SIEMENS

SIMATIC S7-400, CPU 417-4 CENTRAL PROCESSING UNIT WITH: 20MB WORKING MEMORY, (10 MB CODE; 10 MB DATA) 1. INTERFACE MPI 12 MBIT/S, 2. INTERFACE PROFIBUS DP, 3./4. IF IFM MODULES PLUGGABLE

Figure similar

General information	
Firmware version	V4.0
Engineering with	
• Programming package	STEP 7 V5.2 SP1 HF3 or higher with HW update

CiR – Configuration in RUN	
CiR synchronization time, basic load	100 ms
CiR synchronization time, time per I/O byte	40 µs

Supply voltage	
Rated value (DC)	
• 24 V DC	Yes

Input current	
from backplane bus 5 V DC, max.	1.7 A
from backplane bus 24 V DC, max.	Total current consumption of the components connected to the MPI/DP interfaces, but no more than 150 mA per interface

Power loss	
Power loss, typ.	6 W

Memory	
Work memory	
• integrated (for program)	10 Mbyte
• integrated (for data)	10 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.	16 Mbyte
Backup	
• present	Yes
• with battery	Yes; all data
• without battery	No

Battery	
Backup battery	
• Backup current, typ.	600 µA
• Backup current, max.	1 810 µA
• Feeding of external backup voltage to CPU	5 V DC to 15 V DC

CPU processing times	
for bit operations, typ.	0.03 µs
for word operations, typ.	0.03 µs
for fixed point arithmetic, typ.	0.03 µs
for floating point arithmetic, typ.	0.09 µs

CPU-blocks	
DB	
• Number, max.	8 192; DB 0 reserved
• Size, max.	64 kbyte
FB	
• Number, max.	6 144
• Size, max.	64 kbyte
FC	
• Number, max.	6 144
• 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

09/01/2017

• Number of cyclic interrupt OBs	9
• Number of process alarm OBs	8
• Number of multicomputing OBs	1
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
— lower limit	0
— upper limit	2 047
— preset	Z 0 to Z 7
Counting range	
— lower limit	0
— upper limit	999
S7 times	
• Number	2 048
Retentivity	
— adjustable	Yes
— lower limit	0
— upper limit	2 047
— preset	No times retentive
Time range	
— lower limit	10 ms
— upper limit	9 990 s
IEC timer	
• present	Yes
• Type	SFB

Data areas and their retentivity	
retentive data area in 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.	8 192; 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; for each line that is operated in isochronous mode, i.e. to which an OB61 to 64 has been assigned, the distributed IO address areas are halved
— DP interface, outputs	8 kbyte; for each line that is operated in isochronous mode, i.e. to which an OB61 to 64 has been assigned, the distributed IO address areas are halved
Process image	
• Inputs, adjustable	16 kbyte
• Outputs, adjustable	16 kbyte
• Inputs, default	1 024 byte
• Outputs, default	1 024 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; of which 6 ER with K-bus
connectable OPs	63 without message processing, 16 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.	4; IM 463-2
Number of DP masters	
• integrated	2

● via CP	10; via CP 443-5 Ext.
● via IM 467	4
● Mixed mode IM + CP permitted	No; IM 467 cannot be used with CP 443-5 Ext., IM 467 cannot be used with CP 443-1 EX40 in PROFINET IO mode
● via interface module	2; IF 964-DP
● Number of pluggable S5 modules (via adapter capsule in central device), max.	6
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
● CP, LAN	Limited by number of slots and 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)	Yes
● retentive and synchronizable	Yes
● Resolution	1 ms
● Deviation per day (buffered), max.	Power off
● Deviation per day (unbuffered), max.	Power on
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
● PROFIBUS DP master	Yes
● PROFIBUS 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; 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
— Routing	Yes
— Global data communication	Yes
— S7 basic communication	Yes
— S7 communication	Yes
— Equidistance	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
— of which consistent, max.	32 byte
Services	
— PG/OP communication	Yes
— Routing	Yes
Transfer memory	
— Inputs	244 byte

— Outputs	244 byte

2. Interface	
Physics	RS 485 / PROFIBUS
Isolated	Yes
Number of connection resources	32
Functionality	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
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.	125
Services	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	Yes
— S7 basic communication	Yes
— S7 communication	Yes
— Equidistance	Yes
— SYNC/FREEZE	Yes
— Activation/deactivation of DP slaves	Yes
— Direct data exchange (slave-to-slave communication)	Yes
Address area	
— Inputs, max.	8 kbyte
— Outputs, max.	8 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
— of which consistent, max.	32 byte
Services	
— Routing	Yes
Transfer memory	
— Inputs	244 byte

09/01/2017

— Outputs	244 byte

3. Interface

Interface type	Pluggable interface module (IF), technical data as for 2nd interface
Plug-in interface modules	IF 964-DP

4. 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
Equidistance	Yes
User data per isochronous slave, max.	244 byte
shortest clock pulse	1 ms

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
• Size of GD packet (of which consistent), max.	1 variable

S7 basic communication

• supported	Yes; in MPI mode via: SFC X_SEND, X_RCV, X_GET and X_PUT; in DP master mode via: SFC I_GET and I_PUT
• User data per job, max.	76 byte
• User data per job (of which consistent), max.	1 variable

S7 communication

• supported	Yes
• as server	Yes
• as client	Yes
• User data per job, max.	64 kbyte
• User data per job (of which consistent), max.	1 variable

S5 compatible communication

• supported	Yes; Via FC AG_SEND and AG_RECV, max. via 10 CP 443-1 or 443-5
• User data per job, max.	8 kbyte

Standard communication (FMS)

• supported	Yes; Via CP and loadable FB

Number of connections

• overall	64
• usable for PG communication	
— reserved for PG communication	1
• usable for OP communication	
— reserved for OP communication	1

S7 message functions	
Number of login stations for message functions, max.	16
Symbol-related messages	Yes
Program alarms	Yes
simultaneously active Alarm-S blocks, max.	ALARM_S/SQ blocks or ALARM_D/DQ blocks
Alarm 8-blocks	Yes
• Number of instances for alarm 8 and S7 communication blocks, max.	Number of communication jobs for Alarm_8 blocks and for blocks for S7 Communication
Process control messages	Yes
Number of messages	
• overall, max.	1 024
• in 100 ms grid, max.	128
• in 500 ms grid, max.	512
• in 1000 ms grid, max.	1 024
Number of additional values	
• with 100 ms grid, max.	1
• with 500, 1000 ms grid, max.	10

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.	3 200
— adjustable	Yes
— preset	120

Configuration	
Configuration software	
• STEP 7	Yes
Programming	
• Nesting levels	8
Programming language	

09/01/2017

— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
Number of simultaneously active SFCs	
— RDSYSST	1 to 8
Know-how protection	
• User program protection/password protection	Yes

Dimensions

Width	50 mm
Height	290 mm
Depth	219 mm

Weights

Weight, approx.	1 070 g
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