ZOOM

REVISION HISTORY

REV	EDITOR	REVISION DESCRIPTION	LogicLoader Version	APPROVAL	DATE
A	Eric Nelson, Jed Anderson	Release; Corrected "Block Length" error in 1.6.2	2.0.5	SS	3/2/06
B	Jed Anderson	Added content for MCF5373-10; Corrected LCD PN for the 12.1" display; Added hyperlinks for documents where mentioned	MCF5329-10: ver. 2.1.1 MCF5373-10: ver. 2.3.2	EN	2/15/07

Table of Contents

1   MCF5329/73-10 Memory Map Diagrams

1.1   SDRAM Configuration

The MCF5329-10 and MCF5373-10 Fire Engines are designed to accommodate SDRAM/DDRAM of different sizes. Under LogicLoader's default configuration, all memory installed is accessible.

For further documentation, please refer to the Freescale MCF5329 or MCF5373L Reference Manual for more information on the SDRAM controller.

Note: The MCF5373-10 Fire Engine is built with the MCF5373L microprocessor.

1.2   MMU Remap: Physical Memory to Logical Memory

The MCF5329/73L microprocessor does not have a memory management unit. Remapping of physical memory is not available on this engine.

1.3   Physical Hardware Memory Map

MCF5329/73-10 Logical Memory Map during execution
of LogicLoader for 64M SDRAM

Address	Region
0xFFFFFFFF	Not Used
0xFD000000	Reserved
0xFC000000	Not Used
0xED000000	Reserved
0xEC000000	Not Used
0x80008000	Internal Static Memory (32kB on-chip SRAM)
0x80000000	Not Used
0x44000000	DDR RAM
0x40000000	Not Used
0x30200000	CompactFlash and Hardware Latch
0x30000000	Not Used
0x10010000	NAND Flash
0x10000000	Not Used
0x00800000	Flash Memory
0x00000000	

Figure 1.1: MCF5329/73-10 Hardware Memory Map

1.4   LogicLoader and the Configuration Block in Flash Memory

The Zoom™ ColdFire SDK Development Kits come with both dBUG and LogicLoader programmed into the Fire Engine's resident boot flash array (see figures 1.2 and 1.3 below).

Please note that Fire Engines included with Zoom ColdFire SDK Development Kits ship with dBUG starting at block zero of boot flash, while production Fire Engines will ship with LogicLoader at block zero of boot flash. The optional Configuration Block may be added with the 'config CREATE' command.

TOP

Open for application, data, YAFFS, or operating system storage.

0x00090000

Location of optional Configuration Block.

0x00080000

LogicLoader is resident in flash memory starting at address 0x40000.

0x00040000

dBUG is resident in flash memory starting at address 0x0.

0x00000000
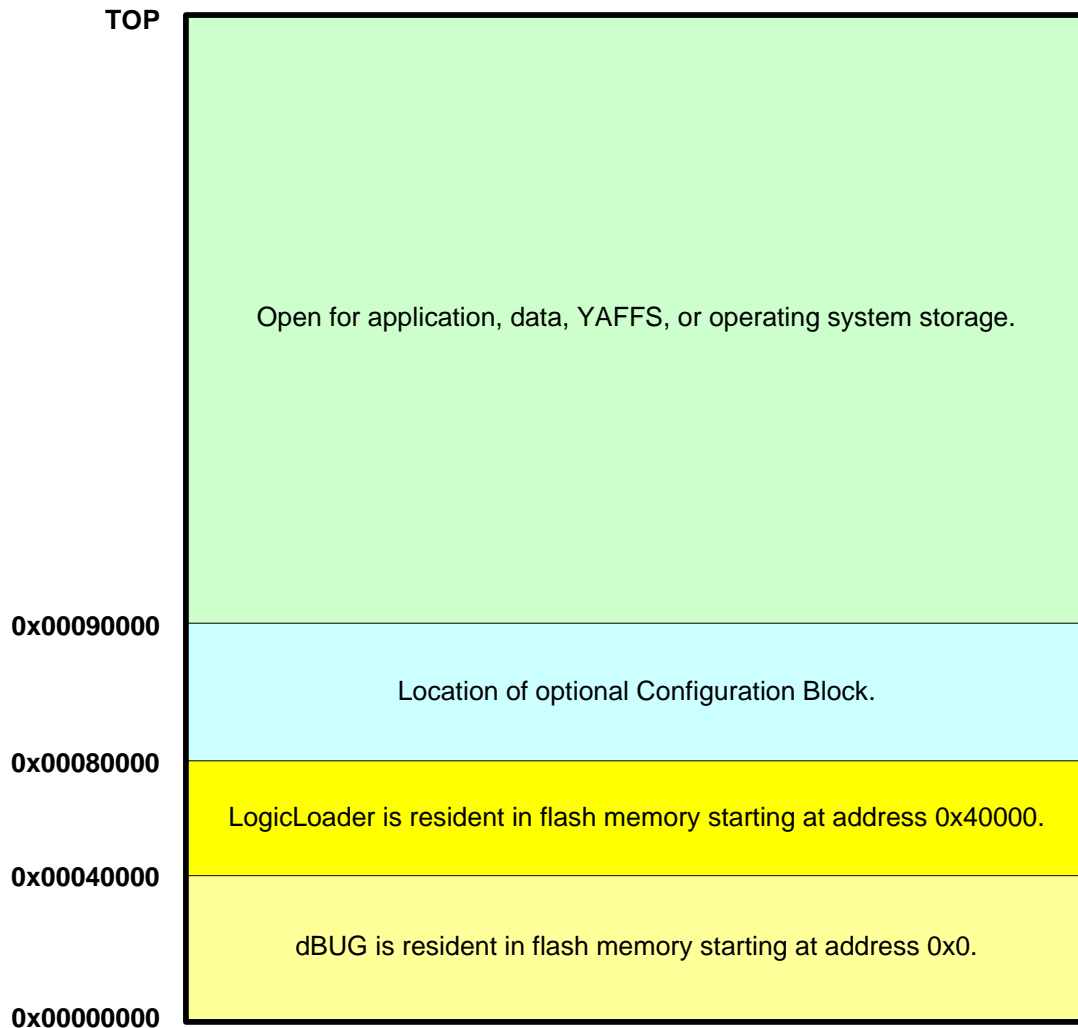
Figure 1.2: Flash Memory Layout With dBUG
(as shipped with ColdFire Development Kits)

