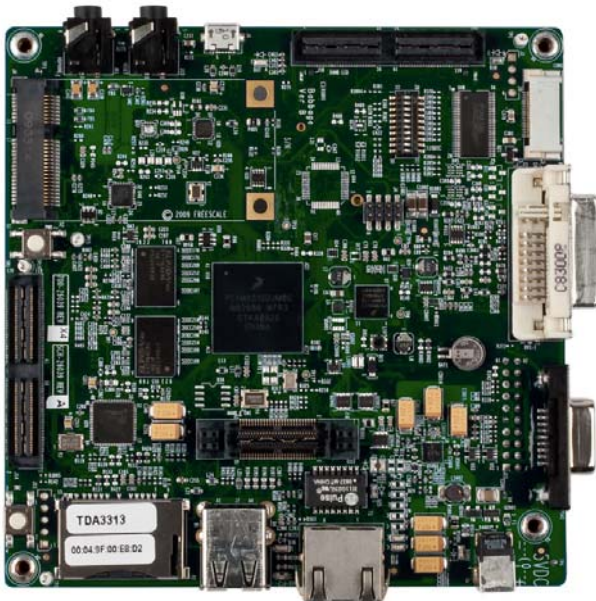


---

# i.MX51 EVK Windows Embedded CE 6.0 Quick Start Guide



Doc Number: 926-26040  
Rev. 2009.12  
1/2010



# Contents



<b>Chapter 1 About the Board .....</b>	<b>1-1</b>
1.1 About the i.MX51 EVK Platform System .....	1-1
1.2 i.MX51 EVK Board .....	1-2
<b>Chapter 2 Getting Started .....</b>	<b>2-1</b>
2.1 Unpack the Kit .....	2-1
2.2 Development PC Requirements .....	2-3
<b>Chapter 3 Using the Platform .....</b>	<b>3-1</b>
3.1 Building a Development Platform .....	3-2
3.2 Connect Development Platform to PC; Run Preloaded Image .....	3-2
<b>Chapter 4 Using the Demo Image .....</b>	<b>4-1</b>
4.1 Multimedia Codecs Content .....	4-1
4.2 Downloading Multimedia Content to the i.MX51 EVK Board .....	4-1
4.3 Using ActiveSync .....	4-1
4.4 Using an SD Card .....	4-6
4.5 Using a USB Memory Stick .....	4-7
4.6 Running the Demo Applications .....	4-8
<b>Chapter 5 Ready to Begin Your Development? .....</b>	<b>5-1</b>



---

# Chapter 1

## About the Board

This chapter provides detailed information about the i.MX51 EVK board and identifies the locations of the connectors and switches.

### 1.1 About the i.MX51 EVK Platform System

Freescall introduces the i.MX51 EVK, designed for developing multimedia and connectivity applications using the i.MX51 Cortex A8® Applications Processor and the MC13892 Power Management chip.

The i.MX51 EVK System decreases the time to market of products providing a near-to-final product design, which can be used as a hardware and software development platform.

The board support packages (BSP) for the i.MX51 EVK, contain drivers optimized for multimedia operations using the i.MX51 and MC13892 devices.

## 1.2 i.MX51 EVK Board

The i.MX51 EVK board have the connectors and peripherals described in the Table 1-1.

Item	Description
SOC and Memory	<ul style="list-style-type: none"><li>• i.MX Cortex A8™ Applications Processor</li><li>• 4 MB SPI NOR Flash</li><li>• 512 MB of 32 bit DDR2 SDRAM memory</li></ul>
Power	<ul style="list-style-type: none"><li>• MC13892 power management chip</li></ul>
Audio	<ul style="list-style-type: none"><li>• SGT5000 Stereo Audio Codec</li><li>• Audio Extension Connector</li></ul>
Touch Screen Controller	<ul style="list-style-type: none"><li>• 4 wire touch screen controller function provided by the MC13892</li></ul>
Video Output	<ul style="list-style-type: none"><li>• VGA and DVI output, both in the DVI connector. (DVI to VGA cable needed, not included)</li><li>• LVDS Connector</li><li>• Display Card Connector</li></ul>
Camera Interface	<ul style="list-style-type: none"><li>• Image sensor camera connector</li></ul>
Debug Port	<ul style="list-style-type: none"><li>• RealView®-ICE debug support</li></ul>
PC Card Expansion	<ul style="list-style-type: none"><li>• Two SD card connectors, with card sense functionality (also supports the MMC).</li></ul>
Network Support	<ul style="list-style-type: none"><li>• One Ethernet jack connector (for application/debug)</li></ul>
USB	<ul style="list-style-type: none"><li>• One USB OTG high-speed transceiver with micro-USB connector</li><li>• One USB high-speed host transceiver, connected to an onboard USB host (USB 2517)</li><li>• Two USB Connectors</li></ul>
FM	<ul style="list-style-type: none"><li>• SI402 FM Receiver</li></ul>
Serial Port	<ul style="list-style-type: none"><li>• One RS-232 interface with DB-9 connector, this is driven by UART channel internal to the MX51</li></ul>
Power Supply	<ul style="list-style-type: none"><li>• 5.0V/5A universal power supply kit</li></ul>

Table 1-1 i.MX51 EVK connectors and peripherals

Figure 1-1 illustrates the top of the i.MX51 EVK Board, this figure show the location of the connector present in this side of the board.

