

User's guide v2.00

KeyCarbon Raptor

Laptop Keystroke Recorder (Mini-PCI slot)

Desktop Keystroke Recorder (PS/2 and USB)



Products: KLAP601, KLAP602, KLAP613

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Introduction

What is the “KeyCarbon Raptor” card?

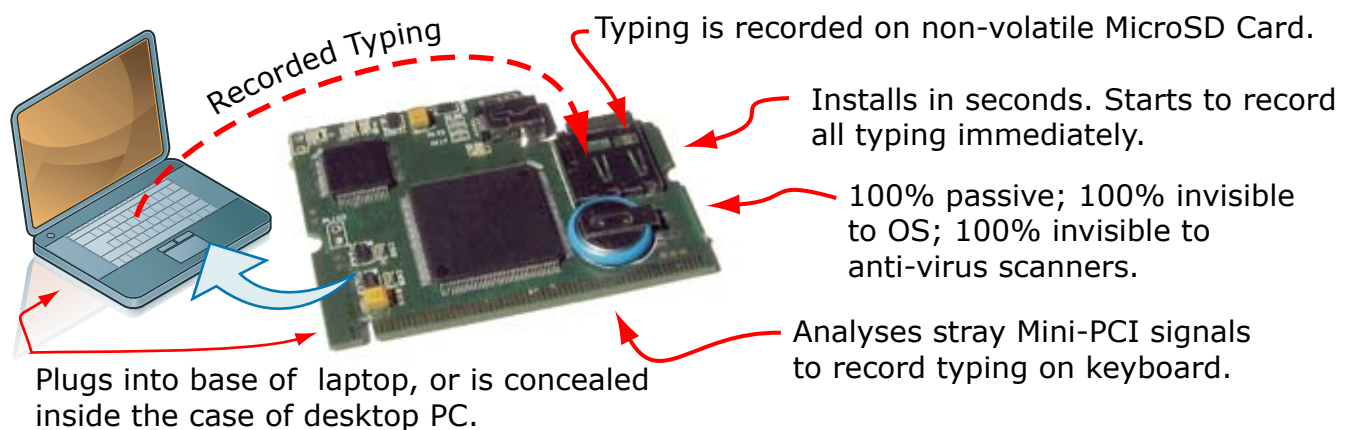
The KeyCarbon Raptor device records all typing on a laptop computer.

The KeyCarbon Raptor device fits inside a Pentium class laptop, and plugs into the mini-PCI slot on the underside of the laptop.

The device can be installed in less than 10 seconds.

Once fitted to the machine, every keystroke typed is recorded to an onboard MicroSD flash memory card, in an encrypted file.

The card can also be concealed in the case of a desktop PC, and can record both PS/2 and USB keystrokes (unofficially supported).



With the KeyCarbon Raptor device you can:

- ▷ Record typing from a laptop keyboard.
- ▷ Record typing from a desktop keyboard, for both PS/2 and USB keyboards (unofficially supported).
- ▷ Create an encrypted audit trail suitable for use in a court of law.

Features

The KeyCarbon Raptor card has the following features:

- ▷ Record of all keystrokes and typing on a laptop.
- ▷ Record of all keystrokes and typing on a desktop PC; both PS/2 and USB (unofficially supported).
- ▷ Up to 64 million keystrokes on the built in 128Mb of memory.
- ▷ Driverless operation - no drivers required. Device is completely passive and invisible to the operating system.
- ▷ Compatible with all laptops that have a user accessible mini-PCI slot.
- ▷ Encryption of log contents in a virtual tamper resistant vault (requires firmware upgrade).
- ▷ Date/time stamping of recorded keystrokes.

Why is it Necessary to Record Typing on a Laptop Computer?

The KeyCarbon Raptor is a complete solution to create an audit trail on a laptop computer.

- ▷ Evidence captured by the KeyCarbon Raptor is admissible in a court of law.

