Wintech®

TDS560USB PLUS Emulator Installation Guide

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IMPORTANT INFORMATION

About This Manual

This Installation Guide is for the TDS560USB PLUS JTAG Emulator product.
The TDS560USB PLUS JTAG Emulator is a module   to be attached to a PC for hardware engineers and software programmers to develop DSP applications.

The text paragraphs in this Guide are very important for proper device functioning and for preventing any possible damages on the Wintech TDS560USB PLUS JTAG Emulator device and project target board. These paragraphs are shaded as in the following example. Please carefully read each of the shaded text.

This is an example of a very important text paragraph.

Related Documents

Code Composer User's Guide(Texas Instruments SPRU296)
Code Composer Studio User's Guide (Texas Instruments SPRU328B)
XDS560 Emulator Technical Reference (Texas Instruments SPRU589）
Using xdsprobe with the XDS560 and XDS510 (Texas Instruments SPRA758A)

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Introduction

Overview

The TDS560USB PLUS JTAG Emulator is designed to be used with digital signal processors (DSPs) operating at 1.0-5.0 volts. The emulator itself is a USB device. It is fully plug and play compatible. The TDS560USB PLUS JTAG Emulator is designed to operate with TI Code Composer Studio IDE debug tool and is compatible with Windows2000/XP/2003 Server.

Figure 1-1

Features

The TDS560USB PLUS JTAG Emulator has the following key features:

- USB compatible. Simple Connection, fully Plug-and-Play compatible– no jumpers, no switch settings

- Hot pluggable

- Supports Texas Instruments （TI） DSP with a JTAG (IEEE 1149.1) interface: C2000, F2400, C27X, F28X, C54X, C55X, C6000, C64X, TMS470 (ARM) and OMAP platforms

- Supports Texas Instruments Code Composer Studio

- Compatible with XDS510

- Includes all XDS560PCI features:
  - Real-Time data exchange (RTDX) bandwidth over 2 Mb/s
  - Real-time event sequence server without stopping the application

- Supports multiprocessor debugging of same or different type

- Wide dynamic operating voltage: 1.0 to 5.0 volts

- Programmable TCK: 500KHz to 35MHz

- Increasing code download speed up to 8x faster than XDS510

- Overall cable/pod length of 6ft (1.5m)

- Hardware detection of power losses and cable disconnects

- All pod signals are ESD protected

Quick Install

Quick Install Procedures

This Guide describes the steps to installing the TDS560USB PLUS JTAG Emulator in the following order:

1. Install the TDS560USB PLUS JTAG Emulator hardware
2. Install the TDS560USB PLUS JTAG device driver
3. Make sure Code Composer Studio™ IDE is installed on the PC
4. Install the TDS560USB PLUS JTAG Emulator software
5. Configure Code Composer Studio IDE
6. Reset the TDS560USB PLUS JTAG Emulator and Reset the target DSP
7. Run CCS

The TDS560USB PLUS JTAG Emulator kit contains

(See Figure 1-1)

- TDS560USB PLUS JTAG Emulator and Pod
- USB interface cable
- 5 Volt DC power supply
- AC power cord
- The TDS560USB PLUS driver disk
- TDS560SB PLUS JTAG Emulator Installation Guide Reference Guide (this document)

Installation Requirements

- Code Composer Studio IDE 2.0 or greater
- A free USB port (USB2.0 is recommended)
- 500MHz or higher Pentium ™-compatible CPU (900MHz or higher Pentium III CPU or equivalent is recommended)
- Local CD-ROM drive

Supports Operating Systems

- Windows Win2000(SP4) /WinXP(SP1)/ 2003 Server

Detailed Installation

What you will need

The following list details all items needed to install and run with the TDS560USB PLUS JTAG Emulator.

- PC, with a free Universal Serial Bus (USB) port
- The TDS560USB PLUS JTAG Emulator
- The TDS560USB PLUS driver disk
- USB interface cable
- DSP target system
- Code Composer Studio

The Hardware Installation

- Remove power from the target DSP system
- Attach the keyed TDS560USB PLUS JTAG Emulator JTAG interface cable to the target board
- Attach the TDS560USB PLUS JTAG Emulator to the host computer system using a USB cable
- Apply power to the TDS560USB PLUS JTAG Emulator

WARNING

Make sure that the interface cables are connected to the correct orientation. Pin 1 on the interface cable should match Pin 1 on the DSP system connector. The TDS560USB PLUS JTAG Emulator features a "keyed" connector to minimize the chance of error.
Do not force cables into position. Forcing them may either damage the cables or the interconnected boards and systems.

The USB Device Drivers Installation

1. After plug the TDS560USB PLUS JTAG Emulator into the host computer's   USB port and turn on the power, 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 the system will display the window as shown in Figure A-3. Check "Search for the best driver in this location" and Check "include this location in the search", then Browse the file "TDS560USB_PLUS.INF " in the installation CD, or in the folder