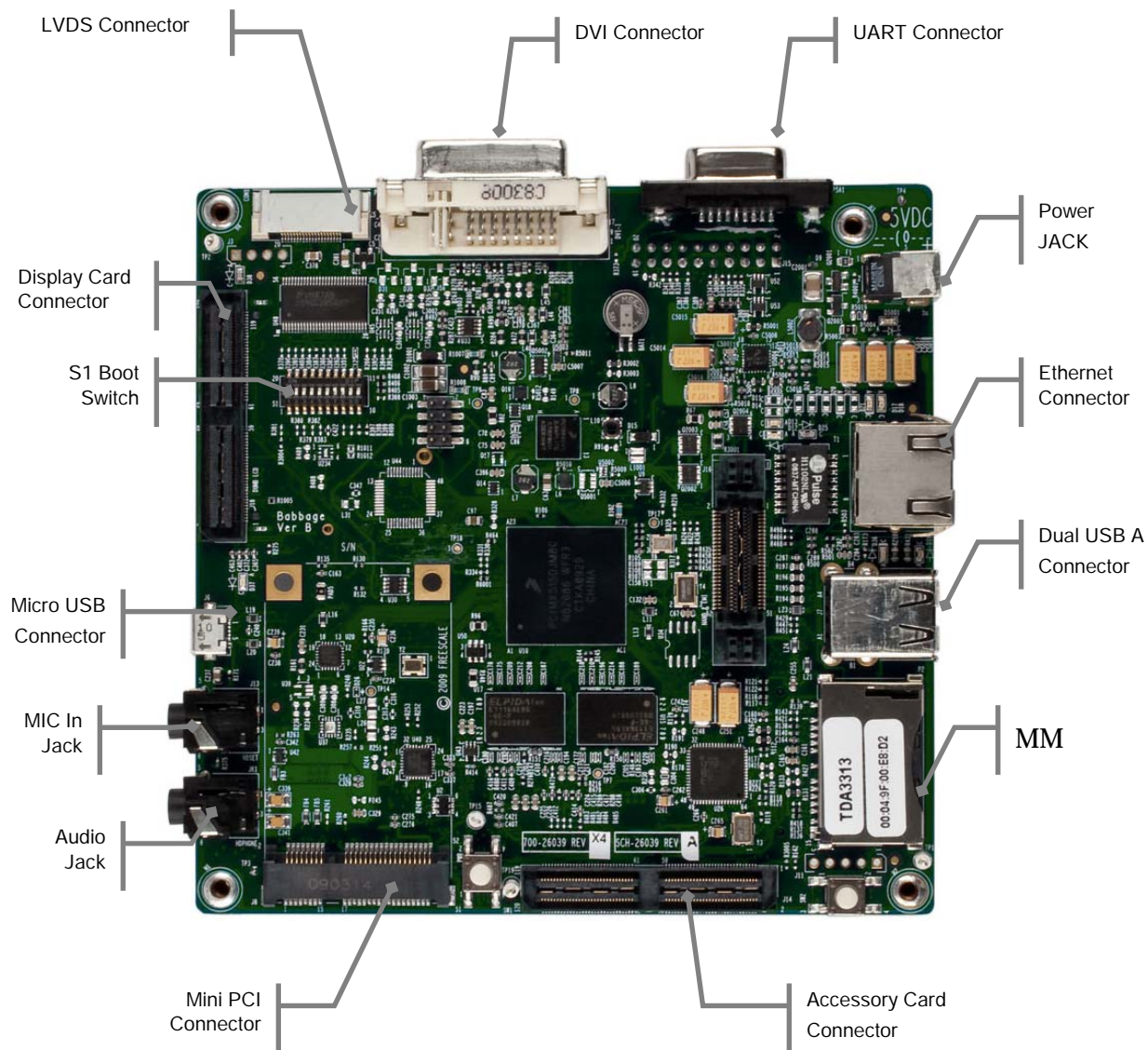


Figure 1-1 i.MX51 EVK board top

In this side of the board is collocated the S1 switch, this switch selects the different boot modes. The Table 1-2 Boot Mode Setting (S1) contains the S1 settings for the different boot options.

Boot Mode Device	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	SW0
SPI FLASH	Off	Off	On	On	On	Off	On	On	Off	Off
SD/MMC	Off	Off	Off	Off	Off	Off	On	On	Off	Off
BootStrap	On	On	Off	Off	Off	Off	On	On	Off	On

Table 1-2 Boot Mode Setting (S1)



Figure 1-2 illustrates the bottom of the i.MX51 EVK Board, this figure show the location of the connector present in this side of the board.

For more information about the hardware implementation, see the *i.MX51 EVK Hardware Users Guide*, which is included in the documentation package of this release.