System Requirements

The minimum system requirements for the KeyCarbon Raptor device are:

- ▷ A laptop with a Pentium class CPU.
- ▷ A mini-PCI slot on the laptop.
- ▷ Compatible Laptops: Any Pentium class laptop including Acer, Compaq, ASUS, Dell, Fujitsu, IBM, ITC, NEC, Toshiba, any almost any other generic laptop. Laptop must have a spare Mini-PCI slot.
- ▷ Incompatible laptops: certain HP laptops; these laptops prevent 3rd party Mini-PCI cards from being used in the laptop.
- ▷ Compatible desktop PC's: any computer with a spare PCI slot on the motherboard (requires PCI-to-MiniPCI adaptor card).
- ▷ Compatible keyboards: the internal keyboard of a laptop, and both USB and PS/2 keyboards on a desktop PC.
- ▷ Any OS (operating system) including:
 - Windows™ (all versions).
 - Linux (all versions).
 - Unix (all versions)
 - OS/2™ (all versions).
 - DOS (all versions).
 - BeOS (all versions).
 - Any other operating system that runs on a PC with a Pentium CPU or equivalent.

Using the KeyCarbon Raptor on a Laptop

The following section explains how to use the KeyCarbon Raptor to record all keystrokes on a laptop.

Installing the Card

Using the KeyCarbon Raptor card is exactly the same as installing any standard mini-PCI card such as a mini-PCI wireless card or a mini-PCI bluetooth card.

To install the KeyCarbon Raptor card, perform the following steps:

1. Power down the laptop.
2. Locate a spare Mini PCI slot on the base of the laptop.
3. Remove the KeyCarbon Raptor card from its static protection bag.
4. Ensure that there is an MicroSD memory card installed in the MicroSD slot on the KeyCarbon

Raptor card. The MicroSD memory card is needed for the KeyCarbon Raptor card to store its captured keystrokes.

5. Plug the KeyCarbon Raptor card into a spare Mini PCI slot inside the laptop.
6. Power up the laptop.
7. The KeyCarbon Raptor is 100% passive, and requires no drivers. The KeyCarbon Raptor card starts to record keystrokes from the moment the laptop is powered on. The KeyCarbon Raptor card records keystrokes typed before the operating system is loaded, including BIOS passwords.
8. An video demonstration is available at:
http://www.keycarbon.com/products/keycarbon_laptop/video/

The KeyCarbon Raptor card will immediately start to capture keystrokes.

You can remove the MicroSD card and read the captured data at any time.

You can remove the KeyCarbon Raptor card and read the captured data at any time, even if the laptop is powered up at the time.

Capturing Data on a Laptop

The KeyCarbon Raptor card begins recording keystrokes the instant that the laptop is powered on.

The MicroSD card records all captured data. Data can be read from the MicroSD card.

There is an internal ring buffer on the KeyCarbon Raptor card that continuously records all data captured by the KeyCarbon Raptor card.

The ring buffer means that no data is ever lost even if the MicroSD card is temporarily ejected from its slot to allow its files to be examined.

The KeyCarbon Raptor card works by examining signals on the Mini PCI bus to reconstruct the typing on internal laptop keyboard.

Viewing the Recorded Keystrokes from a Laptop

The file “datafile.klr” contains all data recorded by the KeyCarbon Raptor card.

The file “datafile.klr” is located on the MicroSD memory card which is inserted into a slot on the KeyCarbon Raptor card.

The file “datafile.klr” can be decoded using the “KeyCarbon Windows Utility” available from:

http://www.keycarbon.com/products/keycarbon_laptop/software/.

To view the log:

1. Download the “KeyCarbon Windows Utility” from.:
http://www.keycarbon.com/products/keycarbon_laptop/software/.
2. Install this utility on a Windows machine.
3. Copy the file “datafile.klr” from the MicroSD card, in the KeyCarbon Raptor card, to your desktop.

4. Select “File..Open” from the “KeyCarbon Windows Utility”.
5. Select the file “datafile.klr” from the desktop.
6. The keystrokes will be displayed within the utility.

Using the KeyCarbon Raptor on a Desktop

The following section explains how to use the KeyCarbon Raptor to record all keystrokes on a desktop.

Recording PS/2 keystrokes on a Desktop

If you purchase a PCI-to-MiniPCI adaptor card, you can record all keystrokes typed on the PS/2 keyboard of your desktop computer. The recording is 100% passive, and works by picking up stray electrical signals that appear on the PCI bus. These port signals are decoded to record the keystrokes typed on the PS/2 keyboard.

1. Purchase a “PCI-to-MiniPCI adaptor” card such as the Zeon (see the website for a link to purchase the Zeon card, or contact customer support for more information). Plug the KeyCarbon Raptor card into the Zeon PCI-to-MiniPCI adaptor card.
2. All keystrokes typed on the keyboard of the PC will be recorded to the flash memory card inserted into the KeyCarbon Raptor card.
3. The recording hardware is invisible to a cursory search, it will be found only if the case of the desktop PC is opened up.
4. Software free - the card is 100% passive, requires no drivers.
5. NOTE: although this functionality is officially not supported, unofficially it is compatible with every known PC.
6. Total install time: 20 seconds.

