

SIMATIC S7-400, CPU 414-2 256 KB WORKING MEMORY (128 KB CODE, 128 KB DATA) 1. INTERFACE MPI/DP 12 MBIT/S 2. INTERFACE DP

### CiR – Configuration in RUN

CiR synchronization time, basic load	100 ms
CiR synchronization time, time per I/O byte	120 $\mu$ s

### Supply voltage

Rated value (DC)	Yes
<ul style="list-style-type: none"> <li>• 24 V DC</li> </ul>	

### Input current

from backplane bus 5 V DC, typ.	1.5 A
from backplane bus 5 V DC, max.	1.6 A
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

### Power loss

Power loss, typ.	7.5 W
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### Memory

Work memory	
<ul style="list-style-type: none"> <li>• integrated</li> </ul>	256 kbyte
<ul style="list-style-type: none"> <li>• integrated (for program)</li> </ul>	128 kbyte
<ul style="list-style-type: none"> <li>• integrated (for data)</li> </ul>	128 kbyte
<ul style="list-style-type: none"> <li>• expandable</li> </ul>	No
Load memory	
<ul style="list-style-type: none"> <li>• expandable FEPR0M</li> </ul>	Yes; with Memory Card (FLASH)
<ul style="list-style-type: none"> <li>• expandable FEPR0M, max.</li> </ul>	64 Mbyte
<ul style="list-style-type: none"> <li>• integrated RAM, max.</li> </ul>	256 kbyte
<ul style="list-style-type: none"> <li>• expandable RAM</li> </ul>	Yes; with Memory Card (RAM)
<ul style="list-style-type: none"> <li>• expandable RAM, max.</li> </ul>	64 Mbyte

### Backup

<ul style="list-style-type: none"> <li>• present</li> </ul>	Yes
<ul style="list-style-type: none"> <li>• with battery</li> </ul>	Yes; all data
<ul style="list-style-type: none"> <li>• without battery</li> </ul>	No

### Battery

Backup battery	
<ul style="list-style-type: none"> <li>• Backup current, typ.</li> </ul>	40 $\mu$ A
<ul style="list-style-type: none"> <li>• Backup current, max.</li> </ul>	380 $\mu$ A

- Feeding of external backup voltage to CPU

5 V DC to 15 V DC

### CPU processing times

for bit operations, typ.	0.1 $\mu$ s
for word operations, typ.	0.1 $\mu$ s
for fixed point arithmetic, typ.	0.1 $\mu$ s
for floating point arithmetic, typ.	0.6 $\mu$ s

### CPU-blocks

<b>DB</b>	
• Number, max.	4 095; DB 0 reserved
• Size, max.	64 kbyte
<b>FB</b>	
• Number, max.	2 048
• Size, max.	64 kbyte
<b>FC</b>	
• Number, max.	2 048
• Size, max.	64 kbyte
<b>OB</b>	
• Number, max.	see instruction list
• Size, max.	64 kbyte
• Number of time alarm OBs	4
• Number of delay alarm OBs	4
• Number of cyclic interrupt OBs	4
• Number of process alarm OBs	4
<b>Nesting depth</b>	
• per priority class	24
• additional within an error OB	2

### Counters, timers and their retentivity

<b>S7 counter</b>	
• Number	256
<b>Retentivity</b>	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	Z 0 to Z 7
<b>Counting range</b>	
— lower limit	1
— upper limit	999
<b>IEC counter</b>	
• present	Yes
• Type	SFB
<b>S7 times</b>	

• Number	256
<b>Retentivity</b>	
— adjustable	Yes
— lower limit	0
— upper limit	255
— preset	No retentivity
<b>Time range</b>	
— lower limit	10 ms
— upper limit	9 990 s
<b>IEC timer</b>	
• present	Yes
• Type	SFB
<b>Data areas and their retentivity</b>	
retentive data area in total	Total working and load memory (with backup battery)
<b>Flag</b>	
• Number, max.	8 kbyte
• Retentivity available	Yes; From MB 0 to MB 8 191
• Retentivity preset	MB 0 to MB 15
• Number of clock memories	8; 1 memory byte
<b>Address area</b>	
<b>I/O address area</b>	
• Inputs	8 kbyte
• Outputs	8 kbyte
<b>Process image</b>	
• Inputs, adjustable	8 kbyte; adjustable at the expense of the code area of the RAM
• Outputs, adjustable	8 kbyte; adjustable at the expense of the code area of the RAM
• Inputs, default	256 byte
• Outputs, default	256 byte
• consistent data, max.	244 byte
• Access to consistent data in process image	Yes
<b>Subprocess images</b>	
• Number of subprocess images, max.	8
<b>Digital channels</b>	
• Inputs	65 536
— of which central	65 536
• Outputs	65 536
— of which central	65 536
<b>Analog channels</b>	
• Inputs	4 096
— of which central	4 096
• Outputs	4 096

