Controls and display elements of the 417-4 CPU

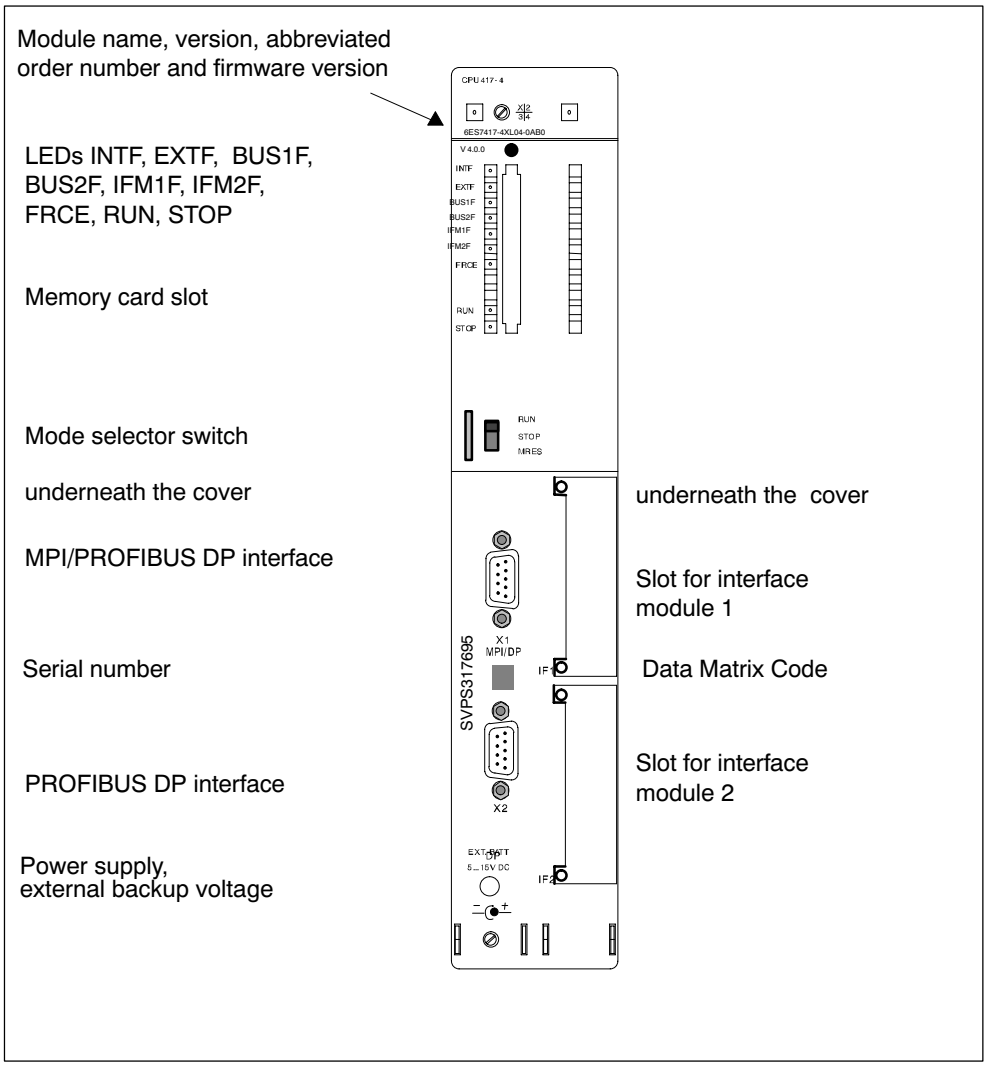


Figure 1-4 Layout of the control and display elements of the 417-4 CPU

LED displays

Table 1-1 gives you an overview of the LEDs on the individual CPUs.

Section 1.2 describes the states and errors indicated by these LEDs.

