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**Product data sheet**
**6ES7416-2XK02-0AB0**


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**Available as a Spare Part Only - subject to availability - SIMATIC S7-400, CPU 416-2 1.6 MB WORKING MEMORY (0.8 MB CODE, 0.8 MB DATA)**

**Supply voltages**
**Rated value**

24 V DC

Yes

Feeding of external backup voltage to CPU

5 to 15 VDC

**Current consumption**

from backplane bus 24 V DC, max.

300 mA ; Total current consumption of the components connected to the MPI/DP interfaces, but no more than 150 mA per interface

from backplane bus 5 V DC, max.

1.6 A

**Current consumption/ power loss**

Power loss, typ.

7.5 W

**Backup battery**

Backup current, typ.

40 µA

Backup current, max.

420 µA

**Memory**
**Data and program memory**

Data memory, max.

0.8 Kibyte

Program memory, max.

0.8 Kibyte

**Work memory**

integrated

1.6 Mbyte

expandable

No

**Load memory**

expandable FEPR0M

Yes ; with Memory Card (FLASH)

expandable FEPR0M, max.

64 Mbyte

integrated RAM, max.

256 Kibyte

expandable RAM

Yes ; With Memory Card (RAM)

expandable RAM, max.

64 Mbyte

**Backup**

present

Yes

with battery	Yes ; All data
without battery	No
CPU/ blocks	
DB	
Number, max.	4095 ; DB 0 reserved
Size, max.	64 Kibyte
FB	
Number, max.	2048
Size, max.	64 Kibyte
FC	
Number, max.	2048
Size, max.	64 Kibyte
OB	
Size, max.	64 Kibyte
Number of time alarm OBs	8
Number of delay alarm OBs	4
Number of watchdog interrupts	9
Number of process alarm OBs	8
Nesting depth	
per priority class	24
additional within an error OB	2
CPU/ processing times	
for bit operations, min.	0.08 $\mu$ s
for word operations, min.	0.08 $\mu$ s
for fixed point arithmetic, min.	0.08 $\mu$ s
for floating point arithmetic, min.	0.48 $\mu$ s
Times/counters 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 Kibyte
Retentivity available	Yes ; MB 0 to MB 16383
Number of clock memories	8 ; 1 memory byte
Data blocks	
Number, max.	4096 ; DB 0 reserved
Size, max.	64 Kibyte
Address area	
I/O address area	
Inputs	16 Kibyte
Outputs	16 Kibyte
Process image	
Inputs, adjustable	16 Kibyte ; adjustable at the expense of the code area of the RAM
Outputs, adjustable	16 Kibyte ; 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	
connectable OPs	63 without message processing, 12 with message processing
Central devices, max.	1
Expansion devices, max.	21 ; (of which 6 ER with K-bus)
Multicomputing	Yes ; 4 CPUs max. (with UR1 or UR2)
IM	
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	0
Number of pluggable S5 modules (via adapter capsule in central device), max.	6
Number of operable FMs and CPs (recommended)	

FM	64 ; Limited due to number of slots and number of connections
CP, point-to-point	64 ; limited due to number of slots
CP, LAN	64 ; limited due to number of connections
PROFIBUS and Ethernet CPs	14 ; incl. CP 443-5 Ext. and IM 467
Time of day	
Clock	
Hardware clock (real-time clock)	Yes
battery-backed and synchronizable	Yes
Resolution	1 ms
Runtime meter	
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
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/control	
Status/control variable	Yes
Forcing	
Forcing	Yes
Status block	Yes
Single step	Yes
Number of breakpoints	4
Diagnostic buffer	

present	Yes
Number of entries, max.	3200
can be set	Yes
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 Kibyte
S5-compatible communication	
supported	Yes ; via CP and FC AG_SEND and FC AG_RECV
User data per job, max.	8 Kibyte
Standard communication (FMS)	
supported	Yes ; Via CP and loadable FB
Number of connections	
overall	64 ; of which one is reserved for PG and OP
reserved for PG communication	1
Adjustable for PG communication, max.	0
reserved for OP communication	1
adjustable for OP communication, max.	0
Reserved for S7 basic communication	0
adjustable for S7 basic communication, max.	0
reserved for S7 communication	0
Adjustable for S7 communication, max.	0
Reserved for routing	0
adjustable for routing, max.	0

1st 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
Services	
PG/OP communication	Yes
Routing	Yes
Global data communication	Yes
S7 basic communication	Yes
S7 communication	Yes
Transmission speeds, max.	12 Mbit/s
DP master	
Number of connections, 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
Transmission speeds, max.	12 Mbit/s
Number of DP slaves, max.	32
DP slave	
Services	
PG/OP communication	Yes ; with interface active
Routing	Yes ; with interface active

Transmission speeds, max.	12 Mbit/s
Transfer memory	
Inputs	244 byte
Outputs	244 byte
Address area, max.	32
User data per address area, max.	32 byte
User data per address area, of which consistent, max.	32 byte
2nd 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
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
Transmission speeds, max.	12 Mbit/s
Number of DP slaves, max.	125
Address area	
Address area, max.	8 Kibyte
DP slave	
Services	
Routing	Yes ; with interface active
Programming	Yes ; when interface active
Transmission speeds, max.	12 Mbit/s



Transfer memory	
Inputs	244 byte
Outputs	244 byte
Address area, max.	32
User data per address area, max.	32 byte
User data per address area, of which consistent, max.	32 byte
Isochronous mode	
Isochronous mode	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
CiR - Configuration in RUN	
CiR synchronization time, basic load	100 ms
CiR synchronization time, time per I/O slave	120 µs
CPU/ programming	
Programming language	
STEP 7	Yes
LAD	Yes
FBD	Yes
STL	Yes
SCL	Yes
CFC	Yes
GRAPH	Yes
HiGraph®	Yes
Nesting levels	8
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User program protection/password protection	Yes
Dimensions	
Required slots	1
Dimensions and weight	
Dimensions and weight	
Width	25 mm
Height	290 mm
Depth	219 mm
Weight	

Weight, approx.

720 g

Status

Apr 26, 2010