:: ColdFire SDK ::

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ZOOM ColdFire SDK
Quickstart Guide

# We fast forward the evolution of new products.

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# 1 Introduction

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 Freescale™ 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 Zoom ColdFire SDK Development Kit Features

**Common Features**

- +Fire Engine[1]
  - +Included—32 MB DDR SDRAM, 2 MB NOR flash, 16 MB NAND flash, Ethernet, audio, touch[2]
- +LCD Display Connector[2]
  - +Integrated LCD, touch, and backlight connector for Zoom Display Kits
- +Audio Stereo
  - +Input and output jacks
- +PC Card Expansion
  - +CompactFlash® Type I card (memory-mode only)
- +Serial Port
  - +RS-232 debug serial port
- +Expansion Headers
  - +Access to all Fire Engine signals
  - +Standard 100 mil pitch on 100 mil grid
- +CAN 2.0B
  - +One port configurable as CAN or a second serial[2]
- +USB
  - +One USB 2.0 full/low-speed host
  - +One USB 2.0 full/low-speed device
- +Network Support
  - +One RJ45 Ethernet jack connector with magnetics (application/debug)

**Cables**

- +Serial cable (null-modem)
- +5 volt power supply with power adapters
- +BDM adapter (USB version)
- +USB cable
- +Ethernet crossover cable

1. The MCF5329/73-10 Fire Engine is not compatible with Logic's Zoom Starter Development Kit (SDK) baseboard.
2. Only available with the MCF5329-10 Fire Engine.

### Software

+µClinux™ Board Support Packages (BSPs) are available from Freescale™
+LogicLoader™ (bootloader/monitor) installed in the Fire Engine flash
+dBUG ROM monitor installed in the Fire Engine flash
+Third-party development tools and operating system software wrapped in individual CDs

### Application Development Tools

+Cygwin, Tera Term, and GNU Cross Development Toolchain
+CodeWarrior™ Special Edition available from Freescale

### Mechanical

+102 mm wide x 152 mm long x 16.8 mm high

# 2 Getting Started

## 2.1 Unpacking the System

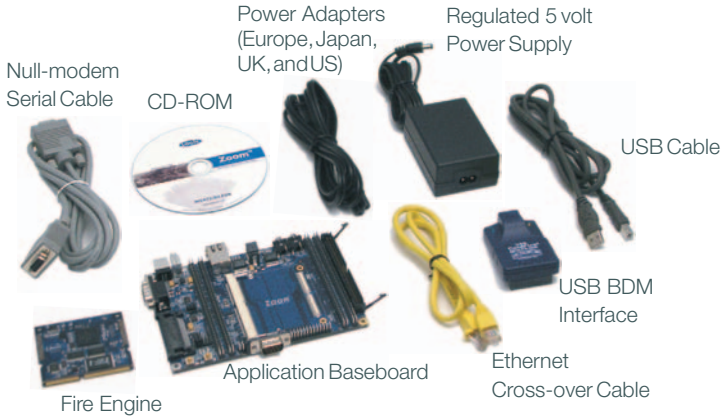
The Zoom ColdFire SDK Development Kit is comprised of the following items:

+Application baseboard
+System on Module Fire Engine
+CD-ROM (see "CD-ROM Content Highlights" Section)
+Null-modem serial cable
+BDM interface (USB version)
+USB cable
+Ethernet crossover cable
+5 volt power supply with power adapters (Europe, Japan, UK, and US)
+End user license agreement
+Warranty card
+QuickStart Guide
+Freescale TIC card

**Note:** Avoid touching the MOS devices. Static discharge can and will damage these devices.

Once you have verified that all the items are present, remove the board from its protective jacket and anti-static bag. Check the board for any visible damage and ensure that there are no broken, damaged, or missing parts.

