Zoom™
ColdFire Development Kit

User's Manual

developed by **LOGIC**
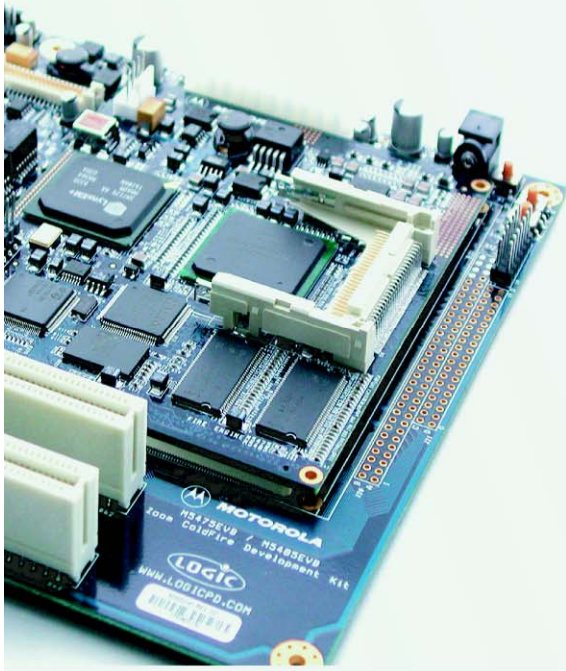
Launched by Motorola

freescale
semiconductor

REVISION HISTORY

REV	EDITOR	REVISION DESCRIPTION	APPROVAL	DATE
A	Eric Harnisch; Robin Bhattacharya	Release	JAW	8/6/04
B	James Wicks	Document Edit; Removed QuickStart Guide section, added note to reference QuickStart Guide, replaced MCF5475/85 with 7x/8x	ELH	9/21/04

Please check www.logicpd.com for the latest revision of this manual and additional applications.

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Congratulations on your purchase of the Zoom™ ColdFire Development Kit. The Zoom ColdFire Development Kit provides a product-ready software and hardware platform or evaluating the functionality of the ColdFire processor and Fire Engine. This results in an embedded product development cycle with **less time, less cost, less risk… more innovation**.

1 Getting Started

1.1 Have you read the Zoom ColdFire Development Kit QuickStart Guide?

If the answer is yes, you are ready to proceed to Section 2: Install Software Tools.

If not, *please familiarize yourself with the QuickStart Guide before you read this document*. The latest version of the QuickStart Guide is located at http://www.logicpd.com/auth/login.php.

1.2 QuickStart Guide Review

Thank you for reading the *QuickStart Guide* before proceeding through this document. Now you are familiar with the following:

- □ CDK System Contents
- □ Development PC Requirements
- □ Peripheral Connectors
- □ Terminal emulator, Freescale dBUG Monitor, and LogicLoader "Test Drive" Scenarios
- □ Jumper/Switch Table
- □ Product Notice and Registration Details
- □ Ordering Information
- □ Support Information
- □ Fire Engine CPLD Important Notice

2   Install Software Tools

Important Note: It is assumed that you have read and completed all steps described in the QuickStart Guide, located at http://www.logicpd.com/auth/login.php, before you begin.

2.1   Objective

The objective of this chapter is to provide step-by-step instructions for installing:
- Tera Term   Section 2.3
- Cygwin   Section 2.4
- GNU Toolchain   Section 2.5

2.2   Prerequisites

- Zoom ColdFire Development Kit CD
- Windows 2000 or later Host PC
- Pentium® processor or equivalent
- 64 MB RAM
- 1 GB free hard disk space
- 115200 baud-capable RS-232 port (COM port)

2.3   Installing Tera Term

Tera Term is a software terminal emulator for MS Windows that can send and receive both binary and ASCII characters over system COM ports.

1. To begin installation, start Macromedia Flash by inserting Logic's Zoom ColdFire CD into your CD ROM drive, or double click the Macromedia Flash .exe file in your CD contents folder.
(Alternatively, access the 'Software Development Tools' directory included on Logic's Zoom ColdFire CD, open the 'Tera Term' folder, double click the setup.exe file, and then proceed to step 4, below.)

