## **SIEMENS**

## **Data sheet**

## 6ES7417-5HT06-0AB0



SIMATIC S7-400H, CPU 417-5H, central processing unit for S7-400H and S7-400F/FH, 5 interfaces: 1x MPI/DP, 1x DP, 1x PN and 2 for sync modules, 32 MB memory (16 MB data/16 MB program)

General information	
Product type designation	CPU 417-5H PN/DP
HW functional status	1
Firmware version	V6.0
Product function	
Isochronous mode	No
Engineering with	
<ul> <li>Programming package</li> </ul>	As of STEP 7 V5.5 SP2 with HF1
CiR - Configuration in RUN	
CiR synchronization time, basic load	60 ms
CiR synchronization time, time per I/O byte	0 μs
Supply voltage	
Rated value (DC)	Power supply via system power supply
Input current	
from backplane bus 5 V DC, typ.	1.6 A
from backplane bus 5 V DC, max.	1.9 A
from backplane bus 24 V DC, max.	150 mA; 150 mA per DP interface
from interface 5 V DC, max.	90 mA; At each DP interface
Power loss	
Power loss, typ.	7.5 W
Memory	
Type of memory	RAM
Work memory	
<ul><li>integrated</li></ul>	32 Mbyte
<ul><li>integrated (for program)</li></ul>	16 Mbyte
<ul><li>integrated (for data)</li></ul>	16 Mbyte
expandable	No
Load memory	
<ul> <li>expandable FEPROM</li> </ul>	Yes; with Memory Card (FLASH)
<ul> <li>expandable FEPROM, max.</li> </ul>	64 Mbyte
<ul><li>integrated RAM, max.</li></ul>	1 Mbyte
<ul> <li>expandable RAM</li> </ul>	Yes
expandable RAM, max.	64 Mbyte
Backup	
• present	Yes
<ul><li>with battery</li></ul>	Yes; all data
without battery	No
Battery	
Backup battery	
<ul> <li>Backup current, typ.</li> </ul>	180 μA; Valid up to 40°C

a Reakun aurrent may	1 000
<ul><li>Backup current, max.</li><li>Backup time, max.</li></ul>	1 000 μA  Dealt with in the module data manual with the secondary conditions and the
■ Backup time, max.	factors of influence
<ul> <li>Feeding of external backup voltage to CPU</li> </ul>	5 V DC to 15 V DC
CPU processing times	
for bit operations, typ.	7.5 ns
for word operations, typ.	7.5 ns
for fixed point arithmetic, typ.	7.5 ns
for floating point arithmetic, typ.	15 ns
CPU-blocks	
DB	
Number, max.	16 000; Number range: 1 to 16000
• Size, max.	64 kbyte
FB	
<ul><li>Number, max.</li></ul>	8 000; Number range: 0 to 7999
• Size, max.	64 kbyte
FC	
Number, max.	8 000; Number range: 0 to 7999
• Size, max.	64 kbyte
ОВ	
<ul><li>Number, max.</li></ul>	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
<ul> <li>Number of cyclic interrupt OBs</li> </ul>	9; OB 30-38
Number of process alarm OBs	8; OB 40-47
<ul> <li>Number of DPV1 alarm OBs</li> </ul>	3; OB 55-57
Number of startup OBs	2; OB 100, 102
<ul> <li>Number of asynchronous error OBs</li> </ul>	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
— lower limit	0
— upper limit	2 047
— preset	Z 0 to Z 7
Counting range	
— lower limit	0
— upper limit	999
— upper limit IEC counter	999
	Yes
IEC counter	
IEC counter  • present	Yes
IEC counter  • present  • Type	Yes SFB
IEC counter	Yes SFB
IEC counter  • present  • Type  • Number  S7 times	Yes SFB Unlimited (limited only by RAM capacity)
IEC counter  • present  • Type  • Number  S7 times  • Number	Yes SFB Unlimited (limited only by RAM capacity)
IEC counter  • present  • Type  • Number  S7 times  • Number  Retentivity	Yes SFB Unlimited (limited only by RAM capacity)
IEC counter  • present  • Type  • Number  S7 times  • Number  Retentivity  — adjustable	Yes SFB Unlimited (limited only by RAM capacity)  2 048  Yes
IEC counter  • present  • Type  • Number  S7 times  • Number  Retentivity  — adjustable — lower limit	Yes SFB Unlimited (limited only by RAM capacity)  2 048  Yes 0
IEC counter  • present  • Type  • Number  S7 times  • Number  Retentivity  — adjustable — lower limit — upper limit	Yes SFB Unlimited (limited only by RAM capacity)  2 048  Yes 0 2 047
IEC counter  • present  • Type  • Number  S7 times  • Number  Retentivity  — adjustable — lower limit — upper limit — preset	Yes SFB Unlimited (limited only by RAM capacity)  2 048  Yes 0 2 047
IEC counter  • present  • Type  • Number  S7 times  • Number  Retentivity  — adjustable — lower limit — upper limit — upper limit — preset  Time range	Yes SFB Unlimited (limited only by RAM capacity)  2 048  Yes 0 2 047 No times retentive
IEC counter  • present  • Type  • Number  S7 times  • Number  Retentivity  — adjustable — lower limit — upper limit — preset  Time range — lower limit	Yes SFB Unlimited (limited only by RAM capacity)  2 048  Yes 0 2 047 No times retentive

Number  Number Control retarrivity  Retentine data area firel times, counters, flags). max.  Retentine data area firel times, counters, flags). max.  Retentinely available  * Size, max.  * Retentinely available  * Retentinely preset  * Number of plock memories  * Number of plock memories  * Address area  * Optical preset  * Optical p	• Type	SFB
Retentive data area (ind. timers, counters, flags), max.  Fortal working and load memory (with backup battery)  Fortal working and load memory (with backup load and load a		
Reterribre data area (incl. timers, counters, flags), max.   Total working and load memory (with backup battery)		Chiminod (minod only by 10 an outputity)
