:: ColdFire SDK ::

ZOOM

LOGIC

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User's Manual   www.logicpd.com

REVISION HISTORY

REV	EDITOR	REVISION DESCRIPTION	APPROVAL	DATE
A	Jed Anderson	Initial Release	JCA	12/6/05
B	Jed Anderson	General doc edits; Changed Sections 2.4 and 2.5 instructions to download from web instead of from CD; Corrected CD file location for GNU Tools Documentation; Removed Linux Tools note in Section 2.5	JCA	02/08/06
C	Jed Anderson	Updated with new layout and design; Changed Section 4.3 to specify that dBUG loads before LogicLoader when the board is reset; Updated to include any changes for the M5373EVB kit	ELH	10/12/06

Please check http://www.logicpd.com for the latest revision of this manual and the most recent documentation associated with this Development Kit.

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1   Getting Started

Congratulations on your purchase of the Zoom™ ColdFire® SDK Development Kit. The Zoom ColdFire SDK Development Kit provides a product-ready hardware and software platform for evaluating the functionality of the ColdFire processor and Fire Engine System on Module. Logic's embedded solutions fast forward product development and helps your company stay focused on your high-value core technologies.

1.1   Have you read the Zoom ColdFire SDK 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 *Zoom ColdFire SDK Development Kit QuickStart Guide* before you read this document. The latest version of the QuickStart Guide is located at http://www.logicpd.com/auth/.

1.2   QuickStart Guide Review

After reading the QuickStart Guide, you are now familiar with the following features:

- Zoom ColdFire SDK Development Kit contents
- Development PC requirements
- Peripheral connectors
- Terminal emulator and LogicLoader "Test Drive" scenario
- Jumper/switch functionality
- Product notice and registration details
- Ordering information
- Support information

2   Install Software Tools

Important Note: It is assumed that you have read and completed all steps described in the QuickStart Guide, available online at http://www.logicpd.com/auth/, 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 SDK 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 Microsoft Windows that can send and receive both binary and ASCII characters over system COM ports.

1.   To begin installation, insert Logic's Zoom ColdFire SDK CD into your CD ROM drive. A web browser window will open, displaying the contents of the CD. If this window does not launch automatically, double-click the 'index.html' file in your CD contents folder. (Alternatively, access the 'Tools' directory included on Logic's Zoom ColdFire SDK CD, open the 'Tera Term' folder, unzip the compressed file, and double-click the setup.exe file. Then proceed to Step 4, below.)

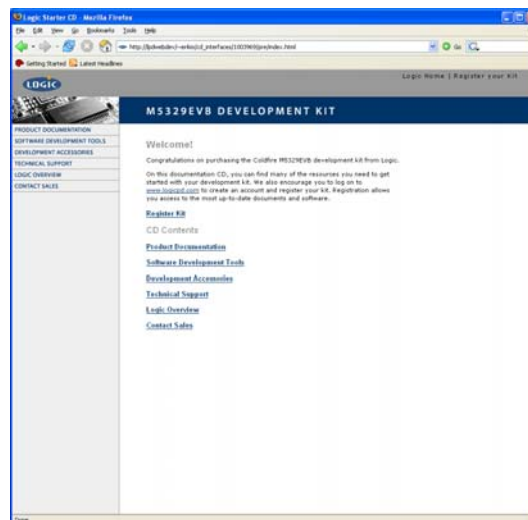Your web browser will display a screen similar to that below.

Figure 2.1: Start Page

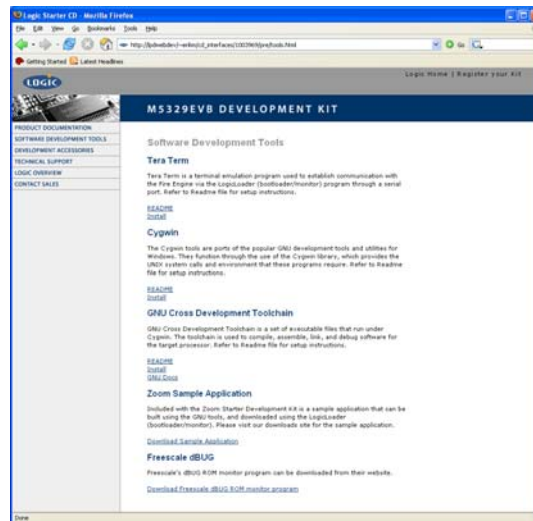2.   On the Start Page, select 'Software Development Tools.'

Figure 2.2: Software Development Tools Page

3.   The first option 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:

    4.1.   Select a language, and then click 'Continue.'
    4.2.   If Tera Term is already running, close it, and then click 'Continue.'

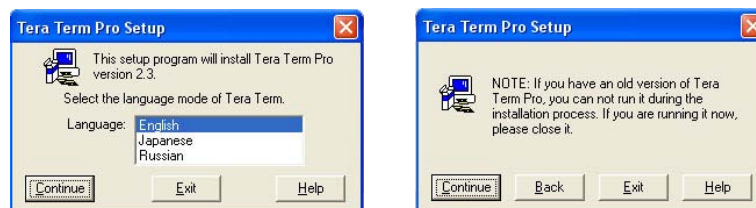*Figure 2.3: Tera Term Setup Windows 1-2*

    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.'
    4.4.   Tera Term will install. Click the 'OK' button. Setup is now complete.