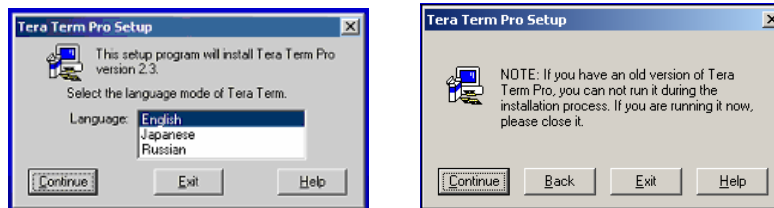   Macromedia Flash will bring up the following screen.

Figure 2.1: Start Page

2. On the Start Page, select 'Software Development Tools.'
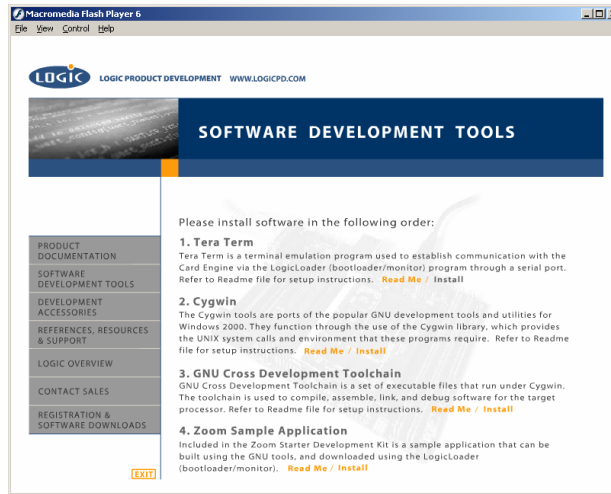
Figure 2.2: Software Development Tools Page

3. Option number one on the 'Software Development Tools' page is Tera Term. Click 'Install.'
4. Tera Term Pro Setup will begin. Follow these steps through the installation windows:

Figure 2.3: Tera Term Setup Windows 1-2

☐   1. Select a language, then click 'Continue.'
☐   2. If an existing version of Tera Term is running, close it, then click 'Continue.'
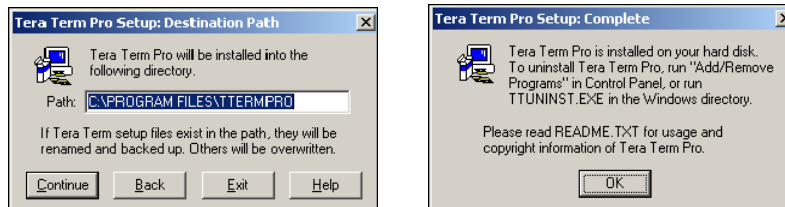
Figure 2.4: Tera Term Setup Windows 3-4

☐   3. Select a root directory for Tera Term. You can accept the default installation directory or enter an alternate path name in the 'Path' text field, then click 'Continue.'
☐   4. Tera Term will install. Click the 'OK' button. Setup is now complete.

2.4   Installing Cygwin

Cygwin is a UNIX® environment for Windows. It is a collection of tools that provides a Unix API emulator to allow compilation of sample source code.

1. To begin installation, start Macromedia Flash by inserting Logic's Zoom ColdFire CD into your CD ROM drive, or double click the Macromedia Flash .exe file in your CD contents folder. (Alternatively, access the 'Software Development Tools' directory included on Logic's Zoom ColdFire CD, open the 'Cygwin' folder, double click the setup.exe file, and then proceed to step 4, below.)

    Macromedia Flash will bring up the following screen.

