TDS510USB 2.0 JTAG Emulator Installation Guide

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IMPORTANT INFORMATION

About This Manual

This document represents the Installation Guide for the TDS510USB2.0 JTAG Emulator product. The TDS510USB2.0 JTAG Emulator is a module that attaches to a personal computer or laptop to allow hardware engineers and software programmers to develop applications with DSPs via their computer's USB port.

This guide contains some text paragraphs that are very important for proper device functioning and for preventing the TDS510USB2.0 JTAG Emulator device and project target board from being damaged. These paragraphs are shaded as in the following example. Please read each of these areas of text carefully.

This is an example of a very important text paragraph.

Related Documents

э Texas Instruments Code Composer User's Guide (SPRU296 - Updated: 12/30/1998)

э Texas Instruments Code Composer Studio User's Guide (SPRU328B - Updated: 03/28/2000)

TABLE OF CONTENTS

Introduction

Overview

The TDS510USB 2.0 JTAG Emulator is designed for use with digital signal processors (DSPs) operating at 1.0-5.0 volts. The emulator itself is a bus-powered USB device. It is fully plug and play compatible and is fully powered by the host computer USB connection. The TDS510USB 2.0 JTAG Emulator is designed to operate with TI Code Composer Studio IDE debug tool and is compatible with Windows 98/SE/ME/2000/XP.

Features

The TDS510USB 2.0 JTAG Emulator has the following key features:

- Supports Texas Instruments DSP with a JTAG (IEEE 1149.1) interface: C240X, F28X, VC33, C5000, C6000, TMS470 (ARM) and OMAP platforms.
- Support Texas Instruments Code Composer Studio.
- Supports 1.0-5.0 volt DSP devices.
- USB compatible. Simple Connection, fully Plug-and-Play compatible – no jumpers, no switch settings.
- Hot pluggable
- No additional power supply is required, power provided by the USB bus.

Quick Install Procedures

This guide describes the steps to installing the TDS510USB2.0 JTAG Emulator in the following order:

1. Install the TDS510USB2.0 JTAG Emulator hardware
2. Install the TDS510USB2.0 JTAG device driver
3. Make sure Code Composer Studio™ IDE is installed on the PC
4. Install the TDS510USB2.0 JTAG Emulator software
5. Configure Code Composer Studio IDE
6. Reset the TDS510USB2.0 JTAG Emulator and Reset the target DSP
7. Run CCS

The TDS510USB2.0 JTAG Emulator kit contains:

- TDS510USB2.0 JTAG Emulator
- USB interface cable
- The TDS510USB 2.0 driver disk.
- TDS510SB2.0 JTAG Emulator Installation Guide Reference Guide (this document)

Installation Requirements

- Code Composer Studio IDE 1.2 or greater
- A free USB port
- 233MHz or higher Pentium ™-compatible CPU (500MHz or higher Pentium III CPU or equivalent is recommended)
- Local CD-ROM drive

Supported Operating Systems

- Windows 98/ME/2000/XP

Detailed Installation

What you will need

The following list details all items needed to install and run with the TDS510USB 2.0 JTAG Emulator.

- PC, with a free Universal Serial Bus (USB) port.
- The TDS510USB 2.0 JTAG Emulator
- The TDS510USB 2.0 driver disk.
- USB interface cable.
- DSP target system
- Code Composer Studio

The Hardware Installation

- Remove power from the target DSP system.
- Attach the keyed TDS510USB 2.0 JTAG Emulator JTAG interface cable to the target board.
- Apply power to the target DSP system.
- Attach the TDS510USB 2.0 JTAG Emulator to the host computer system using a USB cable.

WARNING

Be careful to connect interface cables with the correct orientation. Pin 1 on the interface cable should match Pin 1 on the DSP system connector. The TDS510USB 2.0 JTAG Emulator features a "keyed" connector to minimize the chance of error.
Do not force cables into position. Forcing them may damage the cables or the interconnected boards and systems.

The USB Device Drivers Installation

A. Driver installation for Windows 2000/XP:

1. After plug the TDS510USB 2.0 JTAG Emulator into the host computer's USB port, the system should display the *Found New Hardware* (Figure A-1) dialog box. This dialog box indicates the computer operating system has found a new USB device.

