

PMB (Net-Tech Developments)

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PRODUCT NOTE

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FLASH ACCESS

INTRODUCTION

Swapped data and address bus lines must be taken into account when accessing the FLASH memory.

This was done to simplify the layout of the PCB, allowing it to be as small as it is, without moving to the next level of construction sophistication.

When reading and writing data there is no noticeable difference. It does mean that the data cannot be read or written using a stand-alone programmer without running a conversion. The data is not actually stored exactly where it appears to be. Each block of 256 bytes is mixed up but sector boundaries are not violated, so it has no real effect.

DETAILS

These notes apply to the boards CPU_1A1 and CPU_1B.

The data and address lines between the CPU and the FLASH chip are swapped over:

cpu	to	flash	cpu	to	flash
A0	-	A7	D0	-	D7
A1	-	A6	D1	-	D6
A2	-	A5	D2	-	D5
A3	-	A4	D3	-	D4
A4	-	A3	D4	-	D3
A5	-	A2	D5	-	D2
A6	-	A1	D6	-	D1
A7	-	A0	D7	-	D0
A8	-	A8			
A9	-	A9			
A10	-	A10			
A11	-	A11			
A12	-	A12			
A13	-	A13			
A14	-	A14			
A15	-	nc			

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When writing commands to the flash and monitoring the status of internal operations it is required to convert the data codes and addresses before writing/reading the flash. This is because the FLASH is expecting to see specific codes at specific addresses.

The conversion is simple. Use the codes and addresses listed below instead of the ones in the data sheet.

data sheet	2AAAh	becomes	2A55h	address
data sheet	5555h	becomes	55AAh	address
data sheet	10h	becomes	08h	chip erase
data sheet	30h	becomes	0Ch	sector erase
data sheet	55h	becomes	AAh	2nd cycle
data sheet	80h	becomes	01h	erase
data sheet	90h	becomes	09h	autoselect
data sheet	A0h	becomes	05h	program
data sheet	AAh	becomes	55h	1st & 3rd cycle
data sheet	F0h	becomes	0Fh	reset

The status flag bits are also converted:

flag	DQ7	seen as	00000001	(01H)	data polling
flag	DQ6	seen as	00000010	(02H)	toggle
flag	DQ5	seen as	00000100	(04H)	> time limit
flag	DQ3	seen as	00010000	(10H)	sect. erase timer

. Remember that if the FLASH is mapped to the top 32K of the address space (as it usually is), a 32K (8000h) offset must be added. The data or command bytes are not affected.

2A55h	becomes	AA55h
AA55h	becomes	DA55h