Figure 2.5: Start Page

2. On the Start Page, select 'Software Development Tools.'

Figure 2.6: Software Development Tools Page

3. Option number two on the 'Software Development Tools' page is Cygwin. Click 'Install.'
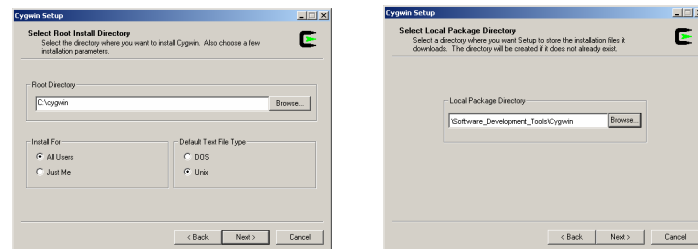
4. A window containing 'Important Steps for Cygwin Installation' will be displayed. To continue, press any key.
5. Cygwin Setup will begin. Follow these steps through the installation windows:
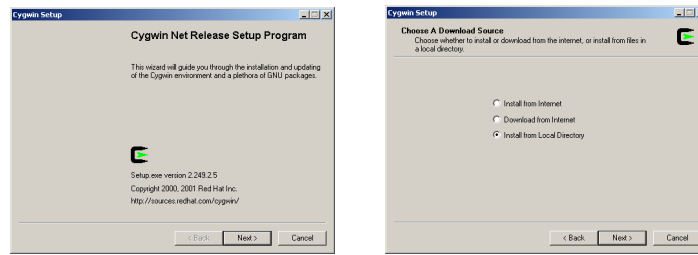
Figure 2.7: Cygwin Setup Windows 1-2

□   1. 'Cygwin Net Release Setup Program' window: click 'Next.'
□   2. 'Choose A Download Source' window: select 'Install from Local Directory,' click 'Next.'

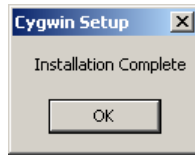*Figure 2.8: Cygwin Setup Windows 3-4*

□   3. 'Select Root Install Directory' window: select a root directory for Cygwin. You can accept the default installation directory or enter an alternate path name in the 'Root Directory' text field. Next, allow 'Install For' to default to 'All Users' unless you must restrict access. Also, allow 'Default Text File Type' to default to 'Unix.' Then click 'Next.'
□   4. 'Select Local Package Directory' window: Type: '.\Software_Development_ Tools\Cygwin' in the 'Local Package Directory' dialog box. (You must include The CD ROM drive letter.) Click 'Next.'
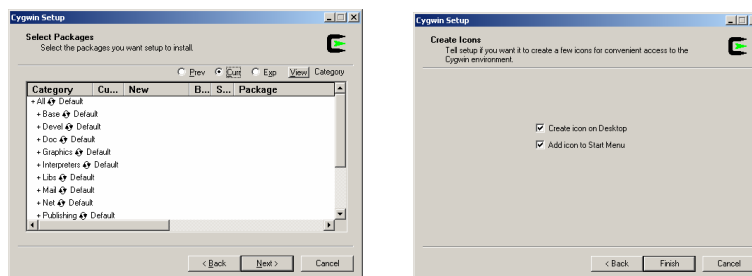
Figure 2.9: Cygwin Setup Windows 5-6

□   5. 'Select Packages' window: verify that 'Default' is selected for each category. Click 'Next.'
□   6. Setup.exe will begin copying files. This may take several minutes. After the files have completed copying, the 'Create Icons' window will appear. Select your icon preference and click 'Finish.'

□   7. Cygwin will install. When the 'Installation Complete' window appears, click 'OK.'
      Setup is now complete.

Figure 2.10: Cygwin Setup: Installation Complete Window

2.5   Installing the GNU Cross Development Toolchain

The GNU Cross Development Toolchain is a collection of tools that allows for software source code compilation and linking to create object code for your target hardware.

Prerequisite
■   You will need a complete installation of Cygwin on a local drive. For example: C:\cygwin or D:\cygwin.

Note
■   This installation is for host PC's running Windows 2000 or later host PC/Cygwin. For host PC's running Linux, see the readme file in the \Software Development Tools\Linux Tools directory (included on the Zoom ColdFire Development Kit CD) for installation instructions.