6.7 Technical Specifications of the CPU 417-4; (6ES7417-4XL04-0AB0)

CPU and Version	
MLFB	6ES7417-4XL04-0AB0
• Firmware version	V 1.0
Associated programming package	As of STEP 7 5.2 SP1 HF3 with HW-Update
Memory	
Working memory	
• Integrated	10 Mbytes for code
	10 Mbytes for data
Load memory	
• Integrated	256 Kbytes RAM
• Expandable FEPROM	With memory card (FLASH) up to 64 Mbytes
• Expandable RAM	With memory card (RAM) up to 64 Mbytes
Backup with battery	Yes, all data
Processing Times	
Processing times for	
• Bit operations	0.03 µs
• Word instructions	0.03 µs
• Integer math instructions	0.03 µs
• Floating-point math instructions	0.09 µs
Timers/Counters and Their Retentivity	
S7 counters	2048
• Retentivity can be set	From Z 0 to Z 2047
• Preset	From Z 0 to Z 7
• Counting range	1 to 999
IEC counter	Yes
• Type	SFB
S7 timers	2048
• Retentivity can be set	From T 0 to T 2047
• Preset	No retentive timers
• Time range	10 ms to 9990 s
IEC timers	Yes
• Type	SFB
Data Areas and Their Retentivity	
Total retentive data areas (including memory bits; times; counts)	Total working and load memory (with backup battery)
Memory markers	16 Kbytes
• Retentivity can be set	From MB 0 to MB 16383
• Preset retentivity	From MB 0 to MB 15
Clock memories	8 (1 memory byte)
Data blocks	Max. 8191 (DB 0 reserved)
• Size	Max. 64 Kbytes
Local data (can be set)	Max. 64 Kbytes
• Preset	32 Kbytes

Blocks	
OBs	See instruction list
• Size	Max. 64 Kbytes
Nesting depth	
• Per priority class	24
• Additionally in an error OB	2
FBs	Max. 6144
• Size	Max. 64 Kbytes
FCs	Max. 6144
• Size	Max. 64 Kbytes
Address Areas (Inputs/Outputs)	
Total I/O address area	16 Kbytes/16 Kbytes
• Of which distributed	incl. diagnostics addresses for I/O interfaces, etc.
MPI/DP interface	2 Kbytes/2 Kbytes
DP interface	8 Kbytes/8 Kbytes
Process Image	16 Kbytes/16 Kbytes (can be set)
• Preset	1024 bytes/1024 bytes
• Number of partial process images	Max. 15
• Consistent data	Max. 244 bytes
Digital channels	Max. 131072/ Max. 131072
• Of which central	Max. 131072/ Max. 131072
Analog channels	Max. 8192/ Max. 8192
• Of which central	Max. 8192/ Max. 8192

Configuration	
Central racks/expansion units	Max. 1/21
Multicomputing	Max. 4 CPUs (with UR1 or UR2)
Number of plug-in IMs (overall)	Max. 6
• IM 460	Max. 6
• IM 463-2	Max. 4
Number of DP masters	
• Integrated	2
• Via IF 964-DP	2
• Via IM 467	Max. 4
• Via CP 443-5 Extended	Max. 10
IM 467 cannot be used with the CP 443-5 Extended	
IM 467 cannot be used with the CP 443–1 EX40 in PN IO mode	
Number of plug-in S5 modules via adapter casing (in the central rack)	Max. 6
Operable function modules and communication processors	
• FM	Limited by the number of slots and the number of connections
• CP 440	Limited by the number of slots
• CP 441	Limited by the number of connections
• Profibus and Ethernet CPs incl. CP 443-5 Extended and IM 467	Max. 14

Time	
Clock	Yes
• Buffered	Yes
• Resolution	1 ms
• Accuracy at	
– Power off	Deviation per day 1.7 s
– Power on	Deviation per day 8.6 s
Runtime meter	8
• Number	0 to 7
• Value Range	0 to 32767 hours
• Granularity	1 hour
• Retentive	Yes
Time synchronization	Yes
• In PLC, on MPI, DP and IF 964 DP	as master or slave

