SIEMENS

Product data sheet 6ES7416-3XL00-0AB0

SIMATIC S7-400,
CPU 416-3 3.2 MB WORKING MEMORY (1.6 MB CODE, 1.6 MB DATA) 1. INTERFACE MPI/DP 12 MBIT/S 2.IF PROFIBUS DP,
3.IF FOR IFM

CiR - Configuration in RUN	
CiR synchronization time, basic load	100 ms
CiR synchronization time, time per I/O slave	120 µs
Supply voltage	
24 V DC	Yes
Input current	
from backplane bus 5 V DC, typ.	1.6 A
from backplane bus 5 V DC, max.	1.8 A
from backplane bus 24 V DC, max.	450 mA ; Total current consumption of the components connected to the MPI/DP interfaces, but no more than 150 mA per interface
Power losses	
Power loss, typ.	8 W
Memory	
Data and program memory	
Data memory, max.	1.6 Mbyte
Program memory, max.	1.6 Mbyte
Work memory	
Integrated	3.2 Mbyte
expandable	No
Load memory	
expandable FEPROM	Yes ; with Memory Card (FLASH)
expandable FEPROM, max.	64 Mbyte
integrated RAM, max.	256 kbyte
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.	50 µA
Backup current, max.	460 µA
Feeding of external backup voltage to CPU	5 to 15 VDC
CPU processing times	
for bit operations, typ.	0.08 µs
for word operations, typ.	0.08 µs
for fixed point arithmetic, typ.	0.08 µs
for floating point arithmetic, typ.	0.48 µs
CPU-blocks	
DB	
Number, max.	4095 ; DB 0 reserved
Size, max.	64 kbyte
FB	
Number, max.	2048
Size, max.	64 kbyte
FC	
Number, max.	2048
Size, max.	64 kbyte
OB	
Number, max.	see instruction list
Size, max.	64 kbyte
Number of time alarm OBs	8
Number of delay alarm OBs	4
Number of time interrupt OBs	9
Number of process alarm OBs	8
Nesting depth	
per priority class	24
additional within an error OB	2
Counters, timers and their retentivity	
S7 counter	
Number	512
Retentivity	
can be set	Yes
lower limit	0
upper limit	2047
preset	Z 0 to Z 7
Counting range	

lower limit	1
upper limit	999
IEC counter	
present	Yes
Type	SFB
S7 times	
Number	512
Retentivity	
can be set	Yes
lower limit	0
upper limit	511
preset	No retentivity
Time range	
lower limit	10 ms
upper limit	9990 s
IEC timer	
present	Yes
Type	SFB
Data areas and their retentivity	
retentive data area, total	Total working and load memory (with backup battery)
Flag	
Number, max.	16 kbyte
Retentivity available	Yes ; MB 0 to MB 16383
Retentivity preset	MB 0 to MB 15
Number of clock memories	8 ; 1 memory byte
Data blocks	
Number, max.	4096 ; DB 0 reserved
Size, max.	64 kbyte
Address area	
I/O address area	
Inputs	16 kbyte
Outputs	16 kbyte
of which, distributed	
MPI/DP interface, inputs	2 kbyte
MPI/DP interface, outputs	2 kbyte
DP interface, inputs	8 kbyte
DP interface, outputs	8 kbyte
Process image	

Inputs, adjustable	16 kbyte ; adjustable at the expense of the code area of the RAM
Outputs, adjustable	16 kbyte ; adjustable at the expense of the code area of the RAM
Inputs, default	512 byte
Outputs, default	512 byte
consistent data, max.	244 byte
Access to consistent data in process image	Yes
Subprocess images	
Number of subprocess images, max.	8
Digital channels	
Inputs	131072
Outputs	131072
Inputs, of which central	131072
Outputs, of which central	131072
Analog channels	
Inputs	8192
Outputs	8192
Inputs, of which central	8192
Outputs, of which central	8192
Hardware configuration	
Expansion devices, max.	21 ; of which 6 ER with K-bus
connectable OPs	63 without message processing, 12 with message processing
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.	6 ; IM 463-2
Number of DP masters	
Integrated	2
via IM 467	4
Via CP	10
Mixed mode IM + CP permitted	No ; IM 467 cannot be used jointly with CP 443-5 Ext.
via interface module	1
Number of pluggable S5 modules (via adapter capsule in central device), max.	6
Number of operable FMs and CPs (recommended)	
FM	64 ; Limited by number of slots and number of connections
CP, point-to-point	64 ; limited by number of slots
CP, LAN	64 ; limited by number of connections
PROFIBUS and Ethernet CPs	14 ; incl. CP 443-5 Ext. and IM 467