TOP

Open for application, data, YAFFS, or operating system storage.

0x00050000

Location of optional Configuration Block.

0x00040000

LogicLoader is resident in flash memory starting at address 0x0.

0x00000000
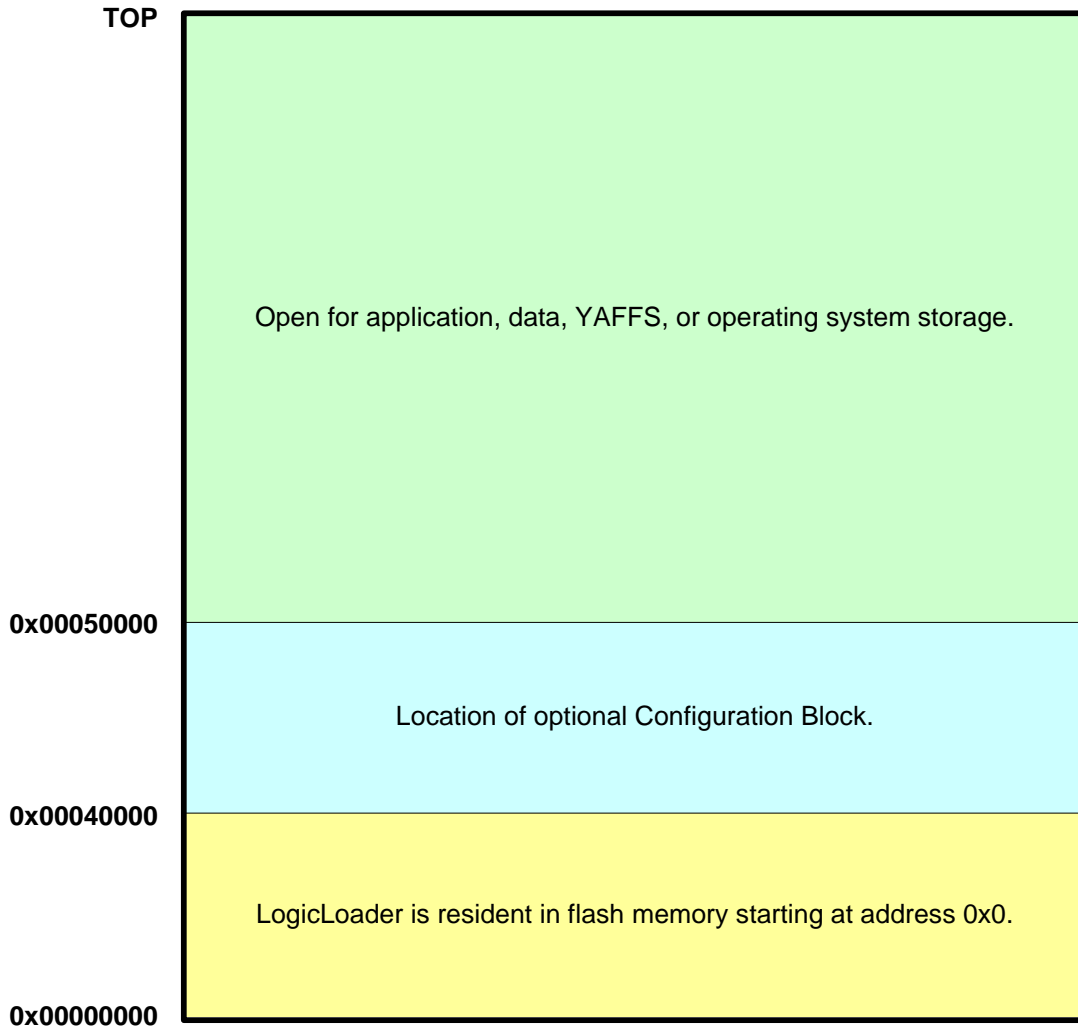
Figure 1.3: Flash Memory Layout Without dBUG
(as shipped with Production Fire Engines)