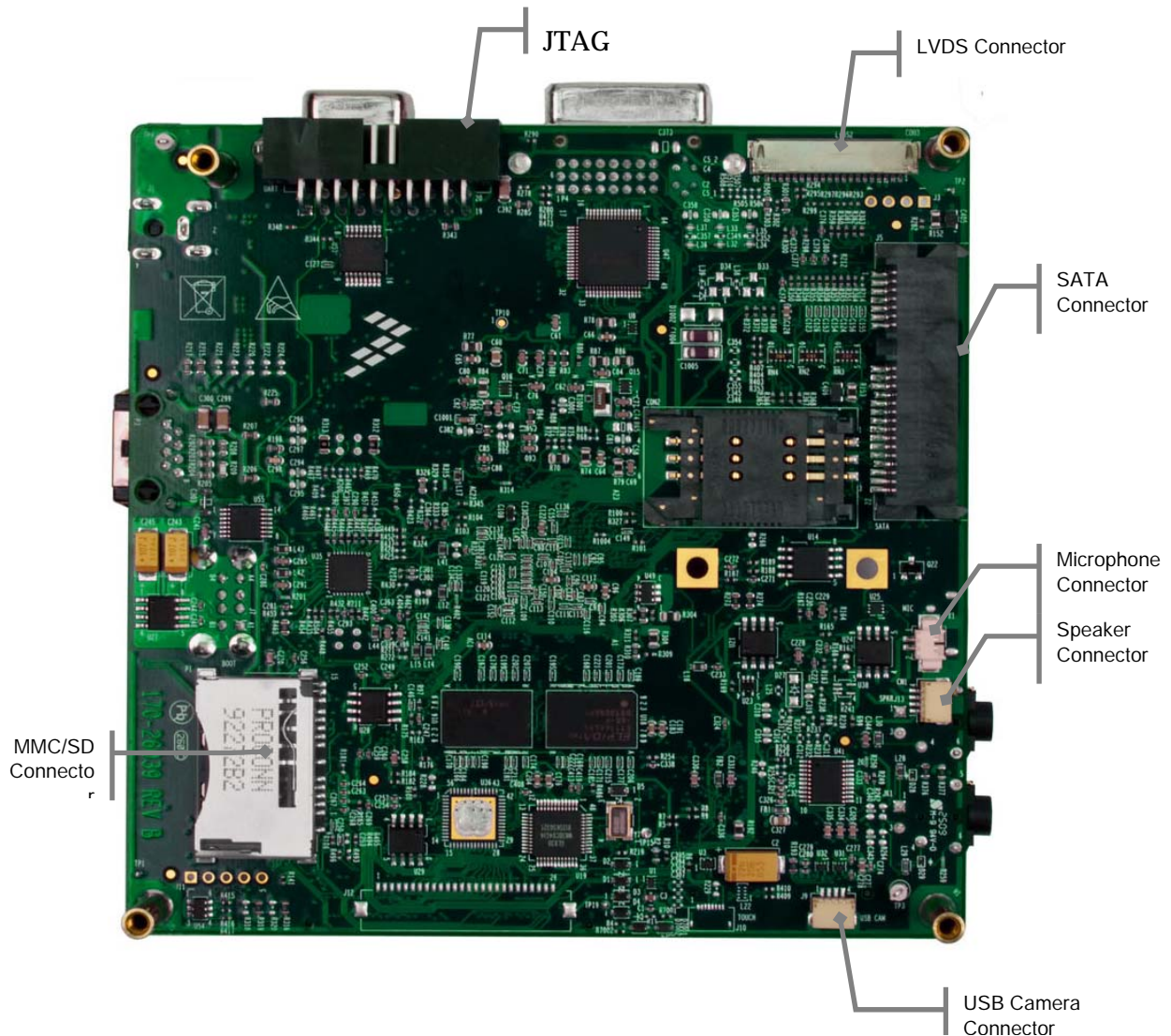


Figure 1-2 i.MX51 EVK board bottom



## Chapter 2 Getting Started

### 2.1 Unpack the Kit

The i.MX51 EVK is shipped with the items listed in Table 2-1.

Item	Description
Boards	<ul style="list-style-type: none"><li>• i.MX51 EVK Main Board</li></ul>
Cables	<ul style="list-style-type: none"><li>• RS-232 serial cable</li><li>• Ethernet straight cable</li><li>• Cable microUSB B to type A Male</li></ul>
Power Supply	<ul style="list-style-type: none"><li>• 5.0V/5.0A universal power supply kit</li></ul>
Paperwork	<ul style="list-style-type: none"><li>• CD</li><li>• End-User License Agreement</li><li>• Quick Start Guide (this document)</li><li>• Warranty card</li><li>• Freescale Support card</li><li>• DVD: Windows Embedded CE 6.0 180 days evaluation kit</li></ul>

**Table 2-1 i.MX51 EVK Development Kit Contents**

Verify that all of the items are contained in the package. See Figure 2-1.

Remove the board from the anti-static bags and check the boards for any visible damage.

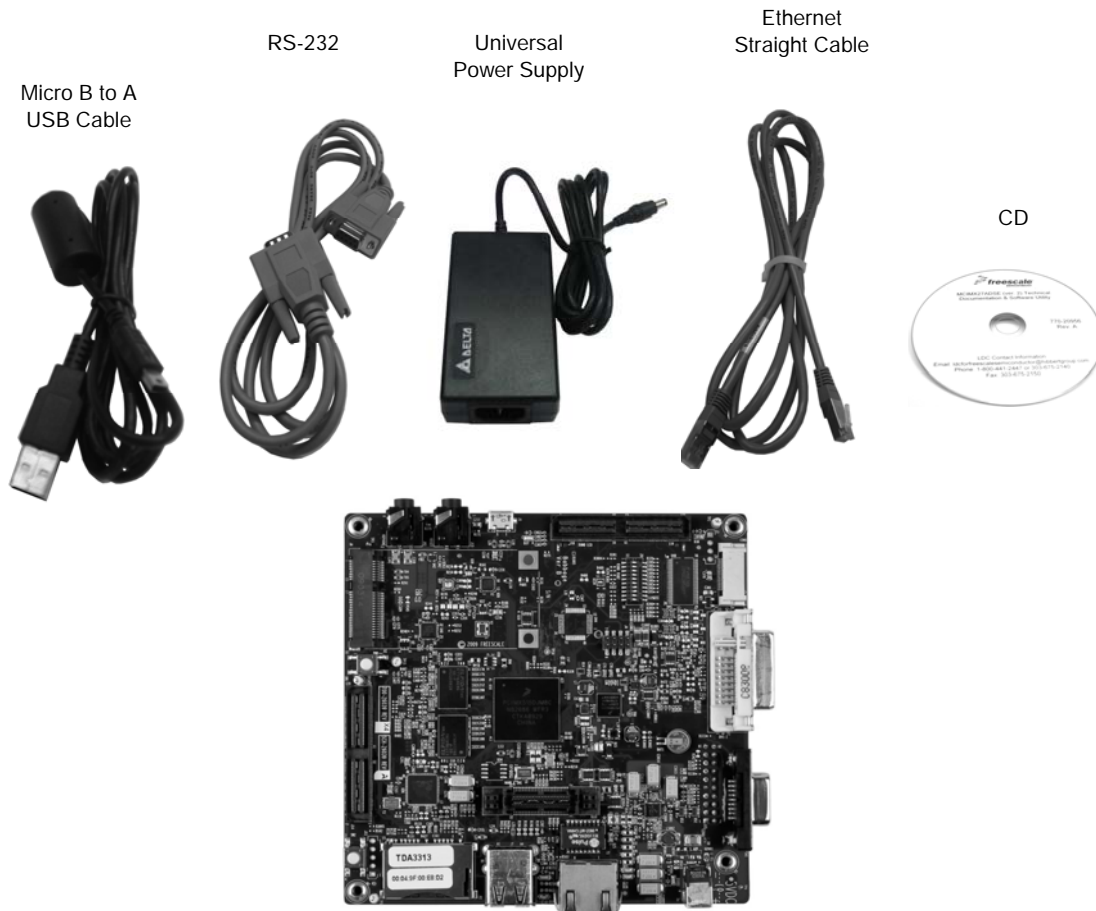


Figure 2-1 i.MX51 EVK Kit Contents

## 2.2 Development PC Requirements

To develop applications using the i.MX51 EVK development kit, you need a PC with the requirements shown in Table 2-2.