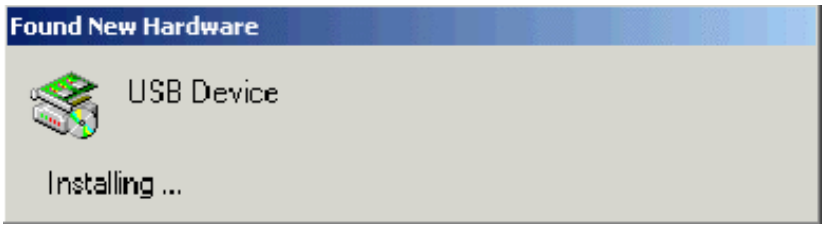

Figure A-1

2. The system will prompt for new hardware detected and start the "Found New Hardware Wizard" as shown in Figure A-2.

Figure A-2

3. Click on Next and system will display the window as shown in Figure A-3.

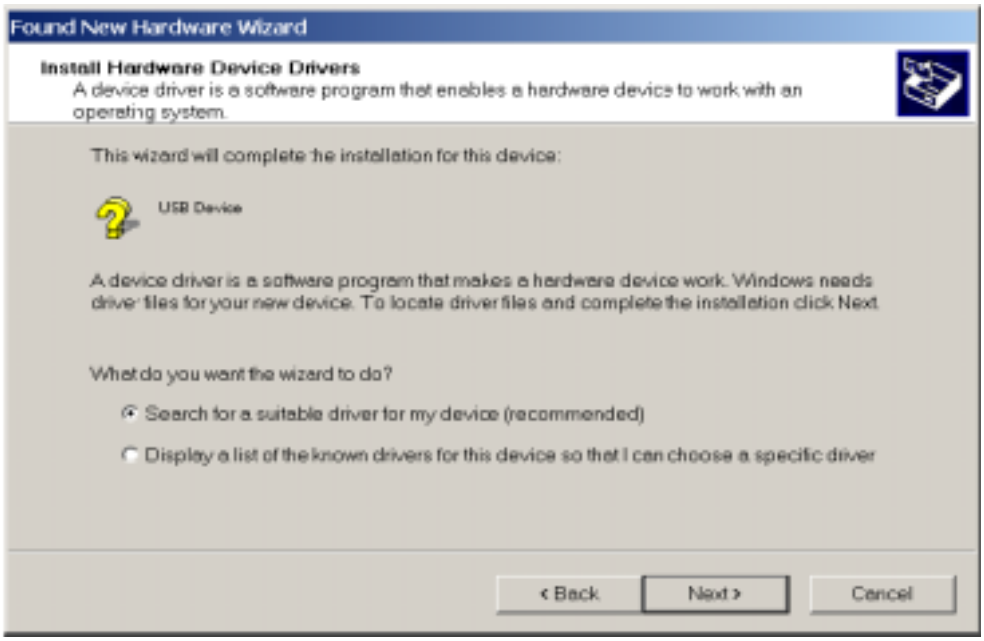

Figure A-3

4. Check on “Search for a suitable driver for my device (Recommended)” and click on Next. The system will display a window as shown in Figure A-4.

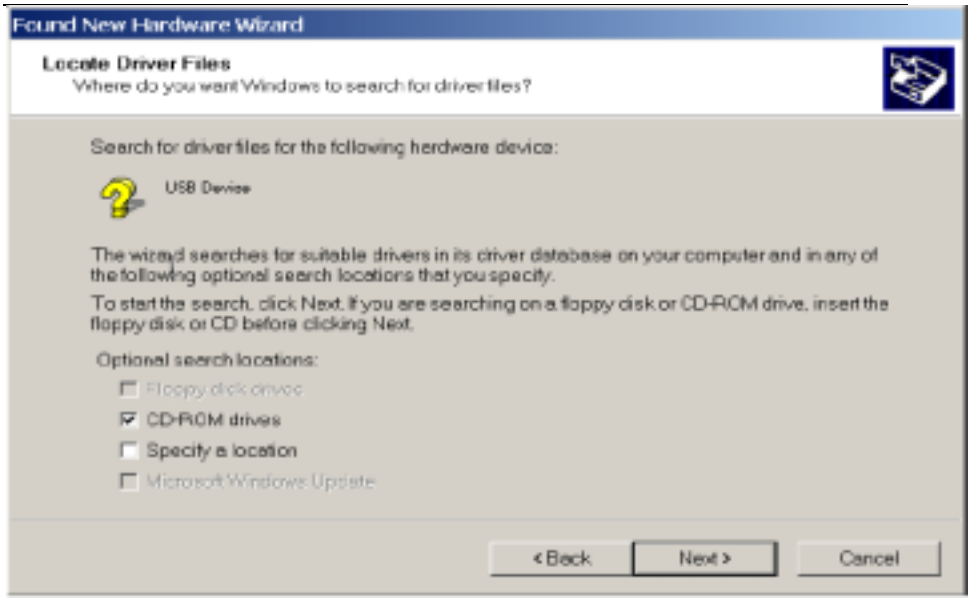

Figure A-4

5. Check on “CD-ROM drives” and click on Next. The system will prompt you to insert the manufacturer’s installation disk, as shown in the Figure A-5.

