Hardware User Manual for iMX51
R 2.0
3rd Dec, 2010

iMX51-Carrier Card Hardware User Manual

DOCUMENT REVISION HISTORY

Revision	Date	Change Description	Author
2.0 –REL1.0	2nd Aug 2010	USB Host image updated Rest same as R1.0 REL 1.1	SK
2.0 –REL1.1	3rd Dec 2010	ATK Flash Address for Diagnostic, Linux, Android and WinCE binaries updated.	SK
2.0 –REL1.2	24th Feb 2011	1. Change the SD1 Host to SD2, 2.USB HOST to USB OTG 3.Added Power Rating For Supply 4. GUI Diagnostic Updated	RG

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1 Introduction

1.1 Purpose

The purpose of this document is to explain the procedure about the user interface, Power ON procedure and ATK tool kit usage for iMX51-Carrier Card.

1.2 Scope

This document describes the Hardware details, Power-on procedure and setting up Serial communication with PC/Laptop. This document also explains usage procedure for ATK tool kit.

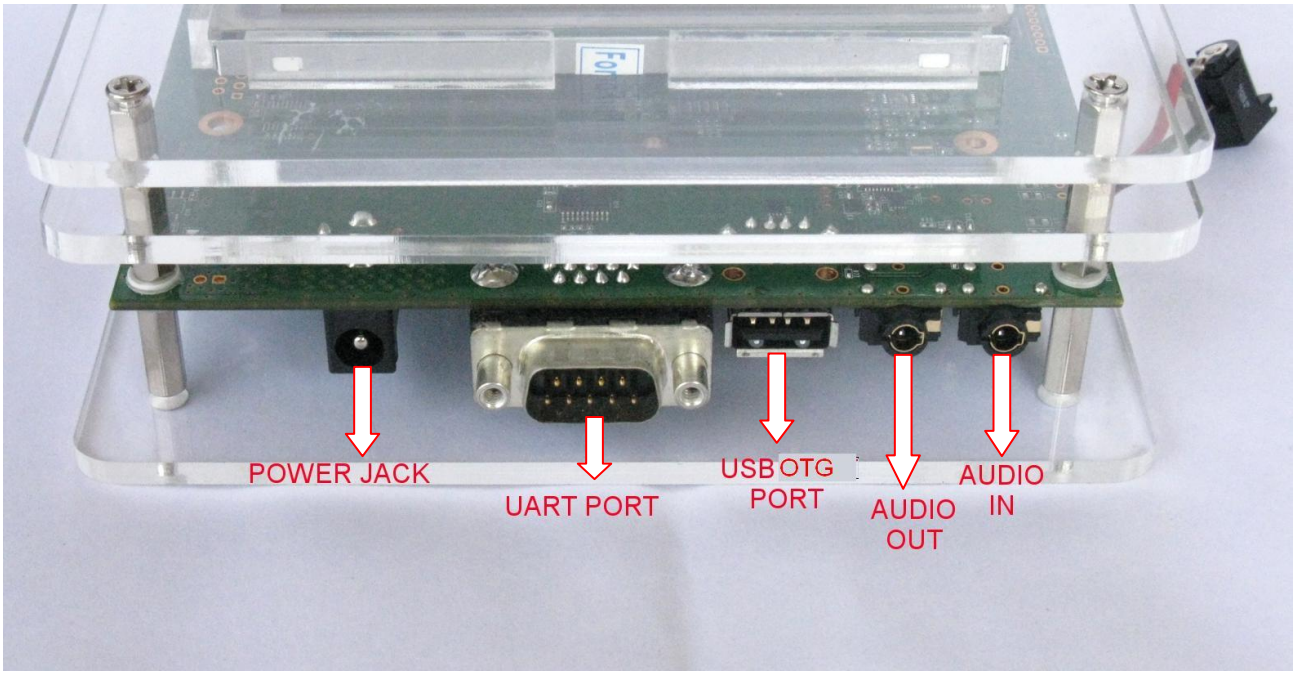
1.3 Glossary

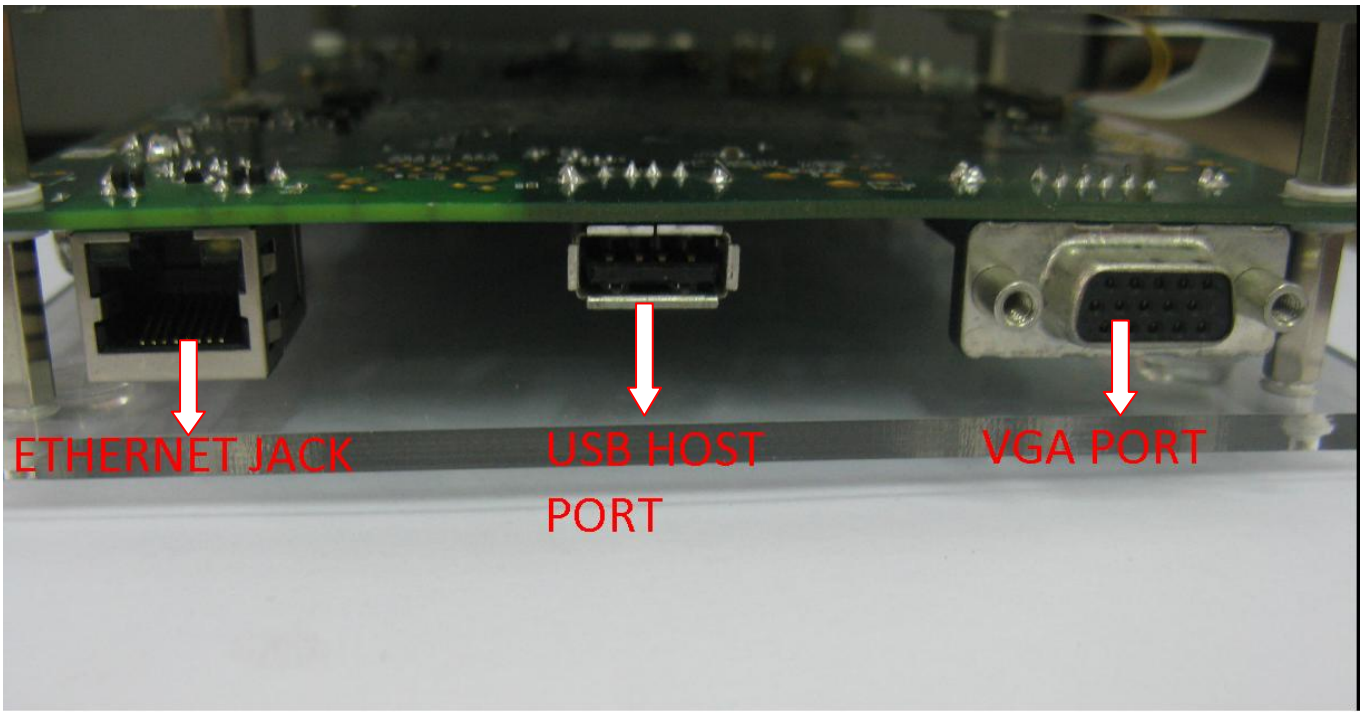
Table 1:Glossary

Acronyms	Description.
CSPI	Configurable Serial Peripheral Interface
FFS	Flash File System
GUI	Graphic User interface
LCD	Liquid Crystal Display
DDR	Double Data Rate
MMC	Multi Media Card
PC	Personal computer
PMIC	Power management Integrated circuit
RAM	Random Access memory
RTC	Real time Clock
TV	Television
UART	Universal Asynchronous Receiver Transmitter
USB	Universal Serial Bus
UUE	Unix to Unix Encoded file

2 Hardware Details

2.1 iMX51-Carrier Card Connector details





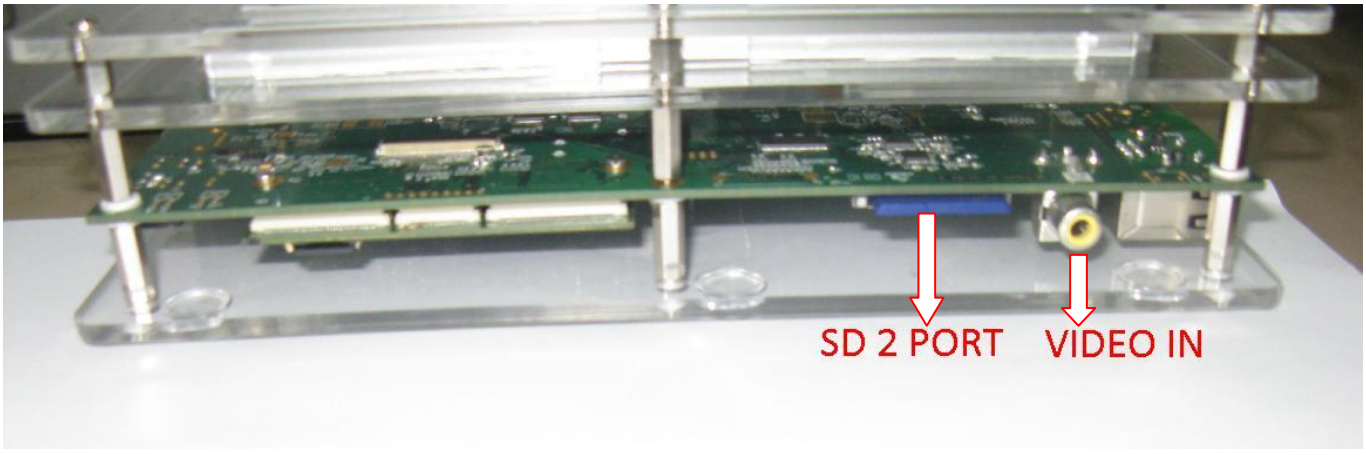


Figure 1:iMX51-Carrier Card Connector Details

2.2 Hardware Setup Details

2.2.1 Power supply Connecting procedure

Insert the power plug of the power supply into the power jack of the iMX51-Carrier Card as below.