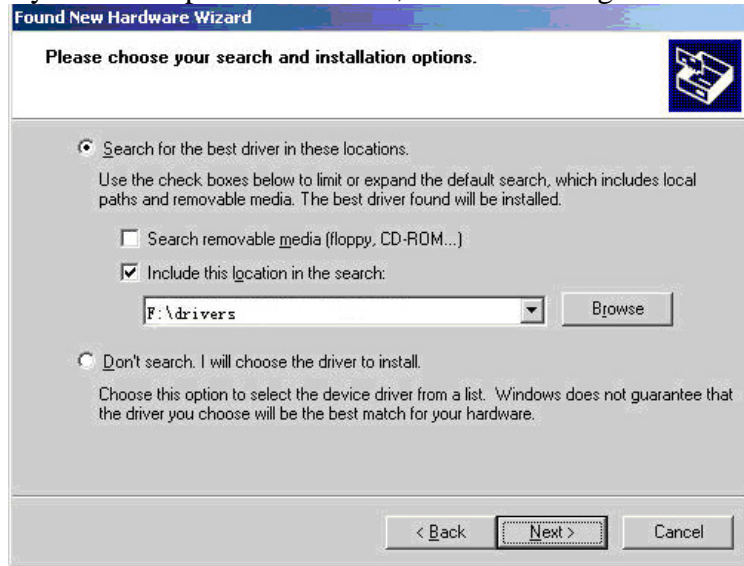where you have copied the file into, as shown in Figure A-3.

Figure A-3

4. Click on "Next" and the following window will be displayed, as shown in Figure A-4.
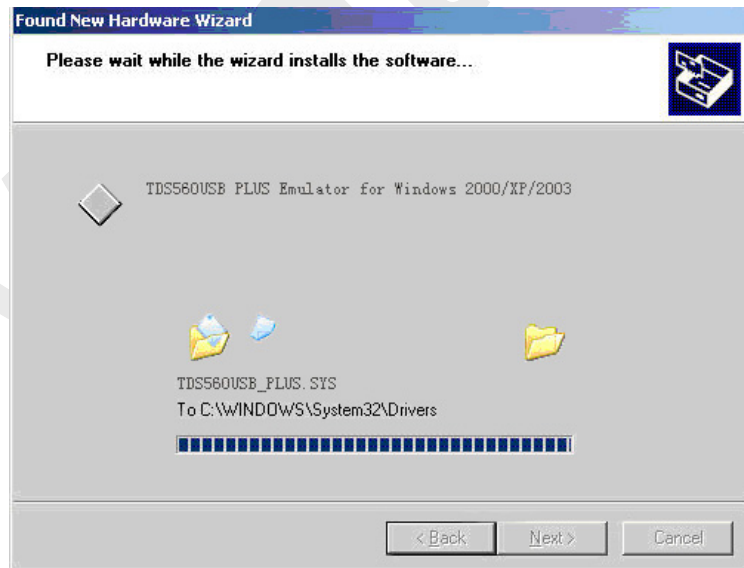
Figure A-4

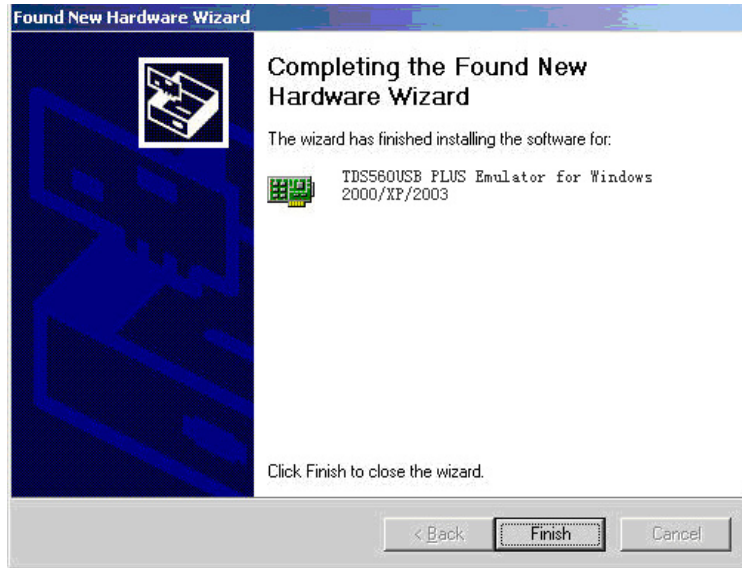5. Click on "Finish". Setup is completed.

Figure A-5

6. In "my computer→system property→device manage", you can see the device "Wintechdigital JTAG Emulator" as figure A-6.

Figure A-6

Installing the TDS560USB PLUS 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 TDS560USB PLUS driver disk into your CDROM, Double click on **setup.exe** to install the JTAG emulator tools for CCS. When this is finished, the "TDS560USB PLUS" folder will be created in the CCS install directory (as C:/ti/tds560usb_plus).

NOTE

Be sure that the Code Composer Studio has been installed before run setup.exe. It'll copy files to the CCS install directory and create environment variables to enable the file usage by CCS. If this step is not completed, the TDS560USB PLUS can't work

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Code Composer Studio Setup

1. Click on "Start" button →Program →Texas Instrument→Code Composer Studio 3.3 →Setup Code Composer Studio v3.3，Code Composer Studio Setup window will appear.