Type	Requirement
Operating System	Windows XP Professional with Service Pack 1 or Windows 2000 Professional with Service Pack 4
Network	Internet access
Software Tools	<ul style="list-style-type: none"><li>• Microsoft ® .NET Framework, version 1.1</li></ul>
PC HW	<ul style="list-style-type: none"><li>• 933 MHz Pentium II or later processor;</li><li>• 2 GHz processor recommended</li><li>• 512 MByte of RAM; 1 GByte recommended</li><li>• 1 GByte of available space required on system drive</li><li>• 18 GByte of available hard-disk space</li><li>• DVD ROM drive</li><li>• 1024x768 or higher resolution display with 256 colors</li></ul>

**Table 2-2 Development PC Requirements**



## Chapter 3

### Using the Platform

This chapter describes how to connect the i.MX51 EVK to the peripherals and host PC required to achieve a full development platform. Figure 3-1 shows the typical connections needed.

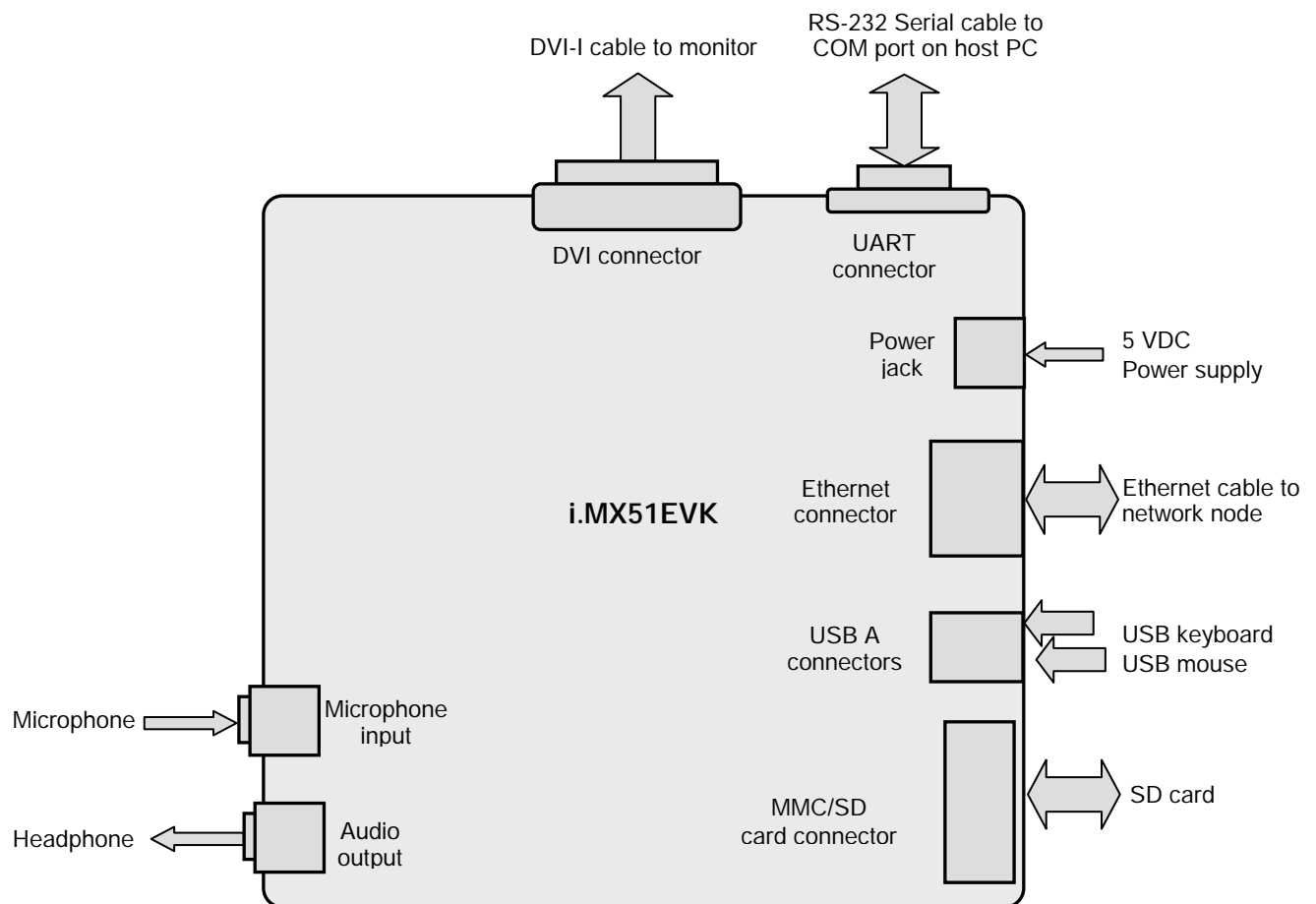


Figure 3-1 i.MX51 EVK connections to peripherals and host PC

## 3.1 Building a Development Platform

This section explains how to connect the input and output devices to the i.MX51 EVK, see Figure 1-1 and Figure 1-2 to locate the referenced connectors.