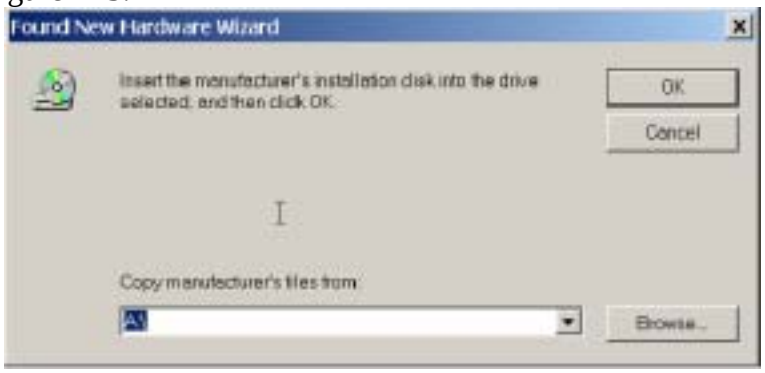

Figure A-5

6. Click on Browse and locate the file WTUSB510.INF in the installation CD, or in the folder where you have download the file into, as shown in Figure A-6.

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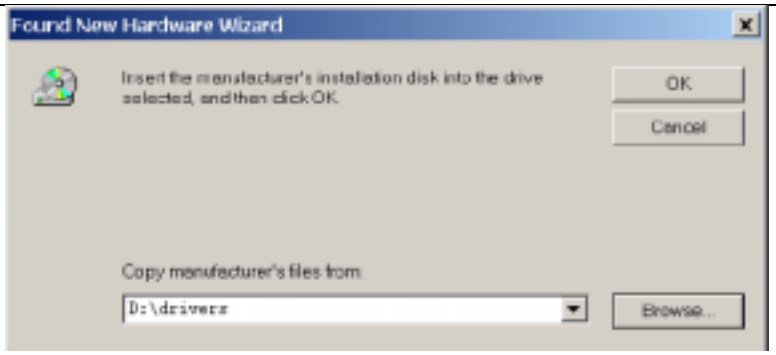

Figure A-6

8. Click on Next, the following window will be displayed, as shown in Figure A-7.

Figure A-7

9. Click on Finish. Setup is completed.

B. Driver installation for Win98/ME :

1. After plug the TDS510USB 2.0 JTAG Emulator into the host computer's USB port, the system should display the *Found New Hardware* (Figure B-1) dialog box. This dialog box indicates that the computer operating system has found a new USB device.

