

3.2 CPU module PM6

Order No.	6DD1600-0AK0
Description	The CPU module processes open- and closed-loop tasks which demand an extremely high computational performance, or where the program is very large. They have • 8 binary inputs, of which a maximum of 4 can be used to call-up interrupt tasks.
Performance data	Computational performance: 64/128 MHz, 32/64 bit RISC processor DRAM 8 MByte (SD), version with 16Mbyte SRAM 256 KByte The CPU module permits extremely fast cycle times of 0.1 ms. A typical application (e.g. control loop) can be configured in approx. 0.5 ms.
DRAM	The DRAM contains: • Program code (is loaded and expanded when the memory module is initialized) • Data memory for the operating system, communications, message buffer, trace function
SRAM, buffered	The buffered SRAM (using either a battery in the subrack or an external battery) contains the following data, which are to be saved during and after a power failure: • Operating system error diagnostics ("exception buffer") • Max. 1000 process quantities, configured with the function block SAV • Data recorded/traced using the message system or trace function (can be optionally configured on the SRAM)
Programming	The program, running on the CPU module, is configured on a PC using STEP7/HWConfig and CFC. This is then loaded into an MS5 program memory module (or MS51). The program memory module is inserted in the module receptacle provided on the CPU module. The user program can be loaded in two ways: • via a PCMCIA card installed in the PC-programming adapter (offline loading) • directly from the PC via a serial communications connection in the memory module inserted in the CPU module (online loading)
Program size	The size of the software to be loaded in the memory module (compressed to approx. 50% and the size of the available program memory is displayed in CFC under the following menu item: Target system \ Load \ Info

MS5, MS51, MS52

The program is loaded in a program memory module

- MS5 2 Mbyte Flash-EPROM, 8 Kbyte EEPROM
- MS51 4 Mbyte Flash-EPROM, 8 Kbyte EEPROM
- MS52 8 MByte Flash-EPROM, 8 KByte EEPROM

Serial service interface

An RS 232 interface (V.24) with service protocol DUST 1 **with 19.2 kbaud** is permanently installed in **connector X01** (9-pin sub-D socket). It is used to:

- test and commission the user program (using CFC or "basic IBS")
- loading the user program from the PC (only in this module)

Binary inputs

8 binary inputs can be connected at the 10-pin **connector X5**.

Interface modules

The screw terminals for the binary inputs are available via the interface modules (can be connected using cable SC7):

Interface module	Function
SB10, SU10	Electrical 1:1 connection
SB60, SB61	With electrical isolation (floating) and signal conversion

Table 3-7 Possible interface modules for PM6

7-segment display

In normal operation, the configured number of the CPU module (1...8) is displayed. When an error occurs, a letter is displayed, which refers to the error type. Possible operating- and error statuses:

Display	Operating- and error statuses	Display can be deleted with key
1...8	Configured number of the CPU module in normal operation	-
A	User error: with function block USF from the diagnostics event defined by the user. This has no influence on the program run	yes
-	Initialization phase Individual initialization steps are displayed with increasing numbers during the run-up phase	-
.	5V available; no program is being executed	-
0	Error during initialization: the user program does not start if errors occur when the system is being initialized. Initialization error due to erroneous or incorrectly inserted modules for the actual software which has been configured: - flashing „0“: Error on this module - steady „0“: Error on other modules - continuous: Error when loading the system software Start diagnostics at the CPU module, which first displayed the "0" error message. If you cannot identify which CPU module was the first to have displayed the error message, then you should start with that CPU module which displays a "0" and is inserted farthest to the left.	no
b	Monitoring error - e.g. missing, discharged buffer battery - background processing error - when initializing non-critical error which permits standard operation to start	yes
C	Erroneous configured communications or connection	no
d	- steady "d": Module is in the STOP mode; selection in the „Target system/operating status“ menu; software is still not being downloaded - flashing "d": Data is being downloaded in the STOP mode is faster than download in the RUN mode (runs in the background)	no
E	Task administrator error: cycle error a task was not able to be processed within the	yes

Display	Operating- and error statuses	Display can be deleted with key
	sampling time - task backup if the task is not designated as a high-priority task, and has to be re-started. - no free local buffer the data buffer is no longer enabled. Task start is skipped. software watchdog if the base sampling time is not processed for four consecutive times. The basic clock timer is re-initialized with the configured base sampling time and processing is continued.	
H	Fatal system error: hardware or software problem which caused a program crash: Display: - flashing „H“: Fault/error on this module - steady „H“: Fault/error on another module	no

Additional information

on diagnostics refer to the Manual "SIMADYN D Basis Software for D7-SYS

Button S1

The button has 2 functions:

- Deleting the error display:
By depressing button S1, sporadic errors ("E") or non-critical errors ("B") appearing in the display can be deleted.
If another error is present, this is displayed after the first has been acknowledged.
- Binary signal input with function block ASI

Real-time clock

Resolution 0.1 ms; e.g. to time stamp messages;

An MM3 coupling memory module must be used as time source if the time is to be backed-up during power failures.

