



FR Family MB2198-01 Emulator System Installation Guide

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1. Introduction



This installation guide will help you to quickly start setting up the MB2198-01 Emulation Hardware for Cypress 32-Bit MCUs and its usage with the Softune Workbench V30L27 or higher. For in-depth information please refer to the following manuals:

- MB2198-01 Hardware Manual (Emulator)

At the end of this document you will find a guide of trouble shooting items, in order to perform a quick operation check of the 32-bit emulation system.

2. Hardware Requirements

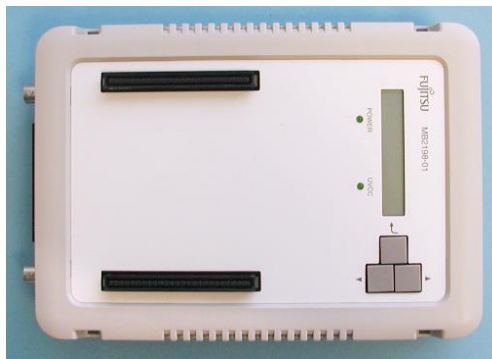


Basic Devices of MB2198 Emulator System

2.1 Devices

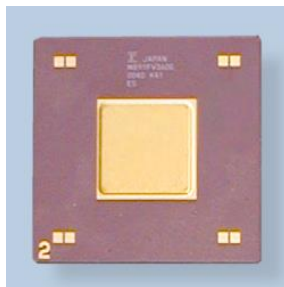
The basic devices which are required for setting up the 32-bit emulation system for Evaluation MCUs:

- Emulator Main Unit MB2198-01

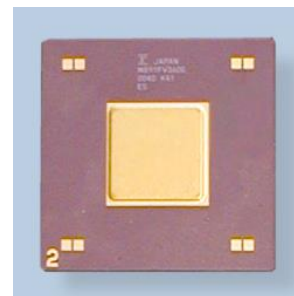


2.2 PGA-401C-A02 Systems

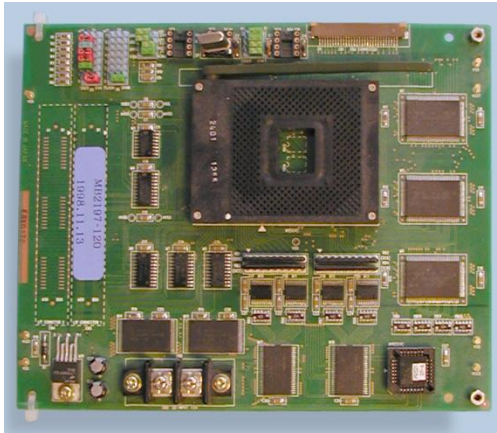
- Evaluation Chip
 - MB91(F)V360 (FR-50)



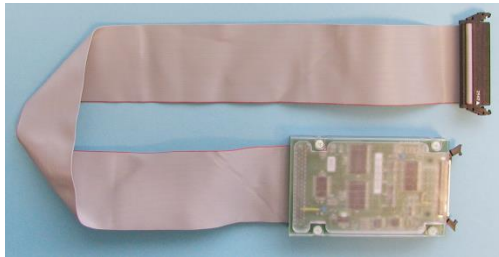
MB91V230 (FR-Lite)



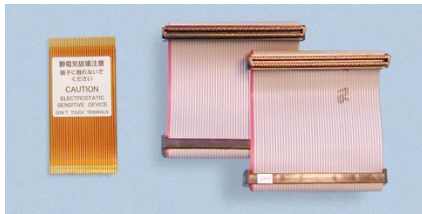
- Evaluation Chip Pod MB2197-120



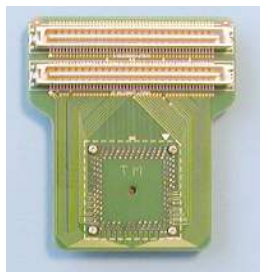
- DSU FR Cable



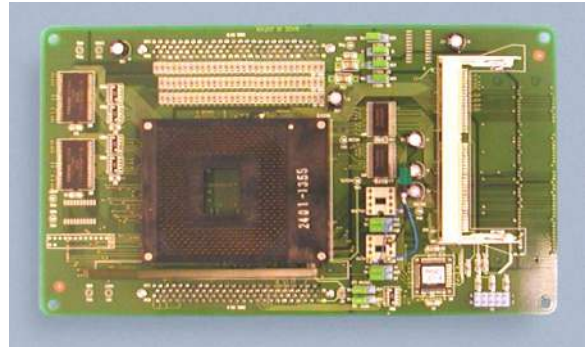
- Flat Cables (for DSU and Pod)



- Adapter Socket MB2197-127-3V3



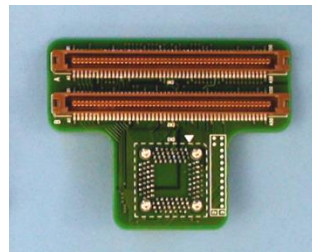
- Evaluation Chip Adapter MB2198-120



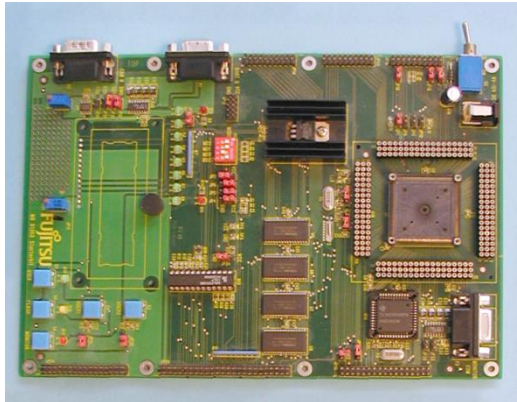
- Flat Cables for LQFP-120P Socket



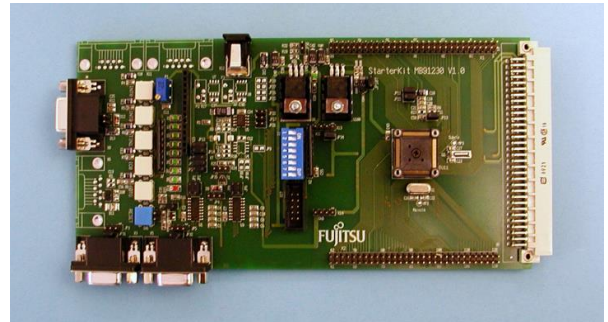
- Adapter Socket MB2197-121



- Target System (here MB91360 Starterkit)



- Target System (here MB91230 Starterkit)

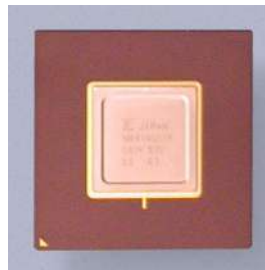


- RS232-, USB-, or LAN-connection cable
- Three Power Supplies (2x 12V, 1x 5V [stabilized])

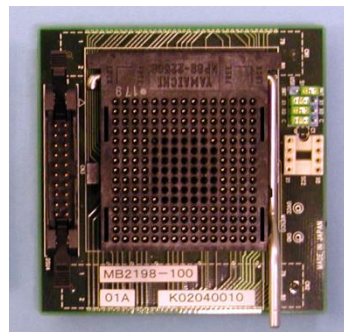
2.3 PGA-179C-A02 System

FR-65 Core

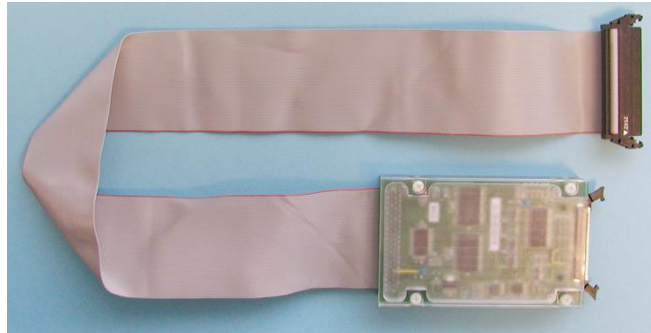
- Evaluation Chip e. g. MB91V302



- Evaluation Chip Adapter Board MB2198-100



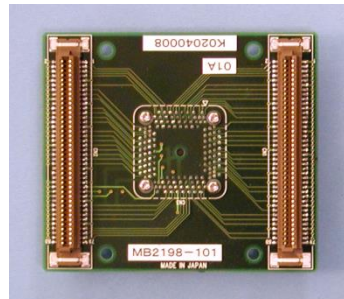
- DSU FR Cable



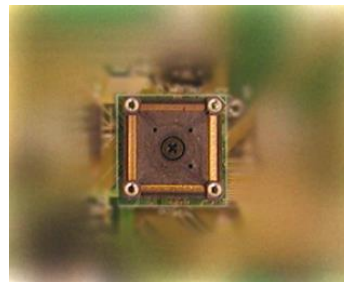
- Flat Cable (for DSU and Adapter Board)