**Figure 2.1 – Kit Contents**



## 2.2 CD-ROM Content Highlights

**Product Documentation**

+Fire Engine and Zoom ColdFire SDK product briefs
+Bill of Materials (.pdf format) for Fire Engine and application baseboard[1]
+Schematics (.pdf format) for Fire Engine and application baseboard[1]
+Fire Engine Hardware Specification
+Zoom ColdFire SDK Development Kit User's Manual
+LogicLoader User's Manual
+LogicLoader User's Manual Addendum[1]
+MCF5329/73 Reference Manuals available for download from Freescale's website http://www.freescale.com/coldfire

**Software Development Tools (Refer to each tool's readme file for instructions)**

+Tera Term
+Cygwin[1]
+GNU cross development toolchain[1]
+dBUG ROM monitor
+CF Flasher is available for download from http://www.freescale.com/coldfire

**References, Resources, and Support**

+FAQ, Technical Discussion Group
+How to get technical support (Ask a Question)
+Support Packages

**Product Registration & Software Downloads**

## 2.3 Development PC Requirements

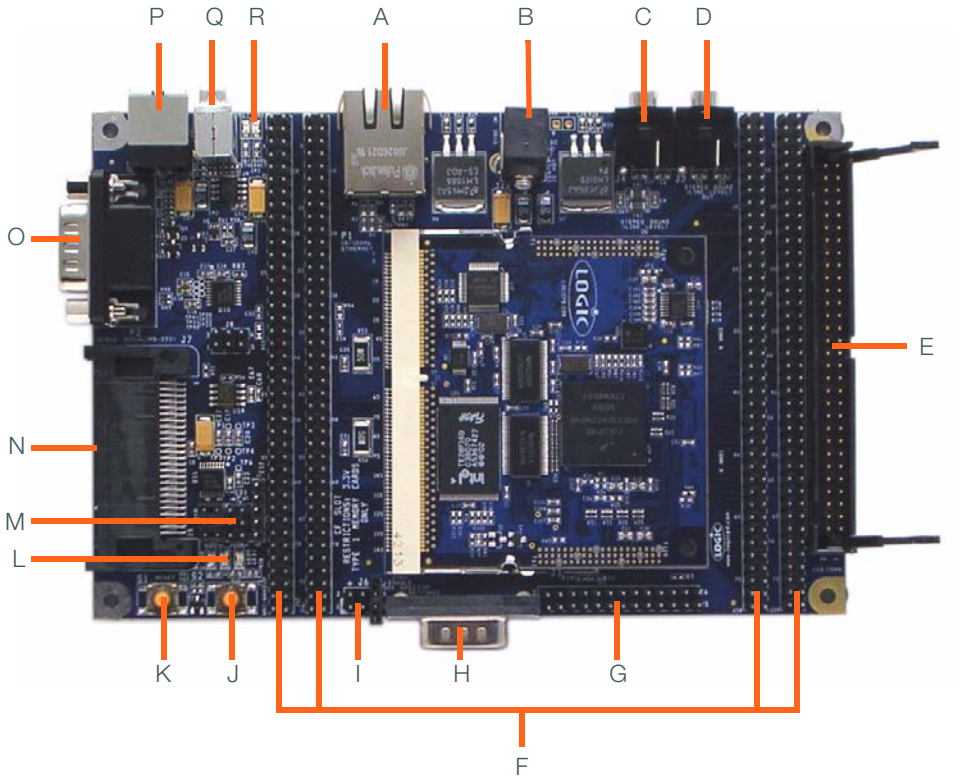
**General**

+Windows® 2000 or later host PC with access to the Internet
+Pentium® processor or equivalent
+64 MB RAM minimum
+1 GB free hard disk space
+115200 baud capable RS-232 port (COM port)
+Tera Term serial emulation program (or equivalent)
+USB port to utilize BDM interface

1. Available as downloads from Logic's website. Please create an account to access and receive notification of the latest updates to these documents: https://www.logicpd.com/auth/.