2. In the Factory Boards List in the CCS setup Window, select the desired ***TDS560USB PLUS Emulator*** configuration. Use Filters to help narrow the available choices. If the proper ***TDS560USB PLUS Emulator*** configuration is located, then double click on it and proceed to Step 10(See Figure C-1).
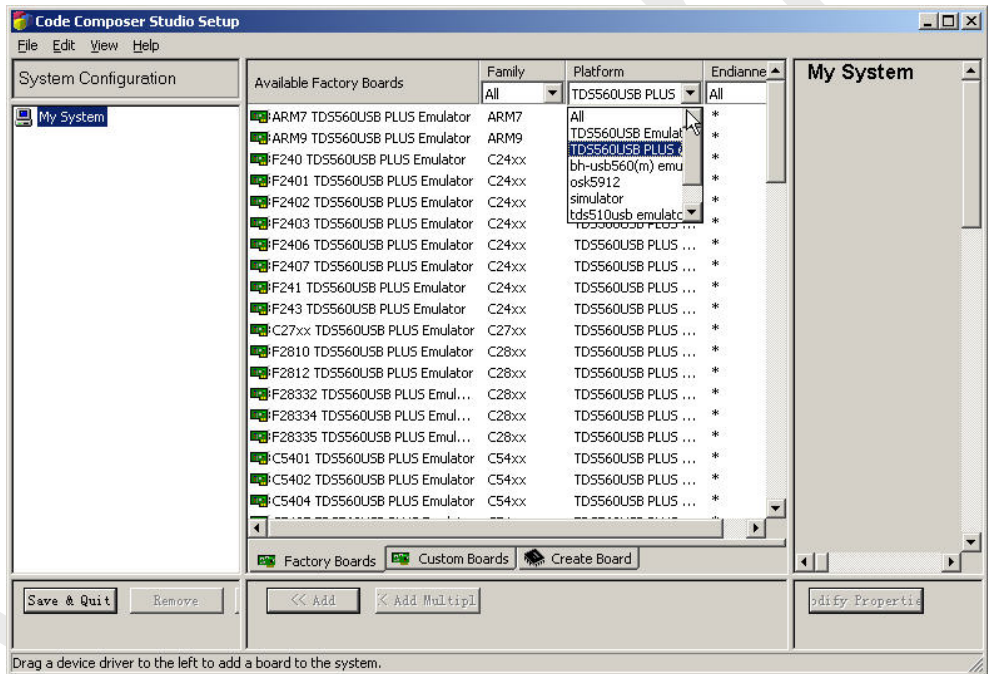

Figure C-1

3. If the desired ***TDS560USB PLUS Emulator*** configuration was not found in the Available Configuration List, click on Create Board and Double click on "WintechDigital TDS560USB PLUS Emulator" (see Figure C-2). The "Board Properties" window will pop-up. (See Figure C-3)
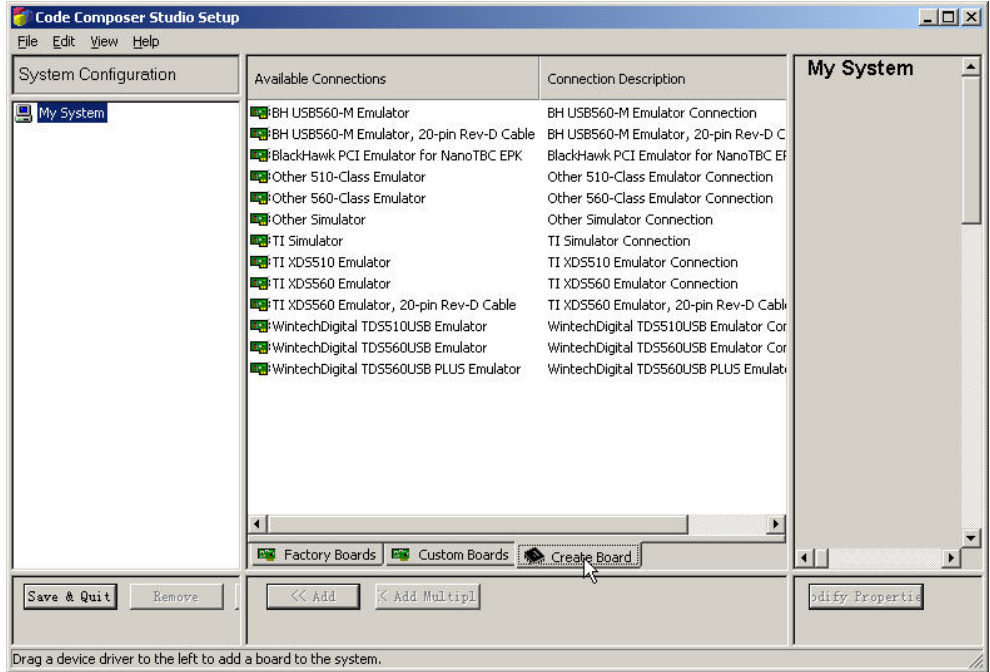
Figure C-2

4. On the "Board Properties" Window, select "Auto-generate board data file" (Figure C-3). Input a Connect Name.
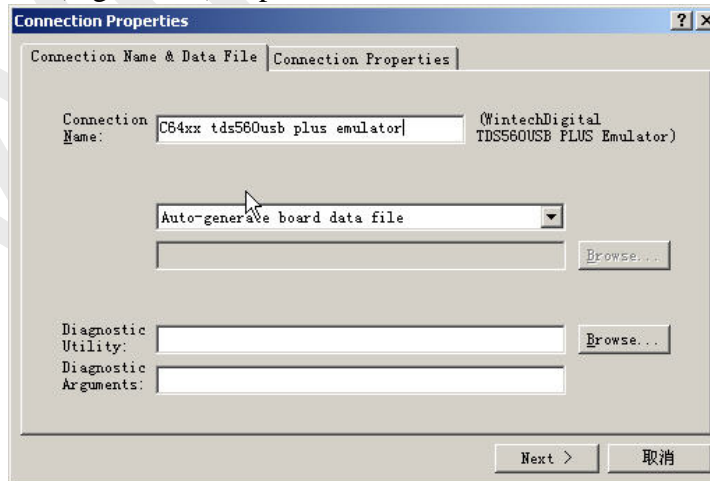