1.   To begin installation, start Macromedia Flash by inserting Logic's Zoom ColdFire CD into your CD ROM drive, or double click the Macromedia Flash .exe file in your CD contents folder. (Alternatively, access the 'Software Development Tools' directory included on Logic's Zoom ColdFire CD, open the 'GNU Cross Development Toolchain' folder, double click the gnutools_install.exe file, and then proceed to Step 4, below.)

Macromedia Flash will bring up the following screen.
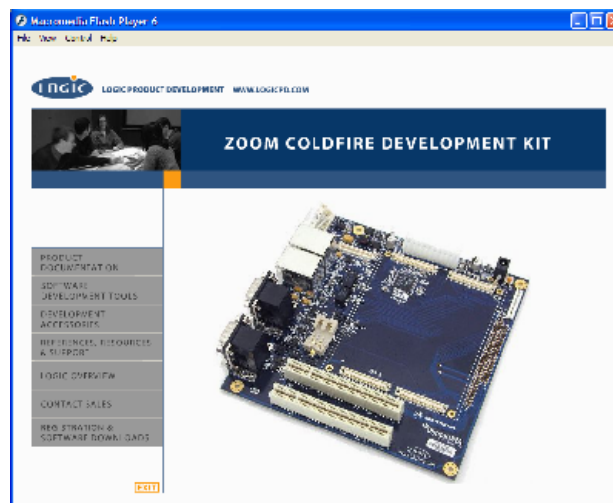
Figure 2.11: Start Page

2. On the Macromedia Flash Start Page, select 'Software Development Tools.'
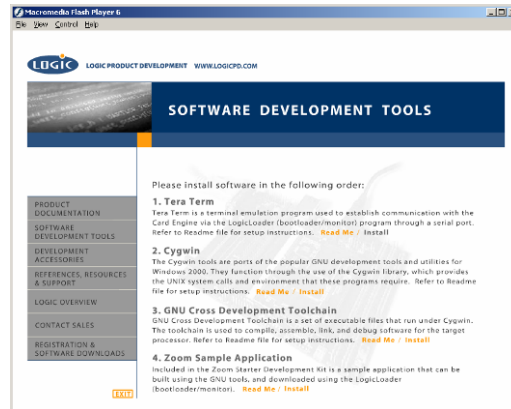
Figure 2.12: Software Development Tools Page

3. Option number three on the 'Software Development Tools' page is GNU Cross Development Toolchain. Click 'Install.'
4. GNU Cross Development Toolchain Setup will begin. Follow these steps through the installation windows:
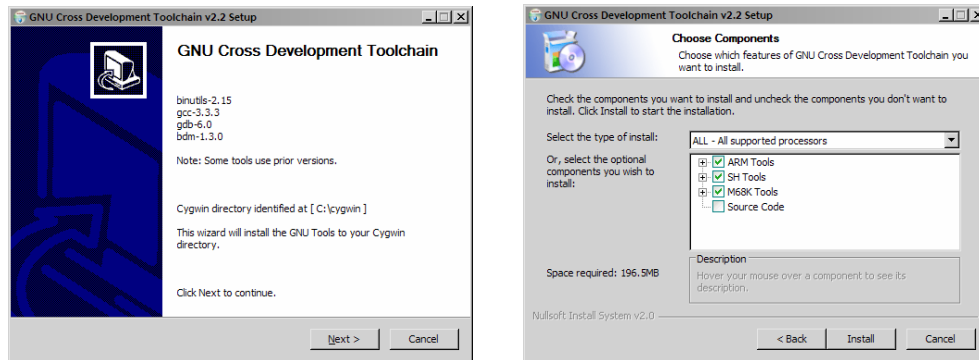
Figure 2.13: GNU Cross Development Toolchain Setup Windows 1-2