Flag   Size, max   16 384 byte     Retentivity preset   MB 0 to MB 15     Nether of clock memories   MB 0 to MB 15     Nether of clock memories   Size in memory byte		Total working and load memory (with backup battery)
1924 byte		Total Horning and load monory (War backap backery)
Retentivity preset Retentivity Ret	-	16 384 byte
Relativity preset Number of clock memories Relativity preset Address area    Outputs		
**Number of clock memories  **Number of clock memories  **Oligitable, max.**  **Oligitable, max.**  **Preset**  **Oligitable, max.**  **Preset**  **Oligitable, max.**  **Process image**  **Oligitable, max.**  **Oligitable, default	•	MB 0 to MB 15
	• •	8; in 1 memory byte
Address area	Local data	
Address area    ID address area   Inputs   16 kbyte   1	adjustable, max.	64 kbyte
Figure   F	• preset	32 kbyte
• Inputs	Address area	
	I/O address area	
Process image  Inputs, adjustable Outputs, adjustable Inputs, default Outputs, default Outputs Outpu	<ul><li>Inputs</li></ul>	16 kbyte
Inputs, adjustable   16 kbyte	Outputs	16 kbyte
Outputs, adjustable     inputs, default     inputs	Process image	
Inputs, default     Outputs, default     Outputs, default     Outputs, default     Outputs, default     Outputs     Outp	<ul> <li>Inputs, adjustable</li> </ul>	16 kbyte
Cutputs, default     Consistent data, max.     Access to consistent data in process image     Access to consistent data in process image     Number of subprocess images.     Number of subprocess images, max.     Is  Digital channels  Inputs     Outputs     Outputs     Outputs     Inputs     Analog channels  Inputs     Number of which central     Inputs	Outputs, adjustable	16 kbyte
Consistent data, max.     Access to consistent data in process image     Subprocess images     Number of subprocess images, max.     Injuts     Injut	<ul> <li>Inputs, default</li> </ul>	1 024 byte
Access to consistent data in process image  Number of subprocess images, max.  Is  Digital channels  Inputs  Outputs  Outputs  Inputs	Outputs, default	1 024 byte
Subprocess images  Number of subprocess images, max.  Is  Digital channels  Inputs  Outputs  Outputs  Outputs  Inputs	• consistent data, max.	244 byte
Number of subprocess images, max.     Digital channels	Access to consistent data in process image	Yes
Inputs	Subprocess images	
Inputs		15
Outputs 131 072 Outputs 131 072  Analog channels  Inputs 8 192  Outputs 8 192  Hardware configuration  Number of expansion units, max. 21  Connectable OPs 119  Multicomputing No  Interface modules  Number of connectable IM 460s, max. 6  Number of connectable IM 460s, max. 4; Single mode only  Number of DP masters  integrated 2  via CP 10; CP 443-5 Extended  No  via interface module  No  integrated 0  via CP 10; CP 443-5 Extended  No  via interface module  integrated 0  Via Interface module  See manual Automation System S7-400H fault-tolerant systems. Limited by number of solos and number of connections  FM See manual Automation System S7-400H fault-tolerant systems. Limited by number of solos and number of connections  PROFIBUS and Ethernet CPs 14; Of which max. 10 CP as DP master  14; Of which max. 10 CP as DP master	Digital channels	
Outputs		
Analog channels  Inputs 8 192  — of which central 8 192  — Outputs 8 192  — of which central 8 192  — the provided of expansion units, max. 21  connectable OPs 119  Multicomputing No  Interface modules  — Number of connectable IMs (total), max. 6  — Number of connectable IMs (total), max. 6  — Number of connectable IM 460s, max. 4; Single mode only  Number of DP masters  — integrated 2  — via CP 10; CP 443-5 Extended  — via interface module No  Number of IO Controllers  — integrated 1  — via CP 0  Number of Operable FMs and CPs (recommended)  — FM See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections  — PROFIBUS and Ethernet CPs 14; Of which max. 10 CP as DP master  Time of day  Time of day	— of which central	
Analog channels	·	
Inputs		131 072
- of which central 8 192  Outputs 8 192  - of which central 8 192  - of which central 8 192  Hardware configuration  Number of expansion units, max. 21  connectable OPs 119  Multicomputing No  Interface modules  • Number of connectable IMs (total), max. 6  • Number of connectable IM 460s, max. 4; Single mode only  Number of DP masters  • integrated 2  • via CP 10; CP 443-5 Extended  • wia interface module 0  Number of IO Controllers  • integrated 0  • wia interface module 0  Number of IO Controllers  • integrated 1  • via CP 0  Number of IO Controllers  • integrated 1  • via CP 0  Number of IO Controllers  • integrated 1  • via CP 0  Number of operable FMs and CPs (recommended)  • FM See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections  • CP, PtP See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections  • PROFIBUS and Ethernet CPs 14; Of which max. 10 CP as DP master  Slots  • required slots 2  Time of day		0.400