## 2.4 Baseboard Connection Diagram

**Figure 2.2 – Connection Diagram for the Baseboard**



### Connection Diagram Details

A – RJ45 Ethernet jack with magnetics
B – Power-in from 5V regulated power supply - use appropriate power adapter
C – Stereo input—3.5mm diameter jack
D – Stereo output—3.5mm diameter jack
E – 60-pin integrated LCD, touch, and backlight connector power[1]
F – Expansion headers—access to all the Fire Engine signals via 100 mil pitch header
G – BDM JTAG header
H – CAN[1]/UART header DB9
I – JTAG selector
J – Processor interrupt
K – System reset
L – User LEDs (power LED on left, LED0 in middle, and LED1 on right, in this view)
M – CAN[1]/UART header DB9 selector
N – CompactFlash Type 1 card (memory-mode only)
O – Serial port—115.2 kbps RS-232 debug serial port
P – USB function
Q – USB host
R – Ethernet LEDs (activity LED on left and link LED on right, in this view)

1. Integrated LCD and CAN interfaces only available on the MCF5329-10 Fire Engine.

# 3 QuickStart

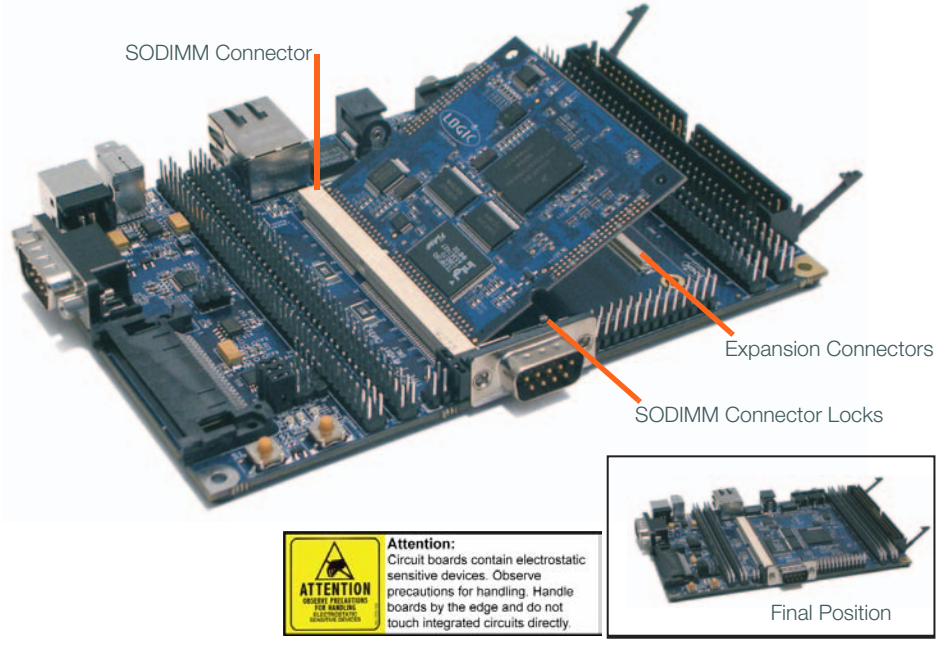
## 3.1 Inserting the Fire Engine into the Baseboard

Insert the Fire Engine connector into the SODIMM connector on the baseboard.

1. Firmly press the Fire Engine into the SODIMM connector until it is fully seated.
2. Press the Fire Engine down onto the baseboard expansion connectors.
3. Verify that the expansion connectors on the Fire Engine and baseboard have mated correctly and the SODIMM connector locks have locked with the Fire Engine down. To remove the Fire Engine, first pull up on expansion connectors to release them, then release the connector locks on both sides of the SODIMM connector and lift up on the non-SODIMM edge of the Fire Engine.

**Note:** Please refer to Logic's White Paper 318 *Card Engine Insertion and Extraction Procedure* for detailed directions on how to avoid damaging the Fire Engine when inserting and removing it from the baseboard.

**Figure 3.1 – Inserting the Fire Engine into the Baseboard**



## 3.2 Connecting the Baseboard to your PC

1. Connect the null-modem serial cable (supplied in the kit) to the serial port connector on the baseboard and to a COM port on the host PC. See Figure 3.2.
2. Confirm JTAG setting for use with your specific Fire Engine, as shown in Figure 3.3.

