

# ATA Driver for MX31

## Freescale Semiconductor

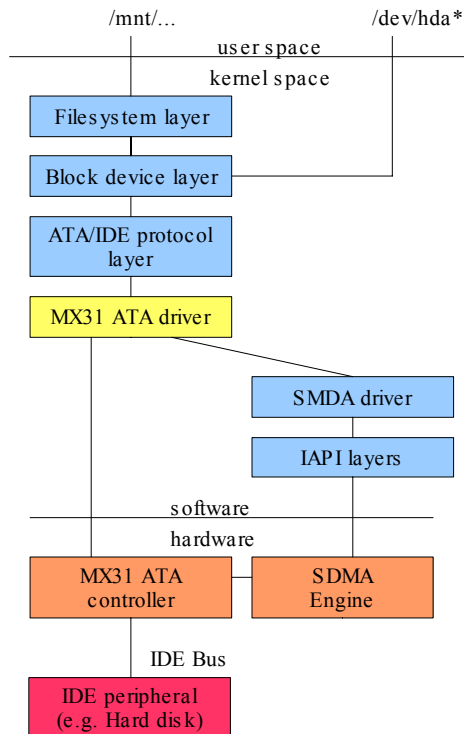
### Linux BSP

## 1 Hardware Operation

The detailed hardware operation of ATA is detailed in the hardware documentation.

## 2 Software Operation

The MX31 ATA/IDE driver sits beneath the IDE layer of the block device infrastructure of the Linux kernel (see the figure below). It handles the details of the integrated ATA controller, while the IDE layer understands and executes the IDE and ATA protocols. The IDE device, such as a hard disk, is exposed to the application in user space by the `/dev/hd` interface. Filesystems are built upon the block device. The integrated SDMA engine, which assists the ATA controller hardware in the DMA transfer modes, is accessed through the Linux SDMA driver.



### 3 Source Code Structure Configuration

Table 3.1 lists the source files found in the following directory:

linux/drivers/ide/arm

Table 3.1. ATA Driver File List

<i>File</i>	<i>Description</i>
mx_c_ide.h	ATA driver header file
mx_c_ide.c	ATA driver source code

### 4 Linux Menu Configuration Options

Enable these kernel configuration options as either modules (M) or built-in to the kernel (Y).

These options are all under "Device Drivers ---> ATA/ATAPI/MFM/RLL support":

- ATA/ATAPI/MFM/RLL support
- Enhanced IDE/MFM/RLL disk/cdrom/tape/floppy support
- Enhanced IDE/MFM/RLL disk/cdrom/tape/floppy support ---> Include
- IDE/ATA-2 DISK support
- Enhanced IDE/MFM/RLL disk/cdrom/tape/floppy support ---> Freescale MXC IDE support

Enable these packages:

- hdparm
- e2fsutils
- Set modutils "module-init-tools"
- In busybox, enable "fdisk" under "Linux System Utilities"

### 5 Board Configuration Options

With the power off,

- Set SW2-2 to off (to turn off the buzzer when using ATA)
- Install the IDE cable and hard drive. Remove the CPU board to get access to the ATA connector on the ADS board.

### 6 Programming Interface

The application interface to the ATA driver is the standard POSIX device interface (e.g. open, close, read, write, ioctl) on /dev/hda\*.

## 7 Usage Example

1. After building the kernel and the ATA driver and deploying, boot the target, and log in as root.
2. On the target, run these commands if you configured the driver as modules. If you built the driver into the kernel, you'll see similar messages in the console boot log.

```
# modprobe mxc_ide  
  
# modprobe ide-disk
```

You should see messages similar to these:

```
freescale# modprobe mxc_ide  
  
Uniform Multi-Platform E-IDE driver Revision: 7.00alpha2  
ide: Assuming 50MHz system bus speed for PIO modes; override with  
idebus=xx  
MXC: IDE driver, (c) 2004-2005 Freescale Semiconductor  
mxc_ide_resetproc: resetting ATA controller  
hda: HTC426020G7AT00, ATA DISK drive  
ide0 at 0xd408c0a0-0xd408c0a7,0xd408c0d8 on irq 15  
hda: max request size: 512KiB  
hda: 39070080 sectors (20003 MB), CHS=16383/255/63  
hda: cache flushes supported  
hda: hda1  
ide0: read chan=31 (42 BDs), write chan=30 (42 BDs)  
hda: enabling UDMA3 mode
```

You may use standard Linux utilities to partition and create a file system on the drive (e.g. fdisk, and mke2fs) to be mounted and used by applications.

The device nodes for the drive and its partitions will appear under `/dev/hda*`. For example, to check basic kernel settings for the drive, execute

```
hdparm /dev/hda
```