Figure B-1

2. The system should detect the new hardware and start the “Add New Hardware Wizard”, as shown in Figure B-2.

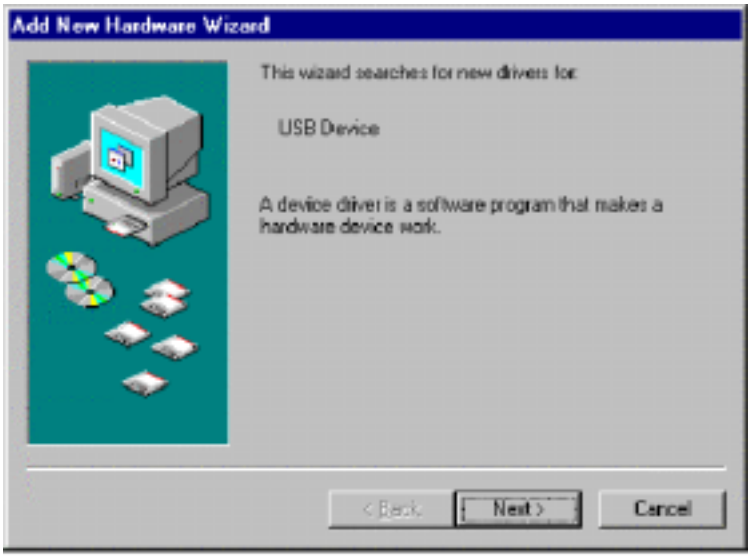

Figure B-2

3. Click on Next to go to the next window, as shown in Figure B-3.

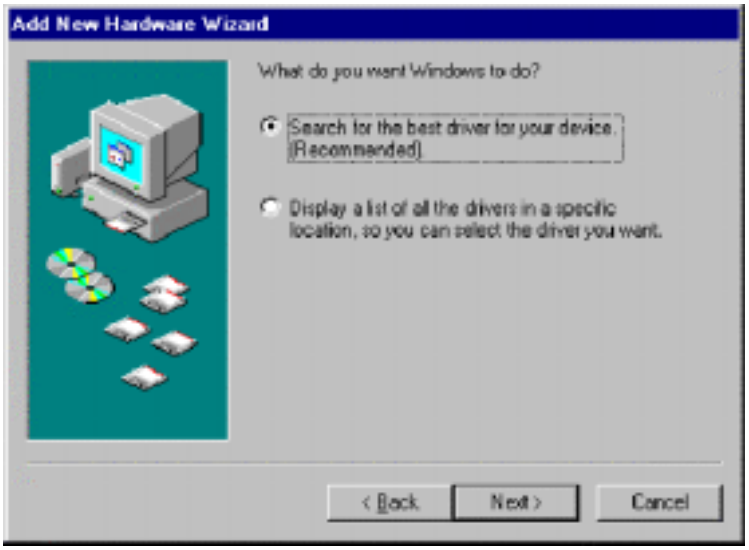

Figure B-3

4. Click on Next to go to the next window, as shown in Figure B-4.

Figure B-4

5. Click on OK and the wizard will display the driver to be installed, as shown in Figure B-5.

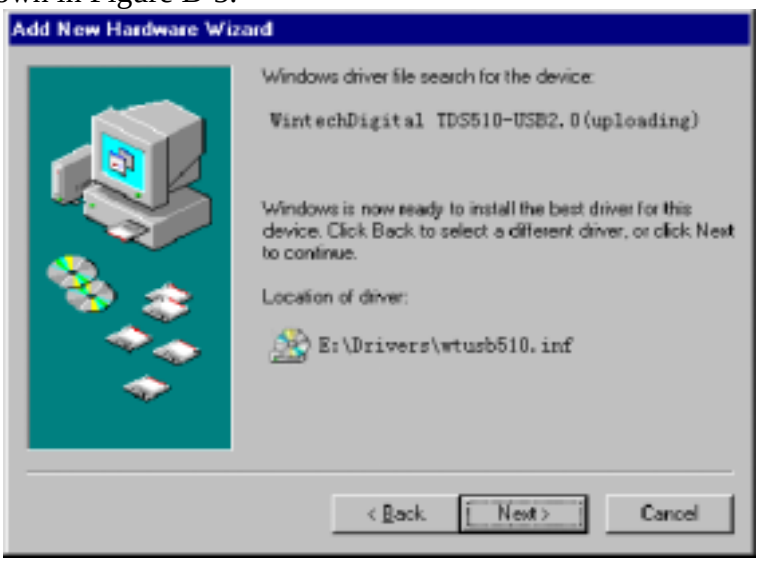

Figure B-5