Figure 2.4: Tera Term Setup Windows 3-4

2.4   Installing Cygwin

Cygwin is a UNIX® environment for Windows. It is a collection of tools that provides a UNIX Application Program Interface (API) emulator to allow compilation of sample source code.

1.   To begin installation, insert Logic's Zoom ColdFire SDK CD into your CD ROM drive. A web browser window will open, displaying the contents of the CD. If this window does not launch

automatically, double-click the 'index.html' file in your CD contents folder.

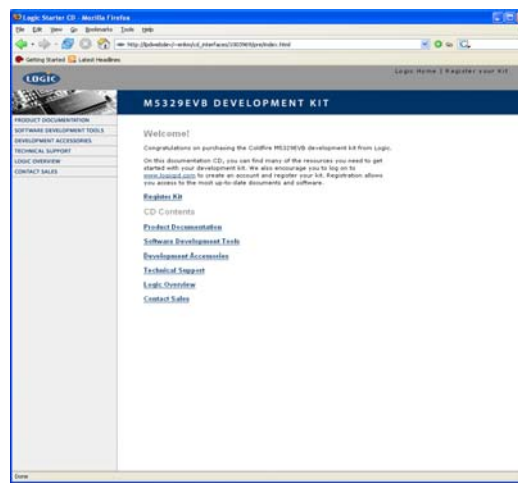Your web browser will display a screen similar to that below.

Figure 2.5: Start Page

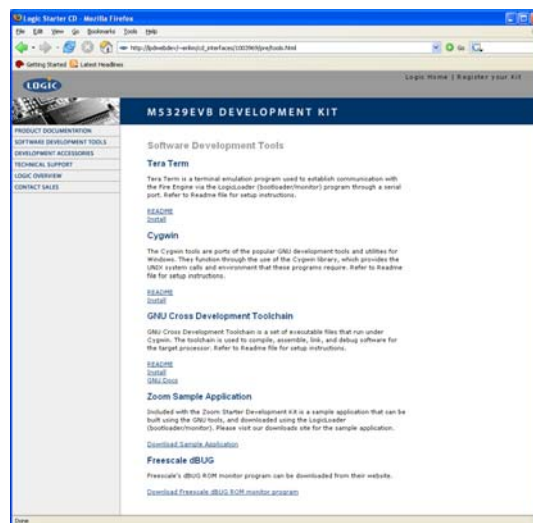2.   On the Start Page, select 'Software Development Tools.'

Figure 2.6: Software Development Tools Page

3.   The second option on the 'Software Development Tools' page is Cygwin. Click on the link to Logic's downloads site, enter your username and password, and then download the Cygwin.zip file. (If you have not registered your product—or do not have your registration information—please register at http://www.logicpd.com/auth/. You will receive an e-mail with your new username and password.)

4.   Double-click on the 'setup.exe' file after unpacking the .zip file. 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:

     5.1.   'Cygwin Net Release Setup Program' window: click 'Next.'
     5.2.   'Choose Installation Type' window: select 'Install from Local Directory,' click 'Next.'
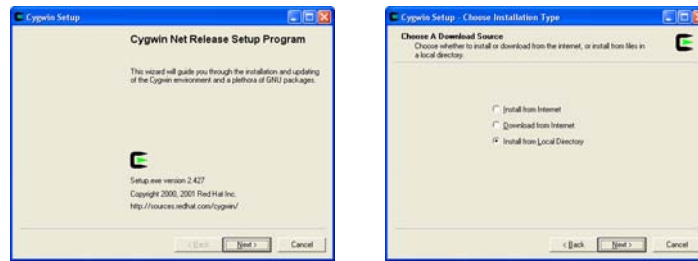
Figure 2.7: Cygwin Setup Windows 1-2

5.3.   'Select Root Install Directory' window: select a root directory for Cygwin. You can accept the default installation directory, after making sure it is an available local drive, 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.'

5.4.   'Select Local Package Directory' window: this should point to the location of the unpacked contents of the .zip file. Click 'Next.'

Figure 2.8: Cygwin Setup Windows 3-4

5.5.   'Select Packages' window: verify that 'Default' is selected for each category. Click 'Next.'

5.6.   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.'

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

Figure 2.9: Cygwin Setup Windows 5-6

Figure 2.10: Cygwin Setup: Installation Complete Window

2.5   Installing the GNU Cross Development Toolchain

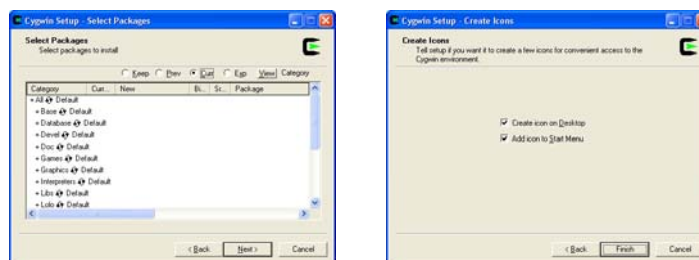The GNU Cross Development Toolchain is a collection of tools that allows for software source code compilation and linking to create object code for your target hardware. **Note:** You will need a complete installation of Cygwin on a local drive. For example: C:\cygwin or D:\cygwin.