☐   1. 'GNU Cross Development Toolchain v2.2 Setup' window: click 'Next.'
☐   2. 'Choose Components' window: select the type of install as 'ALL - All Supported Processors,' then click 'Install.'
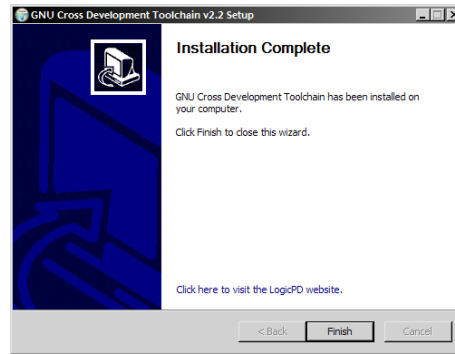
Figure 2.14: GNU Cross Development Toolchain Setup Window 3

☐ 3. Please wait while an 'Installing' window appears and the necessary files are copied to your Cygwin directory. When installation is complete, click 'Finish.' Upon completion, the installer automatically appends /gnutools/bin to the Cygwin PATH variable. Setup is now complete.

2.5.1   GNU Tools Documentation

A complete set of manuals for the GNU tools is contained in the Zoom ColdFire Development Kit CD in the following directory: .\Software Development Tools\Documentation\GNU_Docs.

3   Build a Sample Application

3.1   Objective

The objective of this section is to explain how to build a sample application for the Zoom ColdFire Development Kit.

Background Information:
■   This application is very simple and is only intended to serve as a starting point for software developers. The main function of this sample application is to verify that the development tools (compiler, linker, etc.) have been correctly installed and are working properly. The source code for this sample application is contained on the Zoom ColdFire Development CD.
■   'make' utility:
The build procedure in this section utilizes the 'make' utility in Cygwin-- 'make' is a utility common in Unix environments. Note that the files in the 'sample_zoom_app' directory tree are called makefiles. Makefiles contain rules that the 'make' utility follows when building an application. For additional info. regarding 'make,' refer to the documentation on the Zoom CDK CD at: Software Development Tools/Documentation/GNU_Docs/Using_make/make.pdf.
■   'target' argument:
For the sample application the user supplies a 'target' argument on the 'make' command line. For example: 'make sample_RAM' instructs 'make' to build a new target called 'sample_RAM.'

3.2   Prerequisites

■   Base directory in which source code can be placed
■   Cygwin with GNU Cross Development Tools installed
■   Tera Term installed

3.3   Procedure

1.   To begin installation, start Macromedia Flash by inserting Logic's Zoom ColdFire CD into your CD ROM drive, or double click the Macromedia Flash .exe file in your CD contents folder.
2.   (Alternatively, access the 'Software Development Tools' directory included on Logic's Zoom ColdFire CD, open the 'sample_zoom_app' folder, double click the apps_install.exe file, and then proceed to Step 4, below.)

Macromedia Flash will bring up the following screen.