Power Rating: 5V input with 2.5A.

Figure 2: iMX51-Carrier Card Power Connection

2.2.2 Serial cable connecting procedure

1. The serial cable has DB9 connector (Female type) at both end.
2. Insert DB9 of the serial cable to PC/Laptop COM port.
3. Connectt the other end of the serial cable to iMX51 carrier board serial port connector as shown below.

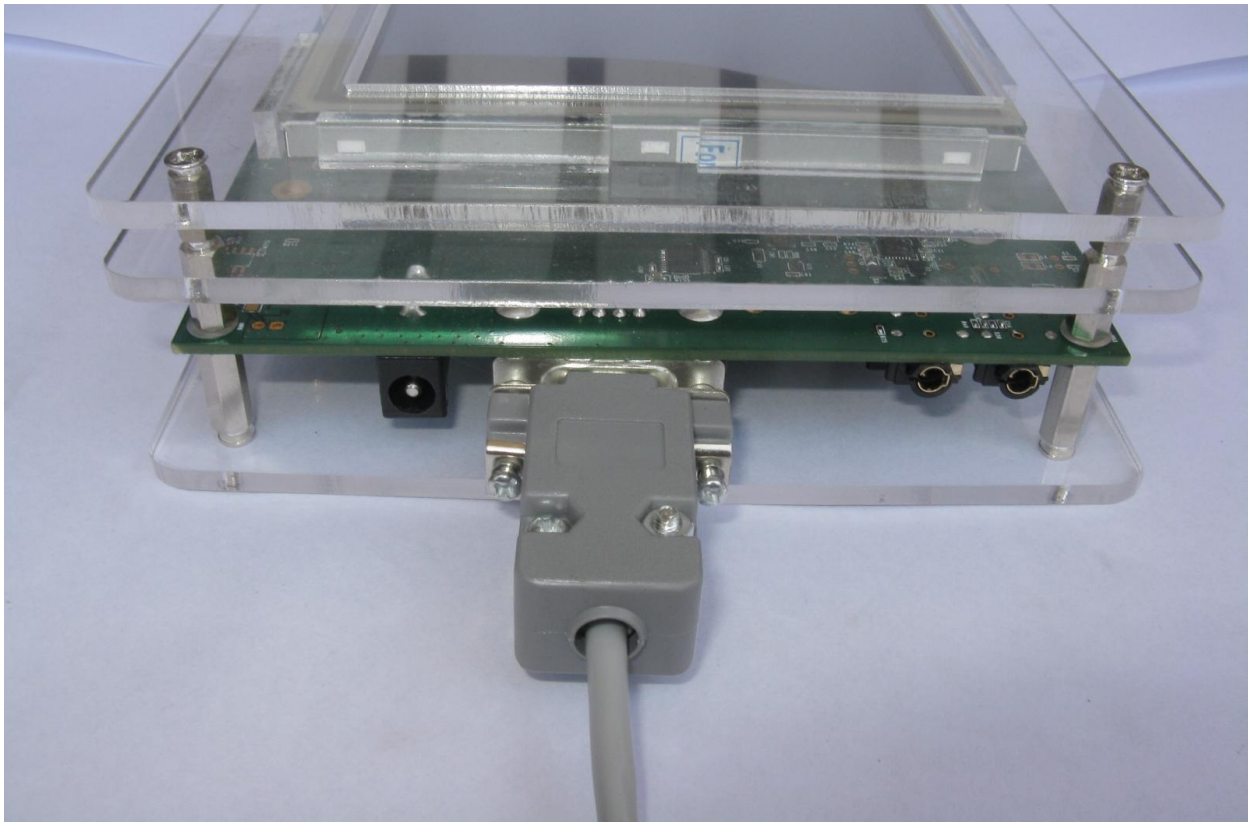


Figure 3: iMX51-Carrier Card Serial Port Connection

2.2.3 USB OTG (as HOST) connecting procedure

Insert the USB in the USB connector as shown below.

Figure 4:USB Connection

2.2.4 SD2/MMC Connecting Procedure

Insert the SD Memory card in the SD1 slot as shown below.

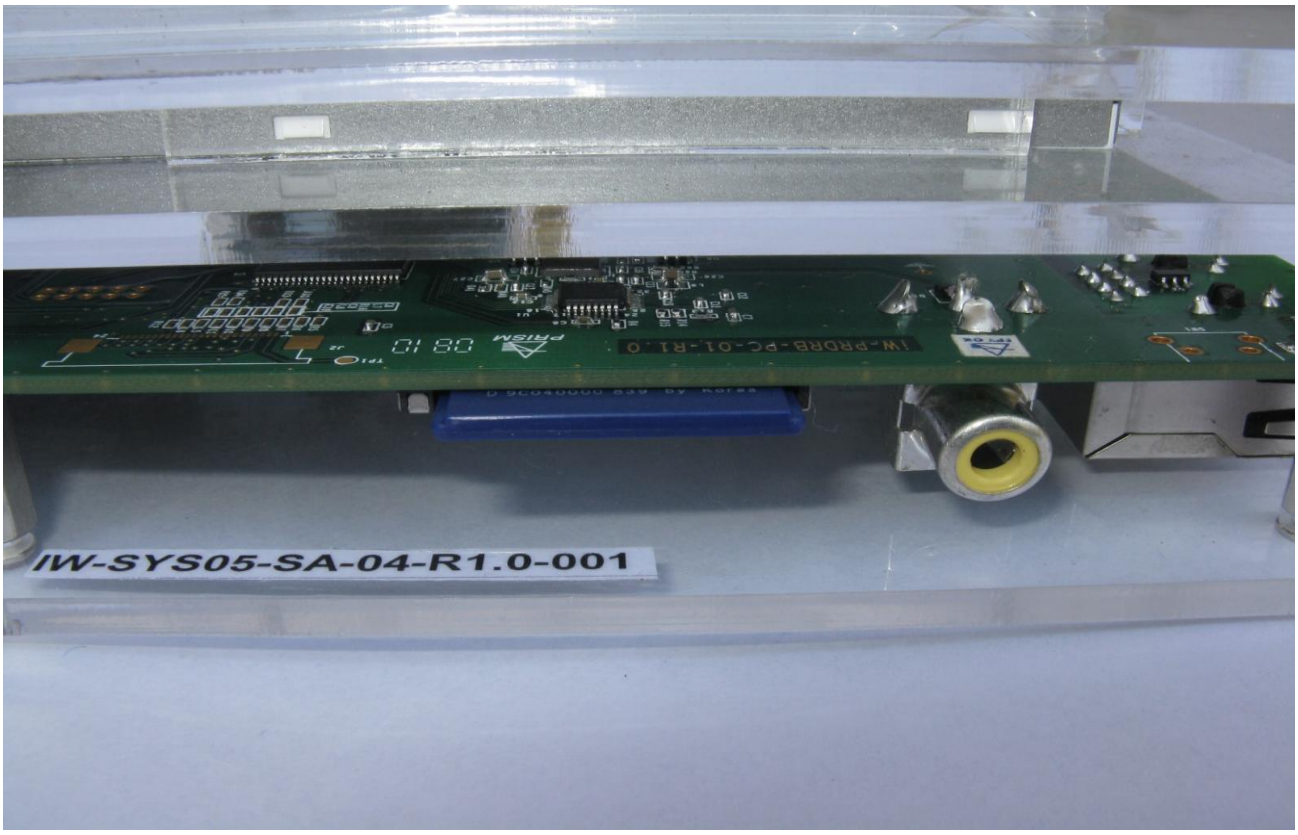


Figure 5:SD2 Connection

2.2.5 Micro SD Connecting Procedure

Insert the Micro SD Memory card in the MicroSD slot as shown below.