Outputs 8 192  — of which central 8 192  Hardware configuration  Number of expansion units, max. 21  connectable OPs 119  Multicomputing No  Interface modules  • Number of connectable IM (total), max. 6  • Number of connectable IM 460s, max. 4; Single mode only  Number of DP masters  • integrated 2  • via CP 10; CP 443-5 Extended  • via interface module 0  Number of IO Controllers  • integrated 1  • via CP 0  • Mixed mode IM + CP permitted No  • via interface module 0  Number of IO Controllers  • integrated 1  • via CP 0  Number of operable FMs and CPs (recommended)  • FM See manual Automation System 57-400H fault-tolerant systems. Limited by number of slots and number of connections  • PROFIBUS and Ethernet CPs 14; Of which max. 10 CP as DP master  14; Of which max. 10 CP as DP master	·	
Hardware configuration  Number of expansion units, max.  21 connectable OPs 119 Multicomputing No Interface modules  • Number of connectable IMs (total), max. • Number of connectable IM 460s, max. • Number of connectable IM 463s, max. • Number of connectable IM 463s, max. • Number of DP masters  • integrated • via CP • Mixed mode IM + CP permitted • via interface module  • win interface module  • Integrated • via CP • Mixed mode IM + CP permitted • via interface module  • Number of ID controllers  • integrated • via CP • Mixed mode IM + CP permitted • via CP • Mumber of ID controllers  • integrated • via CP • O  Number of operable FMs and CPs (recommended)  • FM • See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections • PROFIBUS and Ethernet CPs  14; Of which max. 10 CP as DP master  Time of day		
Hardware configuration  Number of expansion units, max.  connectable OPs  Multicomputing  Interface modules  • Number of connectable IMs (total), max.  • Number of connectable IM 460s, max.  • Number of connectable IM 460s, max.  • Number of DP masters  • integrated  • via CP  • Mixed mode IM + CP permitted  • via interface module  Number of IO Controllers  • integrated  • via CP  • Mixed mode IM + CP permitted  • via CP  Number of IO Controllers  • integrated  • via CP  Number of operable FMs and CPs (recommended)  • FM  See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections  • PROFIBUS and Ethernet CPs  14; Of which max. 10 CP as DP master	·	
Number of expansion units, max.  connectable OPs  Multicomputing  No  Interface modules  • Number of connectable IMs (total), max.  • Number of connectable IM 460s, max.  • Number of connectable IM 460s, max.  • Number of DP masters  • integrated  • via CP  • Mixed mode IM + CP permitted  • via interface module  Number of IO Controllers  • integrated  • via CP  Number of IO Controllers  • integrated  • via CP  Number of operable FMs and CPs (recommended)  • FM  See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections  • PROFIBUS and Ethernet CPs  14; Of which max. 10 CP as DP master		0 192
connectable OPs  Multicomputing  No  Interface modules  Number of connectable IMs (total), max. Number of connectable IM 460s, max. Number of connectable IM 460s, max. Single mode only  Number of DP masters  integrated via CP Mixed mode IM + CP permitted via interface module  Number of IO Controllers  integrated Via CP  Number of IO Controllers  integrated Via CP  Number of Operable FMs and CPs (recommended)  FM  See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections  PROFIBUS and Ethernet CPs  14; Of which max. 10 CP as DP master  Integrated Via CP  See required slots  required slots  14; Of which max. 10 CP as DP master		21
Multicomputing No Interface modules  • Number of connectable IMs (total), max. • Number of connectable IM 460s, max. • Number of connectable IM 463s, max. • Number of pressures • integrated • via CP • Mixed mode IM + CP permitted • via interface module  No • via interface module  Number of IO Controllers • integrated • via CP  O Number of operable FMs and CPs (recommended) • FM • CP, PtP • See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections • PROFIBUS and Ethernet CPs  14; Of which max. 10 CP as DP master  Slots • required slots  2  Time of day		
Interface modules  • Number of connectable IMs (total), max. • Number of connectable IM 460s, max. • Number of connectable IM 463s, max.  • Number of DP masters  • integrated • via CP • Mixed mode IM + CP permitted • via interface module  Number of IO Controllers  • integrated • via CP  • Mixed mode IM + CP permitted • Via interface module  Number of IO Controllers  • integrated • via CP  Number of operable FMs and CPs (recommended)  • FM  See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections  • CP, PtP  See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections  • PROFIBUS and Ethernet CPs  14; Of which max. 10 CP as DP master  Slots • required slots  2  Time of day		
Number of connectable IMs (total), max.  Number of connectable IM 460s, max.  Number of DP masters  integrated  via CP  Mixed mode IM + CP permitted  via interface module  Number of IO Controllers  integrated  via CP  ON  Number of IO Controllers  integrated  via CP  Number of IO Controllers  integrated  via CP  Number of JO Controllers  integrated  via CP  Number of operable FMs and CPs (recommended)  FM  See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections  PROFIBUS and Ethernet CPs  14; Of which max. 10 CP as DP master  Slots  required slots  2  Time of day		110