   **Note:** Do not enable the JTAG unless you intend to use the JTAG with an emulation tool.

3. Connect the regulated 5 volt power supply to the appropriate power adapter. Plug the power adapter into an electrical outlet and the 5 volt line output connector into the power connector on the baseboard.

**Figure 3.2 – Connecting the Baseboard to your PC**

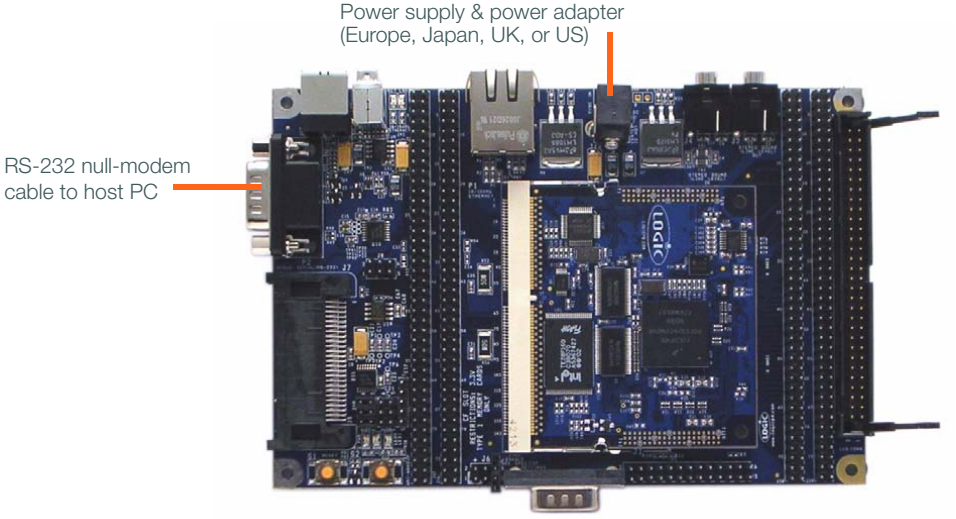
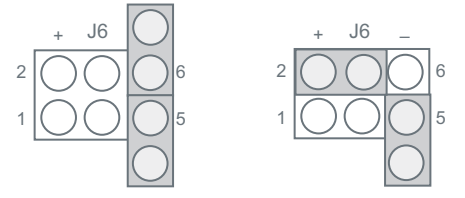



**Figure 3.3 – Baseboard JTAG Settings for MCF5329/73-10 Fire Engine**




Normal/BDM operation JTAG operation

# 4 Test Drive the Zoom ColdFire SDK Development Kit

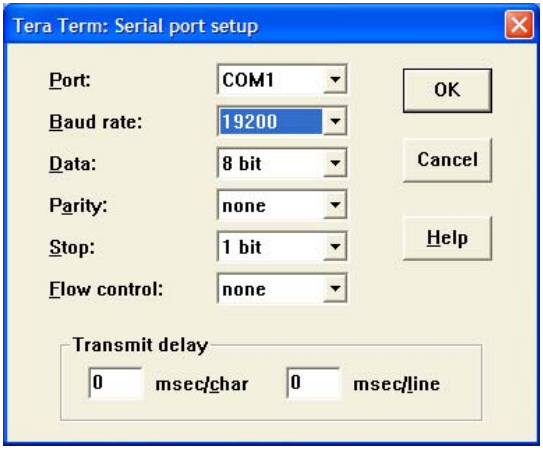
## 4.1 Terminal Emulation Installation

The Zoom ColdFire SDK Development Kit is designed to communicate with terminal emulation programs via the included null-modem serial cable, using the following settings: 19200 baud, 8-data-bits, no-parity, 1-stop-bit, and no-flow-control. The terminal emulation program must support binary transfers in order to download software to the kit.