6. Click on Next and the wizard will complete the driver installation and display the window as shown in Figure B-6.

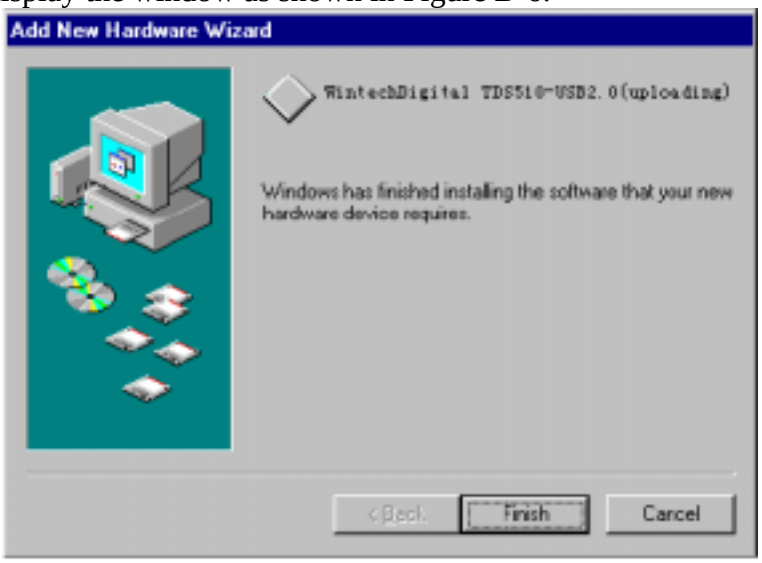

Figure B-6

7. Click on Finish. Setup is completed

Installing the TDS510USB2.0 Software

This installation assumes that the Code Composer Studio IDE has already been installed on the PC. If not, please follow the directions for installing CCStudio first. After completing the installation procedure, you may return to this guide to complete the installation procedure of the TDS560 Emulator.