Figure C-3

5. Click on "Next", you will see "Connection Properties" window. Please select "Automatic" or use the "User Defined".
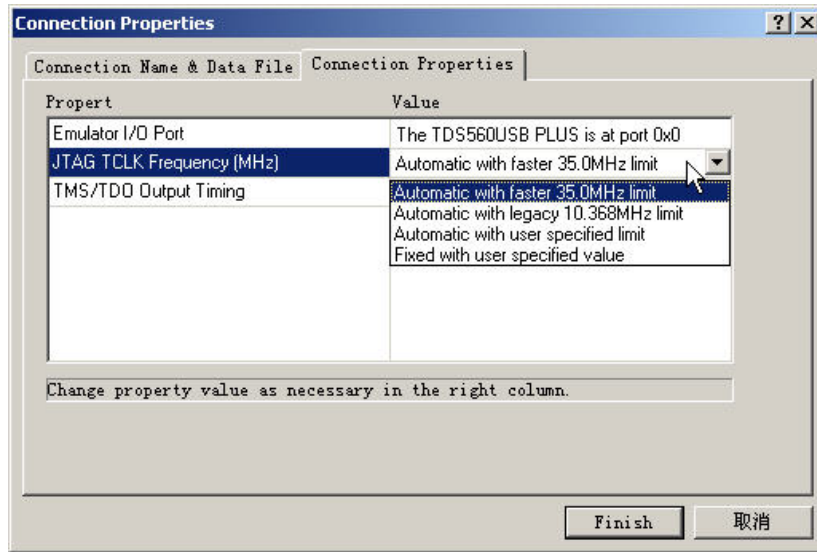

Figure C-4

6. Select "Emulator I/O Port" "**The TDS560USB PLUS is at port 0x0**" to use the first TDS560USB PLUS Emulator connected to your system.(Figure C-5)
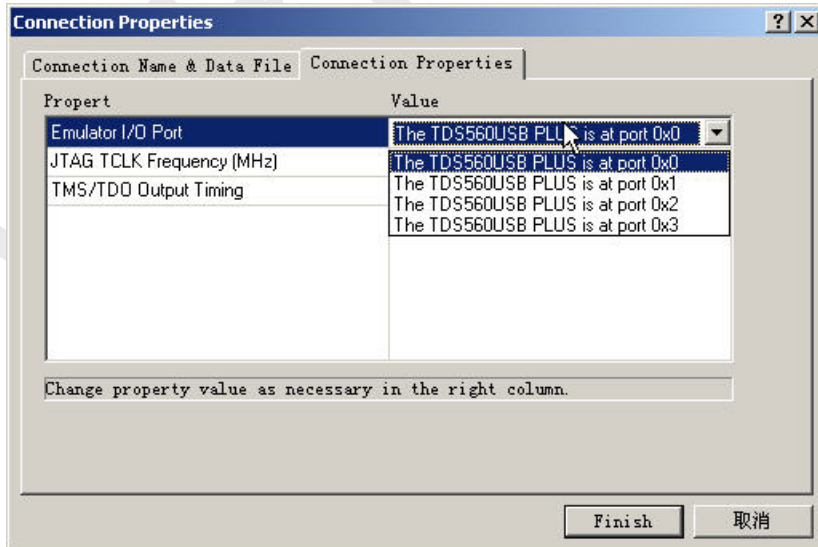

Figure C-5

7. Click on "Finish" to get to the "Process Configuration" window. Click on the Connection Name you inputted at step 4. The available processor will list.(see Figure C-6）Depends on the type and the number of the DSPs on your target board, choose the appropriate processor and double click on it.（See Figure C-6.）
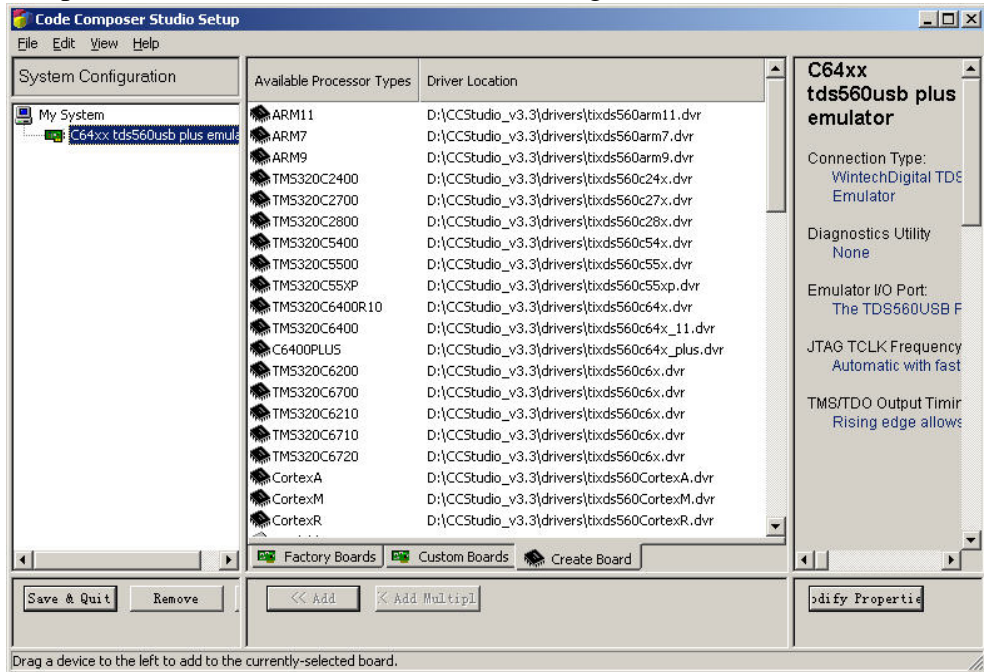