Although Logic Product Development does not support any particular terminal emulation program, we suggest using Tera Term Pro for Windows® 2000 or Windows XP. Tera Term Pro is provided on the CD-ROM or can be downloaded for free from Logic's website at the following location: https://www.logicpd.com/auth/. Step-by-step installation instructions for Tera Term can be found in the *Zoom ColdFire SDK User's Manual*. Tera Term Pro is not available for Linux users. Logic Product Development does not guarantee or support any terminal emulation programs under Linux or Windows platforms.

Once the terminal emulation program has been installed, open a new serial port connection using the port where the null-modem serial cable is connected. For example, using Tera Term, set the 'baud-rate' to 19200, 'data' to 8-bit, 'parity' to none, 'stop' to 1-bit, and 'flow control' to none.

**Figure 4.1 – Tera Term: Serial Port Set-up Window**



## 4.2 Power-up the Development Kit

The Zoom ColdFire SDK Development Kit is shipped with both the Freescale and Logic bootloaders installed in resident flash. The Freescale 'dBUG' ROM monitor is the default bootloader. LogicLoader can be accessed via the dBUG ROM monitor, see Section 4.2.2.

LogicLoader provides the capability for loading operating systems and applications. In addition, it provides a full suite of commands for interfacing to the Fire Engine. These commands load operating systems, configure hardware platforms, bring up hardware, customize applications, perform tests, and manage in-field devices.

### 4.2.1dBUG ROM Monitor Power-up

When you start up your ColdFire SDK Development Kit in Tera Term, the dBUG ROM monitor will appear. The dBUG ROM monitor is programmed into the Fire Engine's boot flash device.

#### Accessing dBUG

Interface to dBUG via a terminal emulation program connected via a null-modem serial cable to the “Terminal” port of Fire Engine. Use the following default terminal settings: 19200 baud, 8-data-bits, 1-stop-bit, no-parity, and no-flow-control.

1. Start a terminal program on the host PC (e.g., Tera Term, HyperTerminal).
2. Connect a serial cable to the host PC and to the serial port on the baseboard.
3. Connect power to the Development Kit.
4. In the terminal program you should now see a dBUG screen presenting firmware version and the dBUG> prompt.

**Note:** If the dBUG monitor screen does not appear, please check Tera Term serial settings, all cable connections, board connections, and press system reset.

5. Logic recommends that you immediately increase the baud rate for faster downloads and for ease of interfacing to LogicLoader. To do so, enter the command 'set baud 115200' at the dBUG prompt. Next, adjust the baud rate on your terminal emulation program to 115200. Then press System Reset and you should see the startup screen that you saw in Step 4. Since the dBUG monitor program stores its settings in flash, the higher baud rate setting will remain in effect until the next time it is changed.

### 4.2.2LogicLoader (Bootloader/Monitor) Power-up

The Fire Engine is shipped with a version of LogicLoader (bootloader/monitor) programmed into the boot flash device at an offset of 0x0004_0000.

### Accessing LogicLoader

Interface to LogicLoader via a terminal emulation program connected via a null-modem serial cable to the “Terminal” port of Fire Engine (debug serial port on the baseboard). Use the following default terminal settings: 19200 baud, 8-data-bits, 1-stop-bit, no-parity, and no-flow-control.

1. Start a terminal program on the host PC (e.g., Tera Term, HyperTerminal).
2. Connect a serial cable to the host PC and to the serial port on the baseboard.
3. Connect power supply to the Development Kit.
4. **If you have not already done so, change the baud rate of dBUG to 115200 by following the steps outlined in Section 4.2.1, Step 5 (above).**
5. At the dBUG prompt enter the command 'go_lolo'. Press Enter.
6. In the terminal program you should now see a LogicLoader screen presenting text similar to that below.

```
*********************************************************************

                        LogicLoader

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 All Rights Reserved.

 Version 2.1.0-MCF5329_10 0001

*********************************************************************

 Type 'help all' for a list of commands.

 losh>
```

**Note:** In order to configure your Fire Engine to always boot directly to LogicLoader, download the LogicLoader .zip file found on the Logic website (https://www.logicpd.com/auth/) and install the LogicLoader file for address 0x0000_0000. Please see the “Release Notes” in the downloaded .zip file for more information.