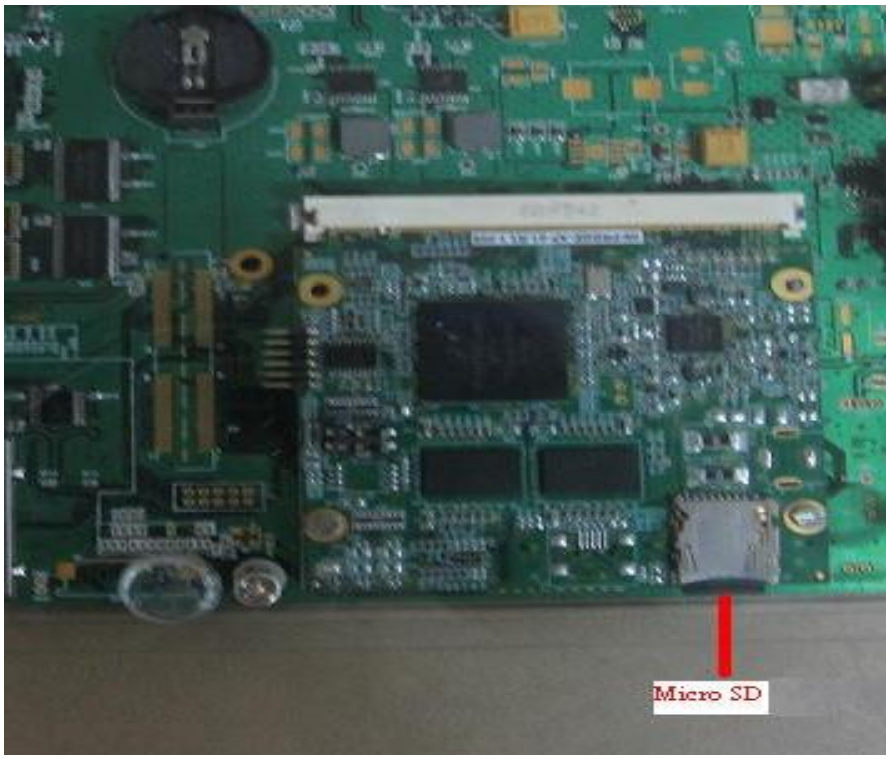


Figure 6:Micro SD Connection

2.2.6 Audio In cable connecting procedure

Insert the Audio IN jack into the Audio in connector as shown below.

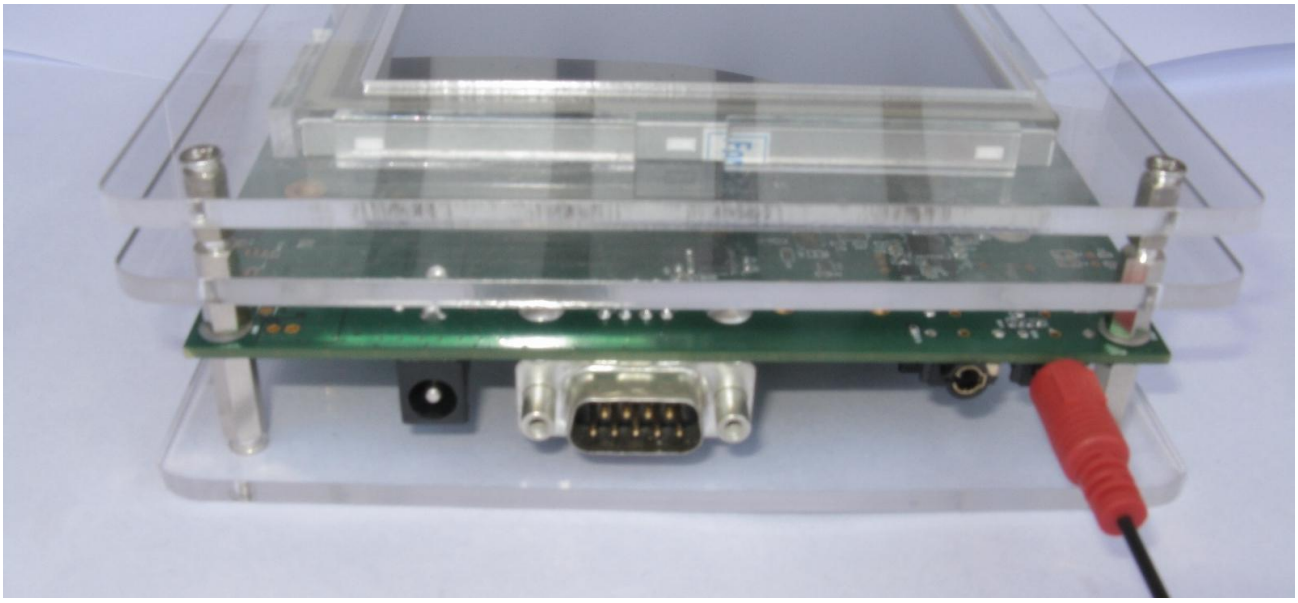


Figure 7:AudioIn Connection

2.2.7 Audio Out cable connecting procedure

Insert the Audio OUT jack into the Audio out connector as shown below.

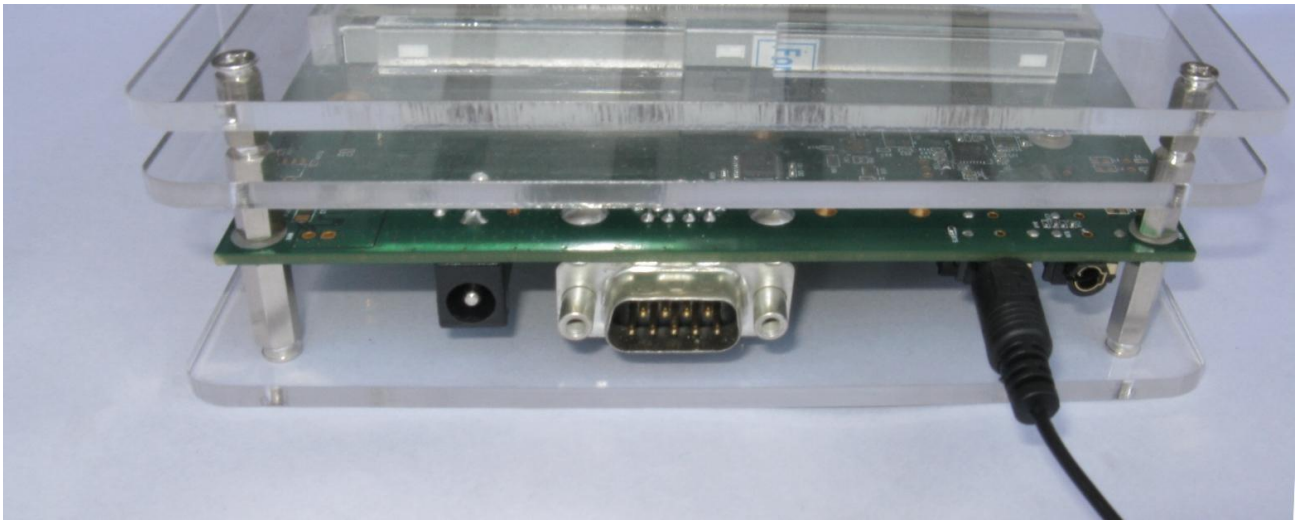


Figure 8:AudioOut Connection

2.2.8 VGA Cable Connecting Procedure

Insert the VGA cable into the VGA OUT(DB15) connector as shown below.

Figure 9:VGA Cable Connection

2.2.9 TV In connecting Procedure (Composite video Input)

Insert the RCA cable in to the TV in connector as shown below.