Figure C-6

8. The "Processor Properties" window will popup.(Figure C-7). Click on the " ▪▪ " button to see a list of gel files. Select the gel file that matches your target board. (**For some target board, if you don't select a gel file, it may cause error while loading a program to CCS**.) Then Click on "OK".
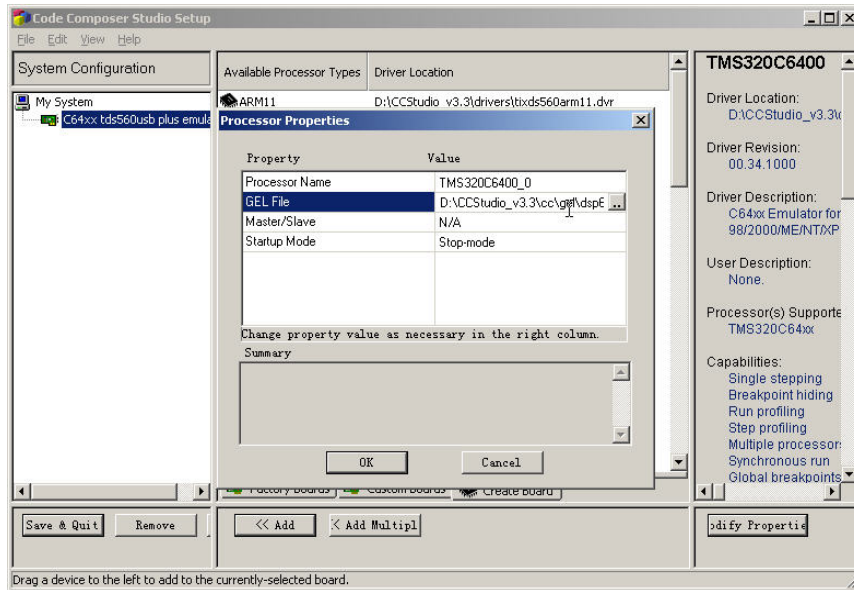
Figure C-7

9. Repeat the previous steps to add additional processors to your system.

10. To save the configuration and exit the "Code Composer Studio Setup" window, click on "File" and then "Exit". (Figure C-8)
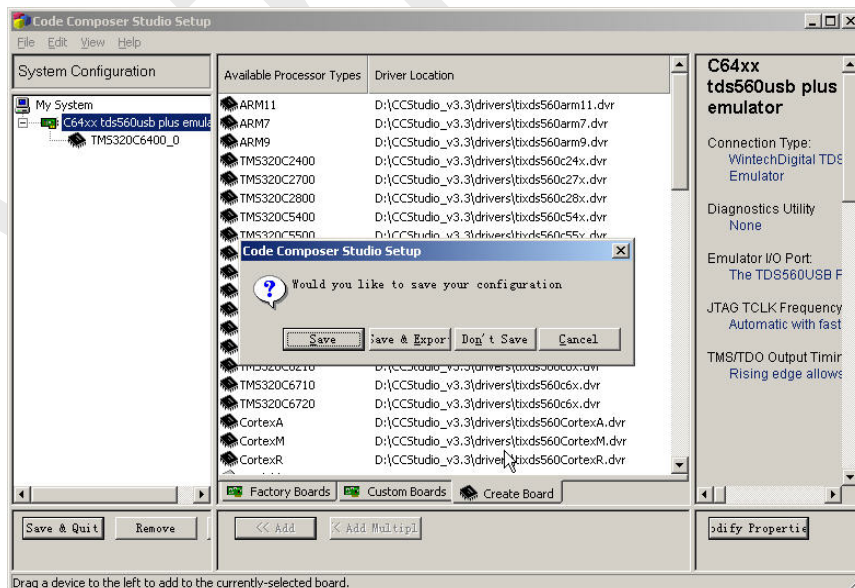

Figure C-8

Hardware Considerations

Wintech TDS560USB PLUS JTAG Emulator is an electronic device that directly connects your computer to your target DSP system, therefore it is very important to follow established procedures in the safe handling of electronic devices. Please be advised that basic precautions regarding static electrical discharge and other electrical safety precautions should be followed when connecting or disconnecting the Wintech TDS560USB PLUS JTAG Emulator to and from the target DSP system or any time electronic devices are handled. Please consult with a technician if you are not sure of these procedures..