## 4.3 Using the Development Kit with the P&E ColdFire BDM Interface

The Zoom ColdFire SDK Development Kit includes a ColdFire BDM (Background Debug Mode) Interface from P&E Microcomputer Systems that can be used with a variety of development tools. The installation and use of the BDM Interface may vary between different development tool vendors.

In order to use the BDM with a particular toolset, please refer to readme files included with each vendor's development tools for specific instructions.

The BDM interface should be plugged into the baseboard connector J3. Use the included USB cable to connect the BDM to your PC's USB port. Refer to the P&E Microcomputer Systems website (https://www.pemicro.com) for the latest information on configuring the BDM for use with your PC.

## 4.4 Sample Application

The Zoom ColdFire SDK Development Kit comes with a sample application that can be downloaded from the Logic website: https://www.logicpd.com/auth/. For instructions, see the *Zoom ColdFire SDK User's Manual* and the readme file that accompanies the downloaded sample application.

# 5 Jumper/Switch Functionality

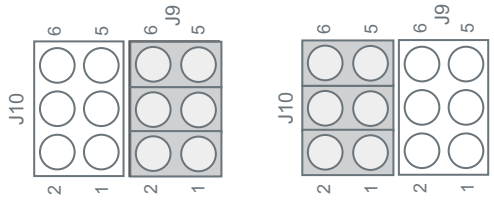
## 5.1 Jumper Settings for M5329EVB Development Kit

The following table describes the function of the jumpers on the MCF5329-10 Fire Engine. **CAN functionality is only available with the MCF5329-10 Fire Engine.**

**Table 5.1 – Jumper Switch Table**

| Jumper Settings | | Function |
|---|---|---|
| JP9 | Jmp 1–2<br>3–4<br>5–6 | When all pins of J9 have jumpers (and no jumpers are on J10), header DB9 can be used as a UART header. (See Figure 5.2, below.) |
| JP10 | Jmp 1–2<br>3–4<br>5–6 | When all pins of J10 have jumpers (and no jumpers are on J9), header DB9 can be used as a CAN header. (See Figure 5.2, below.) |
| JP8 | Jmp 4–6 | CAN Port 0 non-terminated data line. (See Figure 5.3, below.) |
| | Jmp 3–5 | CAN Port 0 terminated data line. (See Figure 5.3, below.) |
| J6 | Jmp 2-4<br>5 | JTAG (See Figure 3.3, earlier in this document.) |

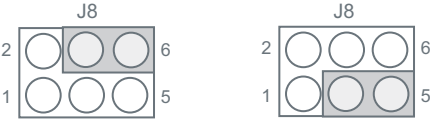
**Figure 5.2 – Jumper Settings for DB9 Header**




Header DB9 as UART header

Header DB9 as CAN header

**Figure 5.3 – Jumper Settings for CAN**




CAN port 0 non-terminated data line

CAN port 0 terminated data line

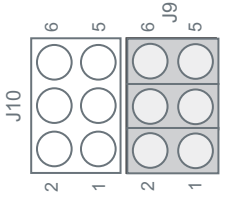
## 5.2 Jumper Settings for M5373EVB Development Kit

The following table describes the function of the jumpers on the MCF5373-10 Fire Engine. **CAN functionality is only available with the MCF5329-10 Fire Engine.**

**Table 5.4 – Jumper Switch Table**

| Jumper Settings | | Function |
|---|---|---|
| J9 | Jmp 1–2<br>3–4<br>5–6 | When all pins of J9 have jumpers (and no jumpers are on J10), header DB9 can be used as a UART header. (See Figure 5.3, below.)<br>**Note:** The SSI port is muxed with UARTB. Only one port can be used at a time. |
| J6 | Jmp 2–4<br>5 | JTAG (See Figure 3.3, earlier in this document.) |

**Figure 5.5 – Jumper Settings for DB9 Header**




Header DB9 as UART header

# 6 Product Notices

The Zoom ColdFire SDK Development Kit being sold by Logic and Freescale is intended for **ENGINEERING DEVELOPMENT OR EVALUATION PURPOSES ONLY**. As such, the goods being provided may not be complete in terms of required design, marketing, and/or manufacturing related protective considerations, including product safety measures typically found in the end product incorporating the goods. The user assumes all responsibility and liability for proper and safe handling of the Zoom ColdFire SDK Development Kit.