1.   To begin installation, insert Logic's Zoom ColdFire SDK CD into your CD ROM drive. A web browser window will open, displaying the contents of the CD. If this window does not launch automatically, double-click the 'index.html' file in your CD contents folder.

Your web browser will display a screen similar to that below.

Figure 2.11: Start Page
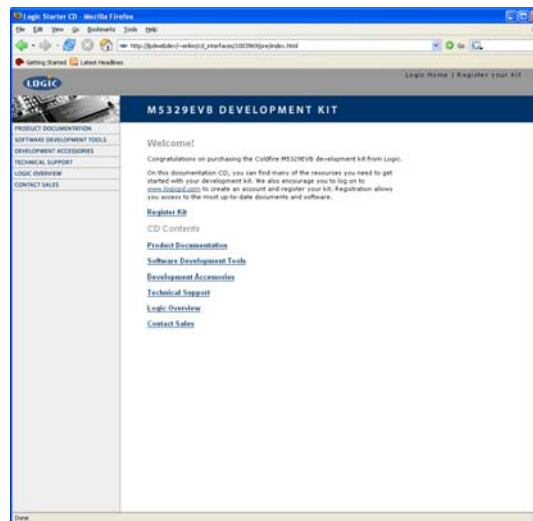
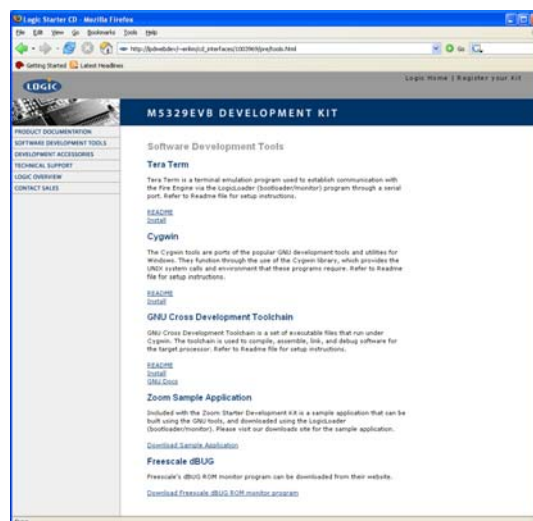2.   On the Start Page, select 'Software Development Tools.'

Figure 2.12: Software Development Tools Page

3.   Option number three on the 'Software Development Tools' page is GNU Cross Development Toolchain. Click on the link to Logic's downloads site, enter your username and password, and then download the GNU Cross Development Toolchain. (If you have not registered your

product—or do not have your registration information—please register at http://www.logicpd.com/auth/. You will receive an e-mail with your new username and password.)

4. Double-click on the downloaded 'gnutools_install' icon. GNU Cross Development Toolchain Setup will begin. Follow these steps through the installation windows:

    4.1.   'GNU Cross Development Toolchain Setup' window: click 'Next.'
    4.2.   'Choose Components' window: select the type of install as 'ALL - All Supported Processors,' then click 'Install.'

Figure 2.13: GNU Cross Development Toolchain Setup Windows 1-2

    4.3.   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.
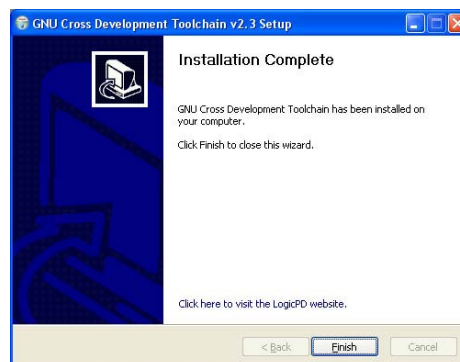

Figure 2.14: GNU Cross Development Toolchain Setup Window 3

2.5.1 GNU Tools Documentation

A complete set of manuals for the GNU tools is contained in the Zoom ColdFire SDK CD in the following directory: \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 SDK 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.

■   '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_app' directory tree are called makefiles. Makefiles contain rules that the 'make' utility follows when building an application. For additional information regarding 'make,' refer to the documentation on the Zoom ColdFire SDK CD at: \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, insert Logic's Zoom ColdFire SDK CD into your CD ROM drive. A web browser window will open, displaying the contents of the CD. If this window does not launch automatically, double-click the 'index.html' file in your CD contents folder.

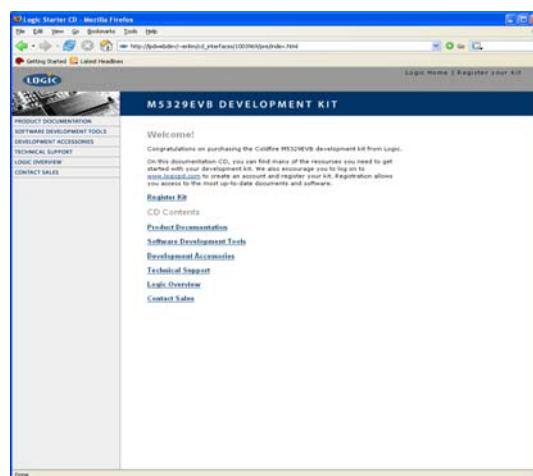Your web browser will display a screen similar to that below.