Software protection

A plug-in socket for a 28-pin EPLD device is provided on the module (ALTERA company) so that the user program can be copy-protected („Hardlock-PAL“).
Using a special function block, this EPLD device can be checked and the program stopped if the code is missing or is incorrect.
Additional information on request.

3.2.1 Supplementary components

- MS5 and MS51 program memory modules
- Cable SC57 for PC connection, 9-core, 5 m
- Cable SC7 to connect an interface module, 10-core, 2 m

If additional input/output signals and other functions are required, then these can be implemented by inserting a maximum of 2 **expansion modules**:

- IT41
- IT42
- ITDC
- ITSL

3.2.2 Application information and noise immunity

- Operation **without fan** is not possible
- Noise-immune operation is only possible if the module is tightly screwed into the subrack
- Do not insert or withdraw the module when the subrack is powered-up

Other information

For more information regarding EMC and ambient conditions, refer to the section "General technical data"!

3.2.3 Technical data

General data

Number of slots occupied	1
Dimensions W x H x D [mm]	20.14 x 233.4 x 220
Weight	approx. 0.51 kg

Power supply

Rated voltage	min.	max.	Typical current drain
+5 V	+4.75 V	+5.25 V	1700 mA
+15 V	+14.4 V	+15.6 V	50 mA
-15 V	-15.6 V	-14.4 V	30 mA
24 V (external)	20 V	30 V	100 mA + binary output currents

Binary inputs

No.	8 of which, max. 4 are interrupt-capable	
Input voltage		+24 V rated voltage
	for 0 signal	-1 V to +6 V or binary inputs open-circuit
	for 1 signal	+13 V to +33 V
Input current		
	for 0 signal	0 mA
	for 1 signal	3 mA typ.
Input delay	max. 20 μ s	
Electrical isolation	no; only via SB60, SB61 interface modules	

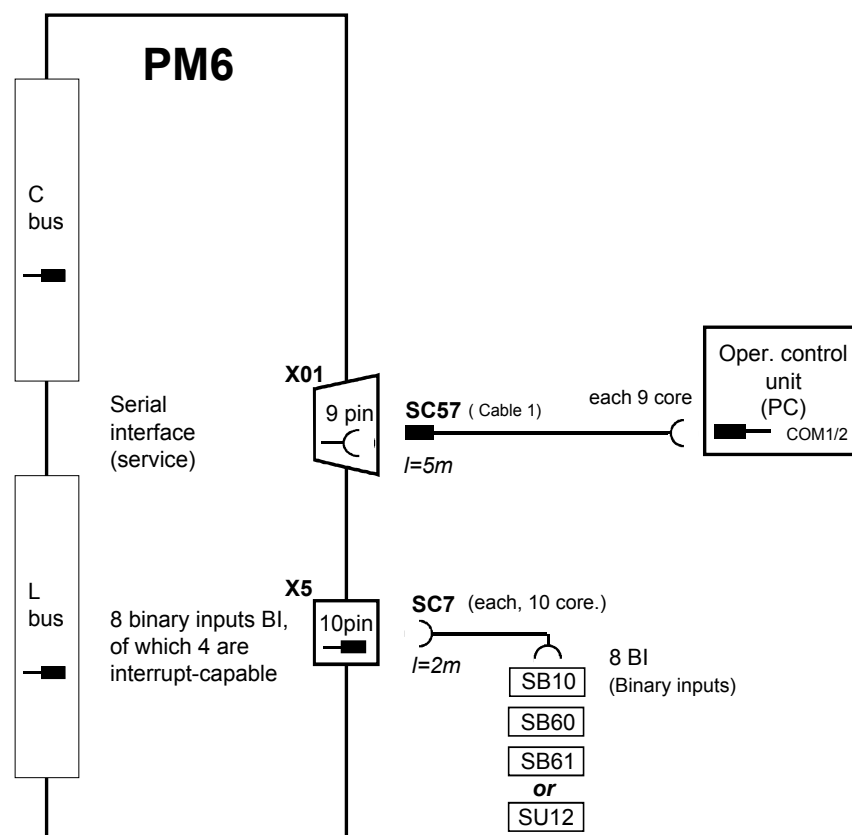
3.2.4 Connection diagram

Fig. 3-3 Connecting cables and interface modules