Recommended Connection Procedure

1. **Remove power from the target DSP system.**
2. **Remove USB cable and power cable connection from the TDS560USB PLUS JTAG Emulator.**
3. **Make sure you are grounded and have eliminated all potentials for static electrical discharge.**
4. **Connect the Wintech TDS560USB PLUS JTAG Emulator to the target system by 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 Wintech TDS560USB PLUS JTAG Emulator to the host computer by using a USB cable.**
7. **If the READY LED on the TDS560USB PLUS does not blink in a few seconds, please connect the power cable to TDS560USB PLUS Emulator.**

Recommend Disconnection Procedure

1. **Remove USB cable connection from the Wintech TDS560USB PLUS⇔USB 2.0 JTAG Emulator.**
2. **Remove power from the TDS560USB PLUS system.**
3. **Remove power from the target DSP system.**
4. **Make sure you are grounded and have eliminated all potentials for static electrical discharge.**
5. **Disconnect the keyed JTAG ribbon cable from the target**

JTAG Cable Connection

The Wintech TDS560USB PLUS JTAG Emulator supports all TI DSP devices with a JTAG interface.

> **IMPORTANT NOTE**
> **It is very important to properly 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 cause damages on your DSP target system or the TDS560USB PLUS JTAG Emulator.**

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

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

TMS	1	2	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

XDSRESET and XDSPROBE

Command line utilities supplied by Texas Instruments 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 any related FPGA's using default (built-in) data. It also strobes the scan-path's JTAG TRST signal to initialize the JTAG Test Access Ports and JTAG emulation logic in target devices.

The necessary files required to run this utility are installed in \ti\cc\bin. Please execute the command below from a command line prompt.C:\ti\cc\bin\xdsreset –h

Syntax for using this command with the TDS560USB PLUS JTAG Emulator is as follows:

xdsreset –f tds560usb_plus.cfg

XDSPROBE

XDSPROBE is a utility used to probe (test) scan-controllers and scan-paths. This utility can help you develop and test both the 510 and 560 class products and the scan controllers and scan paths connecting to the target systems.

The necessary files needed to run this utility are installed in \ti\cc\bin and please execute the command below from a command line prompt.C:\ti\cc\bin\xdsprobe –h

Syntax for using this command with the TDS560USB PLUS JTAG Emulator is as follows:

C:\ti\cc\bin\xdsprobe –f tds560usb_plus.cfg -y
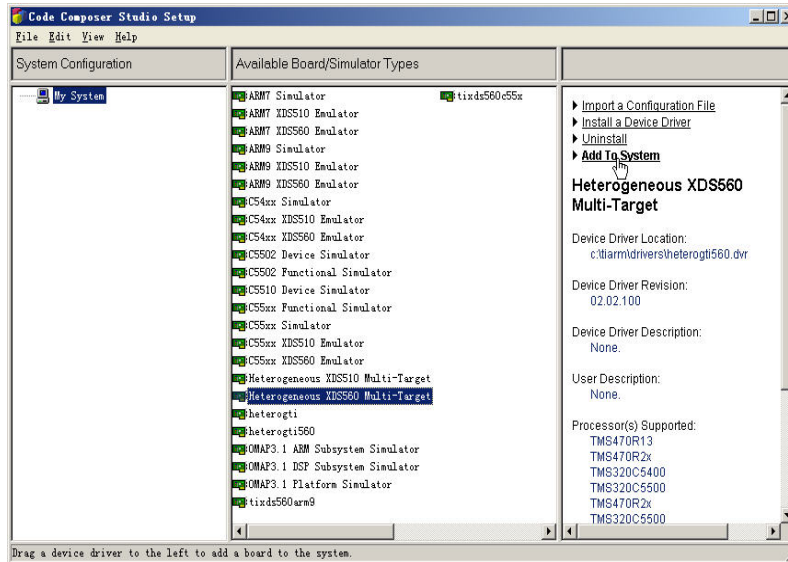
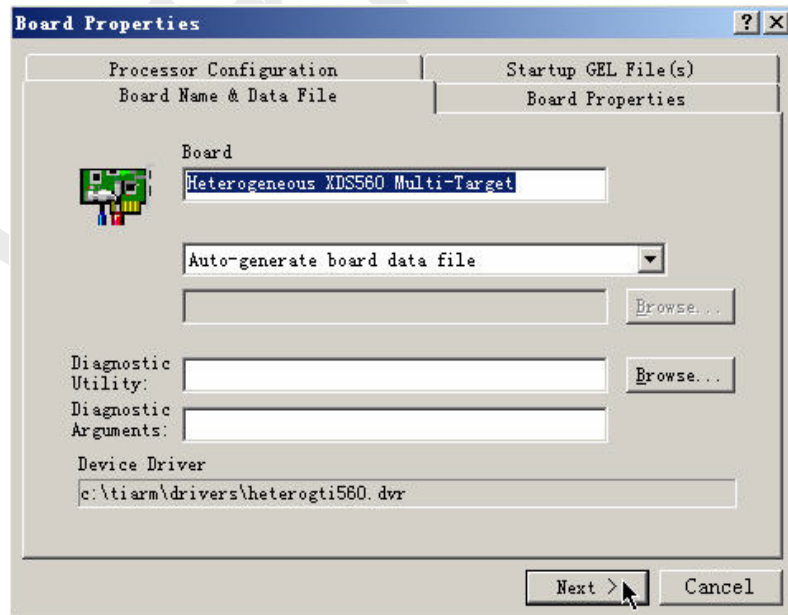# Appendix A

