
User Manual for iMX27 based CE-ATA solution

iW-EMBQF-UM-01

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1 Introduction

1.1 Purpose

The purpose of this document is to explain the procedure to power-on and test the iMX27 based CE-ATA solution board.

1.2 Scope

This document describes the Hardware connection procedure to power-on and perform the GUI diagnostic tests to verify the working of CE-ATA and WinCE using the Touchscreen.

1.3 Setup Details

Each setup consists of One board with the LCD and CE-ATA hard disk connected. The entire set up is as shown in the Figure 1.

1. Processor Board (**iW-EMBQF-AP-01-XX**).

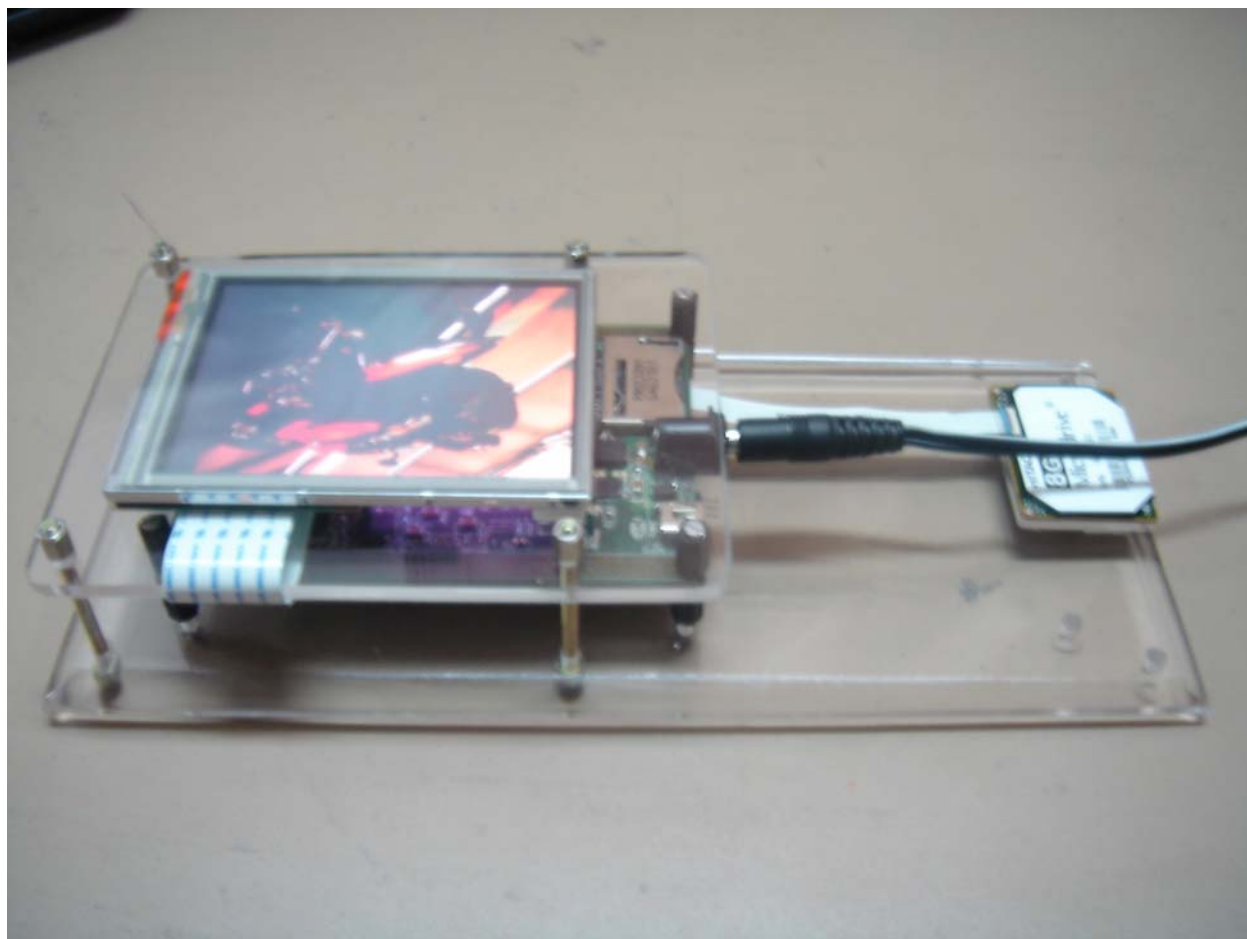


Figure 1: iMX27 based CE-ATA Board Setup

The accessories along with the board setup is shown in the Figure 2

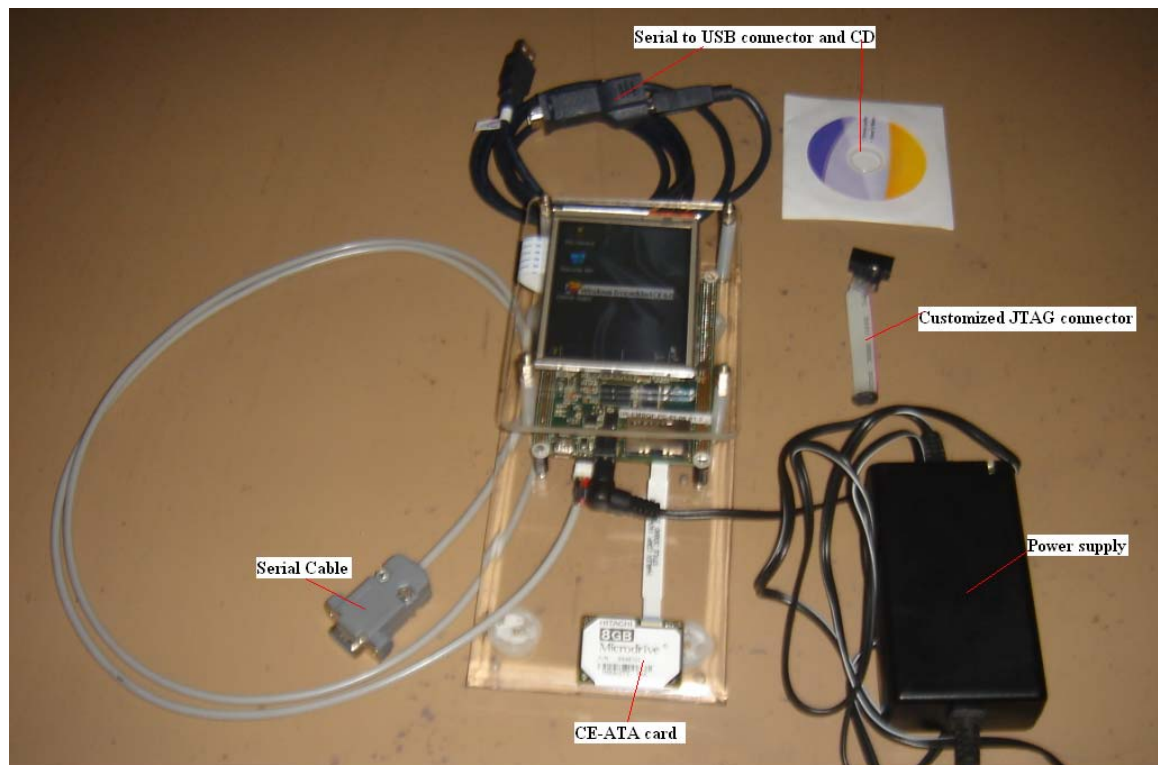


Figure 2: Accessories with iMX27 based CE-ATA Board Setup

The Accessories is as follows

- Power Supply
- CE-ATA card
- Serial Cable for the Flash programming
- Customized cable for programming Actel FPGA. This cable to be connected between JTA programmer and Board JTAG connector
- Serial to USB convertor, with the CD (if DB-9 port not available in the PC/laptop)

2 Procedure to setup Hardware for Demo

2.1 Details regarding the power cable insertion

2.1.1 Power cable Connection procedure

Insert the power cable into the power connector of the Mother-board as shown in the Figure 3

