Flash Microcontroller Support

Fujitsu is currently actively promoting 16-bit MCU with single voltage flash memory. This is due to the advantage of the Fujitsu flash implementation. Namely, single voltage supply, i.e. 5V and guaranteed 10.000 erase cycles. Therefore, customers would like to start their design project swiftly by setting up the supporting 16-bit emulation system on their own.

Short Installation Guide for the 16-bit Emulator Hardware (V1.0a)

This installation guide will help you to quickly start setting up the emulation hardware. For in-depth informaton please refer to the following manuals:

- Emulator Setup manual   - Ref. CM42-00409-1E
- MB2140 Series Main Unit (MB2141A)   - Ref. CM42-00406-1E
- MB2145-506 Hardware Manual   - Ref. CM41-00416-2E
- MB2142-03 Parallel Communication Adapter   - Ref. CM41-00413-1E
- MB2142-02 10Base-T LAN Adapter   - Ref. CM41-00412-1E

At the end of this document you will find a guide of the top 5 trouble shooting items, in order to perform a quick operation check of the 16-bit emulation system.

1. Hardware Requirements

The basic devices one requires for setting up the 16-bit emulation system are:

- MB2141A main unit
- MB2145-506 emulation pod
- MB2132-xxx probe cable
- MB90VxxxCR evaluation chip
- Target system (that properly provides power or logic signals to all MCU pins!)

In addition to the emulator, ordered from Fujitsu, a customer will automatically get the 'Accessories_16'-kit, that includes a set of manuals and some cables (e.g. RS232 interface cable).

## 2. Setting up the Emulation System

In order to properly install the emulation hardware please follow these steps:

2.1 Provide a clock source to the MB2145-506

    If you are using crystals on your target system, it is necessary to install a crystal directly in the MB2145-506 emulation pod (in the so called 'crystal area'). Note, a crystal cannot be installed on the user system as an oscillation source. Therefore, a similar component must be installed in the crystal area of the emulation pod, or create an oscillator circuit on the user system and buffer the oscillation by a CMOS buffer, for example.

For installing a main clock (e.g. 4 MHz) in the crystal area of the MB2145-506:

- Pull the lever and remove the plastic cover of the MB2145-506.
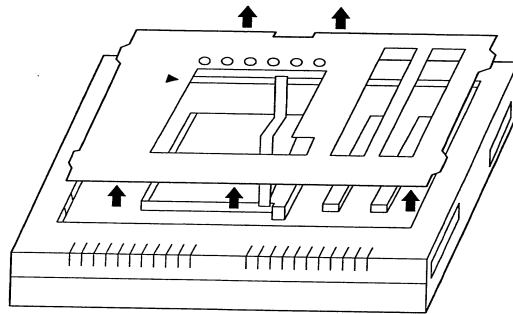
- You will find a 8-pin DIP IC-socket. This is called the crystal area. Insert your crystal (e.g. 4 MHz crystal) for the main clock as well as your capacitors (e.g. 22pF or 33 pF) according to the schematic. This procedure is not necessary for a subclock (32.768 KHz), as it is already available in the emulation unit.
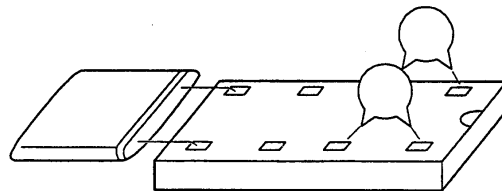

Note, the crystal area must be kept empty if you have want to use the main clock from your target board.

- Enable the DIP-Switches in order to use the crystals in the emulation pod or the clock from the target system.

Clock generation method		SW1 setting						Remarks
Main clock	Sub clock	1	2	3	4	5	6	
Crystal Area	Present	OFF	OFF	ON	OFF	ON	OFF	
	None	OFF	OFF	OFF	ON	OFF	ON	
User system	Present	ON	ON	ON	OFF	ON	OFF	*
	None	ON	ON	OFF	ON	OFF	ON	*

Please use the sub-clock setting 'None', if you do not have a sub-clock on your microcontroller or if you want to use a sub-clock driver from the target system.
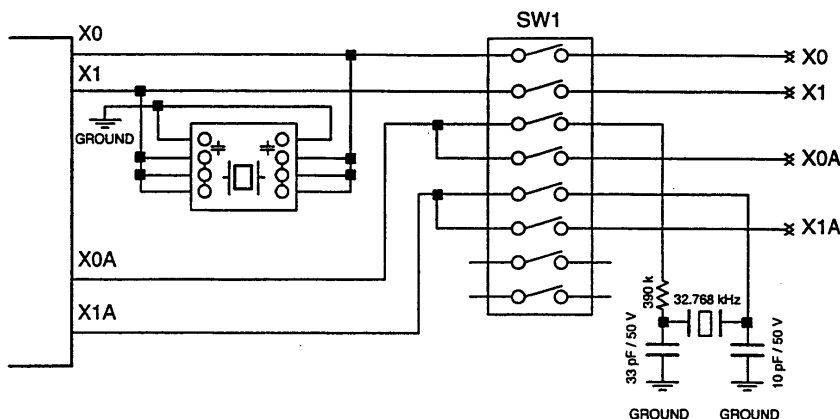
Example: You are using a microcontroller, that has no sub-clock capability. On your target board the main clock will be generated with a crystal. In this case, the setting in the MB2145-506 must be OFF,OFF,OFF,ON,OFF,ON for DIP-switches 1-6, respectively. DIP-switch 7 and 8 are 'don't care'.

