



6ES7412-1XF03-0AB0

Siemens SIMATIC S7-400 CPU 412-1

Product scope

- Provides 48 KB of code memory and 48 KB of data memory for S7-400 control tasks.
- Integrates an isolated MPI/PROFIBUS DP interface operating at up to 12 Mbit/s.
- Supports DP master and slave operation, with up to 32 DP slaves in the documented configuration.
- Uses one S7-400 slot and has documented dimensions of 25 x 290 x 219 mm.

Manufacturer source

Siemens SIMATIC S7-400 CPU Specifications, A5E00165965-01

The enclosed manufacturer pages identify the exact CPU 412-1 article number. All four relevant pages are retained without changes to Siemens technical content.

Request a fast quote	Product reference	
Email: info@apterpower.com Phone: +86 18106909650 apter.com/inquiry.php	6ES7412-1XF03-0AB0	

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Technical Specifications

4.1 Technical Specifications of the CPU 412-1; (6ES7412-1XF03-0AB0)

CPU and Version		Data Areas and Their Retentivity	
MLFB	6ES7412-1XF03-0AB0	Total retentive data areas (including memory bits; times; counts)	Total working and load memory (with backup battery)
• Firmware version	V 3.1	Memory markers	4 Kbytes
Associated programming package	As of STEP7 V 5.2	• Retentivity can be set	From MB 0 to MB 4095
Memory		• Preset retentivity	From MB 0 to MB 15
Working memory		Clock memories	8 (1 memory byte)
• Integrated	48 Kbytes for code 48 Kbytes for data	Data blocks	Max. 511 (DB 0 reserved)
• Expandable	No	• Size	Max. 48 Kbytes
Load memory		Local data (can be set)	Max. 8 Kbytes
• Integrated	256 Kbytes RAM	• Preset	4 Kbytes
• Expandable FEPRM	With memory card (FLASH) up to 64 Mbytes	Blocks	
• Expandable RAM	With memory card (RAM) up to 64 Mbytes	OBs	See instruction list
Backup	Yes	• Size	Max. 48 Kbytes
• With battery	All data	Nesting depth	
• Without battery	None	• Per priority class	24
Processing Times		• Additionally in an error OB	2
Processing times for		FBs	Max. 256
• Bit operations	Min. 0.2 µs	• Size	Max. 48 Kbytes
• Word instructions	Min. 0.2 µs	FCs	Max. 256
• Integer math instructions	Min. 0.2 µs	• Size	Max. 48 Kbytes
• Floating-point math instructions	Min. 0.6 µs	Address Areas (Inputs/Outputs)	
Timers/Counters and Their Retentivity		Total I/O address area	4 Kbytes/4 Kbytes
S7 counters	256	• Of which distributed	
• Retentivity can be set	From Z 0 to Z 255	MPI/DP interface	2 Kbytes/2 Kbytes
• Preset	From Z 0 to Z 7	The distributed I/O address area is halved for each strand operated clock synchronously, i.e. in which an OB 61 is assigned.	
• Counting range	1 to 999	Process Image	4 Kbytes/4 Kbytes (can be set)
IEC counter	Yes	• Preset	128 bytes/128 bytes
• Type	SFB	• Number of partial process images	Max. 8
S7 timers	256	• Consistent data	Max. 244 bytes
• Retentivity can be set	From T 0 to T 255	Digital channels	32768/32768
• Preset	No retentive timers	• Of which central	32768/32768
• Time range	10 ms to 9990 s	Analog channels	2048/2048
IEC timers	Yes	• Of which central	2048/2048
• Type	SFB		

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Configuration		S7 Message Functions	
Central racks/expansion units	Max. 1/21	Number of stations that can log on for message functions (e.g. WIN CC or SIMATIC OP)	Max. 8
Multicomputing	Max. 4 CPUs (with UR1 or UR2)	Symbol-related messages	Yes
Number of plug-in IMs (overall)	Max. 6	• Number of messages	
• IM 460	Max. 6	– Overall	Max. 512
• IM 463-2	Max. 4	– 100 ms grid	None
Number of DP masters		– 500 ms grid	Max. 256
• Integrated	1	– 1000 ms grid	Max. 256
• Via IM 467	Max. 4	• Number of additional values per message	1
• Via CP	Max. 10	– With 100 ms grid	None
IM 467 cannot be used with the CP 443-5 Extended		– With 500, 1000 ms grid	1
Number of plug-in S5 modules via adapter casing (in the central rack)	Max. 6	Block-related messages	Yes
Operable function modules and communication processors		• Simultaneously active ALARM-S/SQ blocks and ALARM-D/DQ blocks	Max. 70
• FM	Limited by the number of slots and the number of connections	ALARM-8 blocks	Yes
• CP 440	Limited by the number of slots	• Number of communication jobs for ALARM-8 blocks and blocks for S7 communication (can be set)	Max. 300
• CP 441	Limited by the number of connections	• Preset	150
• PROFIBUS and Ethernet CPs incl. CP 443-5 Extended and IM 467	Max. 14	Process control reports	Yes
Time		Number of archives that can log on simultaneously (SFB 37 AR_SEND)	4
Clock	Yes	Test and Startup Functions	
• Buffered	Yes	Monitor/modify variable	Yes
• Resolution	1 ms	• Variables	Inputs/outputs, memory markers, DB, distributed inputs/outputs, timers, counters
• Accuracy at		• Number of variables	Max. 70
– Power off	Deviation per day 1.7 s	Force	Yes
– Power on	Deviation per day 8.6 s	• Variables	Inputs/outputs, memory markers, distributed inputs/outputs
Runtime meter	8	• Number of variables	Max. 64
• Number	0 to 7	Status block	Yes
• Value Range	0 to 32767 hours	Single sequence	Yes
• Granularity	1 hour	Diagnostic buffer	Yes
• Retentive	Yes	• Number of entries	Max. 200 (can be set)
Time synchronization	Yes	• Preset	120
• In PLC, on MPI and DP	as master or slave	Number of breakpoints	4
Time of day difference in the system for synchronization via			
• ETHERNET	maximum 10 ms		
• MPI	maximum 200 ms		