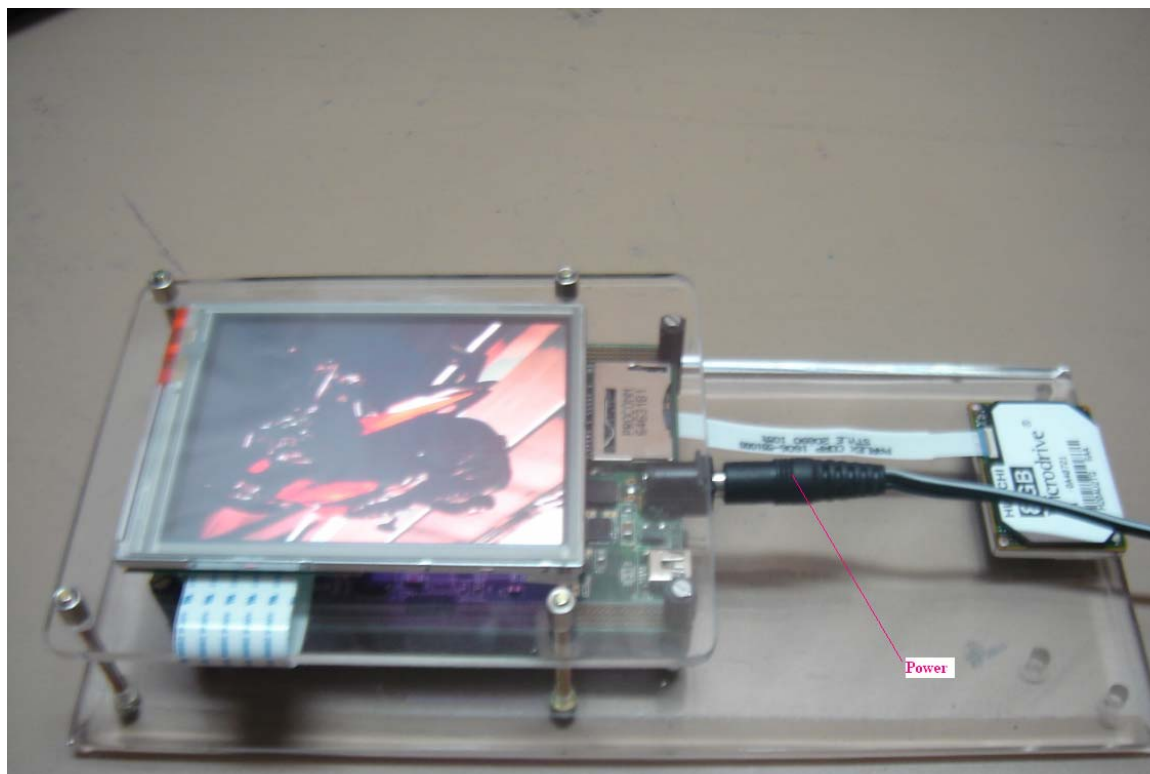


Figure 3: Power Connection

2.2 Actel JTAG programming