- Adapter Socket MB2198-101



- User Target System



- RS232-, USB-, or LAN-connection cable
- Two Power Supplies (2x 12V, 1x 5V [depending on user target board])

3. Setting up a MB91360 Emulation System (PGA-401C-A02)



Hardware Installation for FR-50 Core

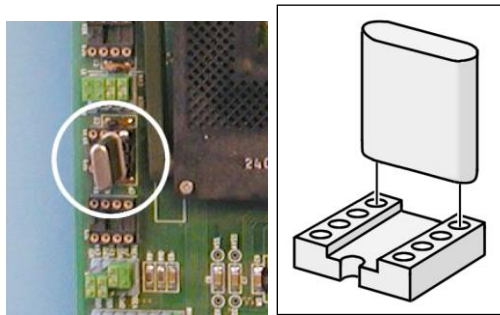
3.1 Installing the emulator system

Attention: Be sure that the system is *not* connected to any power supply, when connecting or disconnecting components to and from it.

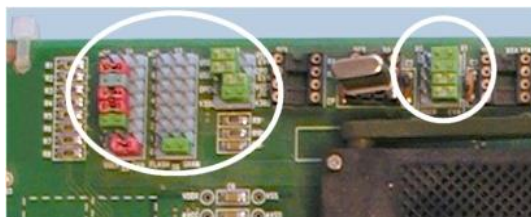
In order to properly install the emulation hardware please follow these steps:

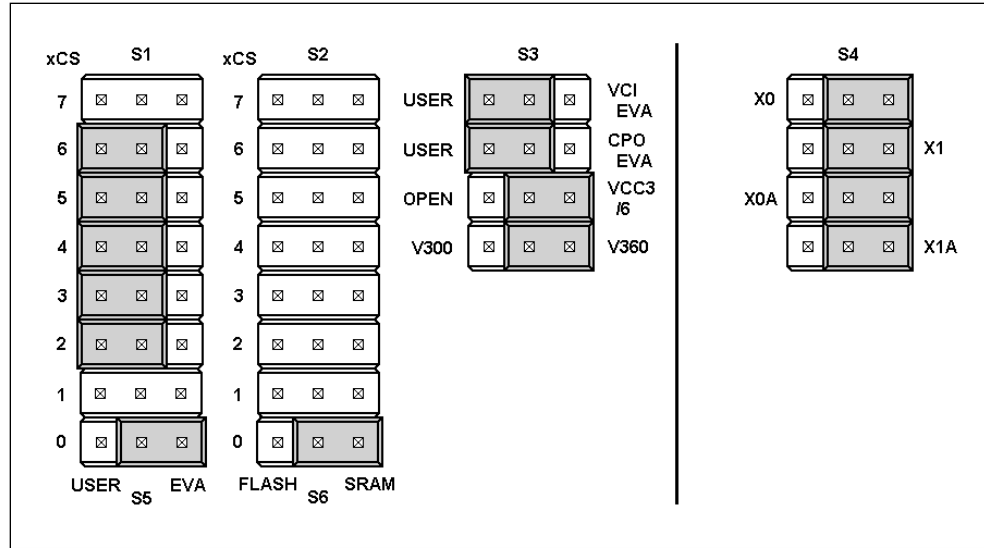
3.1.1 Adapter Pod

Install a crystal on the SC2 socket of the MB2197-120 pod, as shown in the picture below:



Set the jumpers S1 – S6 like in the following graphics:

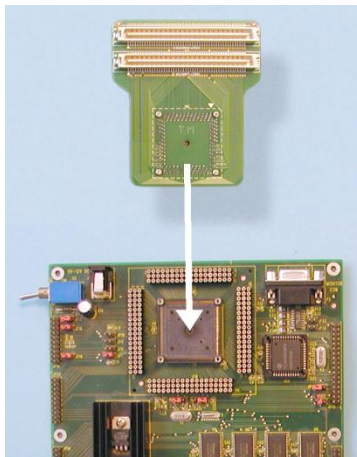




Note:

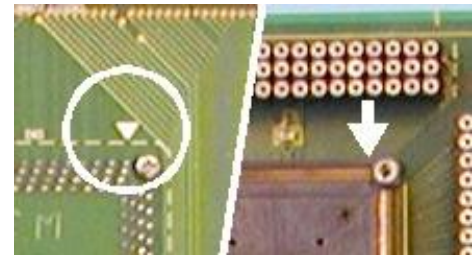
Sub clock crystal (if sub clock is supported) should be installed to SC3 like the main clock crystal. There is **no** connection through the probe cable to the target system.

3.1.2 Target Board (Here: MB91360 Starterkit)

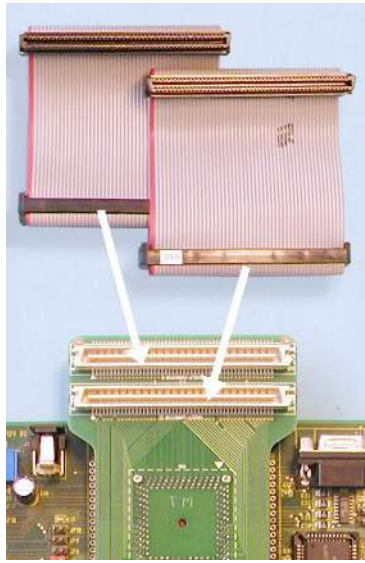


Mount the Adapter Socket MB2197-127-3V3 to the Starterkit board. Use a cross tip screw driver to fix the screws on the socket.

Be sure, that the small white triangle on the Adapter Socket points to Pin 1 on the MCU socket of the Starterkit board as shown in the right illustration.

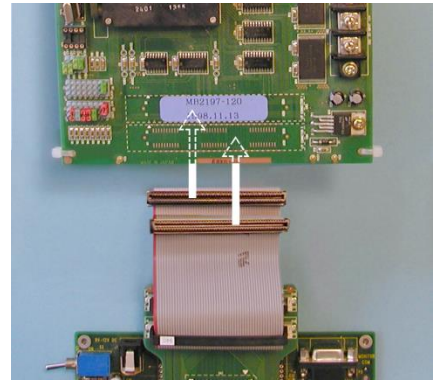
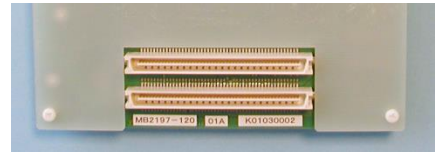


Setting up a MB91360 Emulation System (PGA-401C-A02)

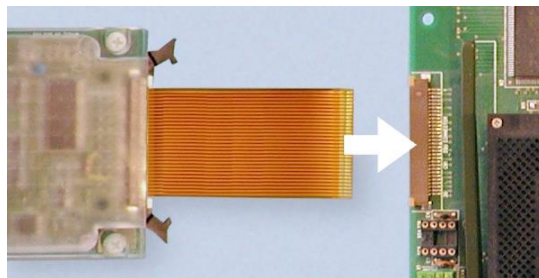
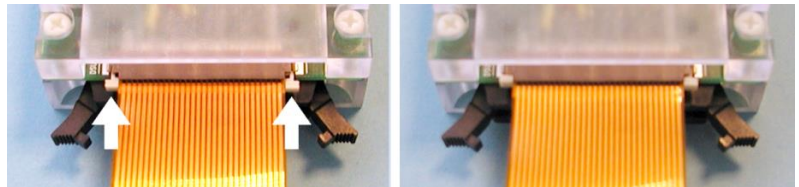
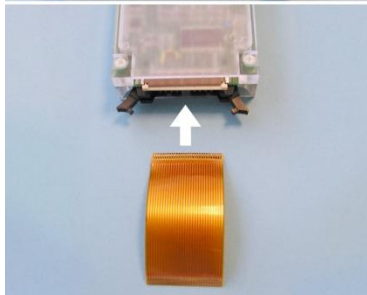


Now connect the two ribbon cables with the Adapter Socket in order to the picture on the left side.