Slots	
Required slots	2
Time of day	
Clock	
Hardware clock (real-time clock)	Yes
battery-backed and synchronizable	Yes
Resolution	1 ms
Operating hours counter	
Number	8
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
to IF 964 DP	Yes ; as Master or Slave
1. Interface	
Physics	RS 485 / PROFIBUS
Isolated	Yes
Number of connection resources	MPI: 44, DP: 32
Functionality	
MPI	Yes
DP master	Yes
DP slave	Yes
MPI	
Number of connections	44
Transmission rate, max.	12 Mbit/s
Services	
PG/OP communication	Yes
Routing	Yes
Global data communication	Yes
S7 basic communication	Yes
S7 communication	Yes
DP master	
Number of connections, max.	32
Transmission rate, max.	12 Mbit/s

Number of DP slaves, max.	32
Services	
PG/OP communication	Yes
Routing	Yes
Global data communication	No
S7 basic communication	No
S7 communication	Yes
Equidistance mode support	Yes
SYNC/FREEZE	Yes
Activation/deactivation of DP slaves	Yes
Direct data exchange (slave-to-slave communication)	Yes
Address area	
Inputs, max.	2 kbyte
Outputs, max.	2 kbyte
User data per DP slave	
Inputs, max.	244 byte
Outputs, max.	244 byte
Slots, max.	244
per slot, max.	128 byte
DP slave	
Transmission rate, max.	12 Mbit/s
Address area, max.	32
User data per address area, max.	32 byte
User data per address area, of which consistent, max.	32 byte
Services	
PG/OP communication	Yes ; with interface active
Routing	Yes ; with interface active
Transfer memory	
Inputs	244 byte
Outputs	244 byte
2. Interface	
Physics	RS 485 / PROFIBUS
Isolated	Yes
Number of connection resources	32
Functionality	
DP master	Yes
DP slave	Yes
DP master	

Number of connections, max.	32
Transmission rate, max.	12 Mbit/s
Number of DP slaves, max.	125
Services	
PG/OP communication	Yes
Routing	Yes
Global data communication	No
S7 basic communication	No
S7 communication	Yes
Equidistance mode support	Yes
SYNC/FREEZE	Yes
Activation/deactivation of DP slaves	Yes
Direct data exchange (slave-to-slave communication)	Yes
Address area	
Address area, max.	8 kbyte
Inputs, max.	8 kbyte
Outputs, max.	8 kbyte
User data per DP slave	
Inputs, max.	244 byte
Outputs, max.	244 byte
DP slave	
Transmission rate, max.	12 Mbit/s
Address area, max.	32
User data per address area, max.	32 byte
User data per address area, of which consistent, max.	32 byte
Services	
Routing	Yes ; with interface active
Transfer memory	
Inputs	244 byte
Outputs	244 byte
3. Interface	
Interface type	Pluggable interface module (IF), technical data as for 2nd interface
Plug-in interface modules	IF 964-DP
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
User data per isochronous slave, max.	128 byte
equidistance	Yes
shortest clock pulse	5 ms ; 2.5 ms without using the SFCs 126 / 127

Communication functions	
PG/OP communication	Yes
Global data communication	
supported	Yes
Number of GD packets, transmitter, max.	16
Number of GD packets, receiver, max.	32
Size of GD packets, max.	64 byte
S7 basic communication	
supported	Yes
User data per job, max.	76 byte
S7 communication	
supported	Yes
as server	Yes
As client	Yes
User data per job, max.	64 kbyte
S5-compatible communication	
supported	Yes ; via CP and FC AG_SEND and FC AG_RECV
User data per job, max.	8 kbyte
Standard communication (FMS)	
supported	Yes ; Via CP and loadable FB
Number of connections	
overall	64 ; of which one is reserved for PG and OP
usable for PG communication	
reserved for PG communication	1
Adjustable for PG communication, max.	0
usable for OP communication	
reserved for OP communication	1
adjustable for OP communication, max.	0
usable for S7 basic communication	
Reserved for S7 basic communication	0
adjustable for S7 basic communication, max.	0
usable for S7 communication	
reserved for S7 communication	0
Adjustable for S7 communication, max.	0
usable for routing	
Reserved for routing	0
adjustable for routing, max.	0
S7 message functions	

Number of login stations for message functions, max.	12
Symbol-related messages	Yes
Block related messages	Yes
Alarm 8-blocks	Yes
Process control messages	Yes
Test commissioning functions	
Status block	Yes
Single step	Yes
Number of breakpoints	4
Status/control	
Status/control variable	Yes
Forcing	
Forcing	Yes
Diagnostic buffer	
present	Yes
Number of entries, max.	3200
can be set	Yes
Configuration	
Configuration software	
STEP 7	Yes
programming	
Nesting levels	8
Programming language	
LAD	Yes
FBD	Yes
STL	Yes
SCL	Yes
CFC	Yes
GRAPH	Yes
HiGraph®	Yes
Know-how protection	
User program protection/password protection	Yes
Dimensions	
Width	50 mm
Height	290 mm
Depth	219 mm
Weights	
Weight, approx.	1070 g