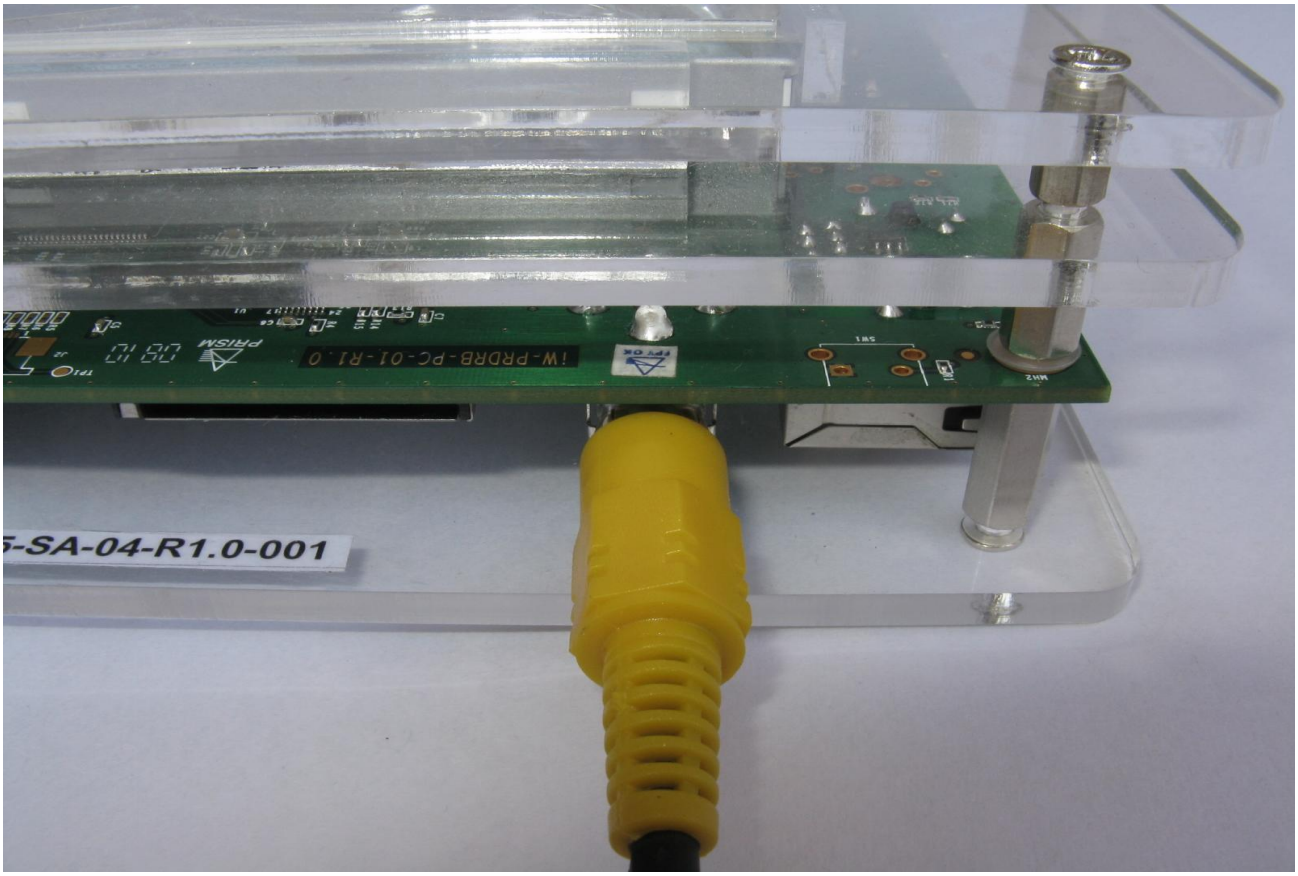


Figure 10:RCA CableConnection

2.2.10 Ethernet Cable Connecting Procedure

Insert the Ethernet cable into the RJ-45 connector as shown below.

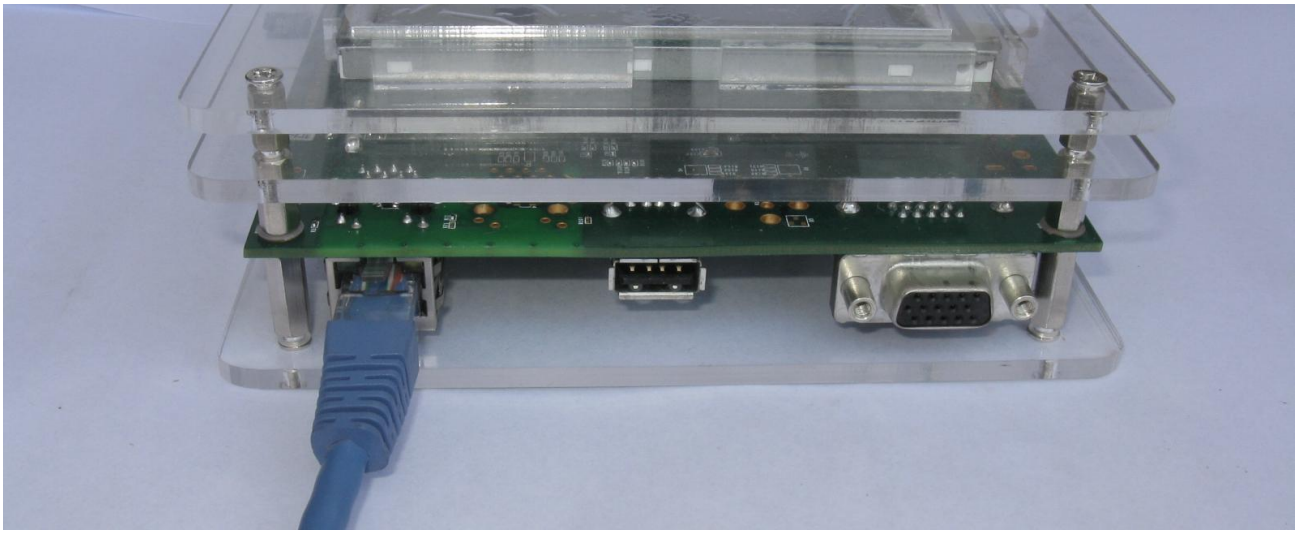


Figure 11:Ehernet Connection

2.2.11 USB Host 1 Connecting Procedure

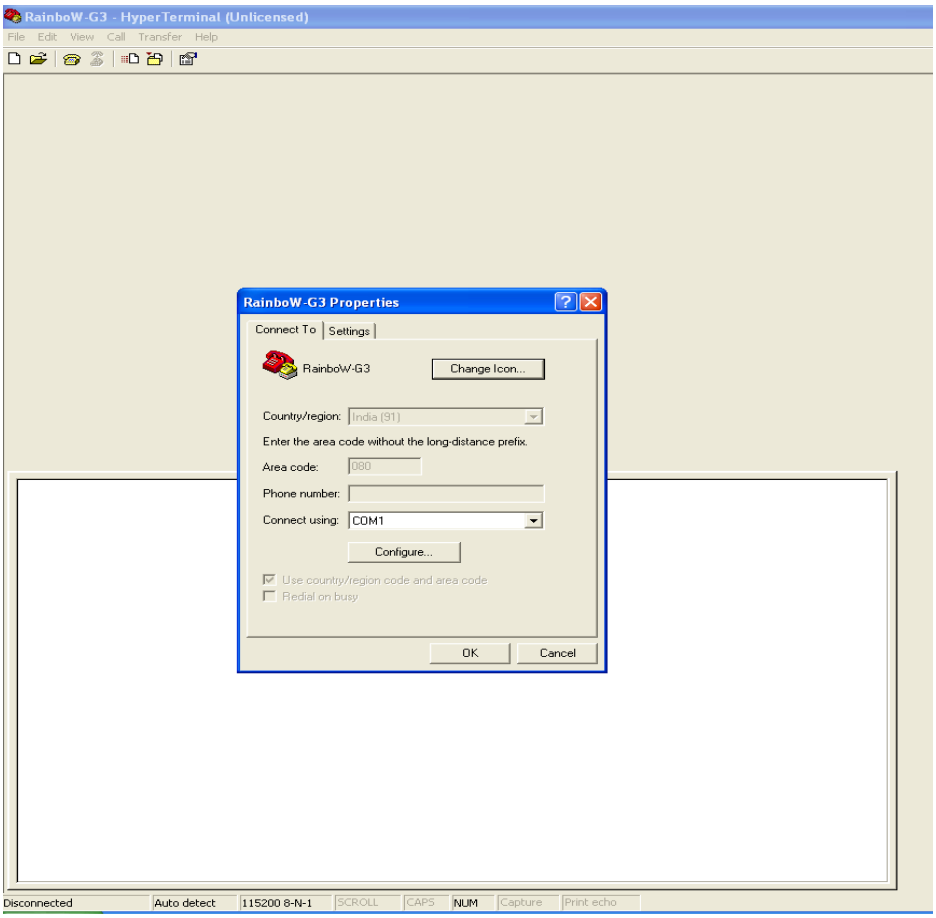
Insert the USB device (ex : USB Pen Drive) to the USB Host1 connector (Standard Type A) as shown below.

Figure 12:USB Host1 Connection

3 Power On

3.1 HyperTerminal Setup

1. Insert one end of the serial cable to PC/Laptop COM port (DB9 Male Connector.)
2. Connect the other end of the serial cable to serial connector in the Board as shown in Figure 3
3. Open the HyperTerminal on the PC/Laptop as mentioned below
4. Go to Start -> Programs -> Accessories -> Communication -> Hyperterminal on the host PC/Laptop.
5. In hyperterminal,Go to Files ->Properties
6. Select COM1 or COM2 port depending on which port you have connected the serial cable.This is shown below.