Number of connectable IM 460s, max.  Number of DP masters  integrated  via CP  Mixed mode IM + CP permitted  via interface module  Number of IO Controllers  integrated  via CP  ONUMBER of Operable FMs and CPs (recommended)  FM  See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections  PROFIBUS and Ethernet CPs  14; Of which max. 10 CP as DP master  Number of day  Number of day		6
Number of DP masters  integrated via CP Mixed mode IM + CP permitted via integrated via CP  No  No  No  No  No  No  Via integrated via CP  Number of IO Controllers  integrated via CP  Number of operable FMs and CPs (recommended)  FM  See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections  PROFIBUS and Ethernet CPs  Slots required slots  2  Time of day		
Number of DP masters  integrated via CP Mixed mode IM + CP permitted No via interface module  Number of IO Controllers  integrated via CP  Number of operable FMs and CPs (recommended)  FM See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections  CP, PtP See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections  PROFIBUS and Ethernet CPs 14; Of which max. 10 CP as DP master  Slots required slots 2  Time of day		
via CP     Mixed mode IM + CP permitted     via interface module     via interface module  Number of IO Controllers      integrated     via CP  Number of operable FMs and CPs (recommended)      FM      See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections      CP, PtP     See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections      PROFIBUS and Ethernet CPs  14; Of which max. 10 CP as DP master  Time of day		
<ul> <li>Mixed mode IM + CP permitted</li> <li>via interface module</li> <li>No</li> <li>Number of IO Controllers</li> <li>integrated</li> <li>via CP</li> <li>Number of operable FMs and CPs (recommended)</li> <li>FM</li> <li>See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections</li> <li>CP, PtP</li> <li>See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections</li> <li>PROFIBUS and Ethernet CPs</li> <li>14; Of which max. 10 CP as DP master</li> </ul> Slots <ul> <li>required slots</li> <li>2</li> </ul> Time of day	integrated	2
<ul> <li>Mixed mode IM + CP permitted</li> <li>via interface module</li> <li>Number of IO Controllers</li> <li>integrated</li> <li>via CP</li> <li>Number of operable FMs and CPs (recommended)</li> <li>FM</li> <li>See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections</li> <li>CP, PtP</li> <li>See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections</li> <li>PROFIBUS and Ethernet CPs</li> <li>14; Of which max. 10 CP as DP master</li> <li>Slots</li> <li>required slots</li> <li>12</li> </ul>	-	10; CP 443-5 Extended
via interface module     Number of IO Controllers     integrated     via CP     0 Number of operable FMs and CPs (recommended)     FM     See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections     CP, PtP     See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections     PROFIBUS and Ethernet CPs     14; Of which max. 10 CP as DP master  Slots     required slots     2  Time of day		
Number of IO Controllers  • integrated • via CP  0  Number of operable FMs and CPs (recommended)  • FM  • CP, PtP  • CP, PtP  • PROFIBUS and Ethernet CPs  • required slots  • required slots  • integrated  1  0  See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections  • PROFIBUS and Ethernet CPs  14; Of which max. 10 CP as DP master  2  Time of day	•	
<ul> <li>integrated</li> <li>via CP</li> <li>Number of operable FMs and CPs (recommended)</li> <li>FM</li> <li>CP, PtP</li> <li>See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections</li> <li>CP, PtP</li> <li>See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections</li> <li>PROFIBUS and Ethernet CPs</li> <li>14; Of which max. 10 CP as DP master</li> <li>Slots</li> <li>required slots</li> <li>Time of day</li> </ul>		
Number of operable FMs and CPs (recommended)  • FM  See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections  • CP, PtP  See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections  • PROFIBUS and Ethernet CPs  14; Of which max. 10 CP as DP master  Slots  • required slots  2  Time of day		1
See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections     CP, PtP     See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections     PROFIBUS and Ethernet CPs     14; Of which max. 10 CP as DP master  Slots     required slots     2  Time of day	• via CP	0
number of slots and number of connections  See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections  PROFIBUS and Ethernet CPs  14; Of which max. 10 CP as DP master  Slots  required slots  2  Time of day	Number of operable FMs and CPs (recommended)	
See manual Automation System S7-400H fault-tolerant systems. Limited by number of slots and number of connections     PROFIBUS and Ethernet CPs     14; Of which max. 10 CP as DP master  Slots     required slots     2  Time of day	• FM	See manual Automation System S7-400H fault-tolerant systems. Limited by
number of slots and number of connections  • PROFIBUS and Ethernet CPs  14; Of which max. 10 CP as DP master  Slots  • required slots  2  Time of day		
● PROFIBUS and Ethernet CPs  Slots  ● required slots  2  Time of day	• CP, PtP	
Slots	PROFIBLIS and Ethernet CPs	