Figure 3.1: Start Page

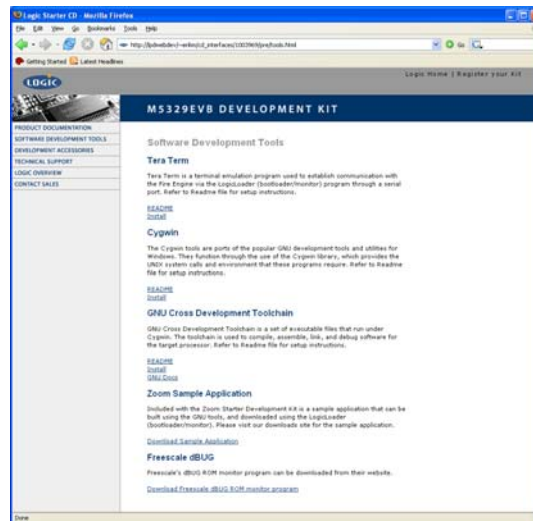2.   On the Start Page, select 'Software Development Tools.'

Figure 3.2: Software Development Tools Page

3.   The fourth option on the 'Software Development Tools' page is Zoom Sample Application. Click on the link to Logic's downloads site, enter your username and password, and then download the Sample Application Package. (If you have not registered your product—or do not have your registration information—please register at http://www.logicpd.com/auth/. You will receive an e-mail with your new username and password.)

4.   Double-click on the 'apps_install.exe' icon you downloaded and LogicLoader Sample Application Package Setup will begin. Follow these steps through the installation windows:

4.1.   'LogicLoader Sample Application Package Setup' window: click 'Next.'
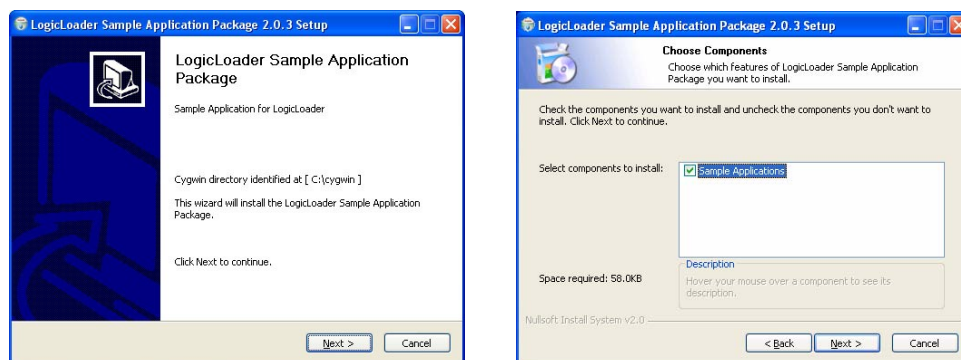4.2.   'Choose Components' window: click 'Next.'

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

4.3.   Select an install location for the LogicLoader Sample Application 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.
4.4.   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.
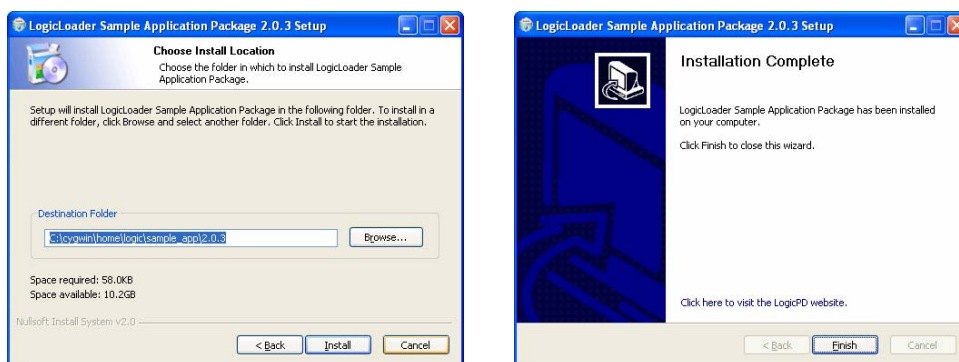
Figure 3.4: LogicLoader Sample Applications Package Setup Windows 3-4

5.   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.

6.   In your Cygwin window, type the following command: 'cd /home/logic/sample_app/2.0.3/led_flasher'. This will change the working directory to your sample_app folder. (Note: 2.0.3 is the version number of the Zoom Sample Application. Please note which version you have downloaded and edit the folder name as appropriate.)