Insert the TDS510USB20 driver disk into your CDROM, Double click on **setup.exe** to install the JTAG emulator tools for CCS.

NOTE

Be sure the Code Composer Studio have been installed before run setup.exe. It'll copy files to the CCS install directory and create environment variable to enable the file usage by CCS. If no this step, the TDS510USB2.0 can't work correctly.

Code Composer Studio Setup

1. Click on "Start" button —〉Program —〉Texas Instrument —〉Code Composer Studio 6000 —〉Setup CCS 2（C6000），Code Composer Studio Setup window will appear.
2. Double click on C6000 XDS（Texas Instrument）on the middle column (see Figure C-1), the "Board Properties" window will pop-up. *（If the "Import Configuration" window appears instead (see Figure C-2), just click on "Close".）*

   Note:

   - *Double click on C54X XDS（Texas Instrument）or C55X XDS（Texas Instrument）if your target CPU is C5000.*

- *If your target CPU is F240X, you need to click on* ***Install a Device Driver*** *on the right column to install* ***tds5102xx.dvr****.*

- *If your target CPU is VC3X, you need to click on* ***Install a Device Driver*** *on the right column to install* ***tds510vc3x.dvr****.*

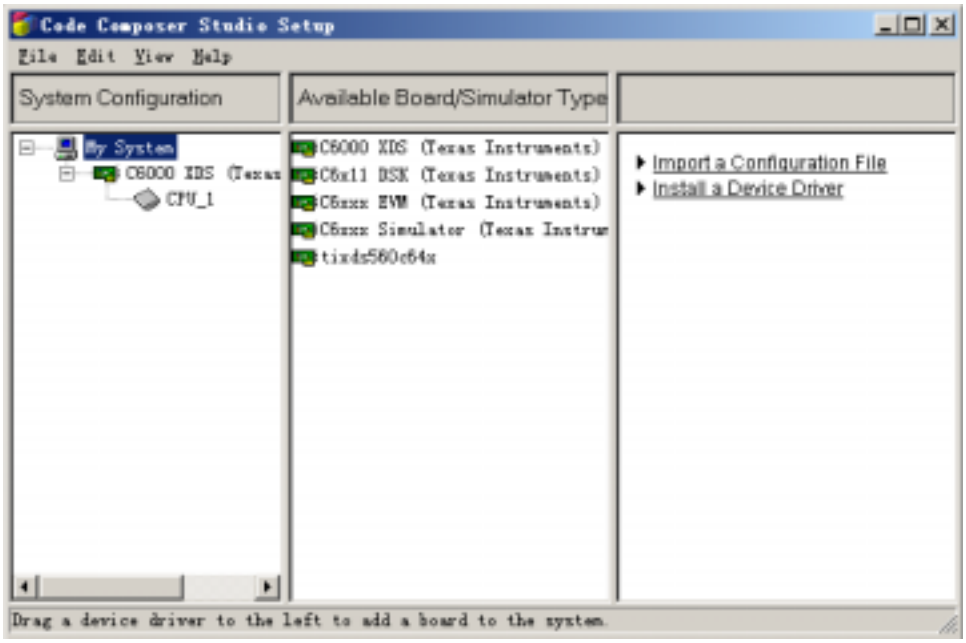

Figure C-1

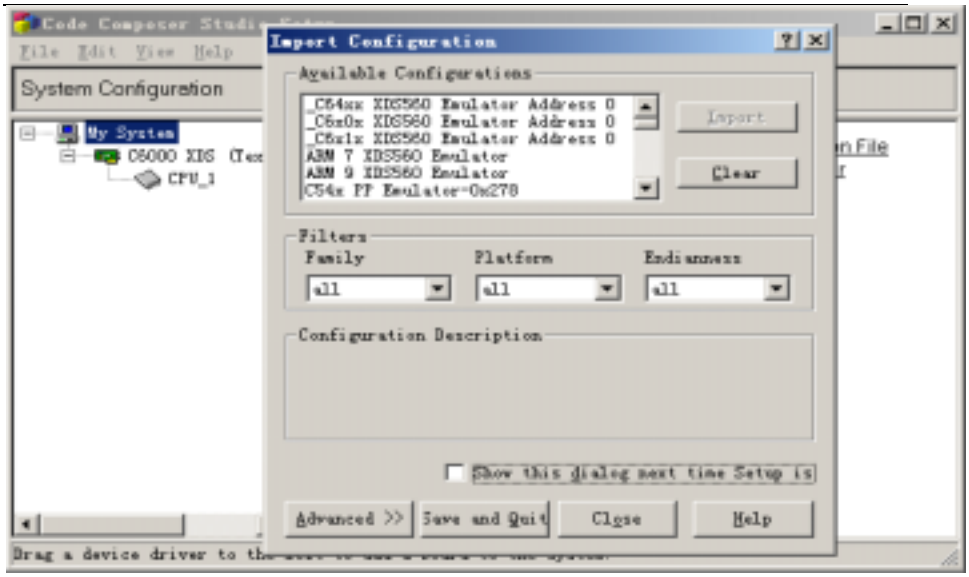

Figure C-2

3. On the “Board Properties” Window, click on “Auto-generate board data file” and change it to “Auto-generate board file with extra configuration file”（see Figure C-3）. Then Click on “Browse” to find the CCS folder (the default path is C:\ti\cc\bin)，choose WT510USB2.CFG and click on “Open”.

