

# VT6202/VT6212/VT8235/VT8237 USB 2.0 Host Controller ATA-Storage Device Installation Guide

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## 1. Summary

The 4-port VT6202/VT6212, 6-port VT8235 and 8-port VT8237 USB 2.0 UHCI and EHCI host controllers for the PCI bus offers high-speed connectivity and is back warded compatible with USB 1.1. This guide describes how to update kernel to enable the USB devices with these VIA USB 2.0 host controllers under current Linux distributions. The information in this document is provided “AS IS,” without guarantee of any kind.

## 2. Overview

Although some Linux distributions have native support for USB 2.0 EHCI controller, the USB 2.0 function is experimental and instable. Users are advised to update the kernel to latest version 2.4.x or 2.6.x. and to download the latest available packages from <http://www.kernel.org>. Refer to <http://www.linux-usb.org/> for more information.

## 3. Kernel update

This section will describe the procedures to update kernel to 2.4.23 and 2.6.0. The following procedures should work on most Linux distributions, though we tested this only on Red Hat Linux 9.0.

### A. Update the kernel source

First, run the following command to decompress the source code of kernel version 2.4.23 or 2.6.0.

```
# tar xjvf linux-2.4.23.tar.bz2 (or linux-2.6.0.tar.bz2)
```

### B. Configure the kernel

First, run the following command to change the current directory to kernel directory

```
# cd linux-2.4.23 (or linux-2.6.0)
# make menuconfig (xconfig or config)
```

When configuring the kernel, some situations need your special attention.

- (1) Make sure the “*EHCI HCD (USB 2.0) support*” and “*USB Storage*” options under “[*USB support*]/[*USB Host Controller Drivers*]” in kernel 2.4.23 and under “[*Device Drivers*]/[*USB support*]/[*USB Host Controller Drivers*]” in kernel 2.6.0 are enabled, by selecting either the built-in or the module option.

If you select the module option, then you have to manually load the modules each time you want to use USB 2.0. The following command may be used for manually loading the modules once the kernel patch is finished.

```
# modprobe ehci-hcd
```

**Note:** Users need to install the new module tool to avoid the following error in kernel 2.6.0 during loading the `ehci-hcd` module.

```
Modprobe : QM_MODULES: Function not implemented
modprobe : Can 't locate module ehci-hcd
```

Refer to <http://www.kernel.org/pub/linux/kernel/people/rusty/modules/> to download the `module-init-tools-x.y.z.tar.gz` package. The `x.y.z` is the tool's version.

- (2) According to your processor to select proper CPU family under “*Processor type and features*”. If your platform is not a dual-processor system or above, it is recommended to disable option “*Symmetric multi-processing support*”.
- (3) If your platform uses VIA's IDE chips, remember to enable “*VIA82CXXX chipset support*” under “[*ATA/IDE/MFM/RLL support*]/[*IDE, ATA and ATAPI Block devices*]” in kernel 2.4.23 and under “[*Device Drivers*]/[*ATA/IDE/MFM/RLL support*]/[*IDE, ATA and ATAPI Block devices*]” in kernel 2.6.0. That allows the kernel to change PIO, DMA and UDMA modes and to support optimum performance.

### C. Rebuild the kernel

Run the following command to rebuild the kernel.

- (1) For kernel 2.4.x

```
# make dep clean bzImage modules modules_install
```

- (2) For kernel 2.6.x

```
# make
# make modules_install
```

Next, copy the newly built kernel to **/boot/**.

```
#cp arch/i386/boot/bzImage /boot/vmlinuz-test
```

If using the **GRUB** boot loader, add the following two lines to the **/boot/grub/menu.lst** file.

```
title linux-test
kernel /boot/vmlinuz-test ro root=/dev/hda1
```

On the other hand, if using the **LILO** boot loader, add the following four lines to the **/etc/lilo.conf** file.

```
image=/boot/vmlinuz-test
Label=linux-test
read-only
root=/dev/hda1
```

Run **“lilo”** and let the newly added boot configuration take into effect. On the screen you should be able to see a message like below.

```
Added linux *
Added linux-test
```

You may need to modify the **“hda1”** according to your actual system settings. Finally, reboot the system and test the new kernel.

#### 4. Verify the success of installation

Reboot the system and choose the newly added **“linux-test”** label to boot. Assume you have already loaded the necessary ECHI module and mounted the USB 2.0 ATA Storage device.

##### A. File copy

Assume a **“test.txt”** file exists in your USB 2.0 HDD, named **usb2.0**. Copy it to another directory. Next, run the command **“diff”** or **“cmp”** and make sure both files are identical.

```
# cp /USB2.0/test.txt .
# diff /USB2.0/test.txt test.txt
```

##### B. Stability test

Copy 100MB file from and to the USB 2.0 HDD or copy 100MB file from the USB 2.0 CD-RW ten times, and the action is successful.

## 5. Test Configuration

The following hardware configuration was used for test USB 2.0.

### A. VT6212

Mainboard	EPIA-CL10000 (CLE266 + VT8235)
OS	Red Hat9.0
kernel	2.4.23/2.6.0
USB 2.0 Storage Device	Western Digital USB2.0 160GB HDD Model: WD1600B008 ASUS USB2.0 CD-RW 40x12x48x Model: 4012A

### B. VT8237

Mainboard	VT5814B (CN400 + VT8237)
OS	Red Hat9.0
kernel	2.4.23/2.6.0
USB 2.0 Storage Device	Western Digital USB2.0 160GB HDD Model: WD1600B008 ASUS USB2.0 CD-RW 40x12x48x Model: 4012A