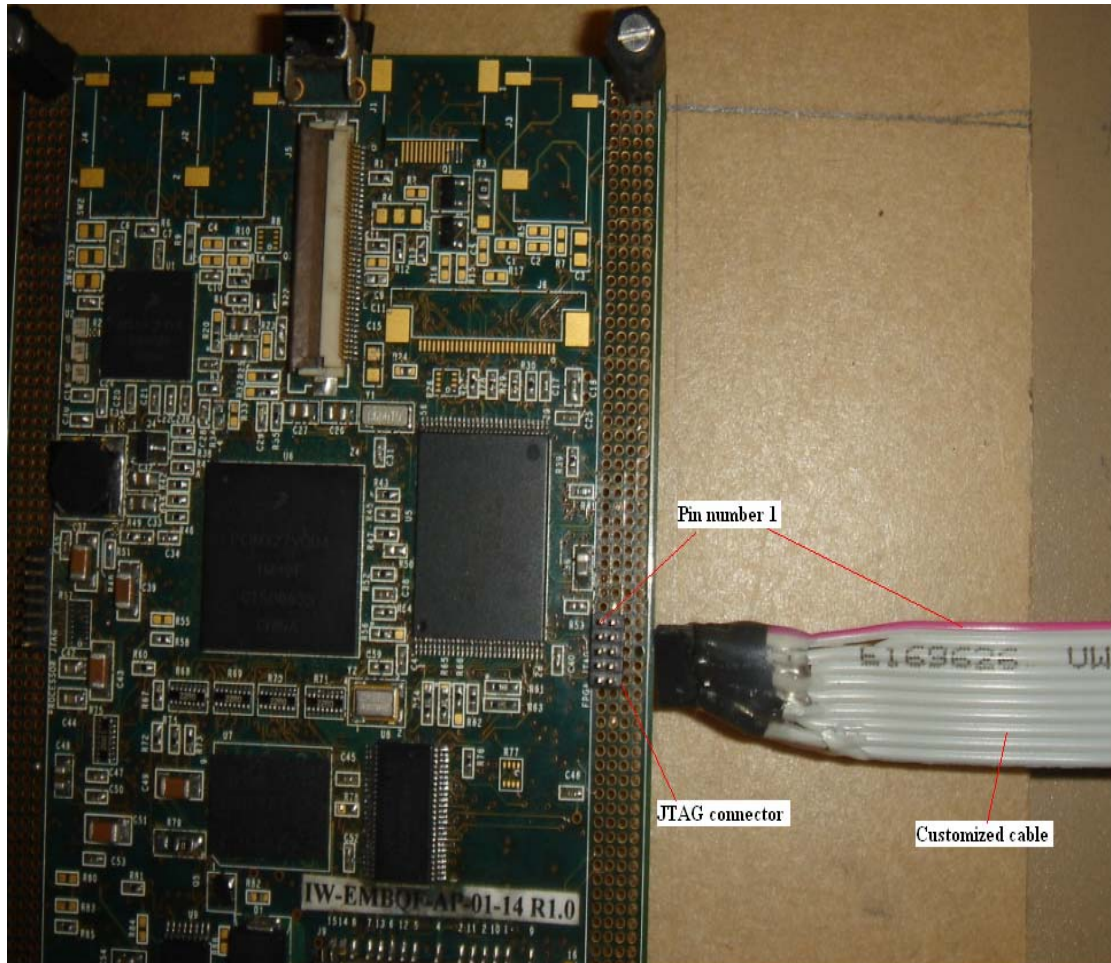
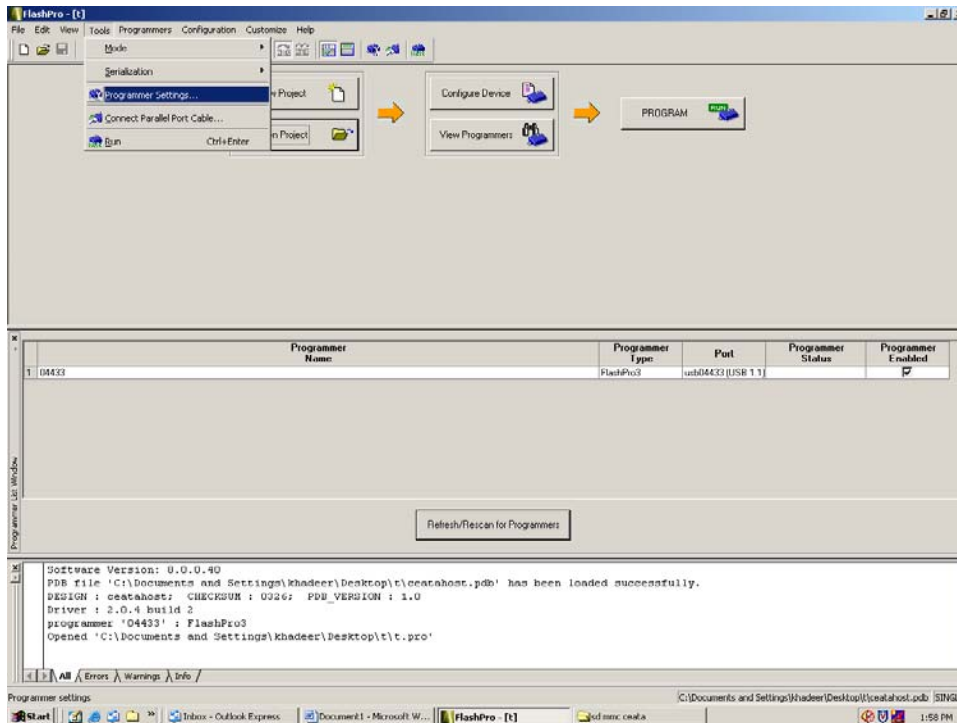