Recording USB keystrokes on a Desktop

You can record all keystrokes typed on the USB keyboard of a desktop. The recording is 100% passive, and works by running the D- and D+ signals lines from the USB keyboard into pins on the KeyCarbon Raptor card.

1. Open the case of the desktop PC.
2. Every USB keyboard has 4 wires. Run the signals from the 4 wires on the keyboard (Power, Ground, D-, D+) into the appropriate pins on the KeyCarbon Raptor card. If the KeyCarbon Raptor card is already powered (placed in a PCI-to-Mini-PCI adaptor such as the Zeon; contact customer support if you wish to purchase a Zeon), you only have to run the D- and D+ lines into the appropriate ports on the KeyCarbon Raptor card.
3. All keystrokes typed on the USB keyboard of the PC will be immediately recorded to the flash memory card inserted into the KeyCarbon Raptor card.

4. The recording hardware is invisible to a cursory search, it will be found only if the case of the desktop PC is opened up.
5. Software free - the card is 100% passive, requires no drivers.
6. NOTE: although this functionality is officially not supported, unofficially it is compatible with every known PC.
7. Total install time: 30 seconds.

Configuring the Card

You may configure the card by altering the file “config.ini” on the MicroSD card.

This file “config.ini” is automatically created by the KeyCarbon Raptor device, if the file does not exist on the MicroSD card.

There are four reasons to alter or delete the file “config.ini”:

1. Altering the date/time in the KeyCarbon Raptor device, used to timestamp the log.
2. Altering the encryption key (available with a free firmware upgrade; contact customer support).
3. Altering the I/O port that the card records from.
4. Regenerating the “config.ini” file if it is corrupt.

Configuring the Card – Altering the Date/Time

The log of keystrokes is stamped with the date and time. The KeyCarbon Raptor card contains a Real Time Clock (RTC) powered by an onboard battery. To alter the timestamp, follow the steps below:

1. Open the file “config.ini” on the MicroSD card.
2. Edit the current date and time under the section “date”. The format is YYYYMMDD-HHMM format where YYYY is year, MM is month, DD is day, HH is hour (24 hour format) and MM is minute. The seconds cannot be specified.
3. Save the file “config.ini” to the MicroSD card.
4. Remove, then reinsert the MicroSD card on the KeyCarbon Raptor device. The KeyCarbon Raptor device will update its internal clock with the new date and time.
5. Open the file “applog.txt” on the MicroSD card. This file contains a log of activity on the KeyCarbon Raptor card. Check the last line in this file; the last line will indicate that the device has updated its internal Real Time Clock (RTC) with the new date and time. If the KeyCarbon Raptor device could not recognize the time format, it will write an error into the log.

Configuring the Card – Altering Your Encryption Key

The configuration file can be altered to specify a password. This password is used to protect sensitive data written to the MicroSD card.

This feature is available with a free firmware upgrade from <http://www.keycarbon.com/>; contact

customer support.

Altering the I/O Port that the Card Records From

The “config.ini” file can be altered so that the card records from an alternate I/O port on the computer.

Using this method, the KeyCarbon Raptor card can record data from the internal RS232 ports on a laptop. However, a number of modern laptops do not have RS232 ports, making this feature mostly redundant.

Contact technical support if you wish to configure the card for a different I/O port or if you wish to configure the card to record data from the internal RS232 ports on a laptop.

Configuring the Card – Regenerating the “config.ini” File

You may force the card to regenerate the “config.ini” file, by deleting the “config.ini” file from the MicroSD card, then removing/reinserting the MicroSD card from the KeyCarbon USB device.

This technique is useful, if the file “config.ini” is edited badly, so that “aplog.txt” records “cannot read config.ini” errors.

Upgrading Your Firmware

From time to time, BitForensics will provide free firmware upgrades that are downloadable from our website.

These firmware upgrades allow you to take advantage of product improvements, and new features, that were introduced after you purchased your device.

From time to time it may be necessary to upgrade the “firmware” or operating system on the card.