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Communication Functions	
Programming device/OP communication	Yes
Number of connectable OPs	16 without message processing, 8 with message processing
Number of connection resources for S7 connections via all interfaces and CPs	16, with each of them reserved for PG and OP respectively
Global data communication	Yes
• Number of GD circuits	Max. 8
• Number of GD packages	
– Sender	Max. 8
– Receiver	Max. 16
• Size of GD packages	Max. 64 bytes
– Of which consistent	1 variable
S7 basic communication	Yes
• User data per job	Max. 76 bytes
– Of which consistent	16 bytes
S7 communication	Yes
• User data per job	Max. 64 Kbytes
– Of which consistent	1 variable (462 bytes)
S5-compatible communication	Yes (via CP – max. 10 – and FC AG_SEND and AG_RECV)
• User data per job	Max. 8 Kbytes
– Of which consistent	240 bytes
Standard communication (FMS)	Yes (via CP and loadable FB)
Interfaces	
1st Interface	
Type of interface	Integrated
Physical	RS 485/Profibus
Isolated	Yes
Power supply to interface (15 VDC to 30 VDC)	Max. 150 mA
Number of connection resources	MPI: 16 DP: 16
Functionality	
• MPI	Yes
• PROFIBUS DP	DP master/DP slave

MPI	
• Utilities	
– Programming device/OP communication	Yes
– Routing	Yes
– Global data communication	Yes
– S7 basic communication	Yes
– S7 communication	Yes
• Transmission rates	Up to 12 Mbps
DP Master	
• Utilities	
– Programming device/OP communication	Yes
– Routing	Yes
– Constant bus cycle time	Yes
– SYNC/FREEZE	Yes
– Enable/disable DP slaves	Yes
• Transmission rates	Up to 12 Mbps
• Number of DP slaves	Max. 32
• Address area	Max. 2 Kbytes inputs/2 Kbytes outputs
• User data per DP slave	Maximum 244 bytes E, maximum 244 bytes A, distributed over 244 slots each with 128 bytes
DP slave	
• Utilities	
– Monitor/modify	Yes, if the interface is active
– Programming	Yes, if the interface is active
– Routing	Yes, if the interface is active
• DDB (GSD) file	http://www.ad.siemens.de/csi_e/gsd
• Transmission rate	Up to 12 Mbps
• Intermediate memory	244 bytes inputs/244 bytes outputs
– Address areas	Max. 32
– User data per address area	Max. 32 bytes
– Of which consistent	32 bytes

Technical Specifications

Programming		Dimensions	
Programming language	LAD, FBD, STL, SCL	Mounting dimensions	25×290×219
Instruction set	See instruction list	W×H×D (mm)	
Bracket levels	8	Slots required	1
System functions (SFC)	See instruction list	Weight	Approx. 0.72 kg
Number of SFCs active at the same time		Voltages, Currents	
• WR_REC	8	Current consumption from S7-400 bus (5 VDC)	Typ. 1.5 A Max. 1.6 A
• WR_PARM	8	Current consumption from the S7-400 bus (24 VDC)	Total current consumption of the components connected to the MPI/DP interfaces, with a maximum of 150 mA per interface
• PARM_MOD	1	The CPU does not consume any current at 24 V, and it only makes this voltage available at the MPI/DP interface.	
• WR_DPARM	2	Backup current	Typ. 40 µA Max. 300 µA
• DPNRM_DG	8	maximum backup time	approx 356 days
• RDSYSST	1 to 8	Incoming supply of external backup voltage to the CPU	5 VDC to 15 VDC
• DP_TOPOL	1	Power loss	Typ. 7.5 W
System function blocks (SFB)	See instruction list		
Number of SFBs active at the same time			
• RD_REC	8		
• WR_REC	8		
User program protection	Password protection		
Access to consistent data in the process image	Yes		
Clock synchronism			
User data per clock synchronous slave	Max. 128 bytes		
Maximum number of bytes and slaves in a process image partition	The following applies: Number of bytes / 100 + number of slaves < 11		
Equidistance	Yes		
Shortest clock pulse	5 ms 2.5 ms without use of SFC 126, 127		
CiR synchronization time			
Base load	100 ms		
Time per I/O byte	200 µs		



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