FDM Quickstart Guide

RENESAS

Introduction

This guide is intended to help you to get started quickly when using the FDM. It will cover:
1. How to install the software tools (FDT 2.2, Sample EDK kernels), plugging in the FDM for the first time.
2. How to generate an FDT project which uses the FDM.
3. How to physically connect the FDM to a target board and precautions of use.
4. Example of connection using FDT with the FDM.

① Software Installation

Note that Microsoft Windows 95 and Windows NT do not fully support USB and so cannot be used with the FDM.
Insert the Software Tools CDROM in your drive, it should automatically run the menu program. If it does not:
- Open "**My Computer**" from your desktop
- Locate and open the CDROM drive
- Double-click the "**autorun.exe**" icon to run the program.

Once the menu program is running:
- Select "FDM" from the drop down list.
- The buttons suffixed with the '**»**' symbol will display a popup menu when clicked. The content above the separator in these menus changes dynamically, depending on the selected EDK device.
- If you do not have FDT already installed, you should click the "**Install Tools »**" button and complete the installation of FDT.
- Click "**Add EDK Support**" to install the sample EDK kernel(s) with support for the FDM pin settings.
- Use of the FDM requires FDT kernels which have settings for controlling the mode pins of the target device. The only kernels which have these settings are for EDK's. It is possible however, to manually add these settings to other kernels; this is covered by a separate application note.
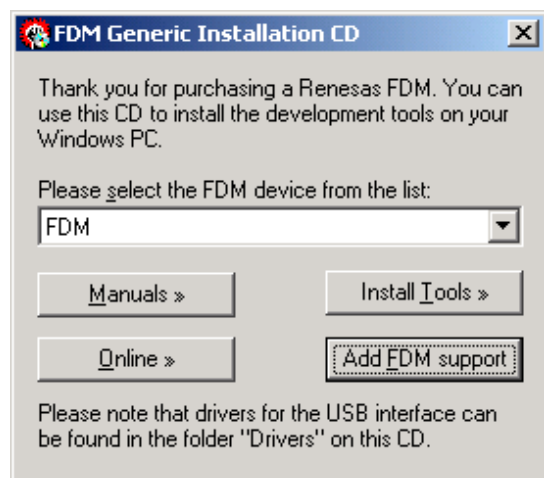
Once FDT is installed, it is possible to plug in the FDM to the PC USB port using the supplied USB A-B cable – the first time this is done it will install the driver: **ensure that the FDM is not plugged into a target device before this first connection is made**. Under Windows 98, Me, and 2000 the driver should install automatically without prompting for a driver disk. Under Windows XP the "**Found New Hardware Wizard**" will launch. Select "**Install the software automatically**" and click "Next" to complete the installation.

Once the driver has been successfully installed the red LED will illuminate continuously and the Green LED will begin to flash. The installed driver will be loaded each time the FDM is plugged in.
Note that the green LED will not flash if the driver is not installed correctly (e.g. FDT is not installed).

Documentation

The CD's menu program will automatically detect if you need to install the Acrobat Reader when you first select a PDF document from the Manuals popup menu. Alternatively, you may install Acrobat Reader manually from the CD's menu program by selecting "**Manuals »**", "**Acrobat Reader**".

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② Generating a Test Project

Once you have installed the required software you can quit the menu program and start the Flash Development Toolkit (FDT). This example uses the EDK 2282 but the method is valid for other EDK's.

- Start FDT by using the Start Menu to navigate to "**Start**", "**Programs**", "**Renesas**", "**Flash Development Toolkit 2.2**" and select "**Flash Development Toolkit 2.2**".
- In the "**Welcome"** dialog box, select "**Create a new Workspace**" and click "**OK**".
- In the "**New Project Workspace**" dialog box, change the directory if the default is not where you would like to save it.
- Enter the Workspace Name, "**EDK with FDM"**. Click "**OK**".
- A dialog box will be displayed asking if you want to run the project wizard to add a new project; click "**Yes"**.
- Enter the Project Name, "**EDK2282**" (replace with an appropriate name if using another EDK). Click "**Next**".
- In the "**Choose Device And Kernel**" dialog, select the EDK target device from the drop down list: "**H8S/2282F**" in this example. Then select the Kernel with .EDK at the end of the kernel version (See screenshot). Click "**Next**". [Note that the EDK kernels are not installed as part of FDT and should have been installed separately in order to use the FDM with FDT 2.2]
- In the "**Communications Port**" dialog, click the Select Port combo box to display the list, scroll up to the top and select "**FDM**". If the Baud rate required is not the default selection, the "**Use Default Baud Rate**" option must be unchecked before the required setting can be set. Click "**Next**".
- For EDK's the default options for "**Crystal Frequency**", "**Clock Mode**", "**CKM**" and "**CKP**" should remain unchanged in the "**Device Settings**" dialog, so click "**Next**" to continue.
- In the "**Connection Type**" dialog, select "**BOOT Mode**" connection and click "**Next**".
- In the "**Programming Options**" dialog, select Messaging level "**Advanced**" and click "**Finish**".