S7 Message Functions	
Number of stations that can log on for message functions (e.g. WIN CC or SIMATIC OP)	Max. 16
Symbol-related messages	Yes
• Number of messages	
– Overall	Max. 1024
– 100 ms grid	Max. 128
– 500 ms grid	Max. 512
– 1000 ms grid	Max. 1024
• Number of additional values per message	
– With 100 ms grid	Max. 1
– With 500, 1000 ms grid	Max. 10
Block-related messages	Yes
• Simultaneously active ALARM_S/SQ blocks and ALARM_D/DQ blocks	Max. 200
ALARM_8 blocks	Yes
• Number of communication jobs for ALARM_8 blocks **and** blocks for S7 communication (can be set)	Max. 10000
• Preset	1200
Process control reports	Yes
Number of archives that can log on simultaneously (SFB 37 AR_SEND)	64

Test and Startup Functions	
Monitor/modify variable	Yes
• Variables	Inputs/outputs, memory markers, DB, distributed inputs/outputs, timers, counters
• Number of variables	Max. 70
Force	Yes
• Variables	Inputs/outputs, memory markers, distributed inputs/outputs
• Number of variables	Max. 512
Status block	Yes
Single sequence	Yes
Diagnostic buffer	Yes
• Number of entries	Max. 3200 (can be set)
• Preset	120
Number of breakpoints	4

Number of connection resources	32, a diagnostic repeater in the strand reduces the number of connection resources by 1
Functionality	
• PROFIBUS DP	DP master/DP slave
2nd Interface DP Master Mode	
• Utilities	
– Programming device/OP communication	Yes
– Routing	Yes
– S7 basic communication	Yes
– S7 communication	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. 125
• Address area	Max. 8 Kbytes inputs/ 8 Kbytes outputs
• User data per DP slave • User data per DP slave	Max. 244 bytes inputs, max.244 bytes outputs, max. 244 slots each with max. 128 bytes
Note: • The accumulated number of input bytes at the slots may not exceed 244 • The accumulated number of output bytes at the slots may not exceed 244 • The maximum address area of the interface (max. 8 KB inputs /8 KB outputs) accumulated by 125 slaves may not be exceeded	
2nd Interface DP Slave Mode	
As for the 1st interface	
3rd Interface	
Type of interface	Plug-in interface submodule
Insertable interface submodule	IF-964-DP
Technical features as for the 2nd interface	
4th Interface	
Type of interface	Plug-in interface submodule
Insertable interface submodule	IF-964-DP
Technical features as for the 2nd interface	
Programming	
Programming language	LAD, FBD, STL, SCL
Instruction set	See instruction list
Bracket levels	8
System functions (SFC)	See instruction list
Number of SFCs active at the same time for every strand	
• DPSYC_FR	2
• D_ACT_DP	4
• RD_REC	8
• WR_REC	8
• WR_PARM	8
• PARM_MOD	1
• WR_DPARM	2
• DPNRM_DG	8
• RDSYSST	1 to 8
• DP_TOPOL	1
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
CiR synchronization time	
Base load	100 ms
Time per I/O byte	40 µs
Clock synchronism	
User data per clock synchronous slave	Max. 244 bytes
Maximum number of bytes and slaves in a process image partition	The following applies: Number of bytes/50 + number of slaves
Constant bus cycle time	Yes
Shortest clock pulse see manual *Clock Synchronism*	1 ms 0.5 ms without use of SFC 126, 127
Dimensions	
Mounting dimensions W×H×D (mm)	50×290×219
Slots required	2
Weight	approx. 1,07 kg
Voltages, Currents	
Current consumption from S7-400 bus (5 VDC)	Typ. 1.5 A Max. 1.7 A
Current consumption from the S7-400 bus (24 VDC) The CPU does not consume any current at 24 V, and it only makes this voltage available at the MPI/DP interface.	Total current consumption of the components connected to the MPI/DP interfaces, with a maximum of 150 mA per interface
Backup current	Typically 600 µA Maximum 1810 µA
Incoming supply of external backup voltage to the CPU	5 VDC to 15 VDC
maximum backup time	See manual *Module Specifications*, chapter 3.3
Power loss	Typ. 6.0 W