7.   Next, type 'make clean' in your Cygwin window. This cleans previously built files (if any).

8.   Next, type 'make' in order to get the list of build file options. (The image below only approximates what your screen will display; this image may not show all available modules for the most recent sample application download.)
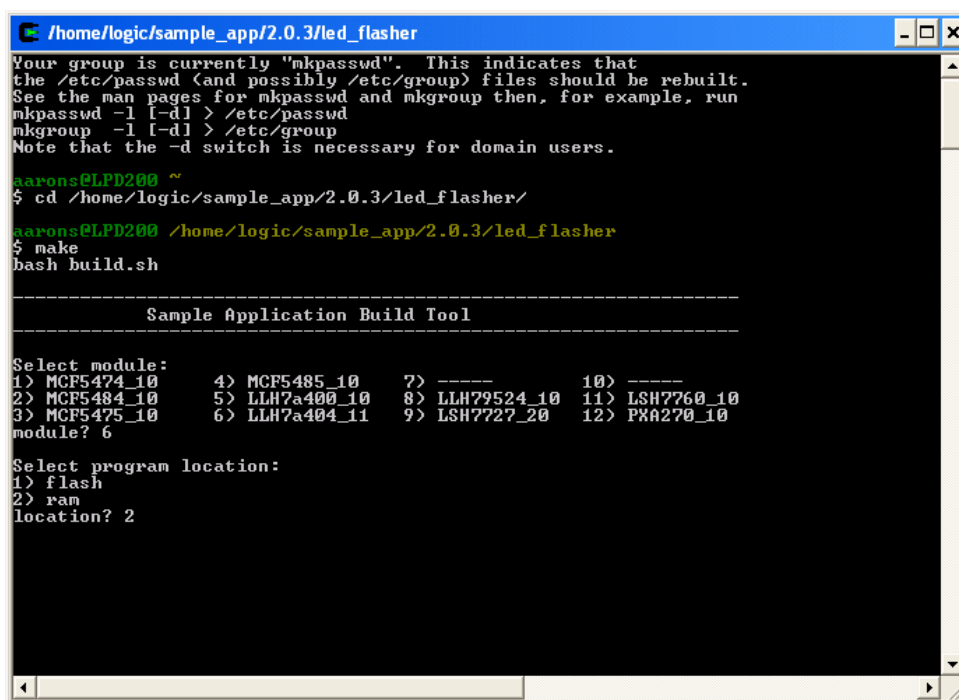

Figure 3.5: Building a Sample Application

9.   Type the appropriate number that matches the Fire Engine module that you are building on. Then select whether you want to build the application for flash or RAM.

10. When complete, your sample applications will be located under the directory: home/logic/sample_app/2.0.3/led_flasher/<program_name>. (Note: 2.0.3 is the version number of the Zoom Sample Application. Please note which version you have downloaded and edit the folder name as appropriate.)

4   Download a Sample Application

4.1   Objective

The objective of this section is to download the sample application that you built in Section 3: "Build a Sample Application" to your Zoom ColdFire SDK Development Kit. This example demonstrates how to download the sample application with LogicLoader.

Background Information:

■   The application 'led_flasher.elf' is linked to download and execute directly from RAM.
■   LogicLoader is a bootloader/firmware-monitor program developed by Logic Product Development. Please refer to the *LogicLoader User's Manual* for more information.

4.2   Prerequisites

■   A successfully built sample application from Section 3: "Build a Sample Application"
■   Cygwin and GNU Cross Development Tools installed
■   Tera Term installed and running
■   Zoom ColdFire SDK Development Kit up and running
■   Zoom ColdFire SDK 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.
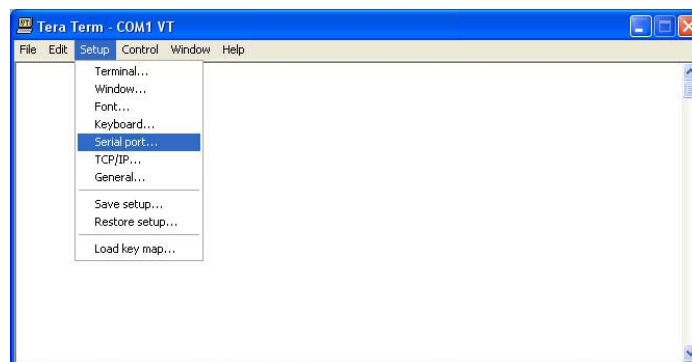

Figure 4.1: Select 'Setup' and click 'Serial port'

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.
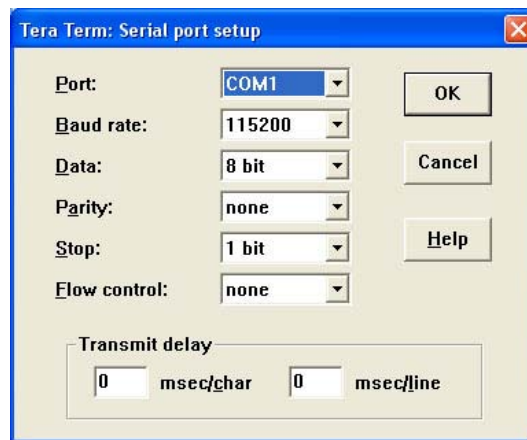
Figure 4.2: 'Serial port' Settings