Figure 4: FPGA programming connection



Figure 5: FPGA programming connection1

Select Programmer settings from Tools menu



Set TCK frequency to 1MHz under FlashPro3 tab



2.3 Serial Cable connection

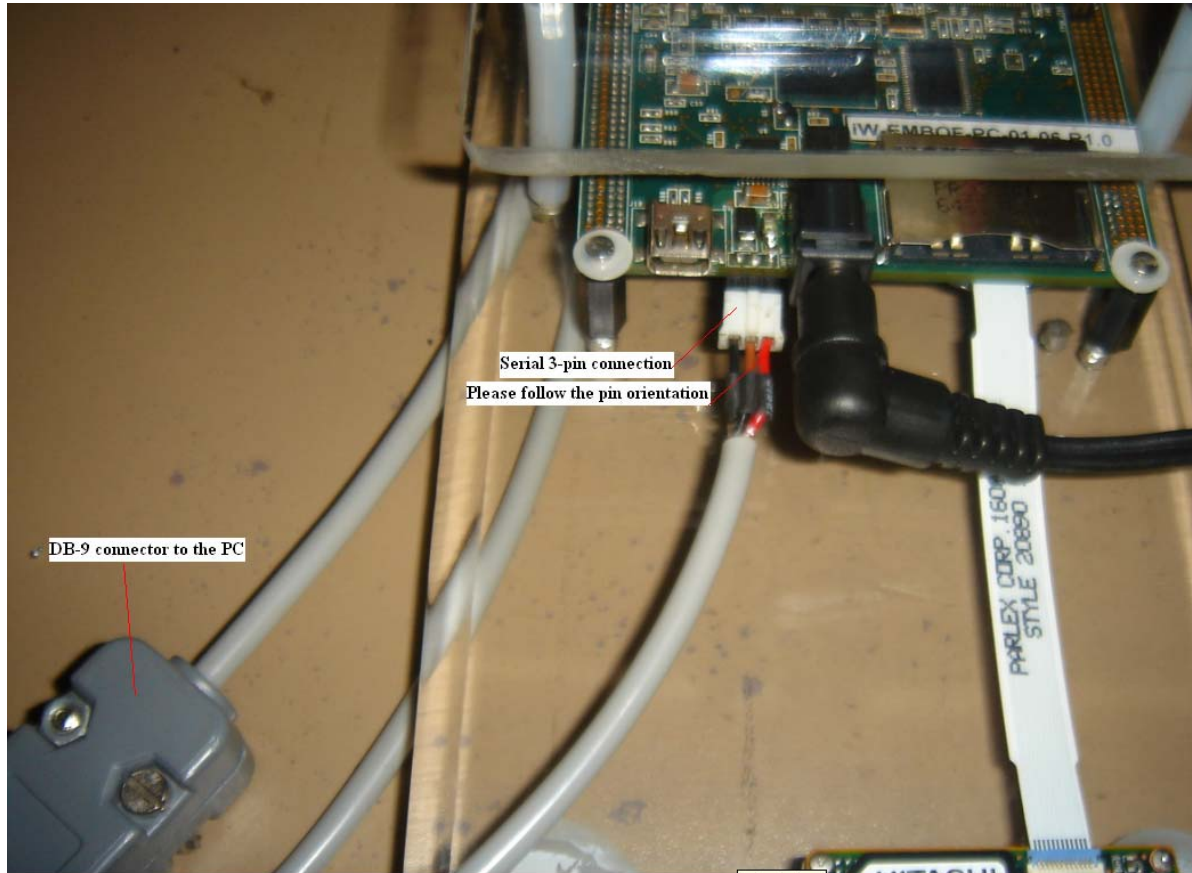


Figure 6: Serial cable connection during the programming of flash

- DB-9 connector needs to be connected to the PC/laptop. If serial connection not available use the Serial to USB convertor (Installation CD also available with the accessories).
- The other end of the serial cable needs to be connected to the Board. Please see the connector position as shown above in the Figure 6

2.4 Programming Flash through Serial interface procedure

2.4.1 Hyperterminal Setup

1. Go to **Start → Programs → Accessories → Communication → Hyperterminal** on the host PC.
2. Select **COM1** or **COM2** port depending on to which port you have connected the serial cable.
3. Click Configure button. Now configure as below.

| | |
|-----------------------------|-----------------|
| Bits per Second (Baud Rate) | : 115200 |
| Data bits | : 8 |
| Parity | : None |
| Stop Bits | : 1 |
| Flow Control | : None |
4. Go to **File → Properties → Settings → ASCII Setup**. There select **Echo Typed Characters locally**.