• required slots 2 Time of day		THE OF WHICH HIGH. TO OF AS DE HIGSTOR
Time of day		2
	·	

Hardware clock (real-time)	Yes
<ul> <li>retentive and synchronizable</li> </ul>	Yes
Resolution	1 ms
<ul> <li>Deviation per day (buffered), max.</li> </ul>	1.7 s; Power off
Deviation per day (unbuffered), max.	8.6 s; Power on
Operating hours counter	40
• Number	16
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	1h
• retentive	Yes
Clock synchronization	Ver
• 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 Voc As allock
on Ethernet via NTP  Time difference in system when synchronizing via	Yes; As client
Time difference in system when synchronizing via	10 mg; Via NTD
<ul><li>Ethernet, max.</li><li>MPI, max.</li></ul>	10 ms; Via NTP 200 ms
Interfaces	200 IIIS
Number of RS 485 interfaces	2
Number of the interfaces	2; Fiber-optic interface
Optical interface	No
1. Interface	NO
Interface type	MPI/PROFIBUS DP
Isolated	Yes
Interface types	100
• RS 485	Yes
Output current of the interface, max.	150 mA
Protocols	100 1111
• MPI	Yes
PROFIBUS DP master	Yes
PROFIBUS DP slave	No
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	
<ul> <li>PG/OP communication</li> </ul>	Yes
— Routing	Yes
<ul> <li>Global data communication</li> </ul>	No
<ul> <li>S7 basic communication</li> </ul>	No
<ul><li>— S7 communication</li></ul>	Yes
<ul> <li>S7 communication, as client</li> </ul>	Yes
<ul> <li>— S7 communication, as server</li> </ul>	
	Yes
PROFIBUS DP master	Yes
Number of connections, max.	Yes  32; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1
<ul><li>Number of connections, max.</li><li>Transmission rate, max.</li></ul>	Yes  32; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1  12 Mbit/s
<ul><li>Number of connections, max.</li><li>Transmission rate, max.</li><li>Number of DP slaves, max.</li></ul>	Yes  32; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1
<ul> <li>Number of connections, max.</li> <li>Transmission rate, max.</li> <li>Number of DP slaves, max.</li> <li>Services</li> </ul>	Yes  32; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1  12 Mbit/s  32
<ul> <li>Number of connections, max.</li> <li>Transmission rate, max.</li> <li>Number of DP slaves, max.</li> <li>Services  — PG/OP communication</li> </ul>	Yes  32; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1  12 Mbit/s  32  Yes
<ul> <li>Number of connections, max.</li> <li>Transmission rate, max.</li> <li>Number of DP slaves, max.</li> <li>Services  — PG/OP communication — Routing</li> </ul>	Yes  32; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1  12 Mbit/s  32  Yes  Yes
<ul> <li>Number of connections, max.</li> <li>Transmission rate, max.</li> <li>Number of DP slaves, max.</li> <li>Services <ul> <li>PG/OP communication</li> <li>Routing</li> <li>Global data communication</li> </ul> </li> </ul>	Yes  32; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1  12 Mbit/s  32  Yes
<ul> <li>Number of connections, max.</li> <li>Transmission rate, max.</li> <li>Number of DP slaves, max.</li> <li>Services  — PG/OP communication — Routing</li> </ul>	Yes  32; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1  12 Mbit/s  32  Yes  Yes  No  No
<ul> <li>Number of connections, max.</li> <li>Transmission rate, max.</li> <li>Number of DP slaves, max.</li> <li>Services <ul> <li>PG/OP communication</li> <li>Routing</li> <li>Global data communication</li> </ul> </li> </ul>	Yes  32; If a diagnostics repeater is used on the line, the number of connection resources on the line is reduced by 1 12 Mbit/s 32  Yes Yes No

<ul> <li>S7 communication, as server</li> </ul>	Yes
— Equidistance	No
— Isochronous mode	No
— SYNC/FREEZE	No
Activation/deactivation of DP slaves	No
<ul> <li>Direct data exchange (slave-to-slave communication)</li> </ul>	No
— DPV1	Yes
Address area	
— Inputs, max.	2 kbyte
— Outputs, max.	2 kbyte
User data per DP slave	·
— User data per DP slave, max.	244 byte
— Inputs, max.	244 byte
— Outputs, max.	244 byte
— Slots, max.	244
— per slot, max.	128 byte
PROFIBUS DP slave	
Number of connections	No configuration of CPU as DP slave
2. Interface	
Interface type	PROFINET
Isolated	Yes
automatic detection of transmission rate	Yes; Autosensing
Autonegotiation	Yes
Autocrossing	Yes
Change of IP address at runtime, supported	No 400
Number of connection resources	120
Interface types  • RJ 45 (Ethernet)	Yes
Number of ports	2
integrated switch	Yes
Protocols	100
PROFINET IO Controller	Yes
PROFINET IO Device	No
PROFINET CBA	No
PROFIBUS DP master	No
PROFIBUS DP slave	No
Open IE communication	Yes
Web server	No
Point-to-point connection	No
Media redundancy	Yes
PROFINET IO Controller	
Transmission rate, max.	100 Mbit/s
Services	
— PG/OP communication	Yes
— S7 communication	Yes
— Isochronous mode	No
— Shared device	Yes; Single mode only
<ul><li>— Prioritized startup</li></ul>	No
<ul> <li>Number of connectable IO Devices, max.</li> </ul>	256; In redundant mode via both interfaces
<ul> <li>Number of connectable IO Devices for RT, max.</li> </ul>	256
— of which in line, max.	256
Activation/deactivation of IO Devices	No
<ul> <li>IO Devices changing during operation (partner ports), supported</li> </ul>	No .