After this the Starterkit Board can be connected to the pod. Note, that the connectors to the ribbon cables are on the bottom side (see right pictures).



Now connect the copper colored flat cable to the DSU cable box. Therefore pull carefully the snap bar out of the cable connector for about 1 mm. Then put the flat cable with the golden contacts on the top (opposite side of the printed circuit board) into the cable connector. Afterwards pull the snap bar back.

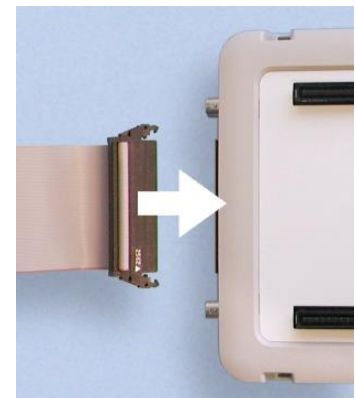


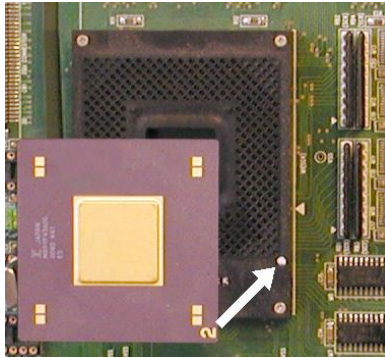
The DSU box is now ready to connect to the pod. Use the same way for the flat cable connector like for the DSU box (The golden contacts have also face to the opposite site of the printed circuit board.).

The MB2198-01 emulator main unit has a connector for the DSU Box cable on the front side shown in the picture below. Plug in the cable of the DSU box as shown in the right picture. The connector has to snap in with the two lever arms.



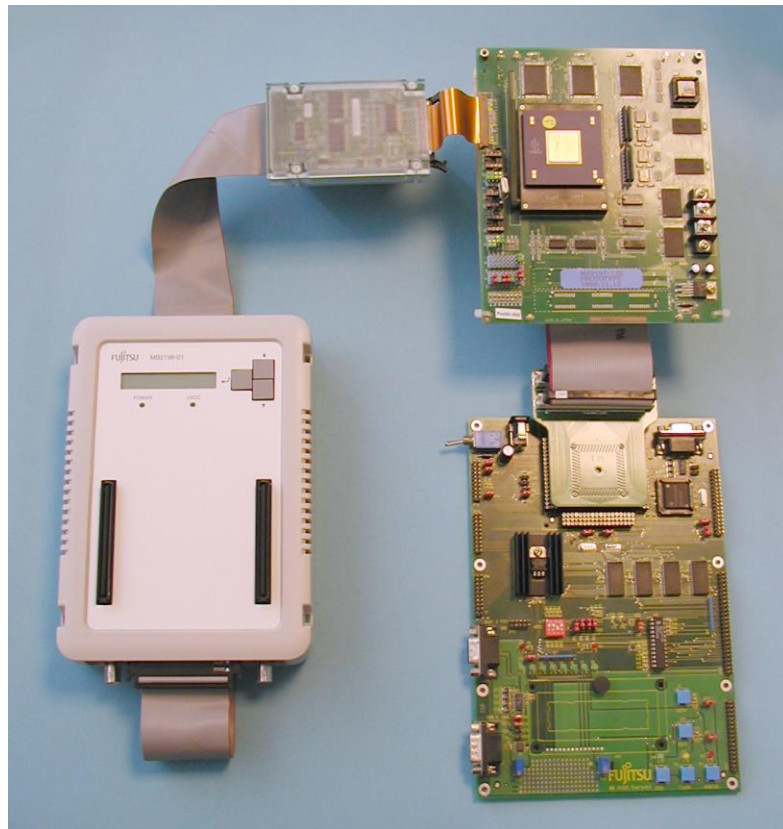
Note, that the small white arrows on the connectors should point together.





Now mount the Evaluation MCU (MB90FV360) to the pod. Therefore pull the level so that it is horizontally. Now insert the Chip with the golden number on the corner heading to the white triangle on the socket.

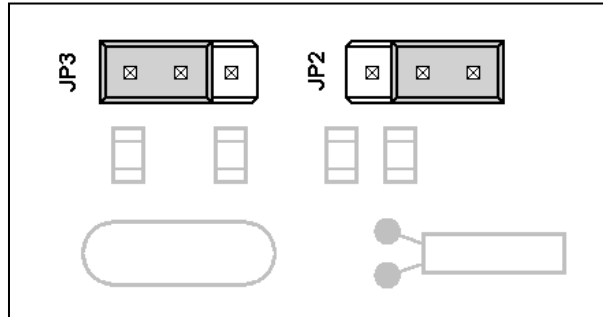
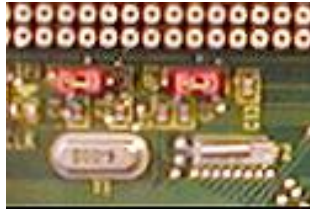
The complete system should look like in the following photograph:



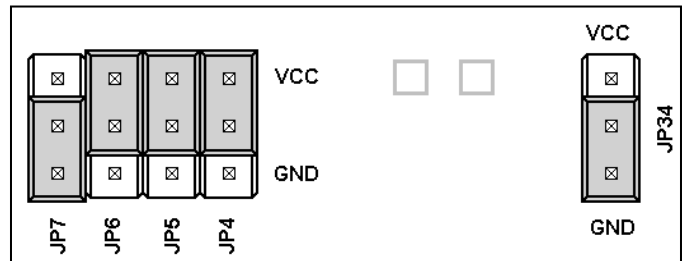
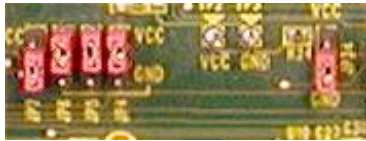
3.1.3 Jumper and DIP switch settings of MB 90360 Starterkit

The following jumpers have to be set: JP1, JP13, JP17, JP18, JP19, JP30, JP31.

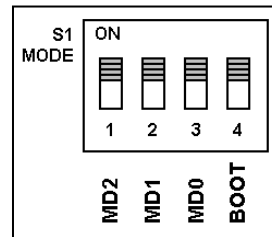
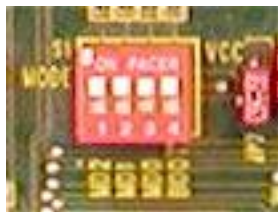
Jumpers JP2 and JP3 have to be set as in the following illustrations:



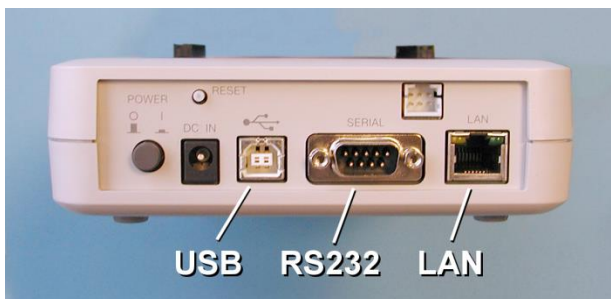
Jumpers JP4, 5, 6, 7 and 34 have to be set as in the following illustrations:



Set the DIP switches (S1) as in the following illustrations:



3.1.4 Connect the MB2198-01 Emulator to a PC or a LAN network



The Emulator has three different communication interfaces.

- USB
- RS232
- LAN

Choose one of these communication interfaces.

3.1.5 Power connection

Connect a power supply to the Emulator *first*, then switch on the Emulator. This prevents damages in the Pod, Target System, the Evaluation Chip, and the Emulator itself.

The power LED should be lightning and in the LC Display the following text should occur:

NO CONNECT

[Enter]:Menu



After this connect a stabilized 5 Volts Power Supply to the Pod. Be careful with the polarization (see left illustration).

The last connection to be done is to provide a 9-12 Volts Power Supply to the Starterkit. Use the switch to turn on the power to this board.

4. Setting up a MB91230 Emulation System (PGA-401C-A02)



Hardware Installation for FR-Lite Core

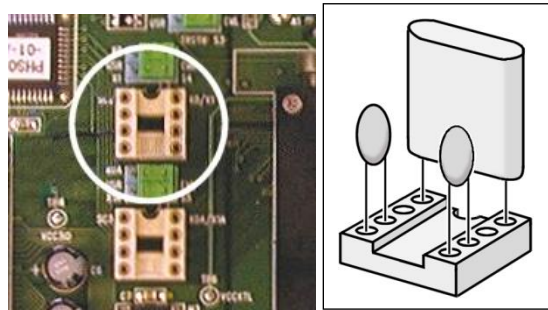
4.1 Installing the emulator system

Attention: Be sure that the system is *not* connected to any power supply, when connecting or disconnecting components to and from it.