7. Now Click Configure button and do Port Settings as below..

Bits per Second (Baud Rate)	:**115200**
Data bits	:**8**
Parity	:**None**
Stop Bits	:**1**
Flow Control	:**None**

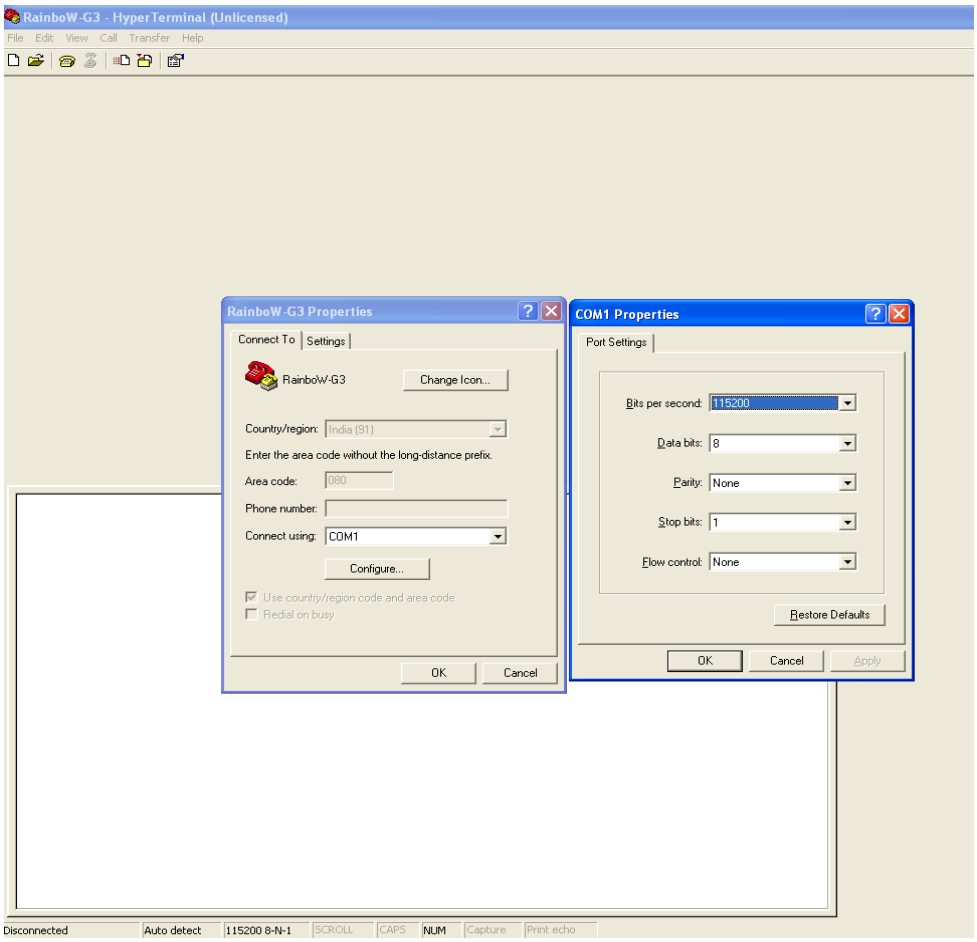


Figure 13:Hyperterminal settings

8. Go to File -> Properties -> Settings ->ASCII Setup.
9. Now Select'Echo typed characters locally' has to be enabled as shown below.
10. Go to Call -> Call to connect.
11. If you want to disconnect, Go to Call -> Disconnect.

