mbyte
- expandable RAM Yes; with Memory Card (RAM)
- expandable RAM, max. 64 Mbyte

Backup

- present Yes
- with battery Yes; all data
- without battery No

Battery

Backup battery

Backup current, typ. 180 μ A; up to 40 °C

- Backup current, max. 850 μ A
- Backup time, max. Dealt with in the module data manual with the secondary conditions and the factors of influence
- Feeding of external backup voltage to CPU 5 V DC to 15 V DC

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CPU processing times

for bit operations, typ. 12.5 ns

for word operations, typ. 12.5 ns

for fixed point arithmetic, typ. 12.5 ns

for floating point arithmetic, typ. 25 ns

CPU-blocks

DB

- Number, max. 10 000; Number range: 1 to 16000
- Size, max. 64 kbyte

FB

- Number, max. 5 000; Number range: 0 to 7999
- Size, max. 64 kbyte

FC

- Number, max. 5 000; Number range: 0 to 7999
- Size, max. 64 kbyte

OB

- Number, max. see instruction list
- Size, max. 64 kbyte
- Number of free cycle OBs 1; OB 1
- Number of time alarm OBs 8; OB 10-17
- Number of delay alarm OBs 4; OB 20-23
- Number of cyclic interrupt OBs 9; OB 30-38 (shortest cycle that can be set = 500 μ s)
- Number of process alarm OBs 8; OB 40-47
- Number of DPV1 alarm OBs 3; OB 55-57
- Number of isochronous mode OBs 4; OB 61-64

- Number of multicomputing OBs 1; OB 60
- Number of background OBs 1; OB 90
- Number of startup OBs 3; OB 100-102
- Number of asynchronous error OBs 9; OB 80-88
- Number of synchronous error OBs 2; OB 121, 122

Nesting depth

- per priority class 24
- additional within an error OB 2

Counters, timers and their retentivity

S7 counter

- Number 2 048

Retentivity

- adjustable Yes
- preset Z 0 to Z 7

Counting range

- lower limit 0
- upper limit 999

IEC counter

- present Yes
- Type SFB
- Number Unlimited (limited only by RAM capacity)

S7 times

- Number 2 048

Retentivity

- adjustable Yes
- preset No times retentive

Time range

- lower limit 10 ms
- upper limit 9 990 s

IEC timer

- present Yes

Type SFB

- Number Unlimited (limited only by RAM capacity)

Data areas and their retentivity

Retentive data area (incl. timers, counters, flags), max. Total working and load memory (with backup battery)

Flag

- Size, max. 16 kbyte; Size of bit memory address area
- Retentivity available Yes
- Retentivity preset MB 0 to MB 15
- Number of clock memories 8; in 1 memory byte

Local data

- adjustable, max. 32 kbyte
- preset 16 kbyte

Address area

I/O address area

- Inputs 16 kbyte
- Outputs 16 kbyte

Process image

- Inputs, adjustable 16 kbyte
- Outputs, adjustable 16 kbyte
- Inputs, default 512 byte

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- Outputs, default 512 byte
- consistent data, max. 244 byte
- Access to consistent data in process image Yes

Subprocess images

- Number of subprocess images, max. 15

Digital channels

- Inputs 131 072
- of which central 131 072
- Outputs 131 072
- of which central 131 072

Analog channels

- Inputs 8 192
- of which central 8 192
- Outputs 8 192
- of which central 8 192

Hardware configuration

Number of expansion units, max. 21

connectable OPs 95

Multicomputing Yes; 4 CPUs max. (with UR1 or UR2)

Interface modules

- Number of connectable IMs (total), max. 6
- Number of connectable IM 460s, max. 6
- Number of connectable IM 463s, max. 4; IM 463-2

Number of DP masters

- integrated 2
- via CP 10; CP 443-5 Extended
- via IM 467 4
- Mixed mode IM + CP permitted No; IM 467 cannot be used jointly with CP 443-5 Ext. or CP 443-1 in

PROFINET IO mode

- via interface module 1
- Number of pluggable S5 modules (via adapter capsule in central device), max.

6

Number of IO Controllers

- integrated 0
- via CP 4; Max. 4 in the central controller; no mixed operation of different CP 443-1

types in PROFINET IO mode

Number of operable FMs and CPs (recommended)

- FM Limited by number of slots and number of connections
- CP, PtP CP 440: Limited by number of slots; CP 441: limited by number of connections
- PROFIBUS and Ethernet CPs 14; In total max. 10 CPs as DP master and PROFINET controller, of which up to 10 IMs or CPs as DP master and up to 4 CPs as PROFINET controller

Time of day

Clock

- Hardware clock (real-time) Yes
- retentive and synchronizable Yes
- Resolution 1 ms
- Deviation per day (buffered), max. 1.7 s; Power off
- Deviation per day (unbuffered), max. 8.6 s; For power On

Operating hours counter

- Number 16

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- Number/Number range 0 to 15
- Range of values SFCs 2, 3 and 4: 0 to 32767 hours SFC 101: 0 to 2^{31} - 1 hours
- Granularity 1 h
- retentive Yes

Clock synchronization

- supported Yes
- to MPI, master Yes
- to MPI, slave Yes
- to DP, master Yes
- to DP, slave Yes
- in AS, master Yes
- in AS, slave Yes
- on Ethernet via NTP No; Via CP
- to IF 964 DP Yes

Time difference in system when synchronizing via

- MPI, max. 200 ms

Interfaces

Interfaces/bus type 1 x MPI/PROFIBUS DP, 1 x PROFIBUS DP, 1 x PROFIBUS DP (optionally pluggable)

Number of RS 485 interfaces 2; Combined MPI / PROFIBUS DP and PROFIBUS DP

Number of other interfaces 1; PROFIBUS DP with IF 964-DP (plug-in option; MLFB: 6ES7964-2AA04-0AB0)

1. Interface

Interface type MPI/PROFIBUS DP

Isolated Yes

Interface types

- RS 485 Yes
- Output current of the interface, max. 150 mA

Protocols

- MPI Yes
- PROFIBUS DP master Yes
- PROFIBUS DP slave Yes

MPI

- Number of connections 44; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1
- Transmission rate, max. 12 Mbit/s

Services

- PG/OP communication Yes
- Routing Yes
- Global data communication Yes
- S7 basic communication Yes
- S7 communication Yes
- S7 communication, as client Yes
- S7 communication, as server Yes

PROFIBUS DP master

- Number of connections, max. 32; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1
- Transmission rate, max. 12 Mbit/s
- Number of DP slaves, max. 32

Services

- PG/OP communication Yes

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— Routing Yes; S7 routing

Protocols

SIMATIC communication

- S7 routing Yes

Open IE communication

- ISO-on-TCP (RFC1006) Via CP 443-1 and loadable FB

— Data length, max. 1 452 bytes via CP 443-1 Adv.

Web server

- supported No

Isochronous mode

Equidistance Yes

Number of DP masters with isochronous mode 3

User data per isochronous slave, max. 244 byte

shortest clock pulse 1 ms; 0.5 ms without use of SFC 126, 127

max. cycle 32 ms

communication functions / header

PG/OP communication Yes

- Number of connectable OPs without message processing 95
- Number of connectable OPs with message processing 95; When using Alarm_S/SQ and Alarm_D/DQ

Data record routing Yes

Global data communication

- supported Yes
- Number of GD loops, max. 16
- Number of GD packets, transmitter, max. 16
- Number of GD packets, receiver, max. 32
- Size of GD packets, max. 54 byte
- Size of GD packet (of which consistent), max. 1 variable

S7 basic communication

- communication function / S7 basic communication Yes

Protocols

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