Installation Guide for the 16-bit Emulator System MB2141 and emulation pod MB2145-507(V2.0)

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. CM42-00410-1E
- MB2140 Series Main Unit (MB2141A)   - Ref. CM42-00406-1E
- MB2145-507 Hardware Manual   - Ref. CM42-00411-1E
- 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 which are required for setting up the 16-bit emulation system are:

- MB2141A main unit
- MB2145-507 emulation pod
- MB2132-xxx probe cable
- MB90VxxxCR evaluation chip
- Target system (that properly provides power or logic signals to all MCU pins!)
- CD-ROM

In addition to the emulator, ordered from Fujitsu, a customer should get the 'Accessories 16'-kit, that includes a set of manuals and some cables (e.g. RS232 interface cable).

Note: Take care that all settings have to be done before the system is switched off.

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 MB2145-507

If you are using crystals on your target system, it is necessary to install a crystal directly in the MB2145-507 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 MB2145-507:

On the top you will find an area with an 8-pin DIP IC-socket (SC3) a DIP switch (SW1) and two Jumper arrays (s1, S2). The 8-pin DIP IC socket 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) according to the schematic. This procedure is not necessary for a subclock (32.768 KHz), as it is already available in the emulation pod.
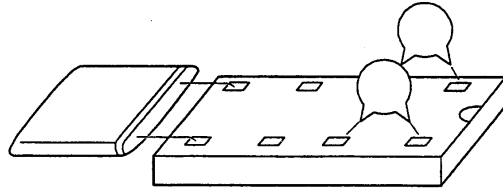
Note, the crystal area must be kept empty if you want to use the main clock from your target board.

- Enable the DIP-Switches in order to use the crystals in the emulation pod or the clock from the target system. The following table shows the DIP switch setting for SW1, switches 1 to 4 and the setting for the jumper S1. S1is used to connect or disconnect the subclock provided on the emulation pod.
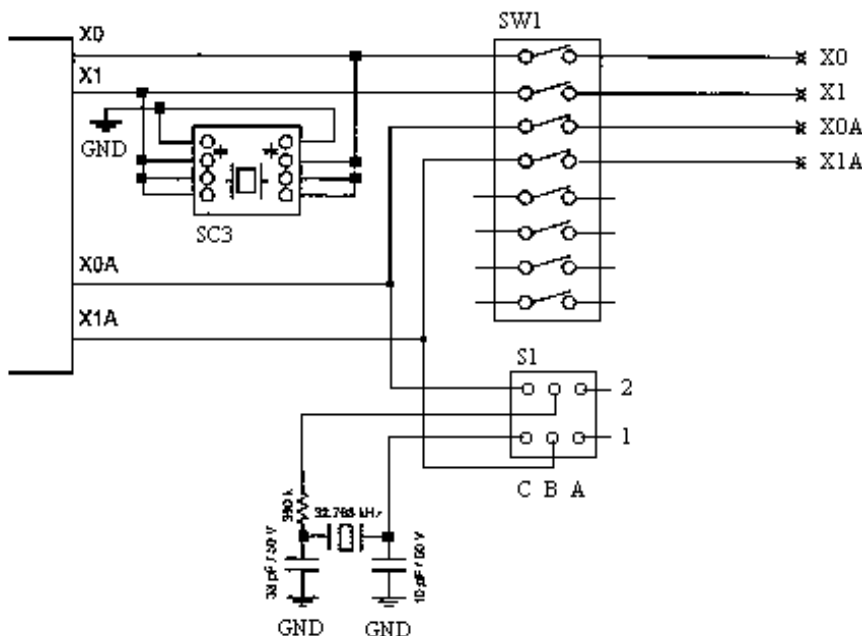
Clock supply method		SW1 setting				S1 setting
Main clock	Secondary clock	1	2	3	4	
Crystal area	Yes	OFF	OFF	OFF	OFF	B1-C1, B2-C2 shorted
	No	OFF	OFF	ON	ON	A1-B1, A2-B2 shorted
User system	Yes	ON	ON	OFF	OFF	B1-C1, B2-C2 shorted
	No	ON	ON	ON	ON	A1-B1, A2-B2 shorted

Please use the secondary clock setting 'No', 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.