The project is now setup and the mode pin settings have been read from the flash configuration file for the selected kernel. The next stage is to connect the hardware.
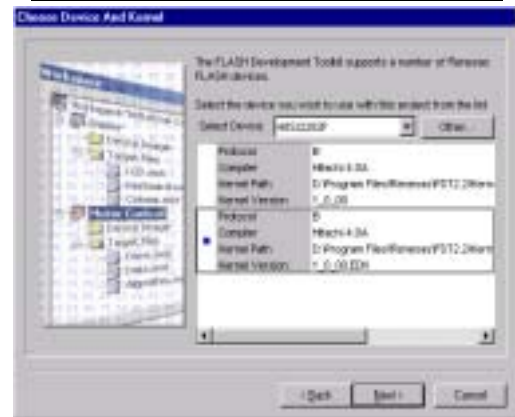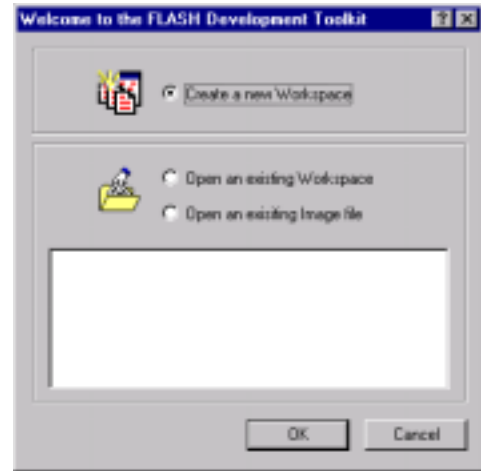
③ Physical connections and precautions of use

1) Ensure that the EDK power is off and that the USB cable is not connected to the FDM.
2) Set the EDK jumper settings to use the FDM. The **RXDISn** jumper should be set **ON** to disable the standard serial port. Check with the EDK user manual for other settings required (normally FWE devices need the UPM jumper on and FWP devices need the UPM jumper off). The EDK2282 requires **RXDISn = ON** and **UPM = ON**.
3) Plug the 14 way ribbon cable into the FDM at one end and into the "FLASH PROGRAMMING" header on the EDK. Ensure that the correct header on the EDK is used (some EDK's have additional 14 way headers for other uses) and that the connector is orientated correctly.
4) Switch on the power to the EDK. Ensure that the EDK is not in Boot mode. **DO NOT ACTIVATE BOOT MODE** as this could lead to contention of the mode pins; the FDM will control these.
5) Plug the USB cable into the FDM.
   The green LED will blink as follows:
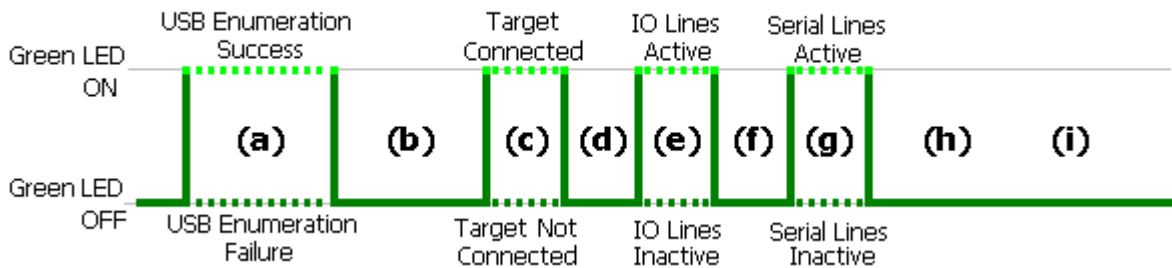
a. Long blink (to show successful USB enumeration)
b. Long Pause
c. Short blink (to show UConnect made – EDK is connected)
d. Short Pause
e. Short blink (to show I/O lines voltage matching active)
f. Short Pause
g. Short blink (to show Serial lines voltage matching active)
h. Long Pause
i. Long Pause

FDM 14 way target connector pin out
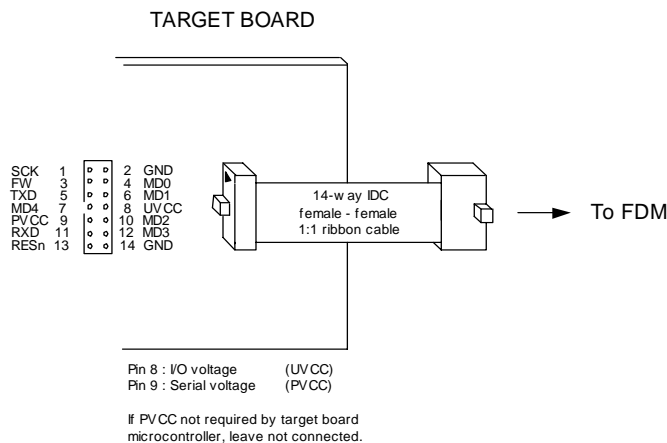
④ Example of connection using FDT with the FDM