## ESD

Due to the open construction of the product, it is the user's responsibility to take any and all appropriate precautions with regard to electrostatic discharge. The various debug header pins are tied to actual lines on the Fire Engine and baseboard. Some of them will reset the board if they are touched directly. Be aware of this situation. Logic's warranty does not cover products damaged by ESD.

## Approvals

This product is compliant with radiated emissions standard EN55022 level A, and may be operated in industrial areas as defined by national regulations. This product may require a special permit for operation at other locations. Cases of interference at such locations need to be handled according to the requirements of the national EMC legislation.

# 7 Product Registration

In order to access the latest revision of this manual, product change notifications, application notes, schematics, and hardware specifications, please register your product online with a recent version of Internet Explorer or Firefox.

In addition, you will be notified when Logic releases updates to your product.

Go to the Log In section on the Logic website (http://www.logicpd.com/support/) and create a user account. You will receive an e-mail with your new username and password, along with additional instructions for logging in. At this point, log in and complete the product registration form to gain access to product download files.

# 8 Ordering Information

Zoom ColdFire SDK Development Kits, Fire Engines, and Display Kits are available direct from Freescale or their worldwide distributors.

## 8.1 Zoom ColdFire SDK Development Kits

+M5329EVBE includes the M5329BFEE Fire Engine
+M5373EVB includes the MCF5373 Fire Engine

## 8.2 MCF5329-10 Fire Engine Configurations

| Freescale P/N | DDR Memory | NOR Flash | NAND Flash | Touch | Audio | Ethernet |
|---|---|---|---|---|---|---|
| M5329AFEE | 32 MB | 2 MB | 0 | Y | Y | Y |
| M5329BFEE | 32 MB | 2 MB | 16 MB | Y | Y | Y |

## 8.3 MCF5373-10 Fire Engine Configurations

| Freescale Processor | DDR Memory | NOR Flash | NAND Flash | Touch | Audio | Ethernet |
|---|---|---|---|---|---|---|
| MCF5373 | 32 MB | 2 MB | 16 MB | -- | Y | Y |

**Important Notes:**

1. The MCF5373-10 Fire Engine does not support an LCD interface, touch, or CAN.
2. The MCF5373-10 Fire Engine is only available as part of the M5373EVB Development Kit. For production volumes, please use an MCF5329-10 Fire Engine.

# 9 Zoom Display Kits

Display Kits are ideal for embedded solutions requiring a graphical user interface. Logic offers a variety of display sizes (e.g., 3.6", 6.4", 12.1") and resolutions (QVGA, VGA, SVGA). Zoom Display Kits are sold separately. Please verify the selected development board/processor supports the Display Kits. Contact Logic for other display requirements. Visit Logic's website at http://www.logicpd.com/eps/displaykits/ for a complete listing of Display Kits.

## 9.1 Zoom Display Kits Specification Table

Logic offers the following Display Kits for use with Development Kits. Visit Logic's website for current information on Zoom Display Kits.

**Note:** The MCF5373-10 Fire Engine does not support an LCD interface.

| Logic Model | Sharp LCD P/N | Display Size | Display Format | LCD Interface | Key Features |
|---|---|---|---|---|---|
| LCD-3.5-QVGA-20 | LQ035Q7DB02 | 3.5" | QVGA 240 x 320 | TFT | Color, transreflective w/HRTFT ASIC |
| LCD-3.6-QVGA-10(R) | LQ036Q1DA01 | 3.6" | QVGA 320 x 240 | TFT | Color, transmissive w/HRTFT ASIC |
| LCD-5.7-QVGA-10 | LQ057Q3DC02 | 5.7" | QVGA 320 x 240 | TFT | Color, transmissive |
| LCD-6.4-VGA-10(R) | LQ64D343 | 6.4" | VGA 640 x 480 | TFT | Color, transmissive |
| LCD-10.4-VGA-10 | LQ10D368 | 10.4" | VGA 640 x 480 | TFT | Color, transmissive |
| LCD-12.1-SVGA-10 | LQ121S1DG31 | 12.1" | SVGA 800 x 600 | TFT | Color, transmissive |