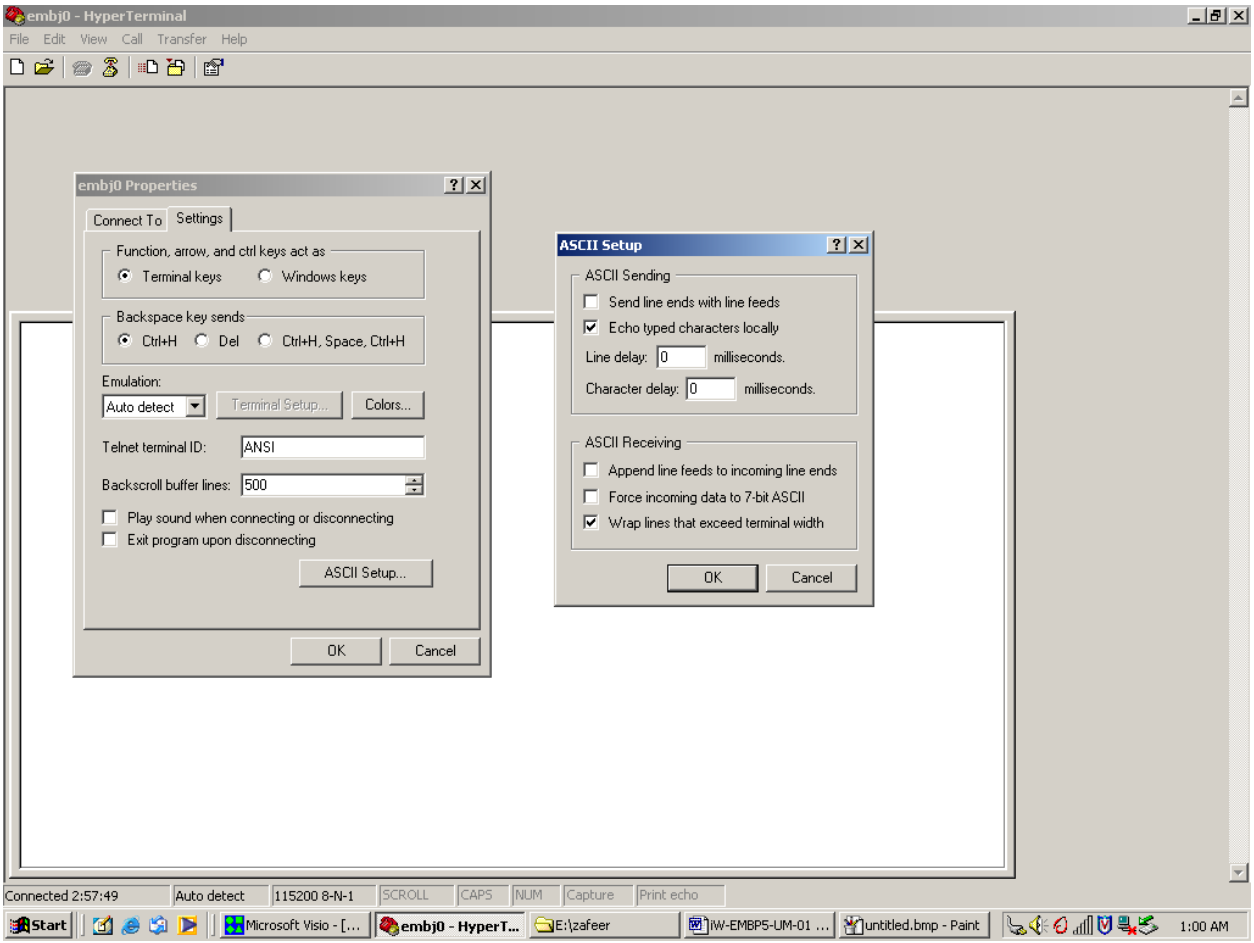


Figure 14:Enable Echo typed characters

3.2 Boot OS from Diagnostics

1. Power the board, the below Menu will display in LCD

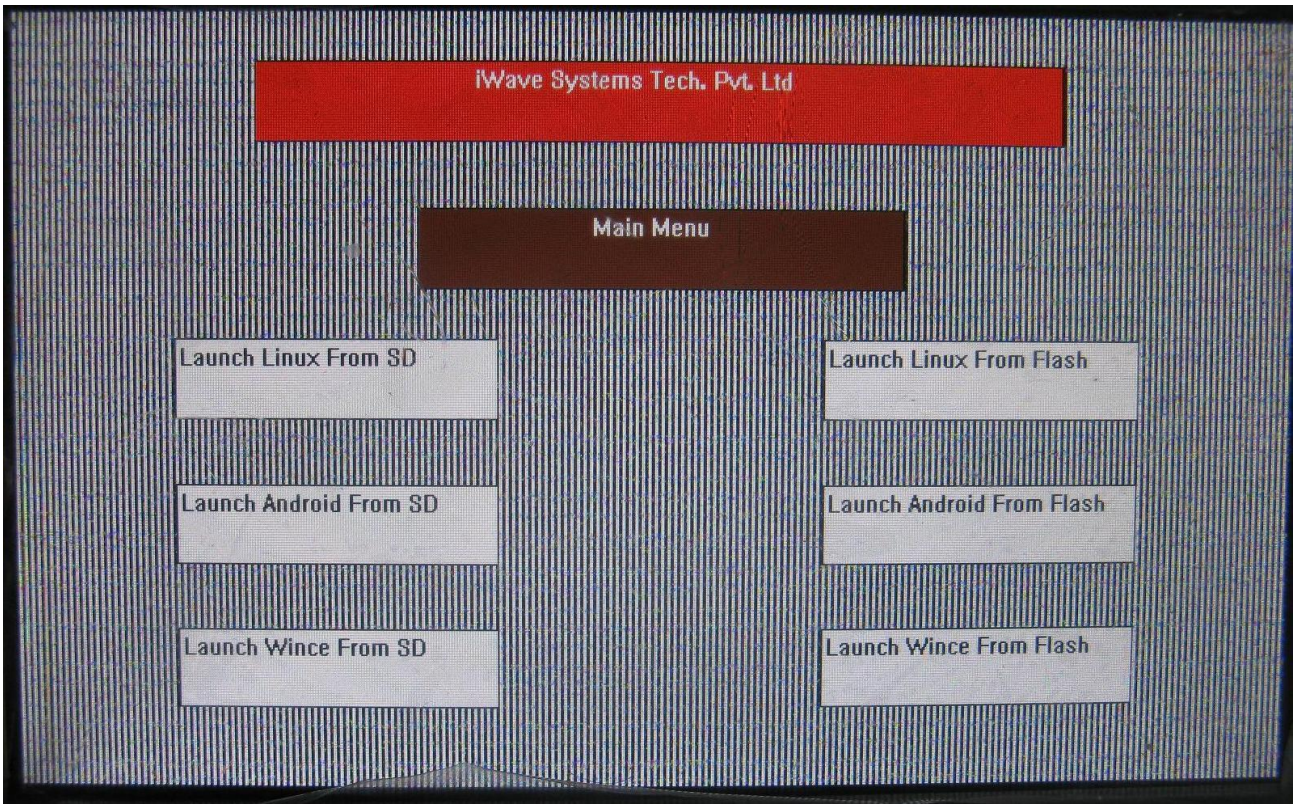


Figure 15: GUI Main Menu in LCD

2. Select the OS type and Memory (SD or FLASH) to boot OS, through LCD Touch panel.
3. To get Diagnostic menu in hyper terminal, press any key from key board. The below menu will display in hyper terminal.

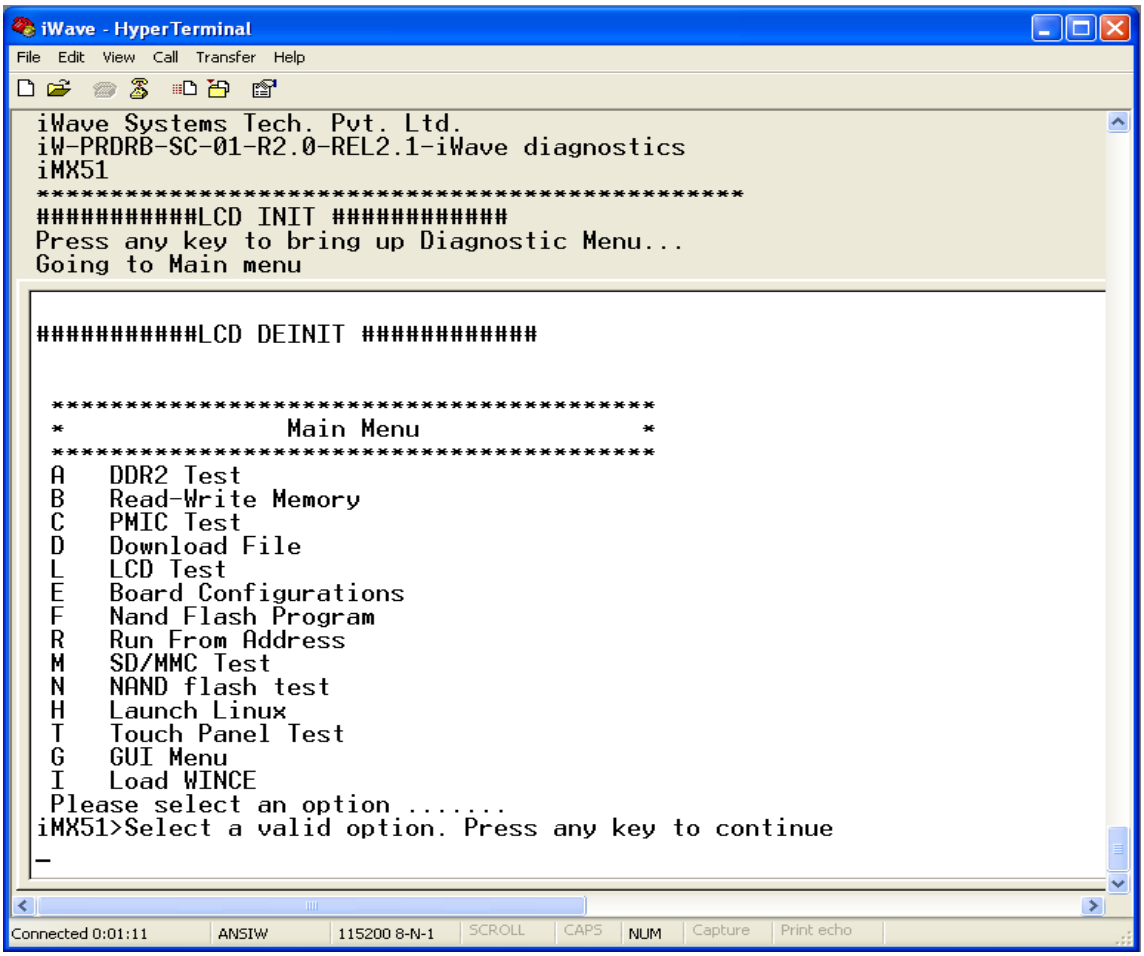


Figure 16: Diagnostic Menu In hyper terminal

4. Select G option from hyper terminal to get GUI Main Menu in LCD.

4 ATK User Manual

4.1 Installing Advanced Tool Kit

1. Install “FSL_ATK_TOOL_WINS_STD_INSTALL_1_67.exe” setup in Windows PC (PC must have COM port or USB to serial convertor).

4.2 Initial Setup of Advanced Tool Kit

1. Connect serial port from PC to i.MX 51 Processor board debug serial port.

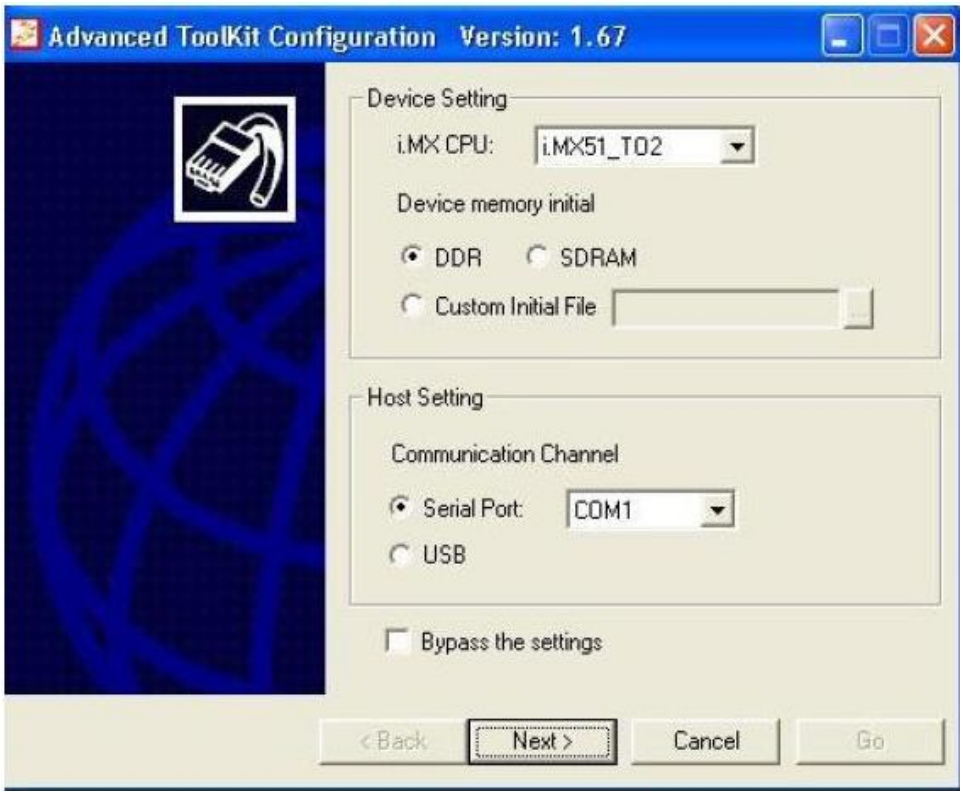
2. Set the Bootstrap mode in the Processor board as mentioned in picture below (push both switches to ON position for bootstrap).