1. Plug the image SD card included in the i.MX51 EVK package into the SD card connector placed in the bottom face of the i.MX51 EVK board
2. Make use of USB keyboard and mouse as input devices to the i.MX51 EVK, connect those to any USB-A connectors in the board.
3. Connect a monitor equipped with a Digital Video Interface (DVI) input to the i.MX51 EVK board using a DVI-I cable.
4. Connect the i.MX51 EVK to the local network using an Ethernet cable
5. Connect the headphone and microphone

## 3.2 Connect Development Platform to PC; Run Preloaded Image

To connect the i.MX51 EVK platform to your host PC, follow these steps:

1. Connect one end of an RS-232 serial cable (included in the kit) to the serial port connector on the i.MX51 EVK board, and connect the other end to a COM port on the host PC.
2. Connect the regulated 5V power supply to the i.MX51 EVK board. Plug the power adapter into an electrical outlet, and plug the 5V connector into the power jack on the i.MX51 EVK board.
3. Start a serial console application on your host PC. Use the configuration settings shown in Table 3-1.

Baud Rate	115200
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None

Table 3-1 Serial Console Configuration

4. Set the boot switch with the SD/MMC boot mode setting, see Table 1-2.
5. Keep pressed the power switch (SW1) until the i.MX51 EVK board powers-up and then release the switch.

---

The OS image is pre-loaded in the i.MX51 EVK board, debug messages from the bootloader should now appear on the serial console application on your PC. When the loading image process is done, the Windows CE desktop should appear in the i.MX51 EVK monitor.





---

## Chapter 4

### Using the Demo Image

This chapter explains how use the platform to load the multimedia content, using the provided demo image.

#### 4.1 Multimedia Codecs Content

The Windows Embedded CE 6.0 Demo Images contain a set of multimedia codecs that support various use cases. These codecs are optimized to run on the i.MX51 platform.

For a list of the provided codecs, see *i.MX51 EVK Windows Embedded CE 6.0 Demo Image Readme*.

For more information about the multimedia codecs, contact a Freescale sales representative or distributor.

#### 4.2 Downloading Multimedia Content to the i.MX51 EVK Board

There are three ways to load multimedia content to the i.MX51 EVK board using the Windows Embedded CE 6.0 image provided:

- Using ActiveSync®
- Using an SD Card
- Using a USB Card

#### 4.3 Using ActiveSync

ActiveSync is a very useful tool to use with a Windows Embedded CE 6.0 device. To obtain the ActiveSync download and instructions, go to:

<http://www.microsoft.com/windowsmobile/activesync/activesync45.mspx/>

When ActiveSync is installed, you can set up communications between the i.MX51 EVK board and your host PC.

To establish communications between the Host PC and the i.MX51 EVK board, use these steps:

1. Ensure that the i.MX51 EVK board is ON and running the Windows Embedded CE 6.0 image.
2. Ensure that ActiveSync is running on your host PC (the ActiveSync icon should appear gray on the Windows task bar).
3. Using the microUSB B to type A cable provided in your kit, connect the microUSB B end to the J6 USB OTG connector on the i.MX51 EVK board, and then connect the other end to the any available USB port on your Host PC.

Windows recognizes the i.MX51 EVK board as a Windows Embedded CE 6.0 device, and the ActiveSync wizard is displayed on the Host PC (Figure 4-1).



Figure 4-1 Setting Up a Partnership

4. Select **Yes**, and then click **Next**. The Select Synchronization Settings options are displayed (Figure 4-2).

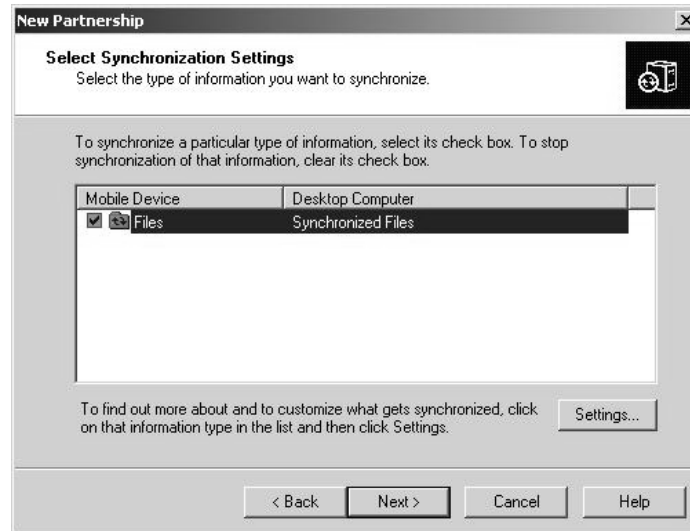


Figure 4-2 Selecting Synchronization Options

5. Select the **Files** option on the Select Synchronization Settings window (Figure 4-2).  
The following message is displayed (Figure 4-3). The message notes that the program will create a folder to transfer files to the mobile device.

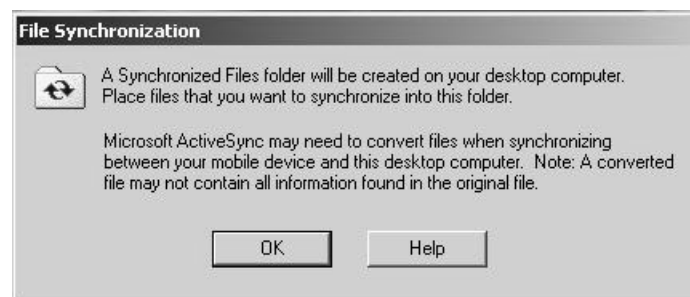


Figure 4-3 Warning from ActiveSync File Synchronization

6. Click **OK**.

7. Continue through the wizard until it is complete.

When ActiveSync establishes communications with the i.MX51 EVK board, the ActiveSync main window (Figure 4-4) is displayed, noting the status of the connection.



Figure 4-4 Viewing the Connection Status

8. To browse the Mobile Device (i.MX51 EVK) folders, click the Explore icon in the ActiveSync window.

A new Windows Explorer window for your Mobile Device opens on the Host PC (Figure 4-5).