Device replacement without swap medium	Yes
— Send cycles	250 μs, 500 μs, 1 ms, 2 ms, 4 ms
— Updating time	250 µs to 512 ms, minimum value depends on the number of configured user data and the configured single or redundant mode
Address area	
— Inputs, max.	8 kbyte
— Outputs, max.	8 kbyte

User data consistency, max.	1 024 hyte
— User data consistency, max.  Open IE communication	1 024 byte
Number of connections, max.	118
Local port numbers used at the system end	0, 20, 21, 25, 102, 135, 161, 34962, 34963, 34964, 65532, 65533, 65534, 65535
Keep-alive function, supported	Yes
3. Interface	
Interface type	PROFIBUS DP
Number of connection resources	32
Interface types	
• RS 485	Yes
<ul> <li>Output current of the interface, max.</li> </ul>	150 mA
Protocols	
PROFIBUS DP master	Yes
PROFIBUS DP slave	No
PROFIBUS 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
— S7 communication, as client	Yes
— S7 communication, as server	Yes
— Equidistance	No
— Isochronous mode	No
— SYNC/FREEZE	No
Activation/deactivation of DP slaves	No
Direct data exchange (slave-to-slave communication)	No
— DPV0	Yes
— DPV1	Yes
Address area	
— Inputs, max.	8 kbyte
— Outputs, max.	8 kbyte
User data per DP slave	
<ul> <li>User data per DP slave, max.</li> </ul>	244 byte
— Inputs, max.	244 byte
— Outputs, max.	244 byte
— Slots, max.	244
— per slot, max.	128 byte
4. Interface	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization modules 6ES7960-1AA06-0XA0 or 6ES7960-1AB06-0XA0
5. Interface	
Interface type	Pluggable synchronization submodule (FO)
Plug-in interface modules	Synchronization modules 6ES7960-1AA06-0XA0 or 6ES7960-1AB06-0XA0
Protocols	
Redundancy mode	
Media redundancy	
— Switchover time on line break, typ.	200 ms
— Number of stations in the ring, max.	50
SIMATIC communication	
• S7 routing	Yes
Open IE communication	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
<ul> <li>Number of connections, max.</li> </ul>	118
— Data length, max.	32 kbyte
·	

<ul> <li>several passive connections per port, supported</li> </ul>	Yes
• ISO-on-TCP (RFC1006)	Yes; Via integrated PROFINET interface or CP 443-1 and loadable FBs
<ul> <li>Number of connections, max.</li> </ul>	118
— Data length, max.	32 kbyte; 1 452 bytes via CP 443-1 Adv.
• UDP	Yes; via integrated PROFINET interface and loadable FBs
<ul> <li>Number of connections, max.</li> </ul>	118
— Data length, max.	1 472 byte
Web server	
<ul><li>supported</li></ul>	No
Isochronous mode	
Equidistance	No
communication functions / header	
PG/OP communication	Yes
<ul> <li>Number of connectable OPs without message processing</li> </ul>	119
Number of connectable OPs with message processing	119; When using Alarm_S/SQ and Alarm_D/DQ
Data record routing	Yes
Global data communication	
• supported	No
S7 basic communication	
• supported	No
S7 communication	
• supported	Yes
• as server	Yes
• as client	Yes
<ul> <li>User data per job, max.</li> </ul>	64 kbyte
<ul> <li>User data per job (of which consistent), max.</li> </ul>	462 byte; 1 variable
S5 compatible communication	
• supported	Yes; (via CP max. 10 and FC AG_SEND and FC AG_RECV)
User data per job, max.	8 kbyte
<ul> <li>User data per job (of which consistent), max.</li> </ul>	240 byte
Number of simultaneous AG-SEND/AG-RECV orders per	64/64
CPU, max.	
Standard communication (FMS)	
• supported	Yes; Via CP and loadable FB
Number of connections	
• overall	120
<ul> <li>usable for PG communication</li> </ul>	
<ul> <li>reserved for PG communication</li> </ul>	1
<ul> <li>adjustable for PG communication, max.</li> </ul>	0
<ul> <li>usable for OP communication</li> </ul>	
<ul> <li>reserved for OP communication</li> </ul>	1
<ul> <li>adjustable for OP communication, max.</li> </ul>	0
<ul> <li>usable for S7 basic communication</li> </ul>	
<ul> <li>reserved for S7 basic communication</li> </ul>	0
<ul> <li>adjustable for S7 basic communication, max.</li> </ul>	0
<ul> <li>usable for S7 communication</li> </ul>	
<ul> <li>reserved for S7 communication</li> </ul>	0
<ul> <li>adjustable for S7 communication, max.</li> </ul>	0
<ul> <li>usable for routing</li> </ul>	
<ul> <li>reserved for routing</li> </ul>	0
— adjustable for routing, max.	0
S7 message functions	
Number of login stations for message functions, max.	119; max. 119 with Alarm_S/SQ and Alarm_D/DQ (OPs); max. 16 with Alarm_8, Alarm_8P, Notify and Notify_8 (e.g. WinCC)
Symbol-related messages	No
SCAN procedure	No
Program alarms	Yes
B " "	Yes
Process diagnostic messages	res
Process diagnostic messages simultaneously active Alarm-S blocks, max.	1 000; Simultaneously active alarm_S/SQ blocks or alarm_D/DQ blocks

blocks, max.	