2.4.2 Steps

1. Switch ON the Board.
2. Now Hyperterminal shows as below

```
*****
iWave Systems Tech. Pvt. Ltd.
Rainbow G3 Monitor
Version 0.1
i.MX27 RAINBOW G3
*****
```

BOARD INFO

| Area | Start address | End address | Size |
|--------------|---------------|-------------|---------|
| SDRAM | 0xa000_0000 | 0xa3ff_ffff | 64 MB |
| Data section | 0xa3e0_0000 | 0xa3ef_ffff | 1 MB |
| UsrcStack | 0xa3f0_0000 | 0xa3f0_ffff | 64 KB |
| IRQStack | 0xa3f1_0000 | 0xa3f1_ffff | 64 KB |
| FIQStack | 0xa3f2_0000 | 0xa3f2_ffff | 64 KB |
| UndefStack | 0xa3f3_0000 | 0xa3f3_ffff | 64 KB |
| AbortStack | 0xa3f4_0000 | 0xa3f4_ffff | 64 KB |
| SVCStack | 0xa3f5_0000 | 0xa3f5_ffff | 64 KB |
| SVSSStack | 0xa3f6_0000 | 0xa3f6_ffff | 64 KB |
| Flash | 0xc000_0000 | 0xc1ff_ffff | 32 MB |
| Bootloader | 0xc000_0000 | 0xffff_fffe | 1023 MB |
| Kernel | 0xffff_ffff | 0xffff_fffe | 0 MB |
| Initrd | 0xffff_ffff | 0xffff_fffe | 0 MB |
| Filesystems | 0xffff_ffff | 0xc1ff_ffff | 3104 MB |

Going to boot linux from flash. Press any key with in 10 sec for diagnostics

```
FPGA supported
Enabling I2C Controller
The PCCRO is: 0xb10c480fSwitching on LCD
Switched on LCD
Drawing Screen 1
draw_screen max_control = 1Drawn Screen

loop starts
loop ends now in current menuGoing to next Screen
Drawing Screen 2
draw_screen max_control = 2Drawn Screen
```


3. Press any Key to continue in Diagnostic Menu.
4. Now Press **D** to download the file

```
SDRAM      0xa000_0000  0xa3ff_ffff  64 MB
Data section 0xa3e0_0000  0xa3ef_ffff  1 MB
UsrStack    0xa3f0_0000  0xa3f0_ffff  64 KB
IRQStack    0xa3f1_0000  0xa3f1_ffff  64 KB
FIQStack    0xa3f2_0000  0xa3f2_ffff  64 KB
UndefStack  0xa3f3_0000  0xa3f3_ffff  64 KB
AbortStack  0xa3f4_0000  0xa3f4_ffff  64 KB
SVCStack    0xa3f5_0000  0xa3f5_ffff  64 KB
SVSStack    0xa3f6_0000  0xa3f6_ffff  64 KB
Flash       0xc000_0000  0xc1ff_ffff  32 MB
Bootloader  0xc000_0000  0xffff_fffe  1023 MB
Kernel      0xffff_ffff  0xffff_fffe  0 MB
Initrd      0xffff_ffff  0xffff_fffe  0 MB
Filesystems  0xffff_ffff  0xc1ff_ffff  3104 MB
```

Going to boot linux from flash. Press any key with in 10 sec for diagnostics

```
FPGA supported
Enabling I2C Controller
The PCCRO is: 0xb10c480fSwitching on LCD
Switched on LCD
Drawing Screen 1
draw_screen max_control = 1Drawn Screen
```

```
loop starts
loop ends now in current menuGoing to next Screen
Drawing Screen 2
draw_screen max_control = 2Drawn Screen

inside powr off
A  RAM test
B  Read-Write Memory
C  CSPI Test
D  Download File
E  Environment variable
F  Flash Program
G  Gui Menu
L  LCD Test
M  SD/MMC Test
N  Load WinCE from SD card
R  Run From Address
T  Touch Panel Test
X  Boot Linux from Flash
Z  Launch Linux form SD Card
Please select an option .....
RainbowG3> d
Enter the SDRAM download address : _
```

Connected 2:22:14 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo

5. Give SDRAM download address as **A3000000** and then Press **Y**.

```
Data section 0xa3e0_0000 0xa3ef_ffff 1 MB
UsrStack    0xa3f0_0000 0xa3f0_ffff 64 KB
IRQStack    0xa3f1_0000 0xa3f1_ffff 64 KB
FIQStack    0xa3f2_0000 0xa3f2_ffff 64 KB
UndefStack  0xa3f3_0000 0xa3f3_ffff 64 KB
AbortStack  0xa3f4_0000 0xa3f4_ffff 64 KB
SVCSStack   0xa3f5_0000 0xa3f5_ffff 64 KB
SVSSStack   0xa3f6_0000 0xa3f6_ffff 64 KB
Flash       0xc000_0000 0xc1ff_ffff 32 MB
Bootloader  0xc000_0000 0xffff_fffe 1023 MB
Kernel      0xffff_ffff 0xffff_fffe 0 MB
Initrd      0xffff_ffff 0xffff_fffe 0 MB
Filesystems 0xffff_ffff 0xc1ff_ffff 3104 MB
```