The following table shows the setting of the SW1 switches 5 and 6. These pins are used to connect the C-Pin. Set the C-pin switch depending on whether there is a C-Pin on the evaluation MCU.
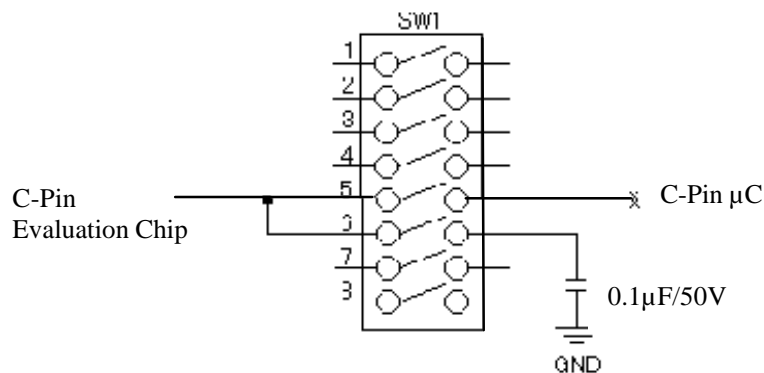
C-pin function	SW1 setting	
	5	6
Yes	OFF	ON
No	ON	OFF

The DIP switches 7 and 8 of SW1 are 'don't care'.

Switch S2 is for future use. For more detailed description please look at the manual of the –507 emulation pod. The default setting of the three S2 jumpers are location A-B.

Example1: You are using a microcontroller, that has no sub-clock capability. E.g the MB90V590, MB90V595, MB90V550 evaluation chip is used. On your target board the main clock will be generated with a crystal. So you have to use the crystal on the pod. In this case, the setting in the MB2145-507 must be as follows:

MB90V550, MB90V590, MB90V595 setting:
SW1: (1-6) OFF, OFF, ON, ON, OFF, ON
1, 2: use clock on pod
3, 4: connect the I/O pins to the evaluation chip
5: Disconnect C-pin to target
6: Connect 100nF on pod to C-pin of V-chip

S1 jumper setting:
Position 1: A-B shortcut, disconnect subclock provided on pod
Position 2: A-B shortcut, disconnect subclock provided on pod

Example 2: You are using a microcontroller, that has a sub-clock capability. E.g the MB90V520, MB90V570, MB90V580, MB90V540 evaluation chip is used. On your target board the main clock will be generated with a crystal. So you have to use the crystal on the pod and the subclock should also be used from the pod. In this case, the setting in the MB2145-507 must be as follows:

MB90V520, MB90V570, MB90V580, MB90V540 setting:
SW1: (1-6) OFF, OFF, OFF, OFF, OFF, ON
1, 2: use clock on pod
3, 4: use subclock on pod
5: Disonnect C-pin from target
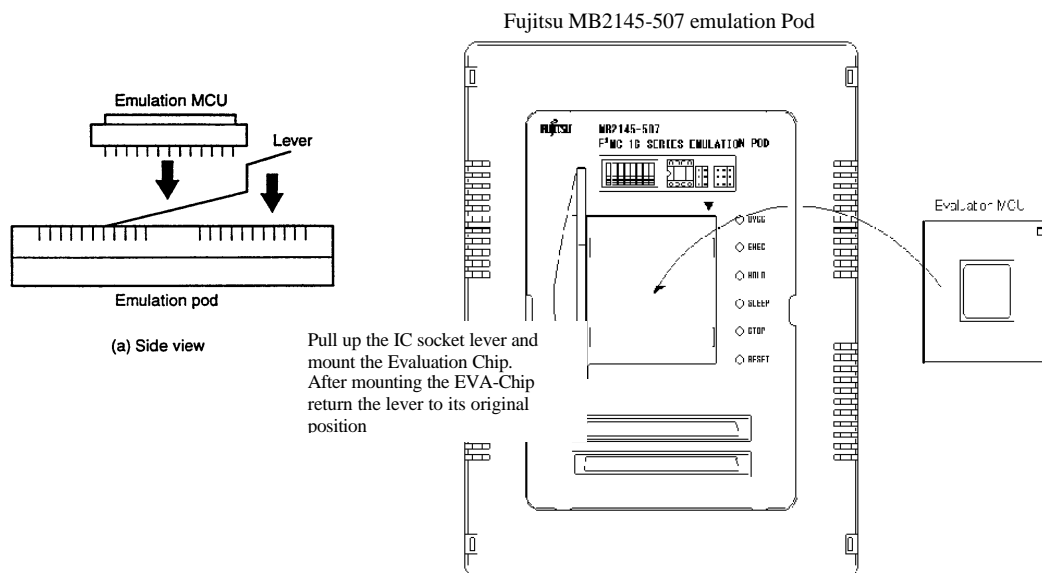6: Connect 100nF on pod to C-pin of V-chip