After installing the crystal and setting the DIP-switches, please put the white plastic cover back on the emulation unit.

2.2 Insert the Evaluation Chip

Insert the evaluation chip by pulling the lever. Then position the evaluation chip by observing pin No. 1.
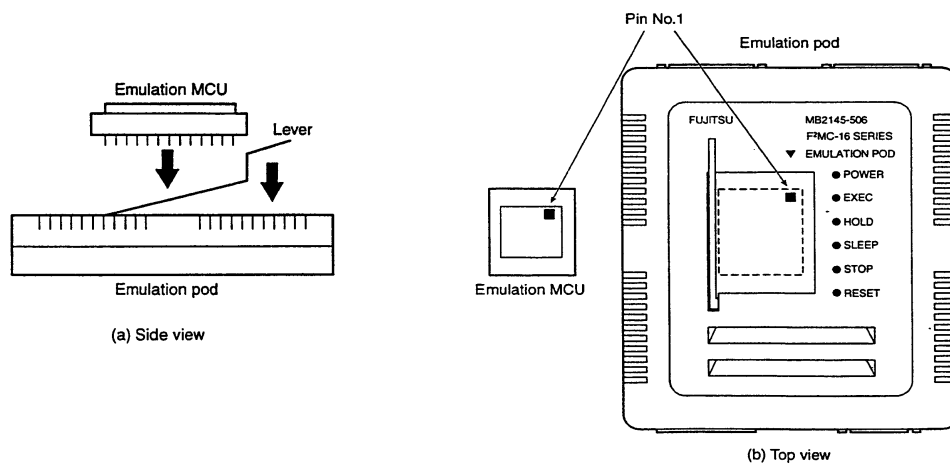
2.3 Connecting the emulation system

The following connections need to be performed:
- Connect the main unit (MB2141A) with the emulation unit (MB2145-506) via the 3 cables named A,B and C.
- Connect the MB2141A with its power lead to 230V.
- Connect the MB2141A with the serial cable (25 pin male - 9 pin female) to the serial interface of your PC or notebook.
- Connect the MB2145-506 with the target system using the MB2132-xxx probe cable.

2.4 Powering up your emulation system

To avoid any damage please always follow this procedure to power up your emulation system:
A. Switch on the main switch at the back of the MB2141A.
    - On the MB2141A the 'Ready' and 'Power' LED must be on.
    - On the MB2145-506 the 'Power' must and the 'Reset' LED can go on.
B. Switch on the power of the target system
- On the MB2145-506 the 'Reset' LED can go off.
    If your emulation software is properly installed and the monitor software downloaded to the MB2141A (see 'Short Emulator SW Installation Guide') the 'Reset' LED should go off.

2.5 'Boot Reset' of the MB2141A

When setting up the emulation system for the first time or when changing to a new 16-bit microcontroller family from Fujitsu (F²MC-16L ↔ F²MC-16LX), you have to download the emulator firmware for this family. Therefore, please follow the instructions in your 'Short Emulator SW Installation Guide'.

In order to achieve this, it is necessary to do a 'boot reset' on the main unit MB2141A:
- Please switch off the power supply of the MB2141A.
- Press the reset button at the back of the MB2141A and keep it pressed.
- Switch on the power supply of the MB2141A.
- Release the reset button min. 3 seconds after the power was swichted on.

Follow this procedure always before installing the emulator firmware.

3. Trouble Shooting

A. Check the above installation procedure and settings!

B. Note, the emulator software (e.g. EML907W) will not work if the emulator is not powered up, initialized and connected to a powered target board. The target board must provide power or logic signals to all MCU pins.
- MB2141A: Only Ready LED and Power LED on.
- MB2145-506: Only Power LED on.

C. If the emulator SW does not start, please check your RS232 interface connection:
Use a standard terminal program (e.g. Hyperterminal - direct cable connection). Connect with 9600 baud, no parity, 1 stop bit, 8 data bits. When pressing 'Enter'. The emulator should respond with '>'. Sending the command 'SYS' should return the internal firmware setting. If you do not get any reponse, please check your notebook setting and after that the cable.

D. If the MB2141A error LED is on, disconnect the probe cable from the target system, switch the emulation sytem on by performing a 'boot reset' (see 2.5). If the problem persists contact your Fujitsu support.
If not, please download the firmware new, and try again. Please check your target board.

E. Note, after an 'ICE-internal error' you have to exit the emulation software on your PC and to press the 'Reset'-button at the back of the MB2141A main unit.

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