**Hardware configuration**

Number of expansion units, max.	21; of which 6 ER with K-bus
connectable OPs	31 without message processing, 8 with message processing
Multicomputing	Yes; 4 CPUs max. (with UR1 or UR2)
<b>Interface modules</b>	
• Number of connectable IMs (total), max.	6
• Number of connectable IM 460s, max.	6
• Number of connectable IM 463s, max.	4; IM 463-2
<b>Number of DP masters</b>	
• integrated	2
• via CP	10
• via IM 467	4
• 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
<b>Number of operable FMs and CPs (recommended)</b>	
• FM	32; Limited by number of slots and number of connections
• CP, PtP	32; limited by number of slots
• CP, LAN	32; limited by number of connections
• PROFIBUS and Ethernet CPs	14; incl. CP 443-5 Ext. and IM 467
<b>Slots</b>	
• required slots	1
<b>Time of day</b>	
<b>Clock</b>	
• Hardware clock (real-time)	Yes
• retentive and synchronizable	Yes
• Resolution	1 ms
<b>Operating hours counter</b>	
• Number	8
<b>Clock synchronization</b>	
• 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
<b>1. Interface</b>	
Physics	RS 485 / PROFIBUS

Isolated	Yes
Number of connection resources	MPI: 32, DP: 16
<b>Protocols</b>	
• MPI	Yes
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
<b>MPI</b>	
• Number of connections	32
• Transmission rate, max.	12 Mbit/s
<b>Services</b>	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	Yes
— S7 basic communication	Yes
— S7 communication	Yes
<b>PROFIBUS DP master</b>	
• Number of connections, max.	16
• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	32
<b>Services</b>	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	No
— S7 basic communication	No
— S7 communication	Yes
— Equidistance	Yes
— SYNC/FREEZE	Yes
— Activation/deactivation of DP slaves	Yes
— Direct data exchange (slave-to-slave communication)	Yes
<b>Address area</b>	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
<b>User data per DP slave</b>	
— Inputs, max.	244 byte
— Outputs, max.	244 byte
— Slots, max.	244
— per slot, max.	128 byte
<b>PROFIBUS DP slave</b>	
• Transmission rate, max.	12 Mbit/s
• Address area, max.	32
• User data per address area, max.	32 byte

— of which consistent, max.	32 byte
<b>Services</b>	
— PG/OP communication	Yes; with interface active
— Routing	Yes; with interface active
<b>Transfer memory</b>	
— Inputs	244 byte
— Outputs	244 byte
<b>2. Interface</b>	
Physics	RS 485 / PROFIBUS
Isolated	Yes
Number of connection resources	16
<b>Protocols</b>	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
<b>PROFIBUS DP master</b>	
• Number of connections, max.	16
• Transmission rate, max.	12 Mbit/s
• Number of DP slaves, max.	96
<b>Services</b>	
— PG/OP communication	Yes
— Routing	Yes
— Global data communication	No
— S7 basic communication	No
— S7 communication	Yes
— Equidistance	Yes
— SYNC/FREEZE	Yes
— Activation/deactivation of DP slaves	Yes
— Direct data exchange (slave-to-slave communication)	Yes
<b>Address area</b>	
— Inputs, max.	6 kbyte
— Outputs, max.	6 kbyte
<b>User data per DP slave</b>	
— Inputs, max.	128 byte
— Outputs, max.	128 byte
<b>PROFIBUS DP slave</b>	
• Transmission rate, max.	12 Mbit/s
• Address area, max.	32
• User data per address area, max.	32 byte
— of which consistent, max.	32 byte
<b>Services</b>	

— Routing	Yes; with interface active
<b>Transfer memory</b>	
— Inputs	244 byte
— Outputs	244 byte
<b>Isochronous mode</b>	
Isochronous operation (application synchronized up to terminal)	Yes
Equidistance	Yes
User data per isochronous slave, max.	128 byte
shortest clock pulse	5 ms; 2.5 ms without using the SFCs 126 / 127
<b>Communication functions</b>	
PG/OP communication	Yes
<b>Global data communication</b>	
• supported	Yes
• Number of GD packets, transmitter, max.	8
• Number of GD packets, receiver, max.	16
• Size of GD packets, max.	64 byte
<b>S7 basic communication</b>	
• supported	Yes
• User data per job, max.	76 byte
<b>S7 communication</b>	
• supported	Yes
• as server	Yes
• as client	Yes
• User data per job, max.	64 kbyte
<b>S5 compatible communication</b>	
• supported	Yes; via CP and FC AG_SEND and FC AG_RECV
• User data per job, max.	8 kbyte
<b>Standard communication (FMS)</b>	
• supported	Yes; Via CP and loadable FB
<b>Number of connections</b>	
• overall	32; 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.	8
Symbol-related messages	Yes
Program alarms	Yes
Alarm 8-blocks	Yes
Process control messages	Yes

### Test commissioning functions

Status block	Yes
Single step	Yes
Number of breakpoints	4
<b>Status/control</b>	
• Status/control variable	Yes
<b>Forcing</b>	
• Forcing	Yes
<b>Diagnostic buffer</b>	
• present	Yes
• Number of entries, max.	400
— adjustable	Yes

### Configuration

<b>Configuration software</b>	
• STEP 7	Yes
<b>Programming</b>	
• Nesting levels	8
<b>Programming language</b>	
— LAD	Yes
— FBD	Yes
— STL	Yes
— SCL	Yes
— CFC	Yes
— GRAPH	Yes
— HiGraph®	Yes
<b>Know-how protection</b>	
• User program protection/password protection	Yes

## Dimensions

Width	25 mm
Height	290 mm
Depth	219 mm

## Weights

Weight, approx.	720 g
<b>last modified:</b>	03/13/2019