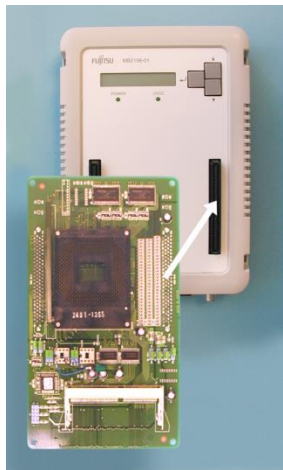
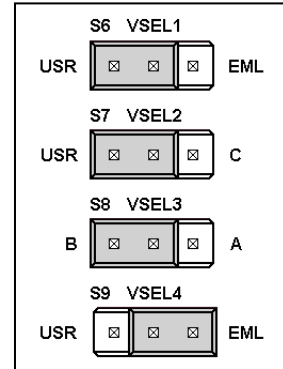
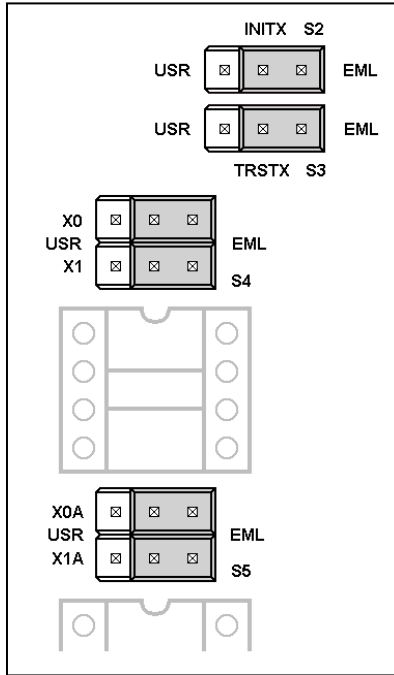
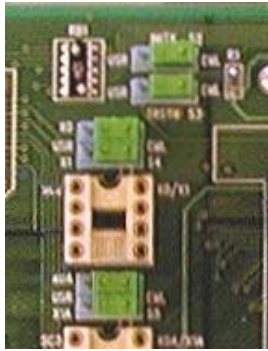
In order to properly install the emulation hardware please follow these steps:

4.1.1 Adapter Board MB2198-120

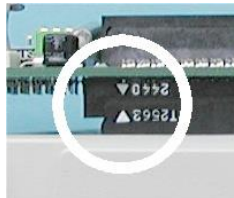
Install a crystal and capacitors (about 15 pF) on the SC2 socket of the MB2198-120 Adapter Board, as shown in the picture below:



Set the jumpers S2 – S9 like in the following graphics (Let S1 open):

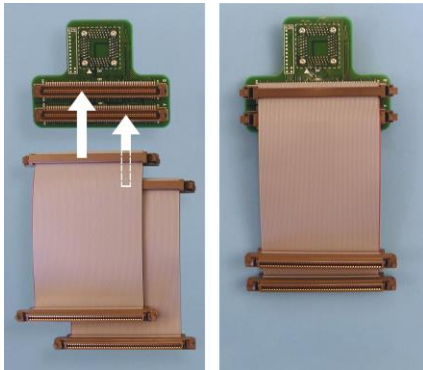


Mount the Adapter Board MB2198-210 to the Emulator Main Unit MB2198-01. Be sure that the two small white triangles of the connectors point together.



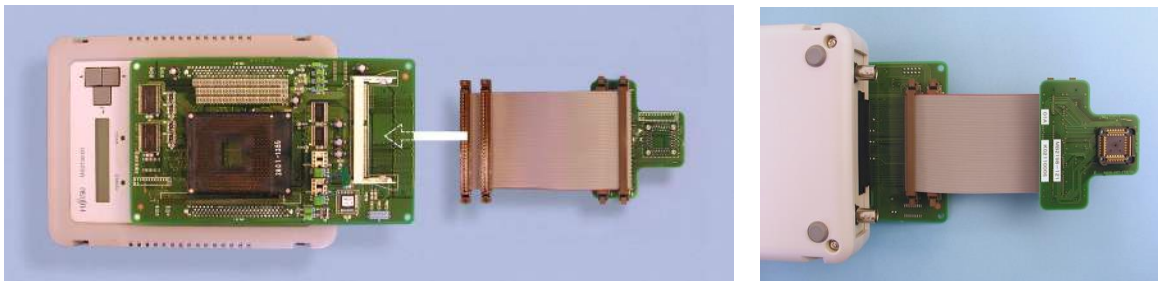
4.1.2 Adapter Socket and Probe Cables

Connect the two ribbon cables to the probe (120P-Adapter Socket) as shown in the pictures on the left side.

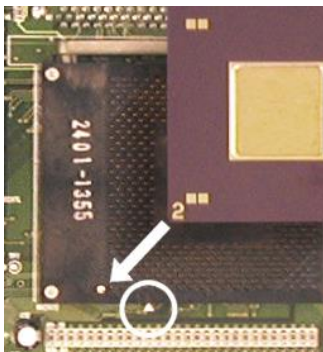


Note, that the connectors of the cables have to snap in with their hooks on both sides.

Now connect the open ends of the two ribbon cables to the Adapter Board. Note, that the connectors on the Adapter Board are placed on the back side:



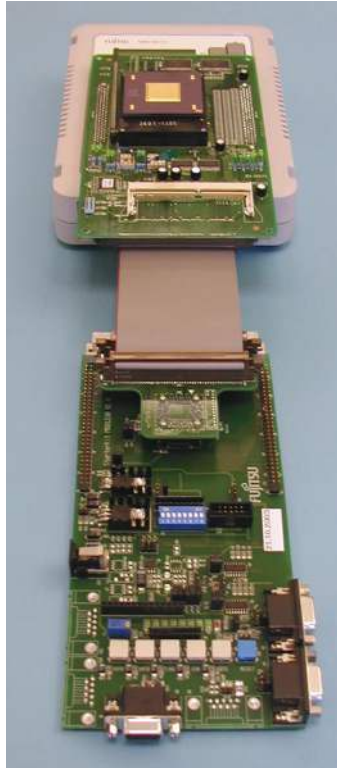
Note, that the connectors of the cables have also to snap in with their hooks on both sides.



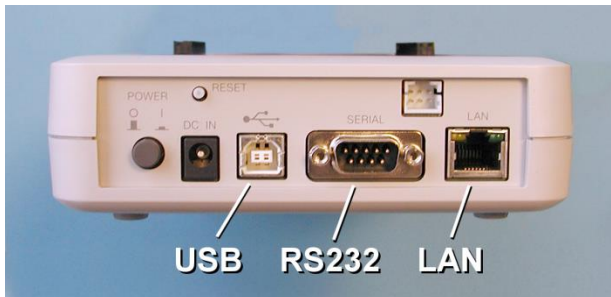
Now insert the evaluation chip on the Adapter Board. The corner with the number on it denotes pin 1. This corner has to point to the small with triangle on the Adapter Board. Therefore pull the lever, mount the V-Chip, and push back the lever.

Connect the Probe Socket Adapter to a target system. Use a cross tip screwdriver for fixing the socket. The small triangle of the Socket PCB points to Pin 1 of the target system.

A complete emulation system looks like in the following photograph:



4.1.3 Connect the MB2198-01 Emulator to a PC or a LAN network



The Emulator has three different communication interfaces.

- USB
- RS232
- LAN

Choose one of these communication interfaces.

4.1.4 Power connection

Connect a power supply to the Emulator *first*, then switch on the Emulator. This prevents damages in the Target System, the Evaluation Chip, and the Emulator itself.

The power LED should be lightning and in the LC Display the following text should occur:

```
NO CONNECT
[Enter]:Menu
```

Now the power for the target system can be connected.

5. Setting up a MB91302 Emulation System (PGA-179C-A02)



Hardware Installation for FR-65 Core

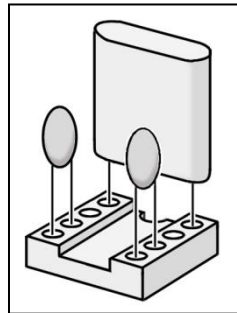
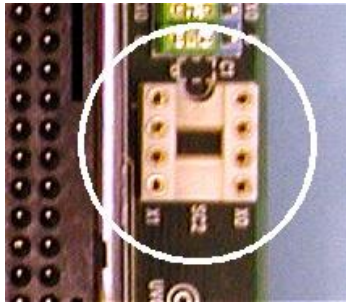
5.1 Installing the emulator system

Attention: Be sure that the system is *not* connected to any power supply, when connecting or disconnecting components to and from it.