3. Next, press the Reset switch on the Zoom ColdFire SDK Development Kit application baseboard (with your Fire Engine properly inserted) in order to reboot the kit. dBUG will appear and type 'go_lolo' to load LogicLoader. LogicLoader will then 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. (Note: the version numbers displayed in these images may differ depending on the Fire Engine model used.)
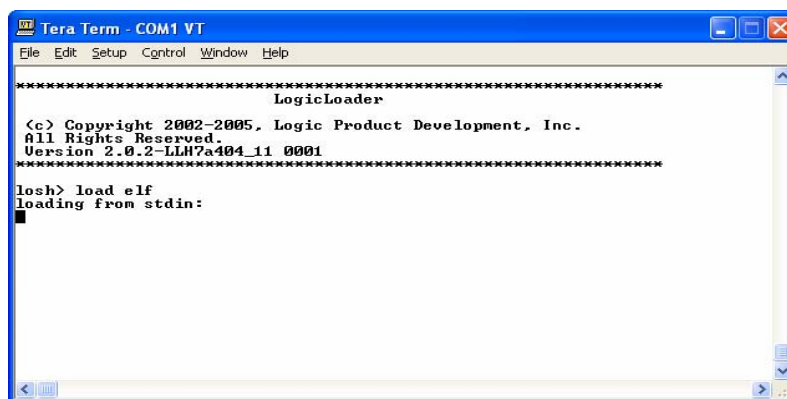

Figure 4.3: Prepare LogicLoader to Receive the Sample Application

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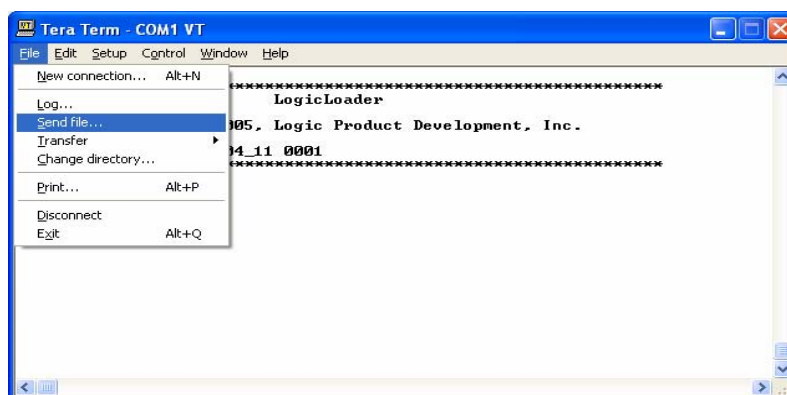

Figure 4.4: Select 'File' and Click 'Send file'

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_app\2.0.3\led_flasher. (Note: 2.0.3 is the version number of the
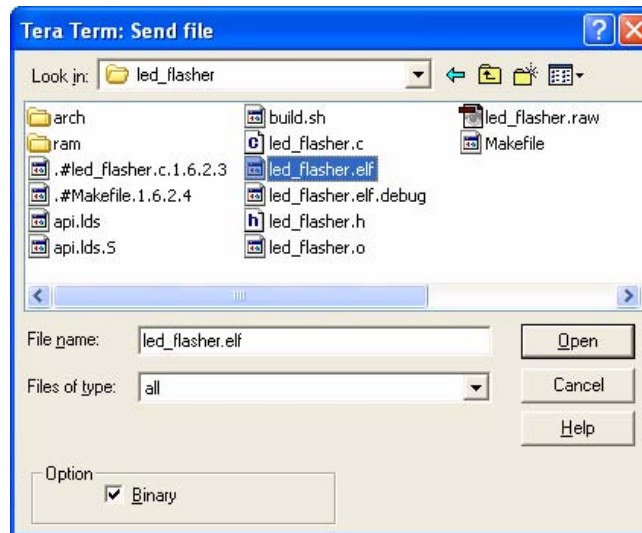   Zoom Sample Application. Please note which version you have downloaded.) See figure below.

Figure 4.5: Locate the Sample Application

8.   Select your sample application file and click 'Open.' The image will download to the Zoom
     ColdFire SDK Development Kit.

9.   Now the sample application is ready to run. At the 'losh>' prompt, type 'jump' to run the
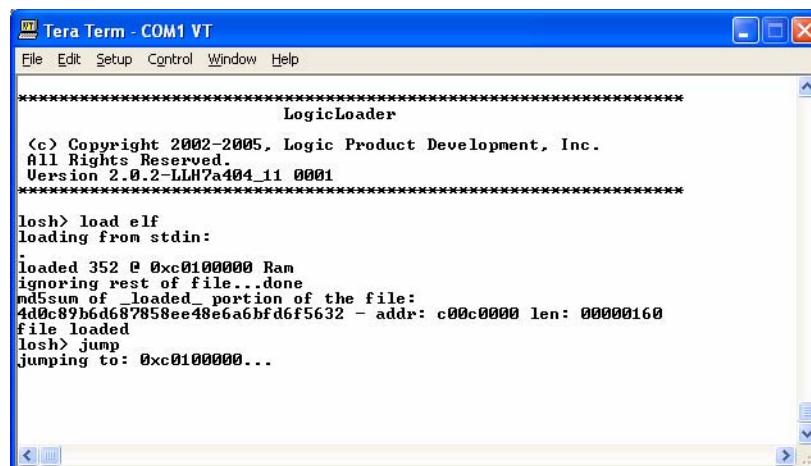   application. See figure below.