Code Composer Studio Setup (OMAP)
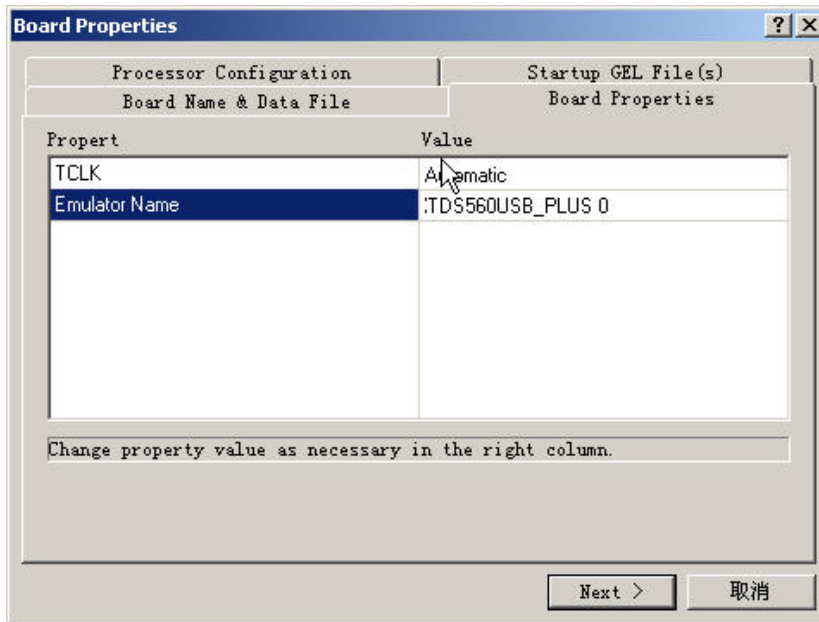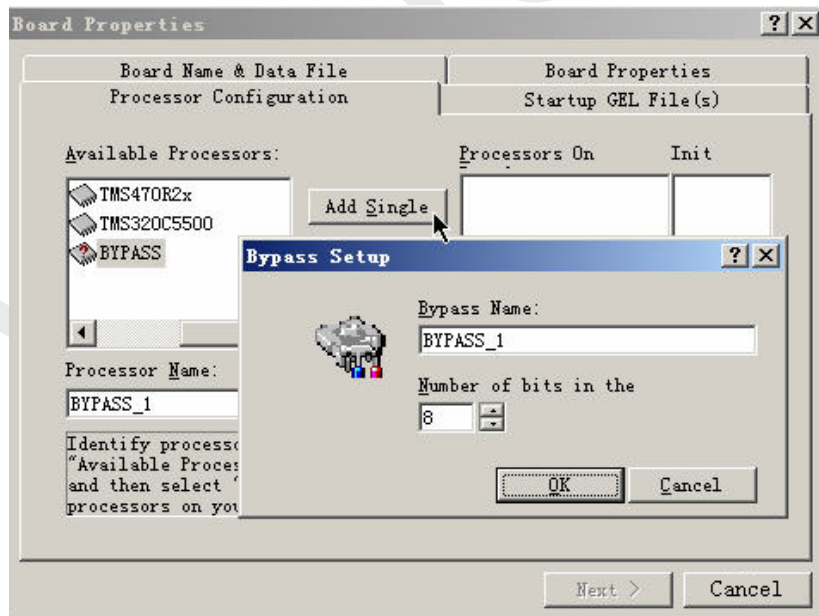