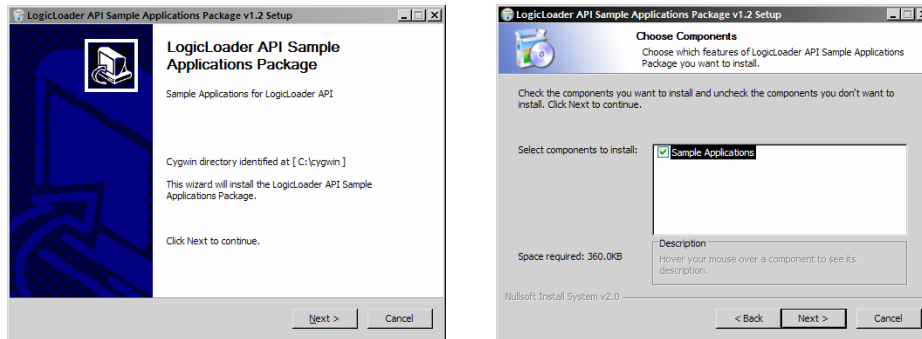*Figure 3.1: Start Page*

3. On the Start Page, select 'Software Development Tools.'

Figure 3.2: Software Development Tools Page

4. Option number four on the 'Software Development Tools' page is Zoom Sample Application. Click 'Install.'
5. LogicLoader API Sample Applications Package v1.2 Setup will begin. Follow these steps through the installation windows:
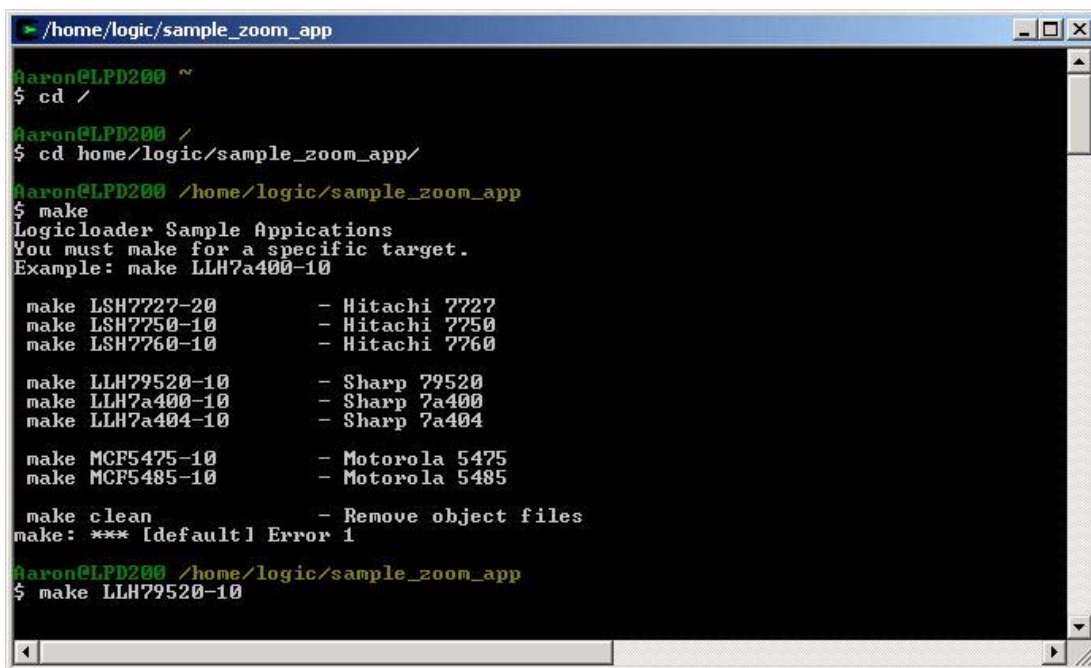

Figure 3.3: LogicLoader API Sample Applications Package Setup Windows 1-2

□   1. 'LogicLoader API Sample Applications Package v1.2 Setup' window: click 'Next.'
□   2. 'Choose Components' window:, click 'Next.'
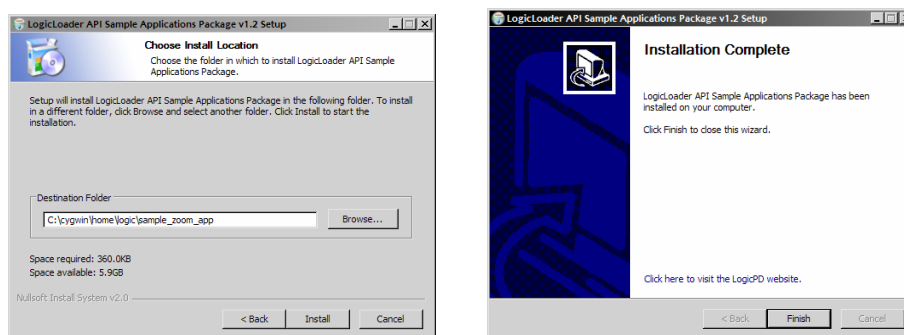
Figure 3.4: LogicLoader API Sample Applications Package Setup Windows 3-4

□ 3. Select an install location for the LogicLoader API Sample Applications Package. You can accept the default installation directory or enter an alternate path name in the 'Destination Folder' field. Click 'Install' to begin installing files.