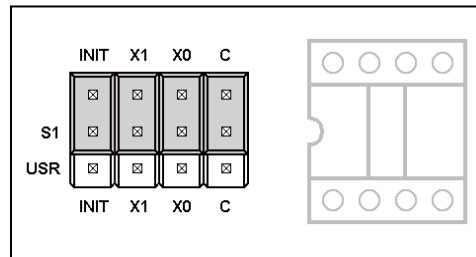
In order to properly install the emulation hardware please follow these steps:

5.1.1 Adapter Pod

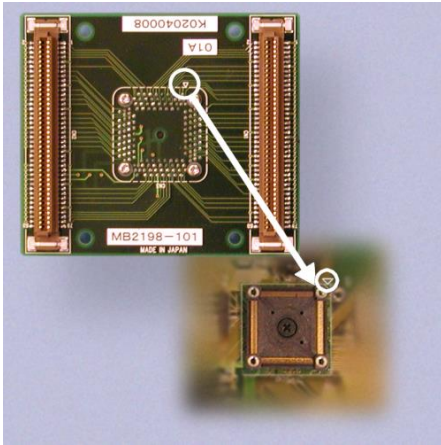
Install a crystal and capacitors (about 15 pF) on the SC2 socket of the MB2198-100 pod, as shown in the pictures below:



Set the jumpers of S1 like in the following pictures:



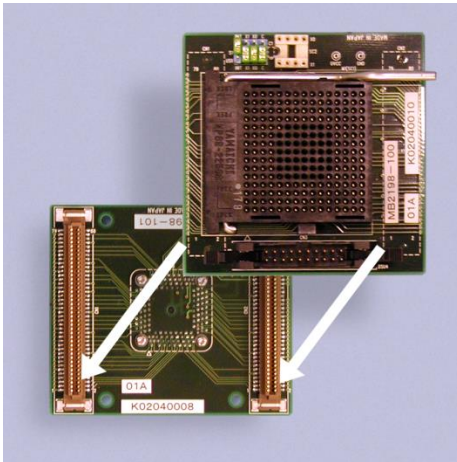
5.1.2 Target System and Adapter Socket MB2198-101



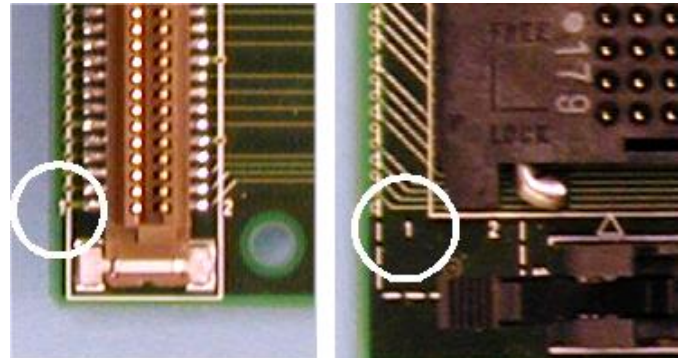
Mount the Adapter Socket to your target system. Be careful that Pin 1 of the Socket (marked with small triangle) points to Pin 1 of your target board.

Use a cross tip screwdriver to fix the four screws of the Adapter Socket.

5.1.3 Evaluation Chip Adapter Board MB2198-100

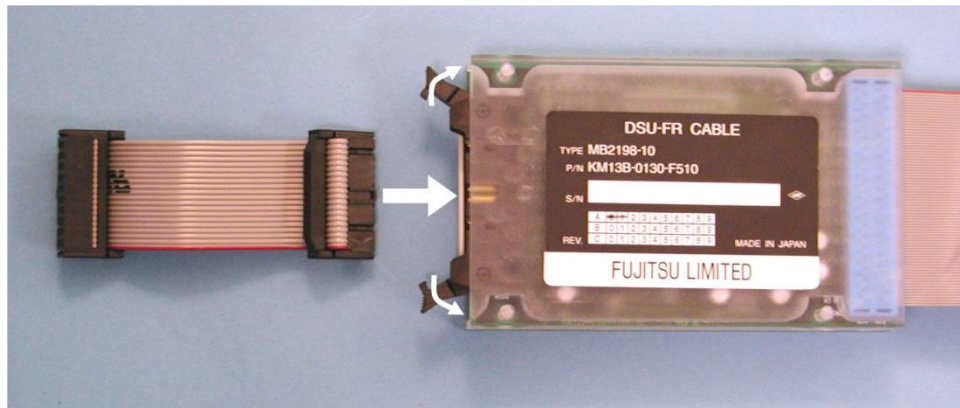


Carefully mount the Adapter Board on top the Adapter Socket. Be sure that the pins 1 of both I/F connectors and sockets point together.

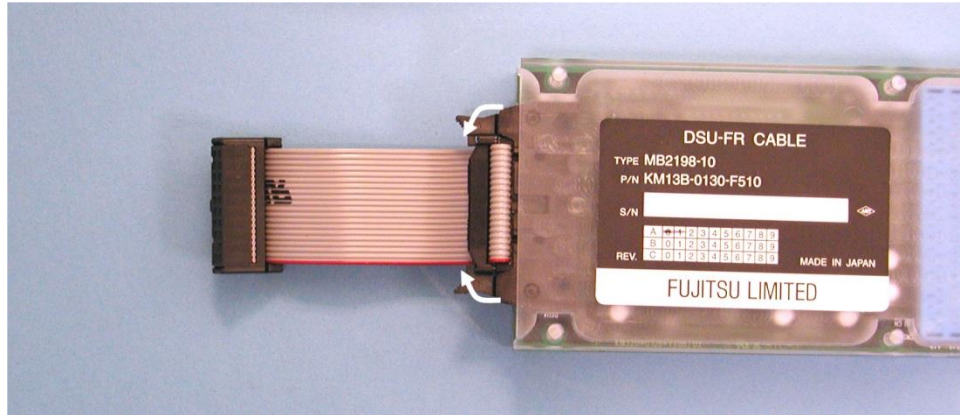


5.1.4 DSU cable

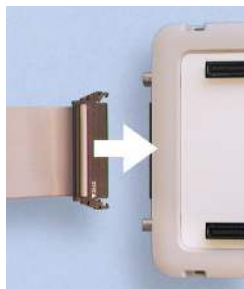
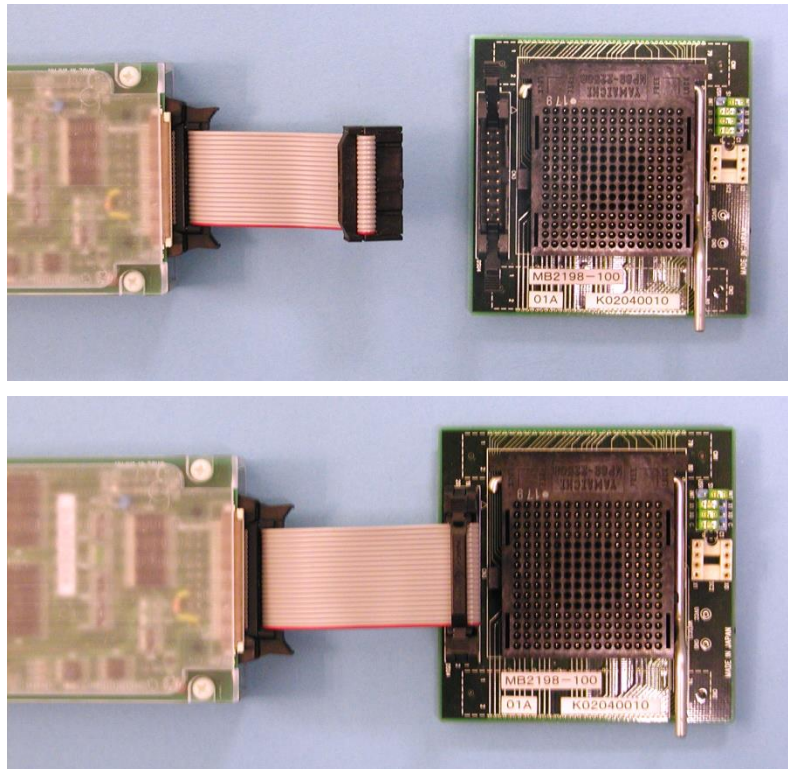
Connect the ribbon cable with the DSU cable box. Turn the lock levers as shown in the picture below and plug in the connector of the ribbon cable.