• preset, max.	1 200
Process control messages	Yes
Number of archives that can log on simultaneously (SFB 37 AR_SEND)	64
Test commissioning functions	
Status block	Yes
Single step	Yes
Number of breakpoints	16
Status/control	
Status/control variable	Yes; Up to 16 variable tables
Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
<ul> <li>Number of variables, max.</li> </ul>	70
Forcing	
• Forcing	Yes
Forcing, variables	Inputs/outputs, bit memories, distributed I/Os
<ul> <li>Number of variables, max.</li> </ul>	512
Diagnostic buffer	
• present	Yes
Number of entries, max.	3 200
— adjustable	Yes
— preset	120
Service data	
• can be read out	Yes
EMC	
Emission of radio interference acc. to EN 55 011	
<ul> <li>Limit class A, for use in industrial areas</li> </ul>	Yes
<ul> <li>Limit class B, for use in residential areas</li> </ul>	No
configuration / header	
Configuration software	
• STEP 7	Yes
configuration / programming / header	
<ul> <li>Command set</li> </ul>	see instruction list
<ul> <li>Nesting levels</li> </ul>	7
<ul> <li>Access to consistent data in process image</li> </ul>	Von
	Yes
System functions (SFC)	see instruction list
System functions (SFC)	see instruction list
<ul><li>System functions (SFC)</li><li>System function blocks (SFB)</li></ul>	see instruction list
<ul><li>System functions (SFC)</li><li>System function blocks (SFB)</li><li>Programming language</li></ul>	see instruction list see instruction list
<ul> <li>System functions (SFC)</li> <li>System function blocks (SFB)</li> <li>Programming language</li> <li>LAD</li> </ul>	see instruction list see instruction list Yes
<ul> <li>System functions (SFC)</li> <li>System function blocks (SFB)</li> <li>Programming language</li> <li>— LAD</li> <li>— FBD</li> </ul>	see instruction list see instruction list Yes Yes
<ul> <li>System functions (SFC)</li> <li>System function blocks (SFB)</li> <li>Programming language</li> <li>LAD</li> <li>FBD</li> <li>STL</li> </ul>	see instruction list see instruction list  Yes Yes Yes
<ul> <li>System functions (SFC)</li> <li>System function blocks (SFB)</li> <li>Programming language</li> <li>LAD</li> <li>FBD</li> <li>STL</li> <li>SCL</li> </ul>	see instruction list see instruction list  Yes Yes Yes Yes Yes
<ul> <li>System functions (SFC)</li> <li>System function blocks (SFB)</li> <li>Programming language</li> <li>LAD</li> <li>FBD</li> <li>STL</li> <li>SCL</li> <li>CFC</li> </ul>	see instruction list see instruction list  Yes Yes Yes Yes Yes Yes
<ul> <li>System functions (SFC)</li> <li>System function blocks (SFB)</li> <li>Programming language</li> <li>LAD</li> <li>FBD</li> <li>STL</li> <li>SCL</li> <li>CFC</li> <li>GRAPH</li> </ul>	see instruction list see instruction list  Yes Yes Yes Yes Yes Yes Yes Yes Yes
System functions (SFC) System function blocks (SFB)  Programming language  LAD FBD STL SCL CFC GRAPH HiGraph®  configuration / programming / number of simultaneously active RD_REC	see instruction list see instruction list  Yes Yes Yes Yes Yes Yes Yes Yes Yes
System functions (SFC) System function blocks (SFB)  Programming language  — LAD — FBD — STL — SCL — CFC — GRAPH — HiGraph®  configuration / programming / number of simultaneously active.	see instruction list see instruction list  Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
System functions (SFC) System function blocks (SFB)  Programming language  LAD FBD STL SCL CFC GRAPH HiGraph®  configuration / programming / number of simultaneously active — RD_REC WR_REC WR_PARM	see instruction list  Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
System functions (SFC) System function blocks (SFB)  Programming language  — LAD — FBD — STL — SCL — CFC — GRAPH — HiGraph®  configuration / programming / number of simultaneously active — RD_REC — WR_REC — WR_PARM — PARM_MOD	see instruction list  Yes Yes Yes Yes Yes Yes Yes Yes Yes SFC / header 8 8
System functions (SFC) System function blocks (SFB)  Programming language  LAD FBD STL SCL CFC GRAPH HiGraph®  configuration / programming / number of simultaneously active — RD_REC WR_REC WR_PARM	see instruction list see instruction list  Yes Yes Yes Yes Yes Yes Yes Yes Yes A Sec SFC / header  8 8 8
● System functions (SFC)  ● System function blocks (SFB)  Programming language  — LAD  — FBD  — STL  — SCL  — CFC  — GRAPH  — HiGraph®  configuration / programming / number of simultaneously active  — RD_REC  — WR_REC  — WR_PARM  — PARM_MOD  — WR_DPARM  — DPNRM_DG	see instruction list see instruction list  Yes Yes Yes Yes Yes Yes Yes Yes Yes A SFC / header  8 8 8 8 1