□ 4. Please wait while an 'Installing' window appears and the necessary files are copied to your Cygwin directory. When installation is complete, click 'Finish.' Setup is now complete.

6. Next, open Cygwin. (Open **Start/ Programs** to locate Cygwin, or double-click the Cygwin shortcut icon on your desktop -- depending on where you saved the icon.) A Cygwin window will appear.
7. In your Cygwin window, type the following command: 'cd /home/logic/sample_zoom_app/' This will change the working directory to your sample_zoom_app folder.
8. Next, type 'make clean' in your Cygwin window. This cleans previously built files (if any).
9. Next, type 'make' in order to get the list of build file options. See figure below.

Figure 3.5: Building A Sample Application

10. Then type 'make' followed by the appropriate file name (matching the Fire Engine type that you are building on).

When complete, your sample applications will be located under the directory: home/logic/sample_zoom_app/apps/<program_name>.

4 Download a Sample Application

4.1 Objective

The objective of this section is to download the sample application which you built in "Section 3: Build a Sample Application' to your Zoom ColdFire Development Kit. This example demonstrates how to download the sample application with LogicLoader (bootloader/monitor).

Background Information:
■ The application 'helloworld.elf' is linked to download and execute directly from RAM.
■ LogicLoader is the name given to the Zoom CDK's bootloader/monitor code module. Refer to the 'LogicLoader User's Manual' for further documentation.

4.2 Prerequisites

■ A successfully built sample application from 'Section 3: Build a Sample Application,' above
■ Cygwin and GNU Cross Development Tools installed
■ Tera Term installed and running
■ Zoom ColdFire Development Kit up and running
■ Zoom ColdFire Development Kit connected to development computer via null modem serial cable

4.3 Procedure

1. Open a Tera Term shell. Select 'Setup' and click 'Serial port' in order to verify that Tera Term is configured correctly.
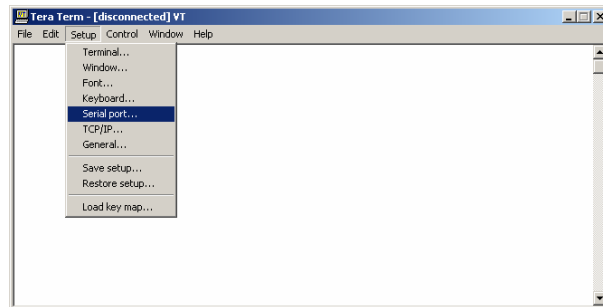
Figure 4.1: Select 'Setup' and click 'Serial port'

2. Verify the following settings: 'port' is the active port, 'baud-rate' is 115200, 'data' is 8-bit, 'parity' is none, 'stop' is 1-bit, and 'flow control' is none.
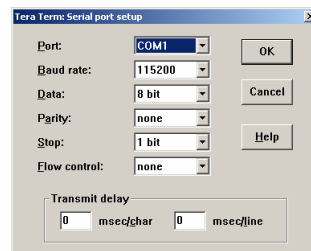
Figure 4.2: 'Serial port' Settings

3.   Next, press the Reset switch on the Zoom ColdFire Development Kit application board (with your Fire Engine properly inserted) in order to reboot the kit. LogicLoader will appear in Tera Term.

4.   Prepare LogicLoader to receive the sample application by typing 'load elf' after the 'losh>' prompt, then press 'Enter'. See figure below.