After this turn back the lock levers.

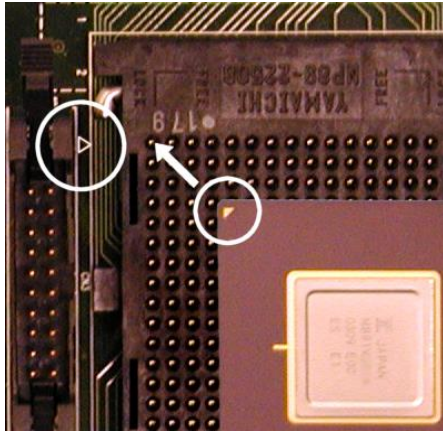


The DSU cable is now ready to be connected to the MB2198-100 Adapter Board. Therefore plug in the ribbon cable to the socket with the two lock levers.



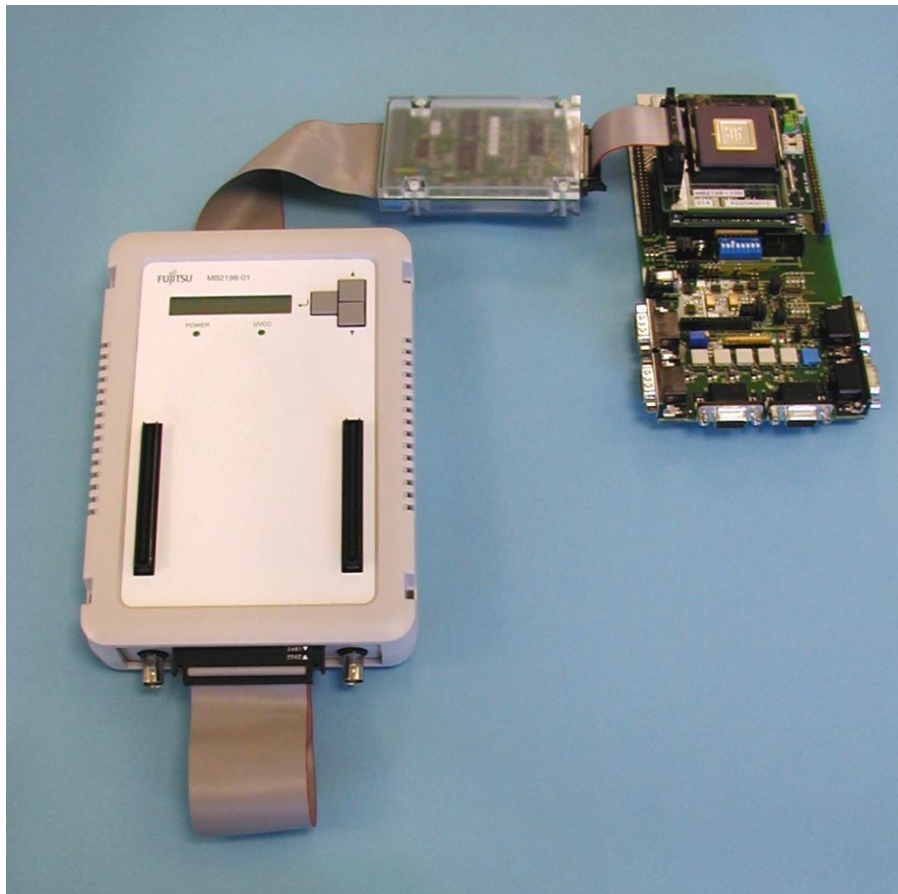
Connect the DSU cable with the Emulator MB2198-01. Note that the levers of the connector socket have to lock in.

5.1.5 Evaluation MCU

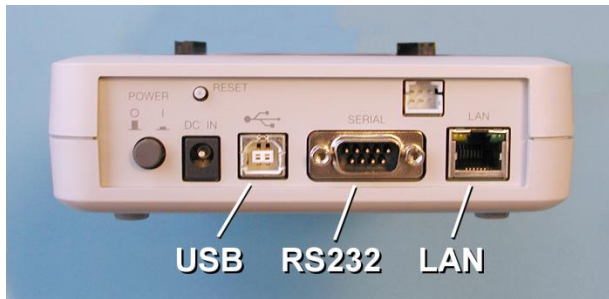


Insert the Evaluation MCU to the Adapter Board. Pull the lever, place the marked corner of the chip to pin 1 (white triangle), and push the lever back.

A complete assembled emulation system should look like in the following photograph:



5.1.6 Connect the MB2198-01 Emulator to a PC or a LAN network



The Emulator has three different communication interfaces.

USB

RS232

LAN

Choose one of these communication interfaces.

5.1.7 Power connection

Connect a power supply to the Emulator *first*, then switch on the Emulator. This prevents damages in the Target System, the Evaluation Chip, and the Emulator itself.

The power LED should be lightning and in the LC Display the following text should occur:

```
NO CONNECT  
[Enter]:Menu
```

Now the power for the target system can be connected.

6. Setting up the Emulation Software for FR-50 (MB90FV360)



Software Installation

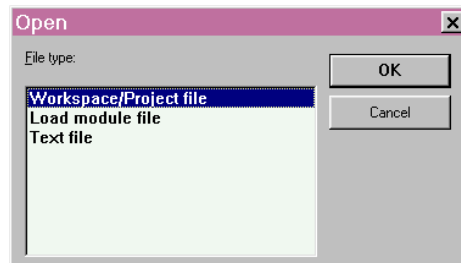
6.1 Installing the emulator software on a PC

To work with the 32-Bit emulation system, you have to install the Softune Workbench (FR) Software environment from the CD-ROM. After executing `propack***.exe` you will find a menu with install options. Select all items and start the installation. The default path is `C:\Softune`. After the installation you will find the Softune workbench ready to use for the 32-Bit microcontroller series.

The CD-ROM includes also some demonstration projects for the MB91360 series. Install them also in a directory of your PC.

6.2 Check Emulation System with the IO-Port Sample Project

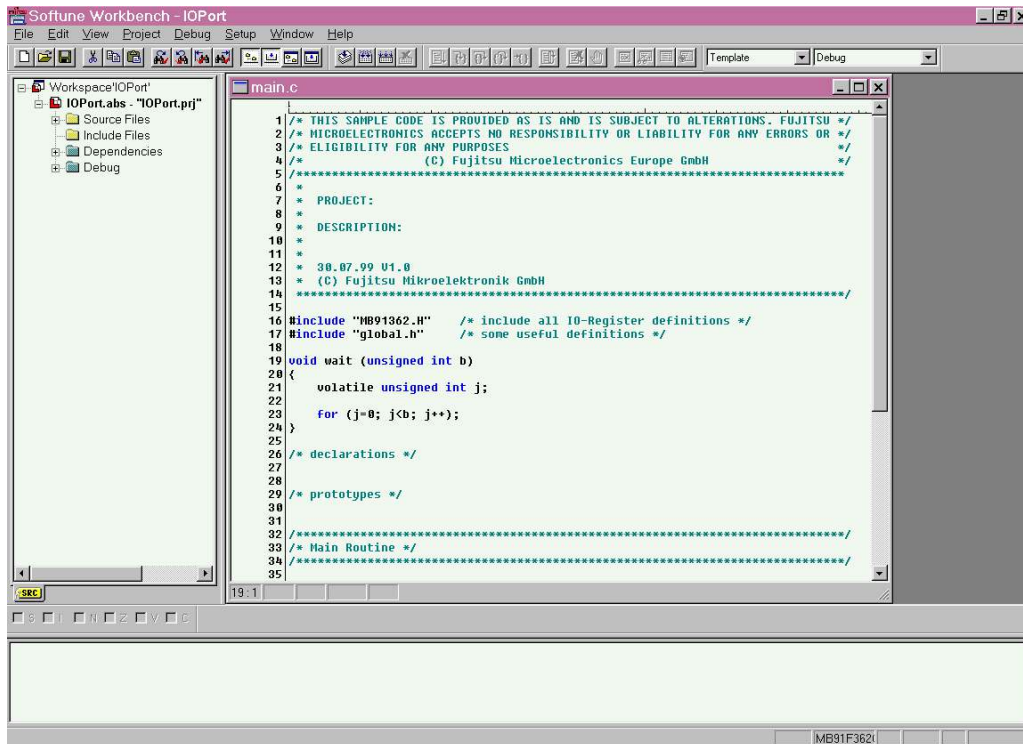
Open the Softune Workbench. Then choose the Menu *File/Open*. The following window will pop up:



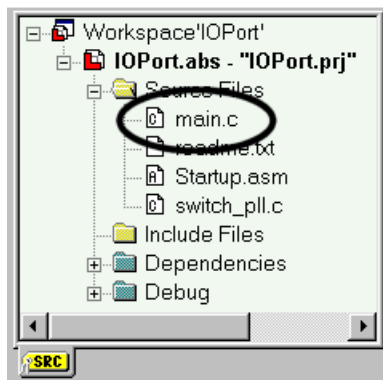
Confirm *Workspace/Project file* with the OK button.