Going to boot linux from flash. Press any key with in 10 sec for diagnostics

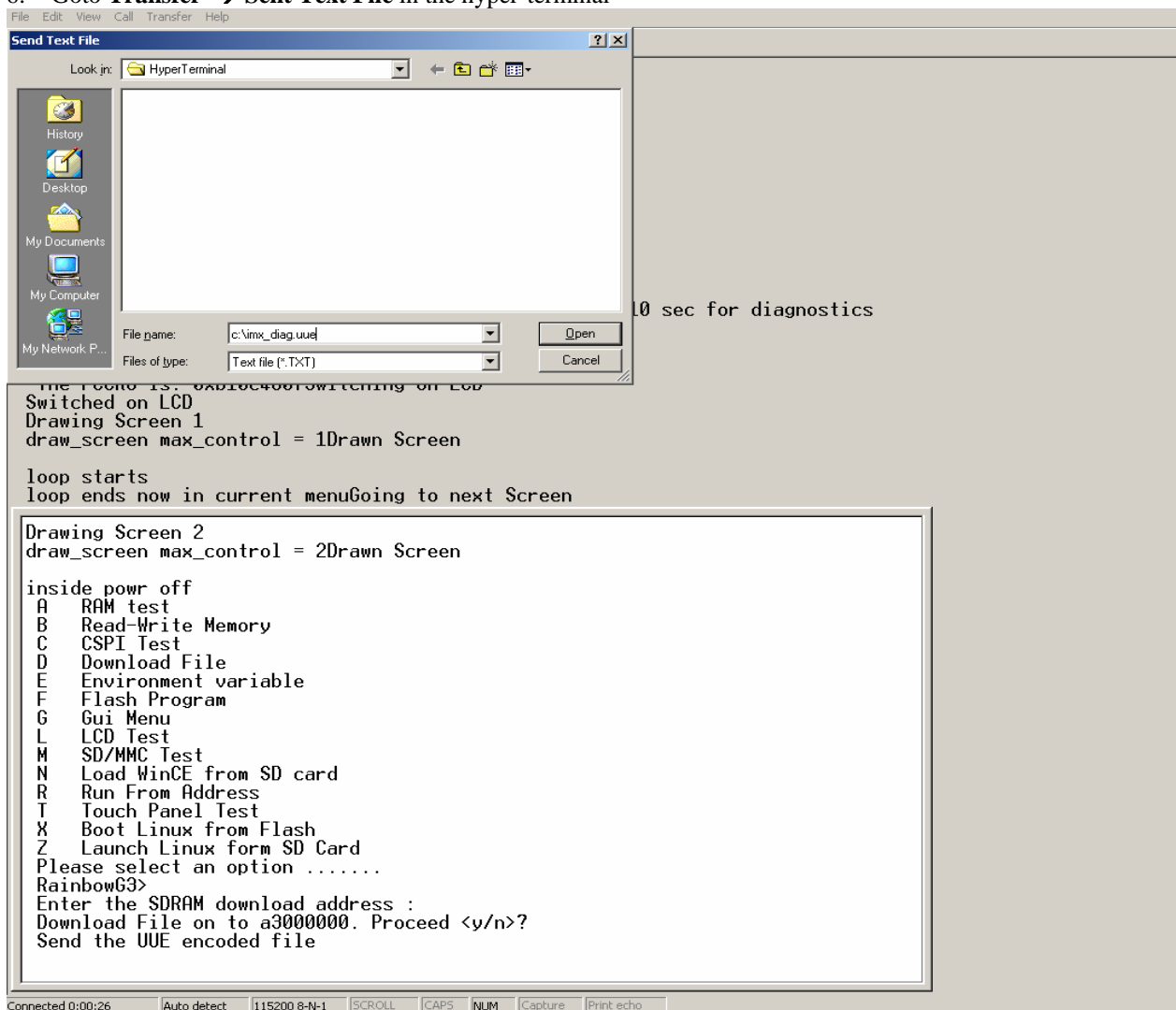
```
FPGA supported
Enabling I2C Controller
The PCCR0 is: 0xb10c480fSwitching on LCD
Switched on LCD
Drawing Screen 1
draw_screen max_control = 1Drawn Screen
```

```
loop starts
loop ends now in current menuGoing to next Screen
Drawing Screen 2
draw_screen max_control = 2Drawn Screen
```

```
inside powr off
A RAM test
B Read-Write Memory
C CSPI Test
D Download File
E Environment variable
F Flash Program
G Gui Menu
L LCD Test
M SD/MMC Test
N Load WinCE from SD card
R Run From Address
T Touch Panel Test
X Boot Linux from Flash
Z Launch Linux form SD Card
Please select an option .....
RainbowG3> d
Enter the SDRAM download address : a3000000
Download File on to a3000000. Proceed <y/n>?
```