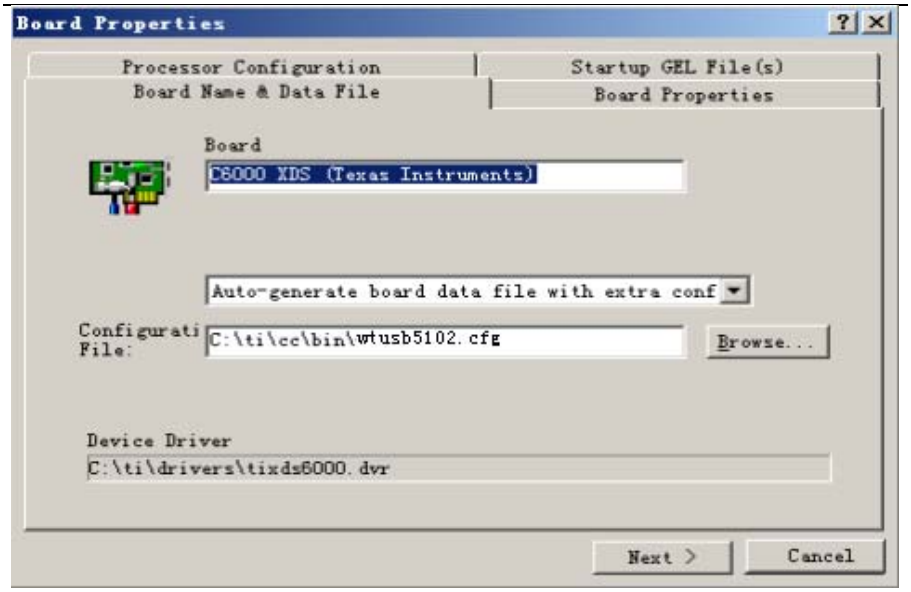

Figure C-3

4. Click on “Next”, you will see the I/O Port Value: 0x240 (see Figure C-4) .

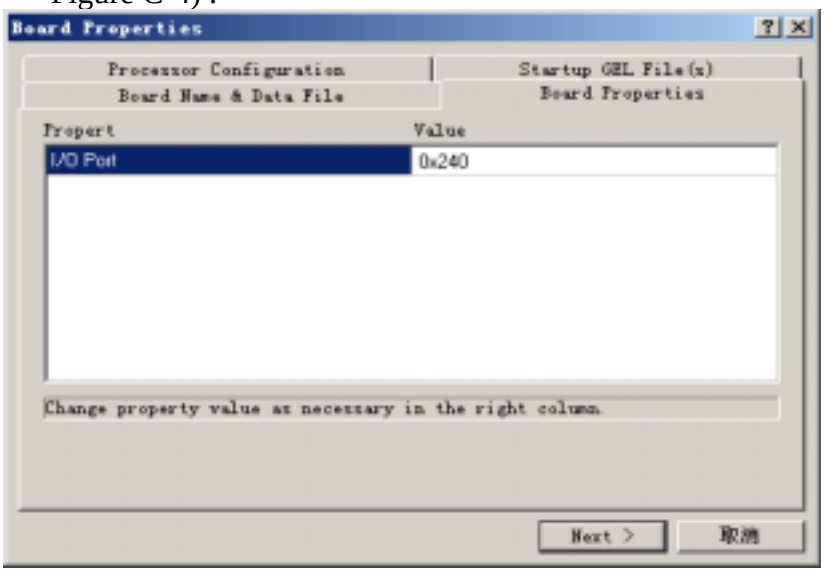

Figure C-4

5. Click on “Next” to get to the Process Configuration page (see Figure C-5). According to the type of the target board and the number of each type of the target boards you have, choose the appropriate processor and click on “Add Single” or “Add Multiple”（see Figure C-5）.

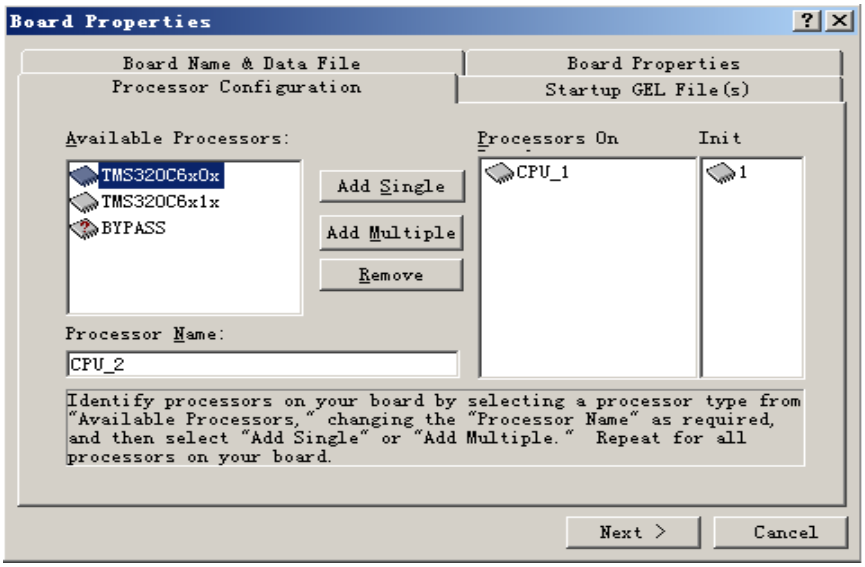

Figure C-5

6. Click on “Next” will bring you to the “Startup GEL File(s) page (Figure C-6). Click on the “ .. ” button to see a list of gel files. Choose the gel file that matches your target board. Click on “Finish”. (For some target board, if you don’t choose a gel file, it may cause error while loading program to CCS.)