Now choose the IO-Port-Workspace-File *IOPort.wsp* in the Open File Dialog Window.

Then the Softune Workbench window will look like this:



On the top of the screen you find a standard menu bar with some icons.



The left window shows the Structure of the work space including the source codes, include files, header files and debugger information.

The right upper window is used for editing and observing files.

The lower Window is the status and message window.

Open the file *Main.c* by double clicking it in the left upper Window.

Now choose the Menu Project/Build or press Ctrl+F8. Now the complete project will be compiled and all object codes will be created.

The message Window will now display:

Now building...

-----Configuration: IOPort.prj - Debug-----

Start.asm

Main.c

Switch_pll.c

Now linking...

C:\.....\mb91362\IOport\ABS\IOPort.abs

Now starting load module converter...

C:\.....\mb91362\IOport\ABS\IOPort.mhx

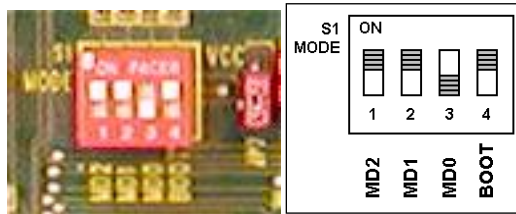
No Error.

Depending on your communication interface to the emulator, double click one of the following download methods in the upper left window (sub menu of “*Debug*”):

- emu_ram_com.sup
- emu_ram_lan.sup
- emu_ram_usb.sup

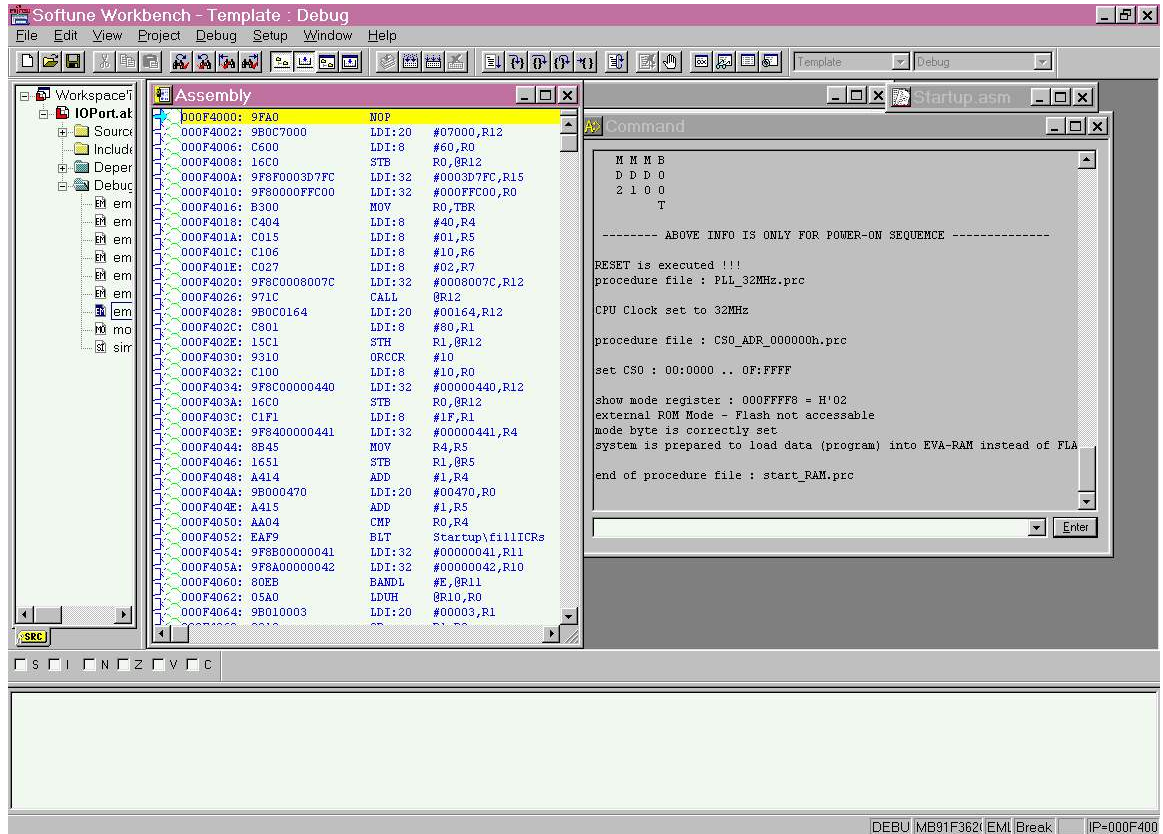
After a short moment, the Softune Workbench will go in its debugger state (RAM debugging).

Now set the DIP switches of the Starterkit to the following settings:



Now choose: *Debug/Load targetfile* if automatically loading is not selected (see chapter 8.4).

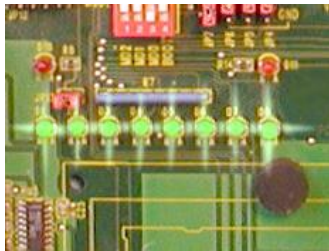
After this the Softune window will look like the following screen shot:



The LC Display of the Emulator will show then:

BREAK Vol:OK
[Enter]:MENU

Now choose the menu Debug/Run/Go or press F5, or click the button.



Look at the Starterkit board. The green LEDs of Port "J" have to flash alternately.

The LCD on the Emulator should display:

EXEC Vol:OK
[Enter]:MENU

To end debugging, choose Debug/End debug in the Softune menu bar, or double-click on the corresponding emulation *.sup entry in the workspace list. The Emulator system will halt then.

For detailed information about debugging methods, please refer to the application note 910011.

7. Setting up the Emulation Software for FR-Lite (MB90FV230)



Software Installation

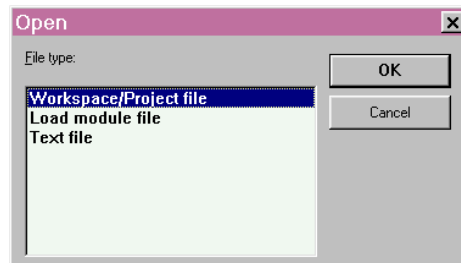
7.1 Installing the emulator software on a PC

To work with the 32-Bit emulation system, you have to install the Softune Workbench (FR) Software environment from the CD-ROM. After executing `propack***.exe` you will find a menu with install options. Select all items and start the installation. The default path is `C:\Softune`. After the installation you will find the Softune workbench ready to use for the 32-Bit microcontroller series.

The CD-ROM includes also some demonstration projects for the MB91230 series. Install them also in a directory of your PC.