connected 2:23:22 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo

6. Goto **Transfer** → **Sent Text File** in the hyper-terminal



7. Give the location of the file **imx_diag.uue** and then give open.
8. After downloading press any key to continue.

```
File Edit View Call Transfer Help
[Icons]

Drawing Screen 1
draw_screen max_control = 1Drawn Screen

loop starts
loop ends now in current menuGoing to next Screen
Drawing Screen 2
draw_screen max_control = 2Drawn Screen

inside powr off
A RAM test
B Read-Write Memory
C CSPI Test
D Download File
E Environment variable
F Flash Program
G Gui Menu
L LCD Test
M SD/MMC Test
N Load WinCE from SD card
R Run From Address
T Touch Panel Test
X Boot Linux from Flash
Z Launch Linux form SD Card
Please select an option .....

RainbowG3>
Enter the SDRAM download address :
Download File on to a3000000. Proceed <y/n>?
Send the UUE encoded file
..... Downloaded 14ec0 bytes on to a3000000

Press any key to continue
A RAM test
B Read-Write Memory
C CSPI Test
D Download File
E Environment variable
F Flash Program
G Gui Menu
L LCD Test
M SD/MMC Test
N Load WinCE from SD card
R Run From Address
T Touch Panel Test
X Boot Linux from Flash
Z Launch Linux form SD Card
Please select an option .....
RainbowG3> _
```

Connected 0:02:53 | Auto detect | 115200 8-N-1 | SCROLL | CAPS | NUM | Capture | Print echo

9. Press **F** to enter in to Flash programming menu.

```

D Download File
E Environment variable
F Flash Program
G Gui Menu
L LCD Test
M SD/MMC Test
N Load WinCE from SD card
R Run From Address
T Touch Panel Test
X Boot Linux from Flash
Z Launch Linux form SD Card
Please select an option .....
RainbowG3>
Enter the SDRAM download address :
Download File on to a3000000. Proceed <y/n>?
Send the UUE encoded file
.....
Downloaded 14ec0 bytes on to a3000000

Press any key to continue
A RAM test
B Read-Write Memory
C CSPI Test
D Download File

E Environment variable
F Flash Program
G Gui Menu
L LCD Test
M SD/MMC Test
N Load WinCE from SD card
R Run From Address
T Touch Panel Test
X Boot Linux from Flash
Z Launch Linux form SD Card
Please select an option .....
RainbowG3> f

*****
* Flash Programming utility *
*****

A Program the diagnostic code
B Program the zImage
C Program the initrd
D Program the FFS area
E Exit

Select an option : _

```

Connected 0:03:43 | Auto detect | 115200 8-N-1 | SCROLL | CAPS | NUM | Capture | Print echo

10. Press **A** to program the diagnostic code.

```
File Edit View Call Transfer Help
[Icons]
F Flash Program
G Gui Menu
L LCD Test
M SD/MMC Test
N Load WinCE from SD card
R Run From Address
T Touch Panel Test
X Boot Linux from Flash
Z Launch Linux form SD Card
Please select an option .....
RainbowG3>
Enter the SDRAM download address :
Download File on to a3000000. Proceed <y/n>?
Send the UUE encoded file
..... Downloaded 14ec0 bytes on to a3000000

Press any key to continue
A RAM test
B Read-Write Memory
C CSPI Test
D Download File
E Environment variable
F Flash Program

G Gui Menu
L LCD Test
M SD/MMC Test
N Load WinCE from SD card
R Run From Address
T Touch Panel Test
X Boot Linux from Flash
Z Launch Linux form SD Card
Please select an option .....
RainbowG3> f

*****
* Flash Programming utility *
*****

A Program the diagnostic code
B Program the zImage
C Program the initrd
D Program the FFS area
E Exit

Select an option : a

Have you downloaded the file in SDRAM location 0xA3000000 (y/n) : _

Connected 0:04:26 | Auto detect | 115200 8-N-1 | SCROLL | CAPS | NUM | Capture | Print echo
```

11. Press **Y** and then give **00020000** as size.

```
File Edit View Call Transfer Help
[Icons]

B Read-Write Memory
C CSPI Test
D Download File
E Environment variable
F Flash Program
G Gui Menu
L LCD Test
M SD/MMC Test
N Load WinCE from SD card
R Run From Address
T Touch Panel Test
X Boot Linux from Flash
Z Launch Linux form SD Card
Please select an option .....
RainbowG3>
Select a valid option. Press any key to continue
A RAM test
B Read-Write Memory
C CSPI Test
D Download File
E Environment variable
F Flash Program
G Gui Menu
L LCD Test

M SD/MMC Test
N Load WinCE from SD card
R Run From Address
T Touch Panel Test
X Boot Linux from Flash
Z Launch Linux form SD Card
Please select an option .....
RainbowG3> f

*****
* Flash Programming utility *
*****

A Program the diagnostic code
B Program the zImage
C Program the initrd
D Program the FFS area
E Exit

Select an option : a

Have you downloaded the file in SDRAM location 0xA3000000 (y/n) : y
Enter the size of the data : 00020000
Proceed <y/n>?
```

Connected 0:08:39 | Auto detect | 115200 8-N-1 | SCROLL | CAPS | NUM | Capture | Print echo

12.Now press Y to program the flash.