3. Run the Open Advanced Toolkit application by double clicking the “Advanced Tool Kit V1.67” located in Desktop.

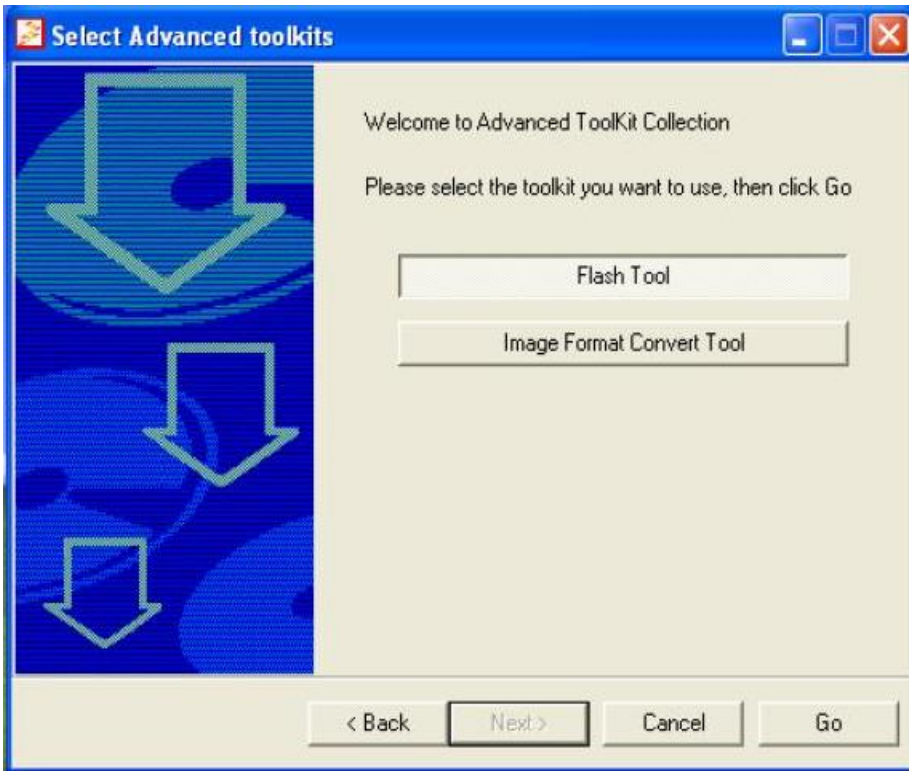
4. In Device Setting select the i.MX CPU as iMX51 TO2.

5. In Host Setting, select Communication channel as “Serial Port” and select the COM port. For example, select COM1 Port.

6. Click Next to Continue



7. Select Flash Tool and Click Go button.

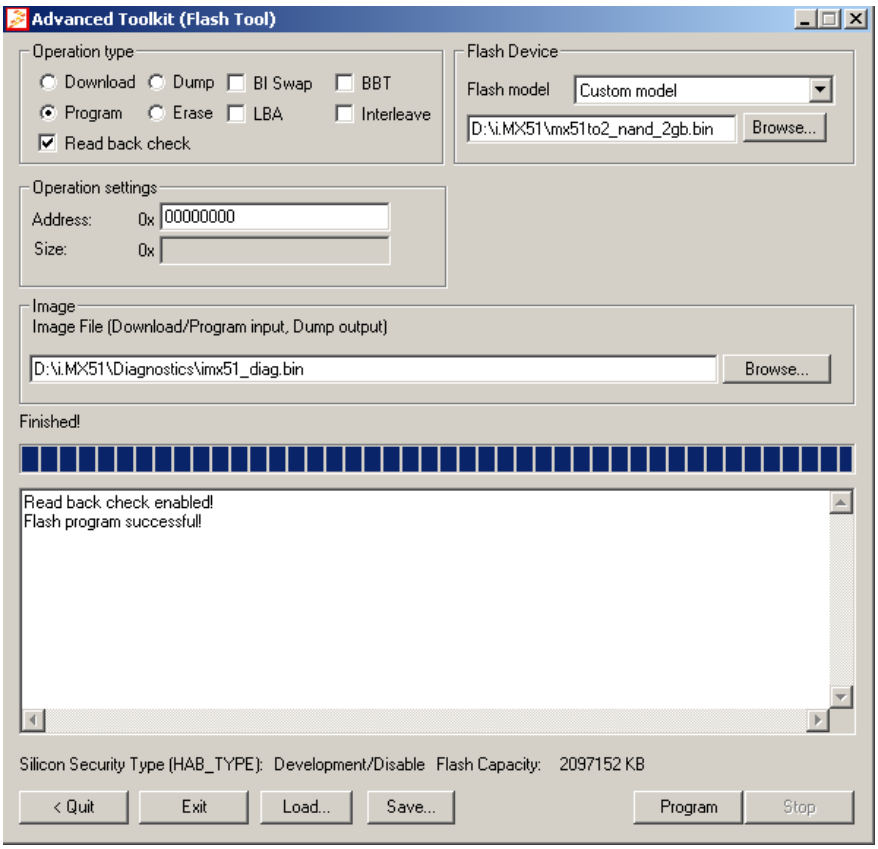


4.3 Flash Programming the Boot Code

1. In the next screen select below things.
2. Select Flash model as Custom model.
3. Click Browse button (under Flash model) and Select the given Binary File (“mx51to2_nand.bin”).
4. In Operation type Select Program.
5. In Operation settings, type Address as “0”.

6. Click Browse button (Under image) and select the image file (“imx51_diag.bin”).

7. Click Program button.



8. Next zImage has to be programmed.

4.4 Flash Programming the Linux Kernel Image

1. In the next screen select below things.

2. Select Flash model as Custom model.

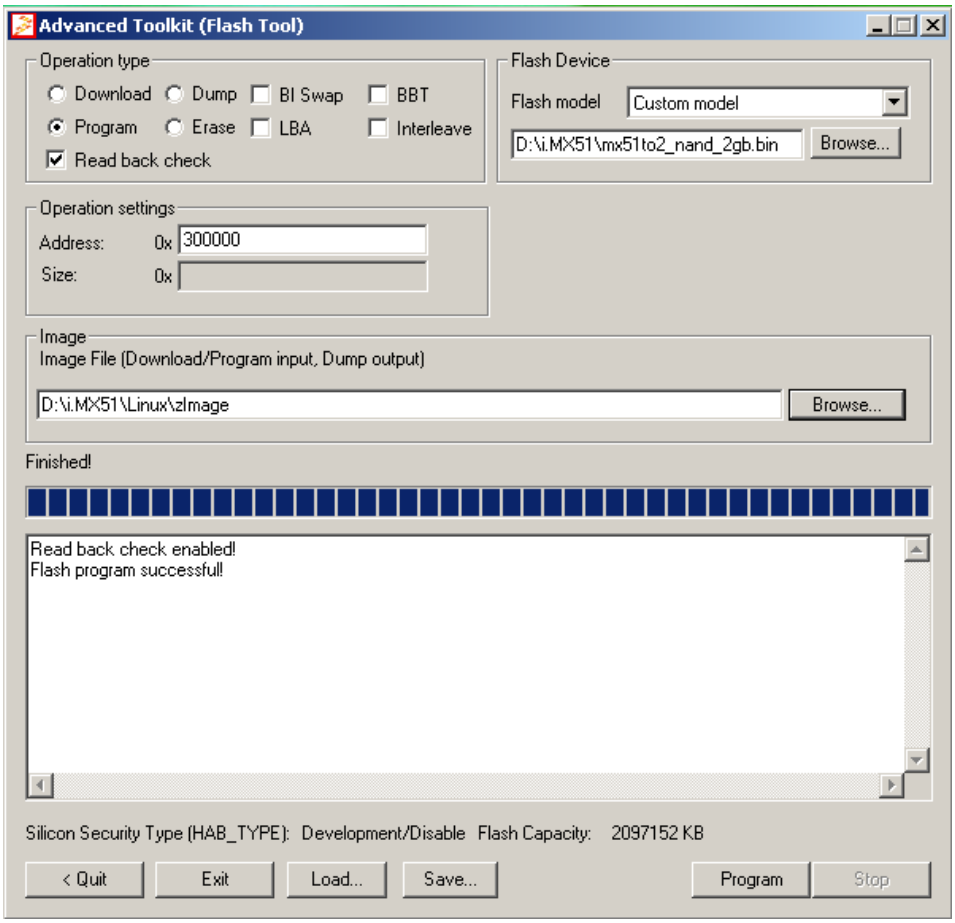
3. Click Browse button (under Flash model) and Select the given Binary File (“mx51to2_nand.bin”).

4. In Operation type Select Program.

5. In Operation settings, type Address as “300000”.

6. Click Browse button(Under image) and select the image file (“zImage”).

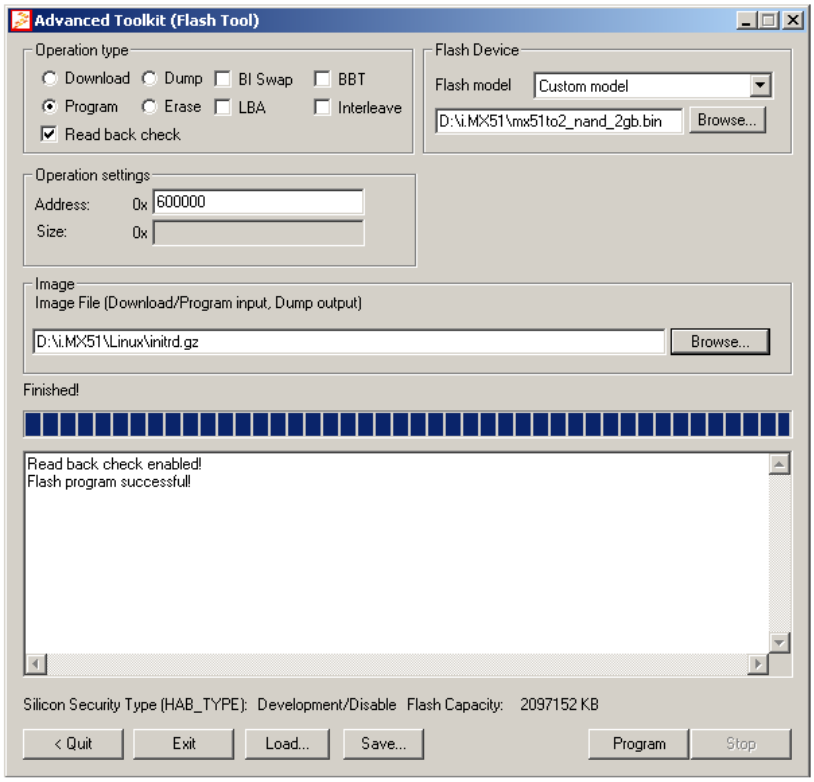
7. Click Program button.