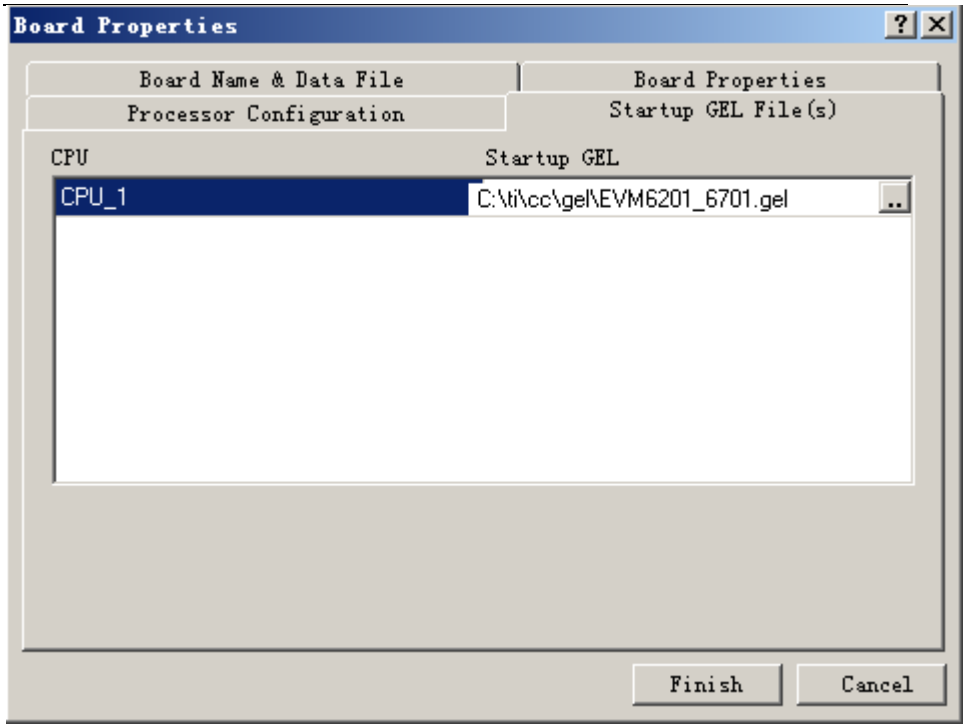

Figure C-6

7. To save the configuration and exit the “Code Composer Studio Setup” window, click on “File” and then “Exit”.

Hardware Considerations

Because the TDS510USB2.0 JTAG Emulator is an electronic device that directly connects your computer to your target DSP system, it is important to follow established procedures in the safe handling of electronic devices. Basic precautions regarding static electrical discharge, and other electrical safety precautions should be followed when connecting or disconnecting the TDS510USB2.0 JTAG Emulator to and from the target DSP system or any time electronic devices are handled. If you are unfamiliar with these procedures, consult with a technician.

Recommended Connection Procedure

1. **Remove power from the target DSP system.**
2. **Remove USB cable connection from the TDS510USB 2.0 JTAG Emulator.**
3. **Insure you are grounded, and have eliminated the potential for static electrical discharge.**
4. **Connect the TDS510USB 2.0 JTAG Emulator to the target system using the keyed JTAG ribbon cable that is supplied with the unit. Be sure to check cable orientation.**
5. **Apply power to the target DSP system.**
6. **Connect the TDS510USB 2.0 JTAG Emulator to the host computer with a USB cable.**

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Recommend Disconnection Procedure

1. Remove USB cable connection from the TDS510USB2.0⇔USB 2.0 JTAG Emulator.
2. Remove power from the target DSP system.
3. Insure you are grounded, and have eliminated the potential for static electrical discharge.
4. Disconnect the keyed JTAG ribbon cable from the target DSP system.

JTAG Cable Connection

The TDS510USB2.0 JTAG Emulator is designed to support all TI DSP devices with a JTAG interface.

NOTE
It is very important to orient the connector on the DSP target system so that Pin 1 on the cable matches Pin 1 on the DSP target system. Connecting the cable incorrectly may damage the DSP target system or the TDS510USB2.0 JTAG Emulator.

The JTAG interface flat cable is designed with a keyed 2x7-socket connector that should match your target DSP system hardware connector.

TMS	1	2	$\overline{\text{TRST}}$
TDI	3	4	GND
PD (V_{CC})	5	6	no pin (key)
TDO	7	8	GND
TCK_RET	9	10	GND
TCK	11	12	GND
EMU0	13	14	EMU1

Figure 23 – 14-Pin JTAG Header Signals

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Signal	Description
TMS	Test mode select
TDI	Test data input
TDO	Test data output
TCK	Test Clock
TRST	Test Reset
EMU0	Emulation pin 0
EMU1	Emulation pin 1
PD(V_{cc})	Presence detect
TCK_RET	Test clock return
GND	Ground

Table 1 - JTAG Signal Descriptions

XDSRESET and XDSPROBE

TI supplied command line utilities that are installed with Code Composer Studio.

XDSRESET

XDSRESET is a utility used to reset scan-controllers and scan-paths. This utility is also used to initialize scan-controllers, and to initialize any related FPGA's using default (built-in) data. It also strobe's the scan-path's JTAG TRST signal so as to initialize the JTAG Test Access Ports and JTAG emulation logic in target devices.
The necessary files needed to run this utility are installed in \ti\cc\bin and you can get command usage by executing the command below from a command line prompt.`C:\ti\cc\bin\xdsreset –h`
Syntax for using this command with the USB 2.0 JTAG Emulator is as follows:

```
xdsreset –p0x240 –f wtusb5102.cfg
```

XDSPROBE

XDSPROBE is a utility used to probe (test) scan-controllers and scan-paths. This utility can help develop and test 510 and 560 class products as well as test the scan controllers and scan paths that connect to target systems.

The necessary files needed to run this utility are installed in \ti\cc\bin and you can get command usage by executing the command below from a command line prompt.`C:\ti\cc\bin\xdsprobe –h`
Syntax for using this command with the USB 2.0 JTAG Emulator is as follows:

```
C:\ti\cc\bin\xdsprobe –f wtusb5102.cfg –p 0x240 -y
```

Support Information

Support is provided for pre-sales information and registered products.

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Corrections
Please report any documentation errors by email to support@wintechdigital.com.