13.After Flash programming is over,Hyperterminal shows as below

```
File Edit View Call Transfer Help
[Icons]
G Gui Menu
L LCD Test
M SD/MMC Test
N Load WinCE from SD card
R Run From Address
T Touch Panel Test
X Boot Linux from Flash
Z Launch Linux form SD Card
Please select an option .....
RainbowG3>
Select a valid option. Press any key to continue
A RAM test
B Read-Write Memory
C CSPI Test
D Download File
E Environment variable
F Flash Program
G Gui Menu
L LCD Test
M SD/MMC Test
N Load WinCE from SD card
R Run From Address
T Touch Panel Test
X Boot Linux from Flash

Z Launch Linux form SD Card
Please select an option .....
RainbowG3> f

*****
* Flash Programming utility *
*****

A Program the diagnostic code
B Program the zImage
C Program the initrd
D Program the FFS area
E Exit

Select an option : a

Have you downloaded the file in SDRAM location 0xA3000000 (y/n) : y
Enter the size of the data : 00020000
Proceed <y/n>? y
Erasing Sector.....##
Programming Sectors.....#####
Verifying Programmed Data: .....
verified
Flash Programming Done

Connected 0:11:14 Auto detect 115200 8-N-1 SCROLL CAPS NUM Capture Print echo
```

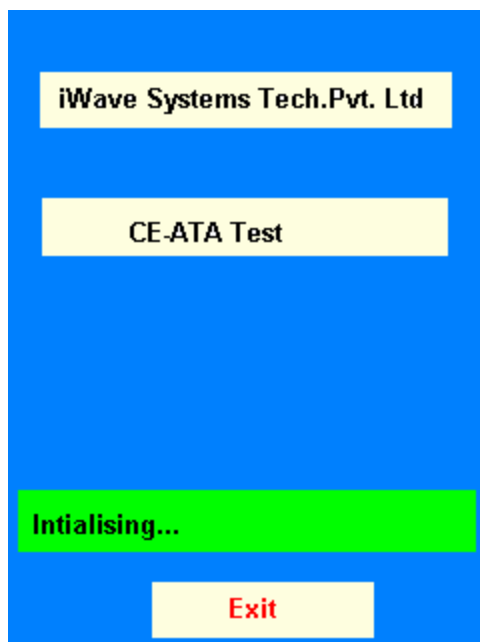
14.Now Switch off the board and then switch ON the board.

3 GUI Diagnostic Tests

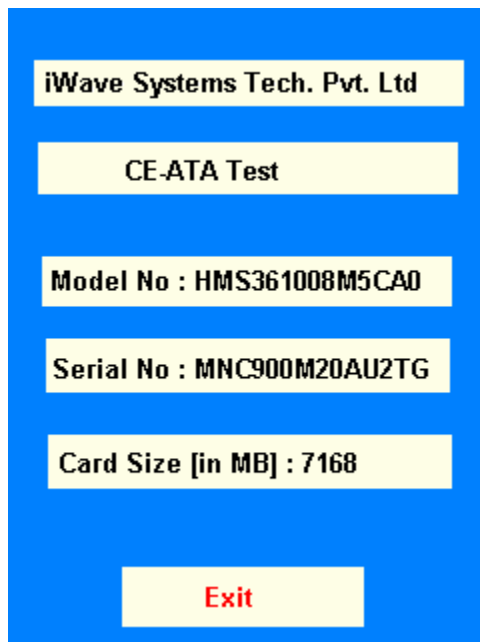
The GUI menu will be displayed as below when the set up is powered ON. The display menu on the LCD is as shown below.



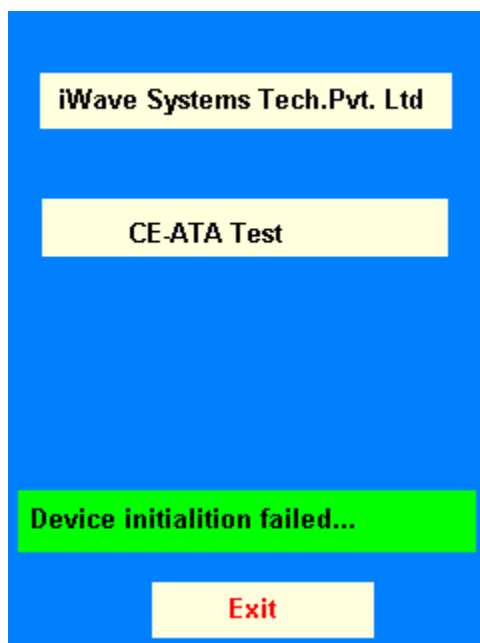
Now touch **CE-ATA Test** using stylus to enter in to the CE-ATA test.



If CE-ATA is Present GUI shows Model No,Serial No,Card Size as below.Press Exit to go to the Main Menu.



If CE-ATA is not Present GUI as below.Press Exit to go to the Main Menu.



3.1 Launch WINDOWS CE

In the Main Menu touch **Launch WinCE from Flash** to Launch WinCE.



4 Windows CE Operating System

4.1 Browsing the device contents

Various folders and files present in the device can be accessed from the **My Device** icon on the WinCE Desktop.

1. Double click on the **My Device** icon on the desktop.
2. The Explorer window will pop up. The contents of the device can be browsed just like using the Explorer in a Windows PC.
3. Double Click the Windows folder.
4. Now double click the Beta Player to play movies.
5. Then Media player window will popup.
6. Go to File→ Open→Windows→Matix to play movie.