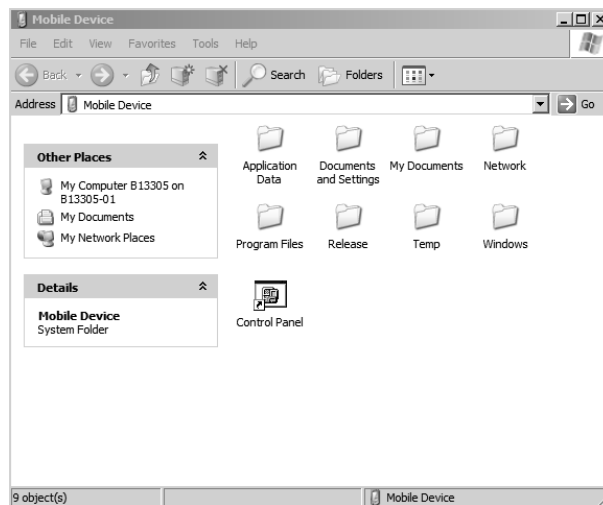


Figure 4-5 Windows Explorer for Mobile Device

9. To download a multimedia file, drag the file to the Mobile Device window.

The ActiveSync program transfers the file to the board and displays a message indicating that the file will be converted.

10. Click **OK**. The download begins.

#### NOTE

For more information about the multimedia files supported by the Windows Embedded CE 6.0 image pre-loaded in the board, see *i.MX51 EVK Windows Embedded CE 6.0 Demo Image Readme*, which is included in the EVK documentation.

11. To access the files, double-click the My Device icon in the Windows Embedded CE 6.0 desktop (on the i.MX51 EVK board).

A Windows Explorer window displays the content you downloaded with ActiveSync (Figure 4-6).

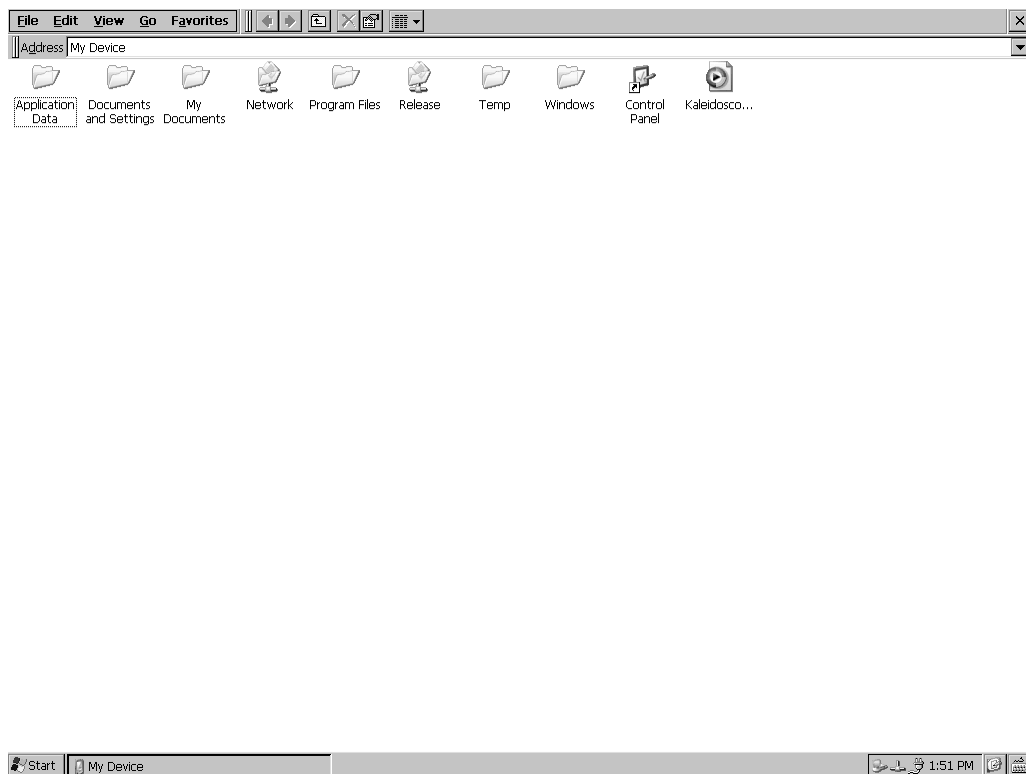


Figure 4-6 Downloaded Content

12. Plug the headphones into the JK1 Audio jack connector.
13. Double-click your multimedia file to play the file.

## 4.4 Using an SD Card

If you have an SD Card with pictures or other multimedia content, you can use the i.MX51 EVK Board to view its content.

To use the SD Card, follow these steps:

1. Ensure that the i.MX51 EVK is powered on and running the Windows Embedded CE 6.0 demo image.
2. Insert the SD Card in the MMC/SD Card slot (P2), which is located on the top layer of the EVK board.
3. Click the My Device icon located in the Windows Embedded CE 6.0 desktop.

A Windows Explorer window opens, displaying the SD Memory icon (Figure 4-7).