1.5   LogicLoader's Location in RAM

Both Freescale's dBUG monitor and Logic's LogicLoader bootloader execute out of SDRAM. The diagrams below depict run time location of LogicLoader. You can use the dBUG command 'mmap' to find out information about its execution environment. Refer to the *Zoom ColdFire SDK QuickStart Guide* for the steps required to start LogicLoader from the dBUG prompt.
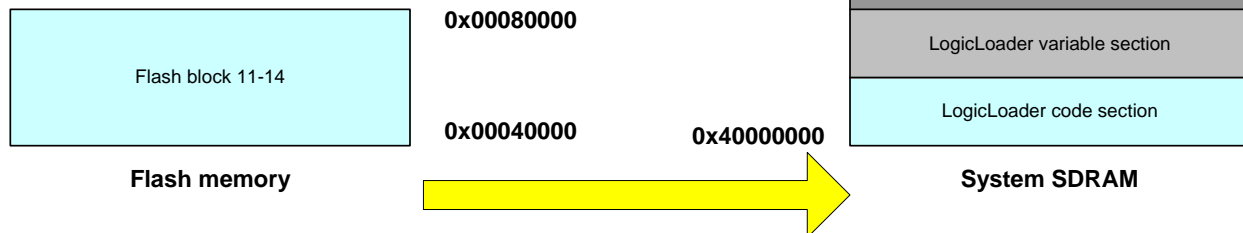.

Run-time location of LogicLoader:

At reset, LogicLoader relocates itself from flash memory to system SDRAM. LogicLoader then spends the remainder of its run-time executing out of system SDRAM.

Note: the size of LogicLoader's code and variable sections are estimates. This size depends on the exact features built into the LogicLoader image and may change with new releases. The location of LogicLoader's stack is dynamically determined at run-time based on the size of the code and variable section. Therefore, the location of the stack is provided as an estimate in this diagram.

Figure 1.4: LogicLoader RAM Execution Environment (with dBUG in Flash)

Run-time location of LogicLoader:

At reset, LogicLoader relocates itself from flash memory to system SDRAM. LogicLoader then spends the remainder of its run-time executing out of system SDRAM.

Note: the size of LogicLoader's code and variable sections are estimates. This size depends on the exact features built into the LogicLoader image and may change with new releases. The location of LogicLoader's stack is dynamically determined at run-time based on the size of the code and variable section. Therefore, the location of the stack is provided as an estimate in this diagram.
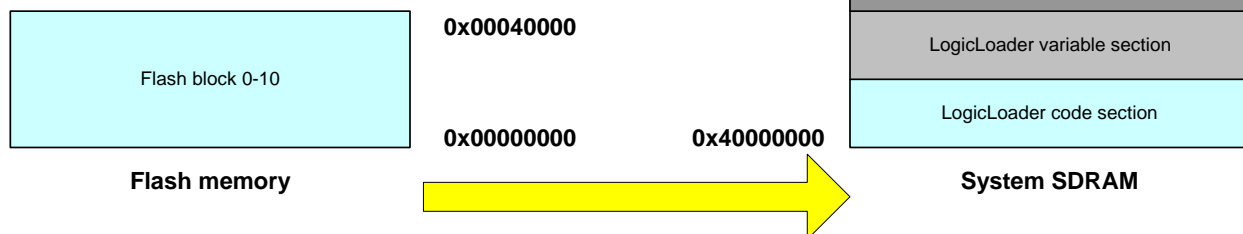
Figure 1.5: LogicLoader RAM Execution Environment (without dBUG in Flash)

1.6   NAND Flash Support

The MCF5329/73-10 supports two types of flash memory: NOR and NAND. NOR flash is a contiguous memory device that is typically used for boot time code. NAND flash is a block device commonly used for bulk storage. Since NAND flash is a block device, a program typically cannot be executed directly out of NAND. Also, reading and writing to the device is more complicated than to a NOR flash device. This is where LogicLoader's implementation of YAFFS is most useful.