8. Next initrd has to be programmed.

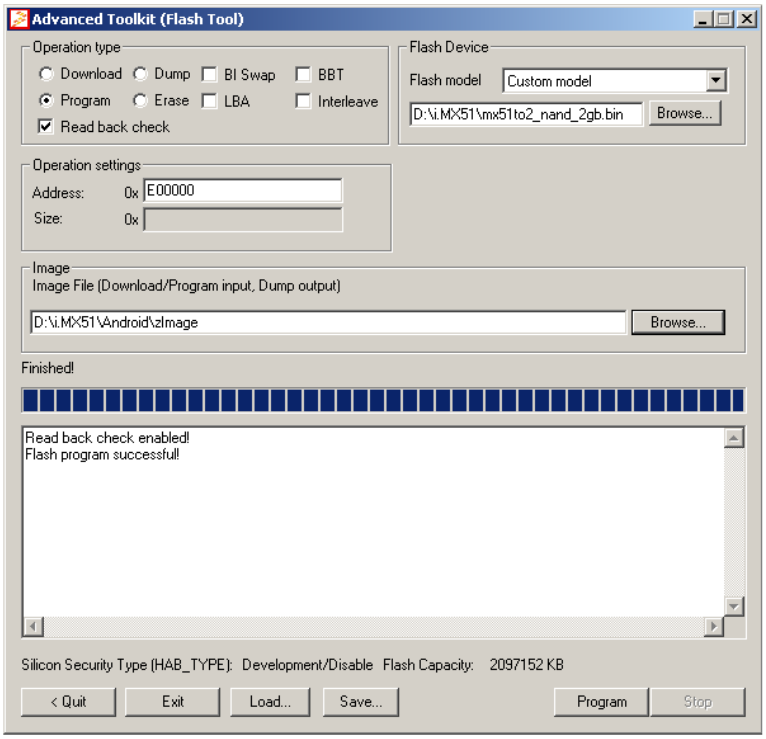
4.5 Flash Programming the Linux initrd Image

1. In the next screen select below things.
2. Select Flash model as Custom model.
3. Click Browse button (under Flash model) and Select the given Binary File (“mx51to2_nand.bin”).
4. In Operation type Select Program.
5. In Operation settings, type Address as “600000”.
6. Click Browse button (Under image) and select the image file (“initrd.gz”).
7. Click Program button.



4.6 Flash Programming the Android Kernel Image

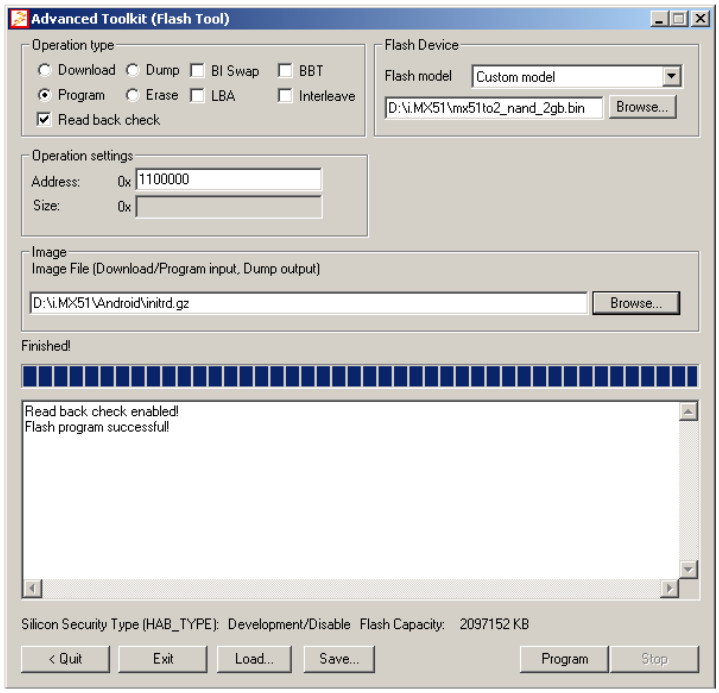
9. In the next screen select below things.
10. Select Flash model as Custom model.
11. Click Browse button (under Flash model) and Select the given Binary File (“mx51to2_nand.bin”).
12. In Operation type Select Program.
13. In Operation settings, type Address as “E00000”.
14. Click Browse button(Under image) and select the image file (“zImage”).
15. Click Program button.



16. Next initrd has to be programmed.

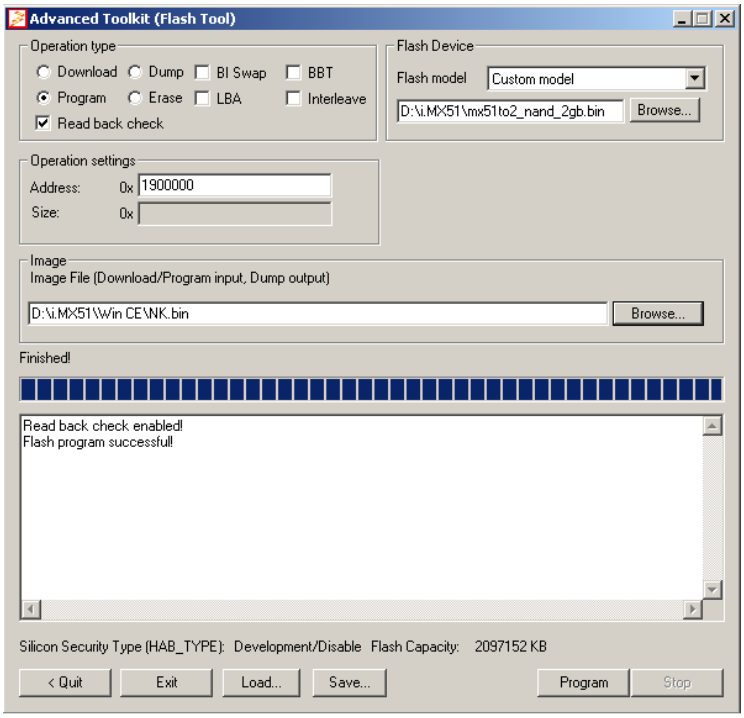
4.7 Flash Programming the Android initrd Image

8. In the next screen select below things.
9. Select Flash model as Custom model.
10. Click Browse button (under Flash model) and Select the given Binary File (“mx51to2_nand.bin”).
11. In Operation type Select Program.
12. In Operation settings, type Address as “1100000”.
13. Click Browse button (Under image) and select the image file (“initrd.gz”).
14. Click Program button.



4.8 Flash Programming the WinCE Image

15. In the next screen select below things.
16. Select Flash model as Custom model.
17. Click Browse button (under Flash model) and Select the given Binary File (“mx51to2_nand.bin”).
18. In Operation type Select Program.
19. In Operation settings, type Address as “1900000”.
20. Click Browse button (Under image) and select the image file (“NK.bin”).
21. Click Program button.



4.9 Frequently Asked Questions (FAQ):

1. What can be done if bootstrap mode is not detected message displayed in ATK toolkit ?

<Answer> There may be three of reasons

a. Check whether COM port is selected properly?

b. Check whether board is set in bootstrap mode (as explained in "**Figure 1 Bootstrap mode settings")**

c. If both options are not helping, power off board and power on again.

2. What can be done If flash programming is getting failed(for any reason) half the way ?

<Answer> Repeat the flash programming procedure for particular image once again.

3. What should I do "COM port is already in use message is displayed" ?

<Answer> Check any program is using COM port (e.g Hyperterminal). Close the that application(which is using COM port) and try again.

5 TECHNICAL SUPPORT

iWave Systems Technologies Pvt. Ltd.
7/B, 29th Main,
BTM Layout 2nd Stage,
Ban galore – 560 076
Phone : +91-80-26683700, 26786245
Fax : +91-80-26685200
Email : mktg@iwavesystems.com
web : www.iwavesystems.com