Figure 4.6: 'LED Flasher' Sample Program Screen

The sample application will run on the Zoom ColdFire SDK Development Kit. This application blinks
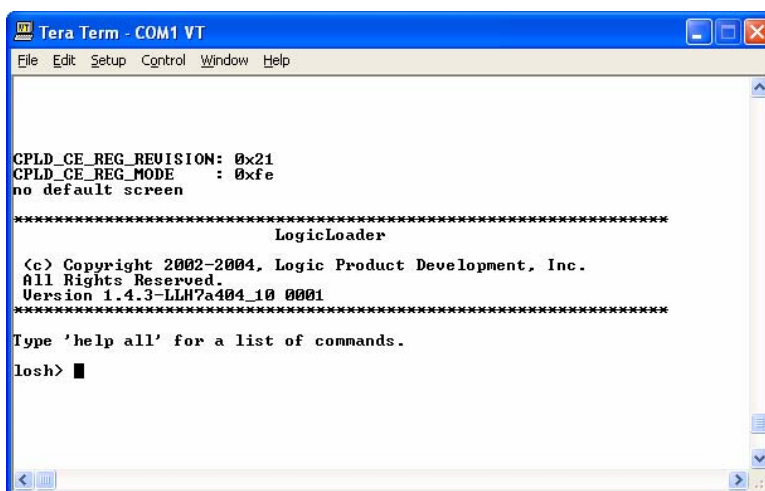LED1 on the Zoom ColdFire SDK baseboard until you reset the kit.

5   Download LogicLoader

5.1   Objective

The objective of this section is to download a new version of the LogicLoader (bootloader/firmware-monitor) to the Zoom ColdFire SDK Development Kit.

Background Information:

■ Logic Product Development MCF5329/73 Fire Engines come with the LogicLoader environment loaded into the flash memory resident on the platform. LogicLoader is capable of booting many different kinds of programs and operating systems. For further documentation, please refer to the *LogicLoader User's Manual*.

■ The most current version of LogicLoader for your Fire Engine can be downloaded from Logic's product downloads page at http://www.logicpd.com/auth/.

■ LogicLoader prints version information at the top of the menu as displayed in the figure below. If the LogicLoader menu is not currently visible, the LogicLoader 'info' command may be used, with no parameters, to display the current version information.

Figure 5.1: Type LogicLoader's 'info' command at the losh> prompt

Please use the steps below to update LogicLoader if you do not have the latest version posted on Logic's downloads site.

5.2   Prerequisites

■ A recent version of Internet Explorer, Firefox, or an FTP program
■ Tera Term installed and running
■ Zoom ColdFire SDK Development Kit up and running
■ Zoom ColdFire SDK Development Kit connected to development computer via null modem serial cable

5.3   Procedure

1. Access Logic's download site at http://www.logicpd.com/auth/ and enter your username and password. (If you have not registered your product—or do not have your registration information—please register at http://www.logicpd.com/auth/. You will receive an e-mail with your new username and password. Use this information to complete this step.)

2. Locate the most recent version of LogicLoader (under the "LogicLoader Bootloader/Monitor" heading) and download it to your hard drive.

3. Next, open a Tera Term shell. Select 'Setup' and click 'Serial port' in order to verify that Tera Term is configured correctly. Verify the following serial port settings: 'port' is the current active port, 'baud-rate' is 115200, 'data' is 8-bit, 'parity' is none, 'stop' is 1-bit, and 'flow control' is none. See figure below.
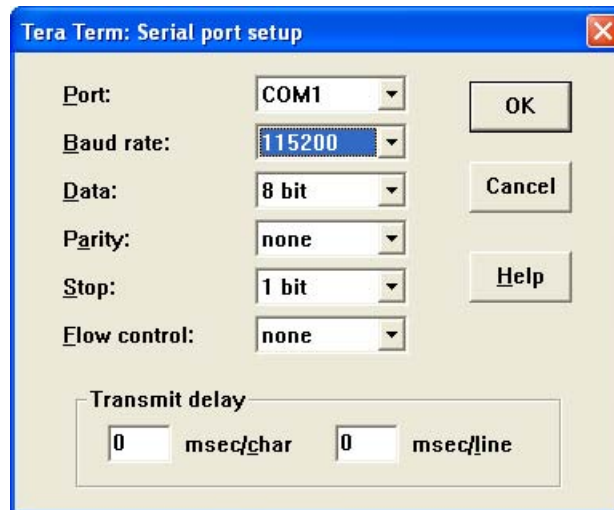

Figure 5.2: Serial Port Settings
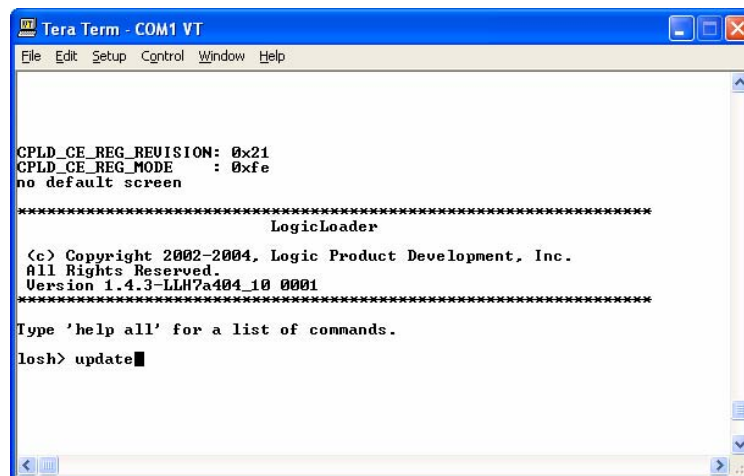
4. Type the 'update' command.