Figure D-1

Figure D-2

Figure D-3
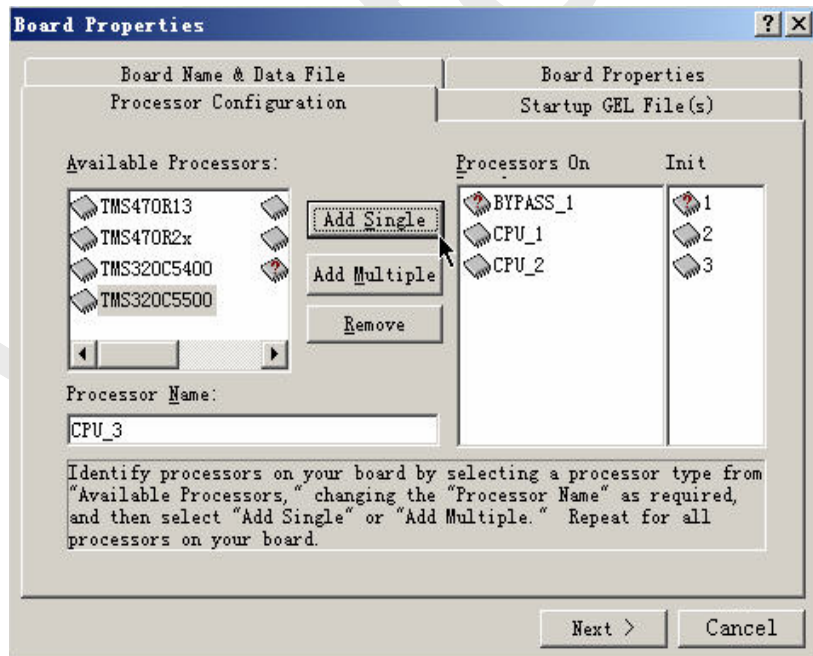
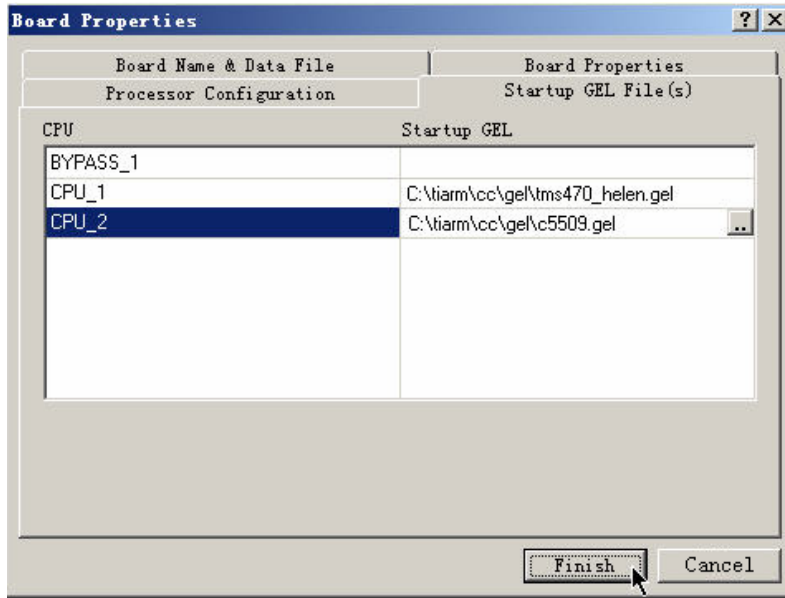**Figure D-4**
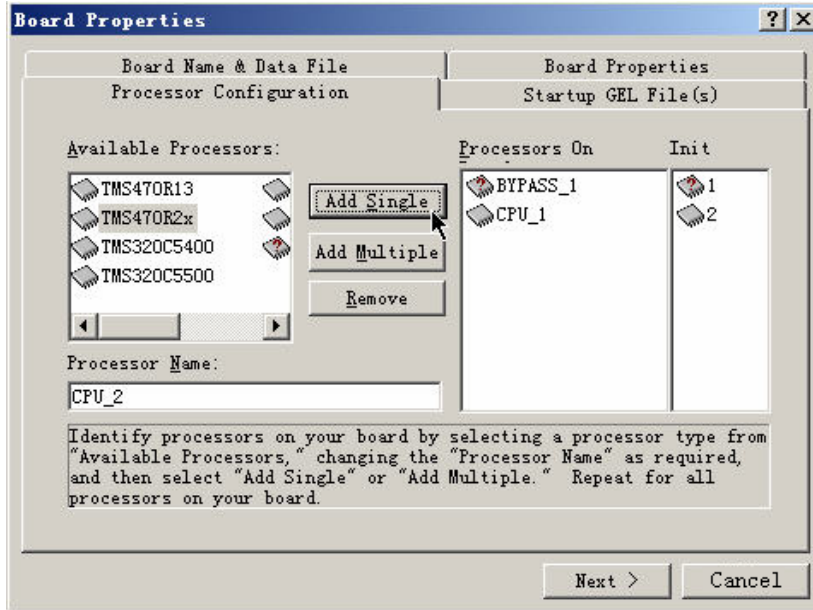
Figure D-5

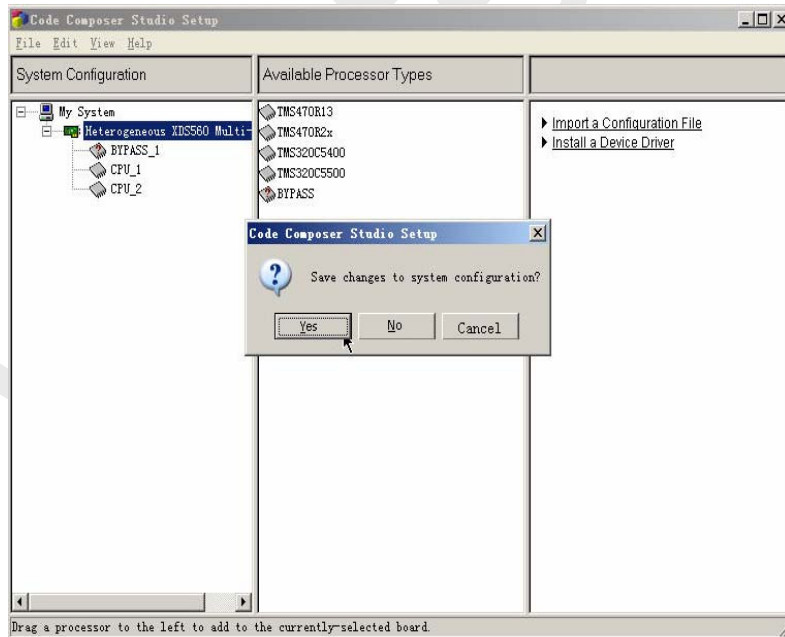**Figure D-6**

Figure D-7

Figure D-8

Appendix B

The following is a comparison chart on the time spent downloading 64KB/4MB program by using different Emulators. The target board is TI's DM642EVM and TI 6211DSK and 2407EVM. The computer is ACER（AcerPower F1, Pentium 2.5G）with USB20 interface. OS is WinXP.

Table 1

time(s) Emulator Type	Target DSP Board			
	DM642EVM 4MB Prog.	6211DSK 4MB Prog.	2407EVM 65KB Prog	2407EVM 65KB FLASH
XDS560PCI	9	8	2	13
TDS560USB PLUS	10	9	2	13
USB510(…)	533	525	67	52

TDS560USB PLUS's high downloading speed reaches 90% that of the XDS560PCI and is more than 50 times faster than the USB510 emulator. The exact result may vary with each computer. Nevertheless, the larger the download size is, the more notable the speed comparison would be.