<ul> <li>System functions (SFC)</li> <li>System function blocks (SFB)</li> <li>Programming language  <ul> <li>LAD</li> <li>FBD</li> <li>STL</li> <li>SCL</li> <li>CFC</li> <li>GRAPH</li> <li>HiGraph®</li> </ul> </li> <li>configuration / programming / number of simultaneously actives</li> <li>RD_REC</li> <li>WR_REC</li> <li>WR_PARM</li> <li>PARM_MOD</li> <li>WR_DPARM</li> </ul>	see instruction list  Yes Yes Yes Yes Yes Yes Yes Yes Yes A B B B B B B B B B B B B B B B B B B B
● System functions (SFC)  ● System function blocks (SFB)  Programming language  — LAD  — FBD  — STL  — SCL  — CFC  — GRAPH  — HiGraph®  configuration / programming / number of simultaneously active  — RD_REC  — WR_REC  — WR_PARM  — PARM_MOD  — WR_DPARM  — DPNRM_DG	see instruction list  Yes Yes Yes Yes Yes Yes Yes Yes Yes A Yes
<ul> <li>System functions (SFC)</li> <li>System function blocks (SFB)</li> <li>Programming language</li> <li>LAD</li> <li>FBD</li> <li>STL</li> <li>SCL</li> <li>CFC</li> <li>GRAPH</li> <li>HiGraph®</li> <li>configuration / programming / number of simultaneously active</li> <li>RD_REC</li> <li>WR_REC</li> <li>WR_PARM</li> <li>PARM_MOD</li> <li>WR_DPARM</li> <li>DPNRM_DG</li> <li>RDSYSST</li> </ul>	see instruction list  Yes Yes Yes Yes Yes Yes Yes Yes Yes A Yes
<ul> <li>System functions (SFC)</li> <li>System function blocks (SFB)</li> <li>Programming language</li> <li>— LAD</li> <li>— FBD</li> <li>— STL</li> <li>— SCL</li> <li>— CFC</li> <li>— GRAPH</li> <li>— HiGraph®</li> <li>configuration / programming / number of simultaneously active</li> <li>— RD_REC</li> <li>— WR_REC</li> <li>— WR_PARM</li> <li>— PARM_MOD</li> <li>— WR_DPARM</li> <li>— DPNRM_DG</li> <li>— RDSYSST</li> <li>— DP_TOPOL</li> <li>configuration / programming / number of simultaneously active</li> <li>— RDREC</li> </ul>	see instruction list  Yes Yes Yes Yes Yes Yes Yes Yes Yes A Yes
<ul> <li>System functions (SFC)</li> <li>System function blocks (SFB)</li> <li>Programming language</li> <li>— LAD</li> <li>— FBD</li> <li>— STL</li> <li>— SCL</li> <li>— CFC</li> <li>— GRAPH</li> <li>— HiGraph®</li> <li>configuration / programming / number of simultaneously active</li> <li>— RD_REC</li> <li>— WR_REC</li> <li>— WR_PARM</li> <li>— PARM_MOD</li> <li>— WR_DPARM</li> <li>— DPNRM_DG</li> <li>— RDSYSST</li> <li>— DP_TOPOL</li> <li>configuration / programming / number of simultaneously active</li> </ul>	see instruction list  Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
<ul> <li>System functions (SFC)</li> <li>System function blocks (SFB)</li> <li>Programming language</li> <li>— LAD</li> <li>— FBD</li> <li>— STL</li> <li>— SCL</li> <li>— CFC</li> <li>— GRAPH</li> <li>— HiGraph®</li> <li>configuration / programming / number of simultaneously active</li> <li>— RD_REC</li> <li>— WR_REC</li> <li>— WR_PARM</li> <li>— PARM_MOD</li> <li>— WR_DPARM</li> <li>— DPNRM_DG</li> <li>— RDSYSST</li> <li>— DP_TOPOL</li> <li>configuration / programming / number of simultaneously active</li> <li>— RDREC</li> <li>— WRREC</li> <li>Know-how protection</li> </ul>	see instruction list  Yes Yes Yes Yes Yes Yes Yes Yes Yes Ye
<ul> <li>System functions (SFC)</li> <li>System function blocks (SFB)</li> <li>Programming language</li> <li>— LAD</li> <li>— FBD</li> <li>— STL</li> <li>— SCL</li> <li>— CFC</li> <li>— GRAPH</li> <li>— HiGraph®</li> <li>configuration / programming / number of simultaneously active</li> <li>— RD_REC</li> <li>— WR_REC</li> <li>— WR_PARM</li> <li>— PARM_MOD</li> <li>— WR_DPARM</li> <li>— DPNRM_DG</li> <li>— RDSYSST</li> <li>— DP_TOPOL</li> <li>configuration / programming / number of simultaneously active</li> <li>— RDREC</li> <li>— WRREC</li> <li>Know-how protection</li> <li>■ User program protection/password protection</li> </ul>	see instruction list  Yes Yes Yes Yes Yes Yes Yes Yes Yes SFC / header  8 8 8 1 2 8 8 1 2 8 8 8 1 Yes Yes
<ul> <li>System functions (SFC)</li> <li>System function blocks (SFB)</li> <li>Programming language</li> <li>— LAD</li> <li>— FBD</li> <li>— STL</li> <li>— SCL</li> <li>— CFC</li> <li>— GRAPH</li> <li>— HiGraph®</li> <li>configuration / programming / number of simultaneously active</li> <li>— RD_REC</li> <li>— WR_REC</li> <li>— WR_PARM</li> <li>— PARM_MOD</li> <li>— WR_DPARM</li> <li>— DPNRM_DG</li> <li>— RDSYSST</li> <li>— DP_TOPOL</li> <li>configuration / programming / number of simultaneously active</li> <li>— RDREC</li> <li>— WRREC</li> <li>Know-how protection</li> </ul>	see instruction list  Yes Yes Yes Yes Yes Yes Yes Yes Yes SFC / header  8 8 8 1 2 8 8 1 2 8 8 8 1 8 8 8 8 8 8

Width	50 mm
Height	290 mm
Depth	219 mm
Weights	
Weight, approx.	995 g

last modified: 4/1/2022 🖸