The following procedure explains how to connect and program the EDK using the FDM from FDT using the project setup in section ② :

1. Select the menu item "**Device**", "**Connect to Device**". FDT will now setup communications with the FDM, reset the target board into boot mode and boot the device. An example of the messages displayed (Advanced messaging) is shown below:

```
Connecting to device 'H8S/2282F' on 'FDM'
Configuration:
'BOOT Mode' connection - using emulated interface
Opening port 'FDM' ...
FDM Reset Active
FDM Mode Pin Setting Active
FDM setting reset pin state: 0x40, 0x00
FDM setting reset pin direction: 0x40, 0x40
FDM setting pin state: 0xBF, 0x81
FDM setting pin direction: 0xBF, 0x85
FDM sending reset: 0x00, 0x00, 0x01, 0xF4
Querying FDM version info...
FDM v01.02, firmware 1.05, product 1.02, build 884
FDM SN: 00000  HMSE FDM
Initiating BOOT SCI sequence
Attempting 9600
Using micro-Kernel : 'C:\Program Files\Renesas\FDT2.2\Kernels\ProtB\2282\hitachi\1_0_00.edk\uGen2282.cde'
Downloading and verifying micro kernel...
micro-Kernel download successful
Changing baud rate to 57600 bps
Set baud rate value = 57600
Downloading main kernel C:\Program Files\Renesas\FDT2.2\Kernels\ProtB\2282\hitachi\1_0_00.edk\Genm2282.cde
Main kernel download complete...
Connection complete
```

2. Add the file(s) to be programmed to the project using "**Project**", "**Add Files to Project…**"
3. Build the device image using "**Project**", "**Build Device Image**"
4. Right click on the built image and select "**Download Image to Device**". An example of the messages is shown below:

```
Processing S-Record file :C:\TEMP\FDT76.tmp'
Data loaded at the following positions:
 H'00000000 - H'00000003     Length : H'00000004
 H'00001000 - H'0000111D     Length : H'0000011E
 H'0001F600 - H'0001FE4B     Length : H'0000084C
Downloaded the operation module
Writing image to device...
Data programmed at the following positions:
 H'00000000 - H'0000007F     Length : H'00000080
 H'00001000 - H'0000117F     Length : H'00000180
 H'0001F600 - H'0001FE7F     Length : H'00000880
2.63 K programmed in 1 seconds
Image successfully written to device
Download operation complete
```

Congratulations! You have successfully installed the software and programmed an EDK using the FDM. You can now select "**Device**", "**Disconnect from Device**". When asked if you want to reset the device, selecting "**Yes**" will reset the target board into **User Mode** where the programmed code will begin to execute. To continue learning about the tools and the board please read all other supporting documentation.

Technical Support

FDT is supplied as freeware without technical support. Technical support is limited to that which is provided on the Renesas Technology Europe's website at: http://www.eu.renesas.com/tools

Appendix:

Explanation of Flash Configuration File settings for FDM usage:

In each FDT 2.2 kernel directory there is a .fcf file for each supported device, which holds information about the device and kernel. The **[Pin State]** section holds details for setting the mode pins from the FDM. The fields are:
BootModeDirection, **BootModeState**, **UserModeDirection**, **UserModeState** and **UserProgramModeState** and represent a bit field as follows:

0x80	0x40	0x20	0x10	0x08	0x04	0x02	0x01
FWx (FWE / FWP)	RESERVED Dir^n must be 0	SCK	MD4	MD3	MD2	MD1	MD0

Where Direction 0=Input, Direction 1=Output. State (if Dir^n is output) 0=Drive Output Low, State 1=Drive Output High

Eg.   *xxxxModeDirection = 0x87* sets the FWx, MD2, MD1 and MD0 pins as outputs,

    xxxxModeState = 0x81 drives the FWx and MD0 pins high, and the MD2 and MD1 pins low for xxxxMode

__WARNING – INCORRECT VALUES IN THE FCF FILE COULD RESULT IN DAMAGE TO THE HARDWARE__

Note that editing a configuration file will render its checksum invalid. FDT will display a warning for fcf files with invalid checksums but will not prevent their use. Supplied kernels should not be edited; if different settings are required, it is suggested that the kernel directory should be copied to an alternative location and the kernel version should be changed in the fcf file (the directory name should match the kernel version). This prevents accidental corruption of the supplied kernels.