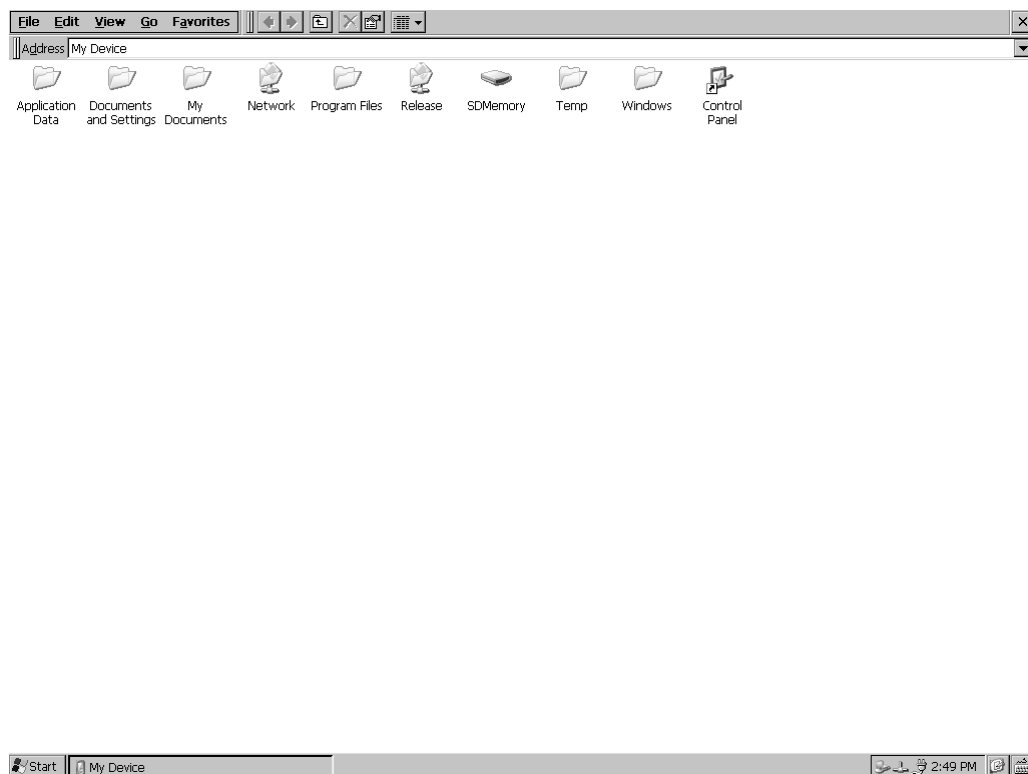


Figure 4-7 Viewing the SD Memory Icon

4. To access the SD Card content, double click the SD Memory icon.



## 4.5 Using a USB Memory Stick

To connect the USB memory stick to the i.MX51 EVK board, use these steps:

1. Ensure that the i.MX51 EVK is ON and running the Windows Embedded CE 6.0 demo image.
2. Connect the USB memory to one of the USB host ports on the J7 connector.
3. Click on the My Device icon in the Windows Embedded CE 6.0 desktop.

A Windows Explorer window opens, displaying the Hard Disk icon (Figure 4-8).

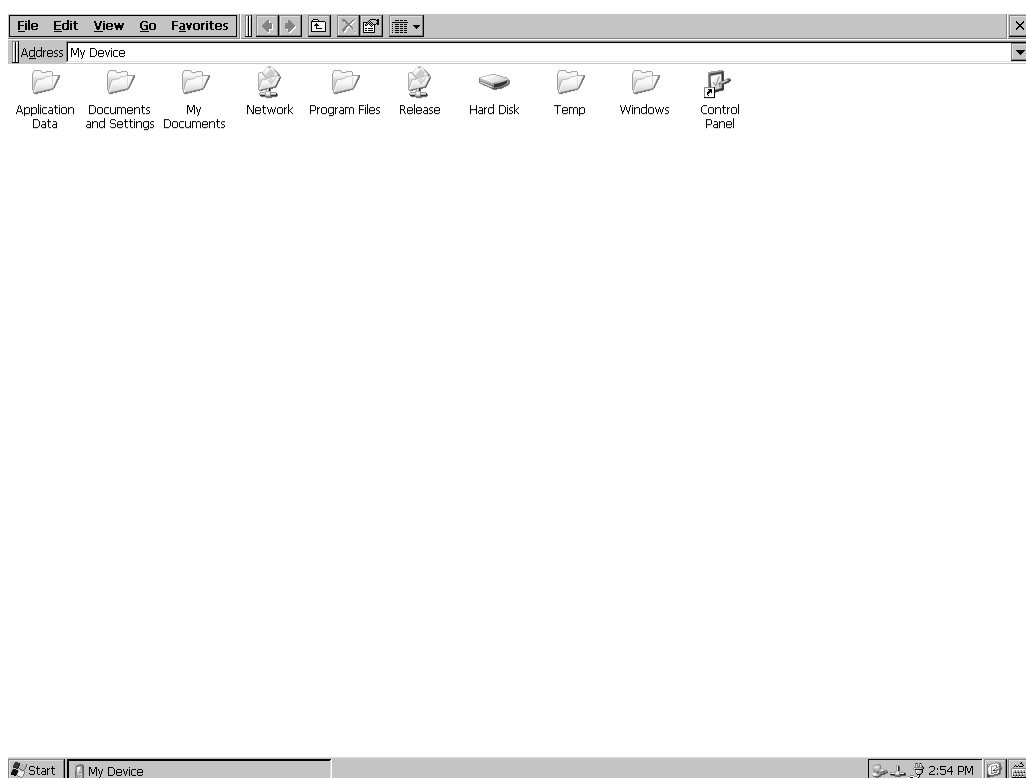


Figure 4-8 Viewing the Hard Disk Icon

4. Double-click the Hard Disk icon to view the files in the USB memory.

## 4.6 Running the Demo Applications

The Windows Embedded CE 6.0 image that is pre-loaded on the i.MX51 EVK board includes the demo applications described in Table 4-1.

Application	Description
cube.exe	OpenGL ES 1.1 Demo Application
triangle.exe	OpenGL ES 2.0 Demo Application
etcha.exe	Touch Driver Test Program
tiger.exe	OpenVG 1.1 Demo Application

Table 4-1 Demo Applications Included in OS Demo Imag

To access the demo applications on the OS image, click the My Device icon on the i.MX51 EVK board desktop. Open the Windows folder. The demo applications are displayed (Figure 4-9).