7.2 Check Emulation System with the IOPort Project

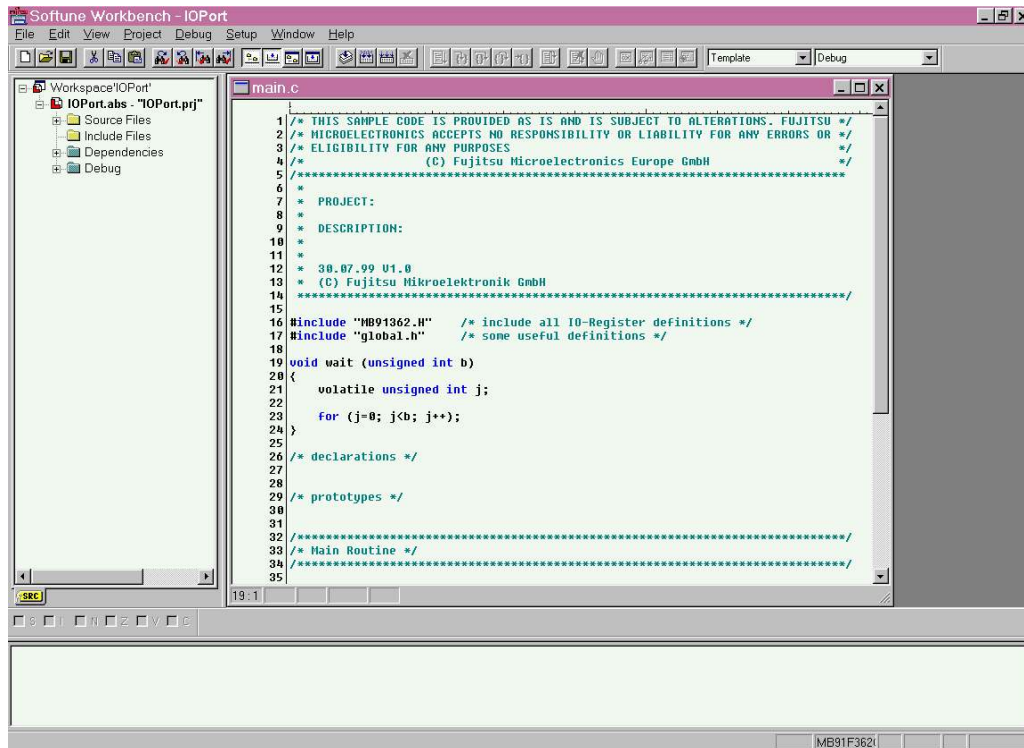
Open the Softune Workbench. Then choose the Menu *File/Open*. The following window will pop up:



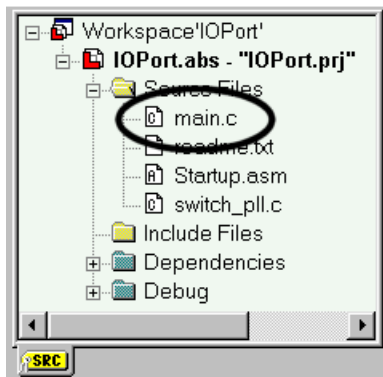
Confirm *Workspace/Project file* with the OK button.

Now choose the IO-Port-Workspace-File *IOPort.wsp* in the Open File Dialog Window.

Then the Softune Workbench window will look like this:



On the top of the screen you find a standard menu bar with some icons.



The left window shows the Structure of the work space including the source codes, include files, header files and debugger information.

The right upper window is used for editing and observing files.

The lower Window is the status and message window.

Open the file *Main.c* by double clicking it in the left upper Window.

Now choose the Menu Project/Build or press Ctrl+F8. Now the complete project will be compiled and all object codes will be created.

The message Window will now display:

Now building...

-----Configuration: IOPort.prj - Debug-----

Start.asm

Main.c

Switch_pll.c

Now linking...

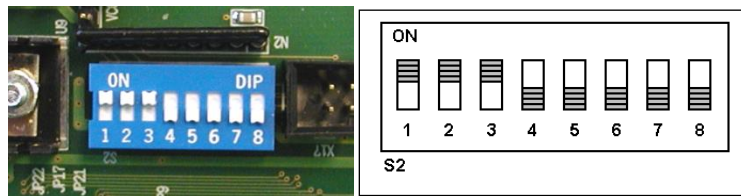
C:\.....\mb91230\IOport\ABS\IOPort.abs

Now starting load module converter...

C:\.....\mb91230\IOport\ABS\IOPort.mhx

No Error.

Make sure that the jumpers on the Starterkit MB91230 are set like in the following illustrations:




Depending on your communication interface to the emulator, double click one of the following download methods in the upper left window (sub menu of "Debug"):

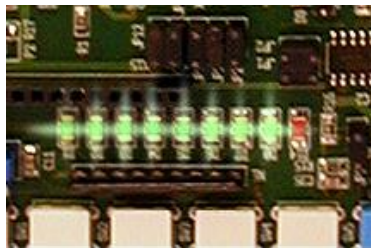
- emu_ram_com.sup
- emu_ram_lan.sup
- emu_ram_usb.sup

After a short moment, the Softune Workbench will go in its debugger state (RAM debugging).

The LC Display of the Emulator will show then:

```
BREAK Vol:OK
[Enter]:MENU
```

Now choose the menu *Debug/Run/Go* or press F5, or click the  button.



Look at the Starterkit board. The green LEDs of Port "1" have to flash alternately.

The LCD on the Emulator should display:

```
EXEC Vol:OK
[Enter]:MENU
```

To end debugging, choose *Debug/End debug* in the Softune menu bar, or double-click on the corresponding emulation *.sup entry in the workspace list. The Emulator system will halt then.

8. Troubleshooting



Trouble during Installation and Emulation

8.1 Emulator Software does not work in debugging mode

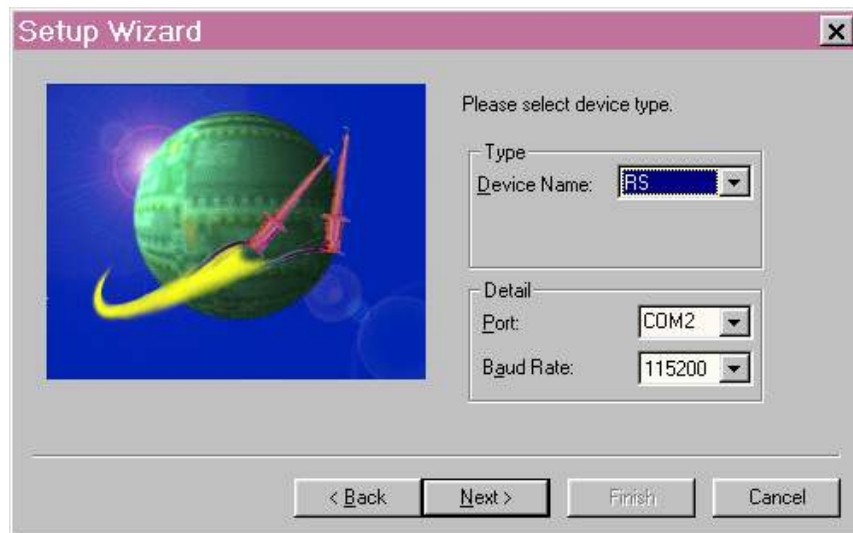
Note, that the Emulator Software will not work if the Emulator is not powered on, not connected to a Target Board, to the DSU cable, to the Pod, not connected properly to a PC or if no Evaluation MCU is in the socket of the Pod.

The Target Board must provide power logic signals to all MCU pins.

8.2 Wrong COM-Port in Softune Workbench

The basic setting after installation for the RS232-PC-COM-Port is COM1. If you want to use your COM2-Port then click with the right mouse button on the entry `emu_ram_com.sup` in the workspace list window. Then a small popup window is displayed. Choose *change...*

Now a Setup Wizard starts. Let all entries in their default states, until the following window occurs:



In this window, you can choose the COM2 port.

Click *Next>* and finally *Finish*.

8.3 Procedure File not loaded

If the debugging fails (or is not possible), the procedure file for RAM emulation may not be loaded at the beginning of the debugging.

Therefore check via the corresponding `emu_ram_***.sup` by right mouse button clicking on its entry in the workspace list window and choose *Change...*. This starts the Setup Wizard.

Click on *Next*> until the following windows occurs:



At the textfield "Before:" browse for the procedure file `start_RAM.prc` in the `Prc` sub folder of the project directory. Click on *Next*> and then on *Finish*.

After this turn off all power supplies of your emulation hardware (Order: Target board first, then Pod, then Emulator) and turn it on again (Order: Emulator, Pod, Target board).

Start debugging mode again.

8.4 Target file not loaded automatically

In the check box *Auto load when starting debug* it is possible to automatically load your compiled target file to the emulator when entering debugging mode.

Revision History



Document Revision History

Document Title: FR Family MB2198-01 Emulator System Installation Guide			
Document Number: 002-05221			
Revision	Issue Date	Origin of Change	Description of Change
**	10/24/2003	NOFL	Initial release
	11/06/2003		Softune emulation guide for MB91V230 added
	07/18/2005		Sub clock notes added
*A	02/05/2016	NOFL	Migrated Spansion Guide from MCU-AN-391026-E-V12 to Cypress format
*B	02/05/2018	NOFL	Updated logo and links. Updated Copyright information.