1.6.1   YAFFS Support of NAND Flash

YAFFS will manage where data is stored and read from within the NAND device, while also managing the bad block areas of the device. Most manufacturers of NAND devices only guarantee about 98% of the blocks to be free of bad bits. YAFFS will keep track of the bad blocks and replace them with blocks marked good. Also, bad blocks can develop over the lifetime of the device; YAFFS will detect and relocate those blocks as well.

1.6.2   Creating a YAFFS Partition in NAND Flash

LogicLoader uses two commands to configure the NAND device with YAFFS. The "add-yaffs" command and the "mount" command. See the *LogicLoader Command Description Manual* for information on how to use these commands. When using the "add-yaffs" command for a NAND device, the <start> and <length> fields refer to the start block and block length of the YAFFS partition. To determine the total number of blocks in the NAND device, type "info mem" at the LogicLoader command prompt.

2   MCF5329/73-10 LogicLoader Functionality

2.1   Supported Hardware Peripherals

The table below lists MCF5329/73-10-specific peripherals supported by LogicLoader.

Hardware Peripheral	Support (Y/N)	Details
Audio	N	--
Display:	Y/N*	Supported on the MCF5329-10; Not supported on the MCF5373-10; LogicLoader supports 8 and 16 bits per pixel; custom displays can be supported by using the configuration block
LCD-3.5-QVGA-10	N	Display kit with LCD part number LQ035Q7DB02
LCD-3.5-QVGA-20	N	Display kit with LCD part number LQ035Q7DB02
LCD-3.6-QVGA-10	Y/N*	Display kit with LCD part number LQ036Q1DA01
LCD-5.7-QVGA-10	Y/N*	Display kit with LCD part number LQ057Q3DC02
LCD-6.4-VGA-10	Y/N*	Display kit with LCD part number LQ64D343
LCD-10.4-VGA-10	Y/N*	Display kit with LCD part number LQ10D368
LCD-12.1-SVGA-10	Y/N*	Display kit with LCD part number LQ121S1DG41
Ethernet	Y	10/100MBit support; MAC address stored in the config. block
NOR Flash Memory	Y	--
NAND Flash Memory	Y	Using YAFFS
IrDA	N	--
Memory Card Expansion:	Y	CompactFlash memory cards are only supported. 16 -> 256 MB CompactFlash memory cards have been verified.
IO Mode PCMCIA/ CF	N	--
Memory Mode CF	Y	Recommended: SanDisk, Toshiba, PNY
SD/MMC	N	--
Smart Card	N	--
Processor:		
Cache	Y	Unified instruction & data cache
Clock	Y	MCF5329-10: 240 MHz CPU / 80 MHz Bus MCF5373-10: 240 MHz CPU / 80 MHz Bus
Power Management	N	--
MMU	N	MCF5329/73L CPU does not have a memory management unit.
PS/2	N	--
RTC	N	--
SDRAM	Y	16, 32, or 64 MB DDR mode
SSP	N	--
Serial Port:		
UARTA	Y	115200 baud standard, RTS flow only; 2400 to 460800 baud can be supported by using the configuration block
UARTB	Y	--
UARTC	Y	--
CAN	Y/N*	Supported on the MCF5329-10; Not supported on the MCF5373-10
Touch Screen	N	--
USB Host	N	--
USB OTG	N	--
Misc:		
GPIO	Y	Use 'w' and 'x' commands to access data direction and data registers to control GPIO lines per register description in Hardware Specification document.
Status	Y	Toggles to show system "heartbeat"
Mode Line 2	Y	QuickBoot Feature details: LogicLoader will typically pause 500 mS to look for the 'q' key on UARTA. However, if the Mode Line 2 (uP_MODE2) is grounded, this 500 mS timeout is skipped and the boot script runs immediately.

*Supported on the MCF5329-10 and **not** supported on the MCF5373-10.
**Note: If a peripheral is not mentioned on this list, it should be assumed there is no native support for it in LogicLoader besides the ability to read and write from registers.*

3   Disclaimer

Logic strives to provide the most up to date information. However, the list of supported features in this document is partial and subject to change.

The "Supported Hardware Peripherals" list was created to describe the supported features for fully populated standard Fire Engine builds. If the Fire Engine in use is a custom build or has some hardware feature omitted, the commands related to those hardware features may not function.

If you need software support on demand, please contact Logic Product Development sales at: product.sales@logicpd.com.