Figure 5.3: Type the 'update' command

5. Send the new version over the serial port. Select 'File' and click 'Send file' to send the new LogicLoader to your development kit. Locate and select the LogicLoader file you downloaded to your hard drive from Logic's website in Step 2. Also, verify that the 'Binary' option is selected. Then click 'Open' to download the new LogicLoader.
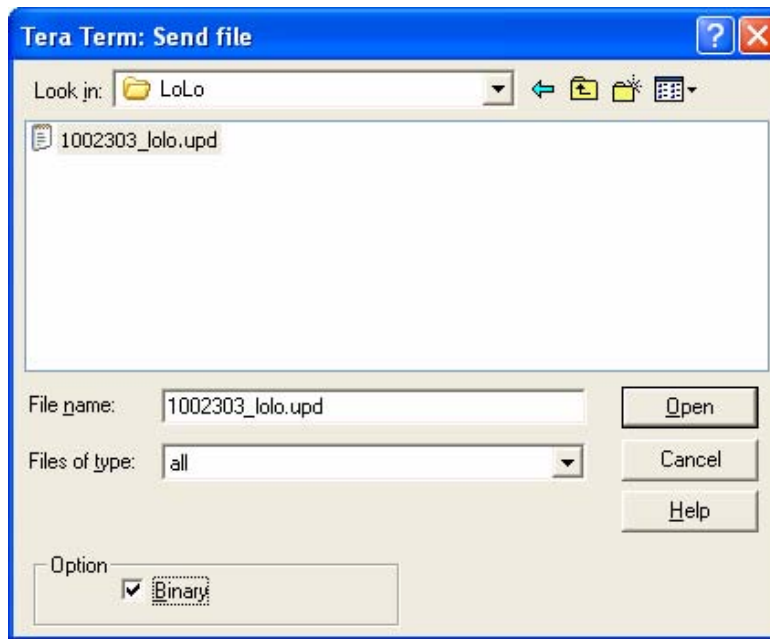
Figure 5.4: Send new version over the serial port

6.   Verify that the download was successful.
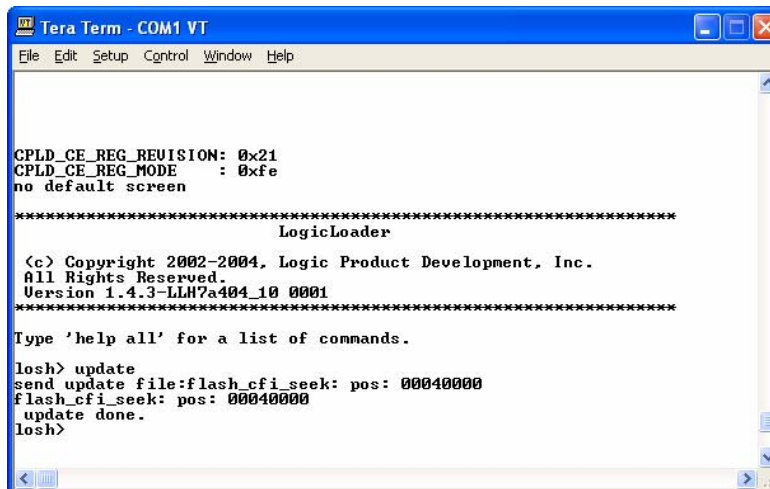

Figure 5.5: Verify that the download was successful

7.   Reset the development kit and verify the new LogicLoader version number.

6   Restore LogicLoader: Preliminary Steps

6.1   Objective

The intention of this section is to describe the preliminary steps necessary to restore LogicLoader if your Zoom ColdFire SDK Development Kit **will not boot up** at the Tera Term window. Because each BDM emulator operates differently and requires unique instructions, the following procedure is only meant to provide preliminary steps for restoring LogicLoader.

Background Information:

■   This section is only applicable if your Zoom ColdFire SDK Development Kit will not boot up at the Tera Term window.
■   In order to restore LogicLoader to your system, you must have the most recent version of LogicLoader downloaded to your hard drive. You also must have a BDM emulator that functions with your particular Zoom ColdFire SDK Development Kit.

6.2   Prerequisites

■   A recent version of Internet Explorer, Firefox, or an FTP program
■   Tera Term installed and running
■   Zoom ColdFire SDK Development Kit connected to development computer via null modem serial cable
■   BDM debugger

6.3   Procedure

1.   Access Logic's download site at http://www.logicpd.com/auth/ and enter your username and password. (If you have not registered your product—or do not have your registration information—please register at http://www.logicpd.com/auth/. You will receive an e-mail with your new username and password. Use this information to complete this step.)

2.   Locate the most recent version of LogicLoader on Logic's website and download it to your hard drive, as described in Section 5, above.

3.   Use a BDM interface device and software (such as Freescale's CF Flasher, available for download from http://www.freescale.com) that functions with your Fire Engine to restore LogicLoader to your Zoom ColdFire SDK Development Kit. Follow any additional instructions included with the BDM interface device and software you are using in order to properly interface with development kit. Contact Logic's Support Services if you need further information.

7   Warranty Statement

Refer to the warranty card enclosed with the Development Kit.

LOGIC

embedded product solutions

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