S1 jumper setting:
Position 1: B-C shortcut, connect subclock provided on pod
Position 2: B-C shortcut, connect subclock provided on pod

2.2 Insert the Evaluation Chip

Insert the evaluation chip by pulling the lever. Then position the evaluation chip by observing pin No. 1.

Fujitsu MB2145-507 emulation Pod

Emulation MCU

Lever

Emulation pod

(a) Side view

Pull up the IC socket lever and mount the Evaluation Chip. After mounting the EVA-Chip return the lever to its original position

2.3 Connecting the emulation system

The following connections need to be performed:
- Connect the main unit (MB2141A) with the emulation unit (MB2145-507) 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, 1:1 cable connection) to the serial interface of your PC or notebook.
- Connect the MB2145-507 with the target system using the MB2132-xxx probe cable.
  Note: If no target system is connected the emulator will not work.

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 MB2145-507 the 'Power' must and the 'Reset' LED can go on.
B. Switch on the power of the target system
- On the MB2145-507 the 'Reset' LED can go off.
  If your emulation software is properly installed and the monitor software downloaded to the MB2141A the 'Reset' LED should go off.

2.5 'Software Installation

To work with the 16-Bit emulation system, you have to install the Softune Workbench Software environment from the CD-ROM. After executing setup.exe you will find a menu with install options. Select all items and start the installation. The default path will be c:\Softune. After the installation you will find the Softune workbench ready to use for the 16-Bit microcontroller series. Also some demoprograms are included on the CD-ROM. For further details regarding the softune workbench please have a look at the appnote „getting started".
When setting up the emulation system for the first time or when changing to a new 16-bit microcontroller family from Fujitsu (F²MC-16L $\leftrightarrow$ F²MC-16LX), you have to download the emulator firmware to the main unit first. Otherwise an error message will occur if the emulator debugger software is started from the softune workbench software environment. For that purpose start the monitor loader. Select „Monitor Loader" from the start menu. The following monitor .hex files must be used, which are located in the softune\lib\907 directory:

Microcontroller Family	MB2145-506 emulation pod	MB2145-507 emulation pod
FFMC 16L	Eml906.hex	Eml906n.hex
FFMC 16LX	Eml905.hex	Eml905n.hex

Select the corresponding serial PC port which is used for the download and the Baudrate (max. 19200). After that start the download with the „start" button. If there is already a monitor program inside the main unit you will get an error message. To download the new firmware, you have to erase the old version first.
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.

After that start again the download procedure. At the end of this procedure, the emulator system will be initialised automatically. After that the system is ready to use.

3. Trouble Shooting

A. Check the above installation procedure and settings!

B. Note, the emulator software 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.
- MB2145-507: 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, switch off the power supply of the emulator and the target system and disconnect the probe cable from the target system. After that switch the emulation system 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.If the Reset LED is always on check the clock setting for the target board. Check whether the crystal area is equipped with the right crystal and capacitors. Download again the firmware to make sure that the system is installed correctly.

F. 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.