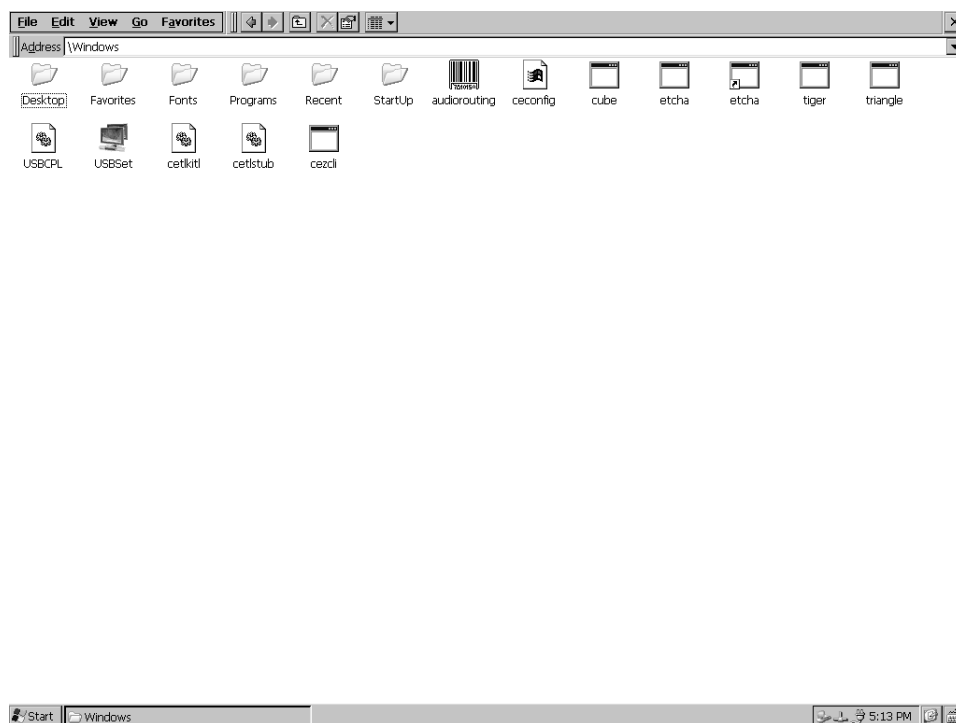


Figure 4-9 Demo Applications in Windows Folder

---

## Chapter 5

# Ready to Begin Your Development?

If you are ready to develop new applications using the i.MX51 EVK, use the following documents to locate the information required for your development:

- i.MX51 EVK Hardware User's Guide provides all of the hardware information for the i.MX51 EVK board, including the connectors, switches, options, and pins.
- i.MX51 EVK Windows Embedded CE 6.0 Release Notes provides the tools needed to use the EVK, including the driver availability and known errors.
- i.MX51 EVK Windows Embedded CE 6.0 User's Guide explains how to build and modify a Windows Embedded CE 6.0 image and deploy the image to the i.MX51 EVK board.
- i.MX51 EVK Windows Embedded CE 6.0 Reference Manual provides detailed information about the Windows BSP drivers, including functional information, dependencies, and building options for each driver.
- i.MX51 EVK Windows Embedded CE 6.0 Hello World Application Note explains how to create a simple Hello World application using Microsoft Platform Builder 6.0.

For additional information, see the support documentation in your i.MX51 EVK package.

## **How to Reach Us:**

### **Home Page:**

[www.freescale.com](http://www.freescale.com)

### **Web Support:**

<http://www.freescale.com/support>

### **USA/Europe or Locations Not Listed:**

Freescale Semiconductor  
Technical Information Center, EL516  
2100 East Elliot Road  
Tempe, Arizona 85284  
+1-800-521-6274 or +1-480-768-2130  
[www.freescale.com/support](http://www.freescale.com/support)

### **Europe, Middle East, and Africa:**

Freescale Halbleiter Deutschland GmbH  
Technical Information Center  
Schatzbogen 7  
81829 Muenchen, Germany  
+44 1296 380 456 (English)  
+46 8 52200080 (English)  
+49 89 92103 559 (German)  
+33 1 69 35 48 48 (French)  
[www.freescale.com/support](http://www.freescale.com/support)

### **Japan:**

Freescale Semiconductor Japan Ltd.  
Headquarters  
ARCO Tower 15F  
1-8-1, Shimo-Meguro, Meguro-ku,  
Tokyo 153-0064, Japan  
0120 191014 or +81 3 5437 9125  
[support.japan@freescale.com](mailto:support.japan@freescale.com)

### **Asia/Pacific:**

Freescale Semiconductor China Ltd.  
Exchange Building 23F  
No. 118 Jianguo Road  
Chaoyang District  
Beijing 100022  
China  
+86 010 5879 8000  
[support.asia@freescale.com](mailto:support.asia@freescale.com)

### **For Literature Requests Only:**

Freescale Semiconductor Literature Distribution Center  
P.O. Box 5405  
Denver, Colorado 80217  
1-800-441-2447 or 303-675-2140  
Fax: 303-675-2150  
[LDCForFreescaleSemiconductor@hibbertgroup.com](mailto:LDCForFreescaleSemiconductor@hibbertgroup.com)

Information in this document is provided solely to enable system and software implementers to use Freescale Semiconductor products. There are no express or implied copyright licenses granted hereunder to design or fabricate any integrated circuits or integrated circuits based on the information in this document.

Freescale Semiconductor reserves the right to make changes without further notice to any products herein. Freescale Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Freescale Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters that may be provided in Freescale Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals", must be validated for each customer application by customer's technical experts. Freescale Semiconductor does not convey any license under its patent rights nor the rights of others. Freescale Semiconductor products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Freescale Semiconductor product could create a situation where personal injury or death may occur. Should Buyer purchase or use Freescale Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold Freescale Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Freescale Semiconductor was negligent regarding the design or manufacture of the part.

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners. Microsoft, Windows, and ActiveSync are trademarks or registered trademarks of Microsoft Corporation. ARM, and Cortex A8 are registered trademarks of ARM Limited.

© Freescale Semiconductor, Inc. 2009. All rights reserved.