**Important Notices:**

+Please verify the selected processor supports the Display Kits.
+(R) An R in the model number denotes a RoHS compliant configuration.
+Please contact Logic for other display requirements.

# 10 Support

The Zoom ColdFire SDK Development Kit is a Freescale part number. Technical support should be handled as follows:

1. First, contact your local Freescale sales office if there are any issues or questions.
2. Second, use Freescale's Technical Information Center. See enclosed information card in box.
3. Third, Logic has created an FAQ and Technical Discussion Group section on the Logic website to make it easier for our customers to find answers to their questions. For additional technical support, please see support packages below.

**What support comes with the Zoom ColdFire SDK Development Kit?**

+Freescale local FAEs and online support forum at http://www.freescale.com
+Unlimited access to Logic's Technical Discussion Group and FAQs available at http://www.logicpd.com/support/

**What is supported in the Zoom ColdFire SDK Development Kit?**

+Zoom ColdFire SDK Development Kit hardware
+LogicLoader (bootloader/monitor)

**What does Logic Product Development NOT support?**

See respective third-party solutions for technical support.

+Freescale's dBUG ROM monitor
+GNU cross development toolchain (http://www.gnu.org/)
+Tera Term
+Cygwin (http://www.cygwin.com/)
+IC components (contact appropriate IC vendor)
+Third-party development tools and operating system software

**Additional Support Services Available for Purchase**

Support Packages for Dedicated Technical Support

Visit http://www.logicpd.com/support/ for complete descriptions, price, and purchase.

+Gold Support Package
+Silver Support Package
+Bronze Support Package
+Hotline Incident

Product Development Services

Logic offers product development and manufacturing services from initial product concept and design to volume production and fulfillment.

+Industrial Design
+Mechanical Engineering
+Electrical Engineering
+Systems & Software Engineering
+PCB Design & Layout
+FPGA/DSP Design
+Manufacturing Services

## 10.1 Frequently Asked Questions

Visit http://www.logicpd.com/support/ for a complete list of FAQs for the Zoom ColdFire SDK Development Kit.

## 10.2 Technical Discussion Group

Visit http://www.logicpd.com/support/ to join our Technical Discussion Group, ask support questions, and share valuable information with other designers.

## 10.3 Warranty Statement

Refer to warranty card enclosed with the Zoom ColdFire SDK Development Kit.

# Revision History

| REV | EDITOR | REVISION DESCRIPTION | APPROVAL | DATE |
|---|---|---|---|---|
| A<br>PN 1003697 | Jed Anderson | Initial Release | ELH | 12/02/05 |
| B<br>PN 1003697 | Jed Anderson | Added Section 4.2.1; Updated all references to indicate dBUG's inclusion on flash; Updated Section 2.2 for tools that are only available via download; Updated configuration specifics in Section 8.3 | JCA | 02/08/06 |
| C<br>PN 1006312 | Jed Anderson | Added notes for features only available on the MCF5329-10; Updated Section 2.2 for documents only available via download; Added note about WP 318 in Section 3.1; Split Section 5 into two sections; Corrected DDR memory configurations in Section 8.2 and Section 8.3; Added Important Notes to Section 8.3; General grammatical edits; Reformatted for new layout design; Changed product PNs for RoHS compliance; General grammatical changes; Corrected M5373EVB PN. | ELH | 10/13/06 |

Please check www.logicpd.com for the latest revision of this manual, product change notifications, and additional application notes.

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Logic PN: 1006312