Figure 4.3: Prepare LogicLoader to Receive the Sample Application

5.   Then select 'File' and click 'Send file' to send the sample application to the development kit.

Figure 4.4: Select 'File' and Click 'Send file'

6.   A 'Tera Term: Send file' window will open. Verify that the 'Binary' option is selected.

7.   Locate the sample application file you built in Section 3, above. The default location is: Cygwin/home/logic/sample_zoom_app/apps/helloworld.
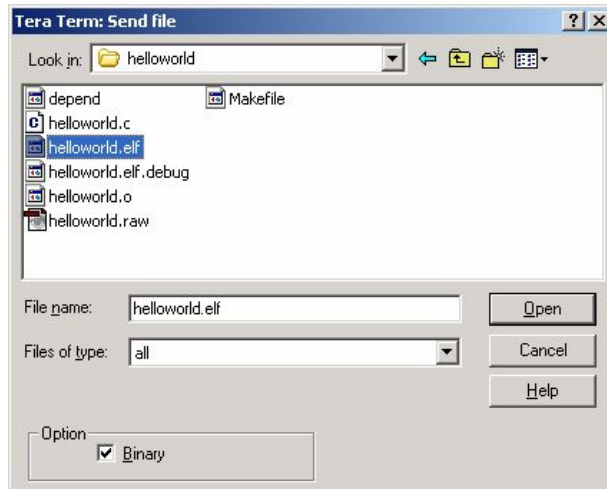
Figure 4.5: Locate the Sample Application

8. Select your sample application file and click 'Open.' The image will download to the Zoom CDK.
9. Now the sample application is ready to run. At the 'losh>' prompt, type 'jump' to run the application. See figure below.
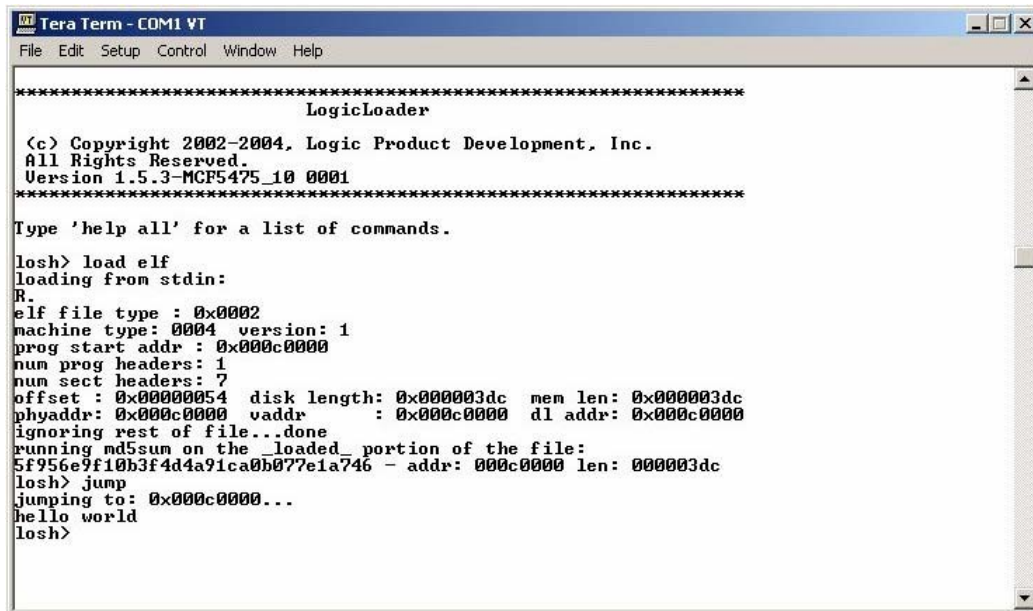
Figure 4.6: 'Hello World' Sample Program Screen

The sample application will run on the Zoom ColdFire Development Kit. The application should print 'Hello World' to the screen.

5　　LogicLoader Restore and Update Procedures

For information on LogicLoader restore and update procedures, please see Logic's *Application Note 257: MCF54xx LogicLoader Procedures* at https://www.logicpd.com/auth/login.php. This document describes how to:

- Use S Record Files with BoLo/LoLo

- Use S Record Files with Freescale's m54xevbup

- Use the 'lolo_xxx.srec' File with dBUG

6　　Warranty Statement

Refer to warranty card enclosed in development kit.

Logic Product Development

411 Washington Ave, N. Suite 101
Minneapolis, MN 55401 USA
Tel. 612.672.9495
Fax. 612.672.9489
www.logicpd.com