There are two methods to upgrade the firmware on the card:

1. The recommended method is to use the built-in MicroSD card mass storage device on the KeyCarbon Raptor card (see method 1).
2. Use a 3rd party MicroSD card reader (see method 2). We recommend this method if you already own an MicroSD card reader.

Method 1 – Firmware Upgrade via Mass Storage

1. Download the latest firmware upgrade file from: http://www.keycarbon.com/products/keycarbon_laptop/firmware/. This will be named “KeyCarbon Raptor Firmware Upgrade vX.NN.zip” where vX.NN is the firmware version.
2. Use WinZip to extract the file “bootload.ehx” onto your desktop or another temporary directory on your hard drive.
3. Plug the small end of the supplied USB cable into the USB port on the KeyCarbon Raptor card.
4. Plug the other end of the supplied USB cable into a free USB slot on your computer. If you are using Windows™ a dialog box similar to the picture to the right will pop up allowing you to

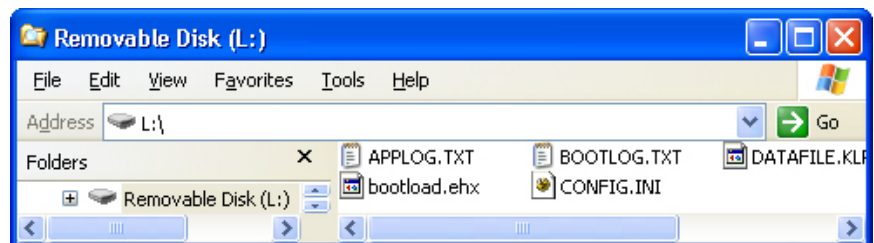
browse the files on the MicroSD card.

5. Copy the file “bootload.ehx” to the base directory of your MicroSD card, as shown in the dialog box above.
6. Unplug the small end of the USB cable from the KeyCarbon Raptor card. Wait 20 seconds then examine the file “bootlog.txt” in the base directory of the MicroSD card. The file “bootlog.txt” contains a log of the bootload procedure. The last line in the file will read “[200x-xx:xx: Bootload: Info: Updated application to vX.NN]” where x-xx:xx is the date and time, and vX.NN is the firmware version. This firmware version must match the firmware version from step 1. This indicates that the firmware upgrade was successful.

Method 2 – Firmware Upgrade via a MicroSD memory card reader:

To upgrade the firmware on the card:

1. Download the latest firmware upgrade file, from http://www.keycarbon.com/products/key-carbon_laptop/firmware/. This will be named “KeyCarbon Raptor Firmware Upgrade vX.NN.zip” where vX.NN is the firmware version.
2. Remove the MicroSD card from the KeyCarbon Raptor card.
3. Plug the MicroSD card into a 3rd party SD card reader (not supplied). You may have to use a MicroSD to SD card adaptor.
4. If you are using Windows™ a dialog box similar to the picture to the right will appear. You can now browse the files on the MicroSD card.
5. Copy the file “bootload.ehx” to the base directory of the MicroSD card, as shown in the dialog box above.
6. Remove the MicroSD card from the MicroSD card reader, and insert it back into the KeyCarbon Raptor device.
7. Apply power to the KeyCarbon Raptor device. Plug the small end of the USB cable into the USB port on the KeyCarbon Raptor card. Plug the other end into a free USB slot on the computer.
8. Wait 20 seconds.
9. The firmware upgrade is now complete.
10. Examine the file “bootlog.txt”, in the base directory of the MicroSD card. The file “bootlog.txt” contains a log of the bootload procedure. The last line in the file should read “[200x-xx:xx: Bootload: Info: Updated application to vX.NN]”.



Frequently Asked Questions (FAQ)

A large FAQ is available from the website, under the URL:

http://www.keycarbon.com/products/keycarbon_laptop/faq/

Appendix A - Definition of Terms

MicroSD memory card – What is a MicroSD memory card?

MicroSD memory cards are used for storing data on many digital cameras, cellphones, and other devices that store data.

The MicroSD memory card is used to store captured keystrokes on the KeyCarbon Raptor card.

See <http://www.sdcard.org/>.

See <http://en.wikipedia.org/wiki/MicroSD/>.

Mini PCI slot – What is the Mini PCI slot on a computer motherboard?

A Mini PCI accepts cards which add additional capabilities to a Pentium class laptop.

See http://en.wikipedia.org/wiki/Mini_PCI/.

KeyCarbon Raptor – What is the KeyCarbon Raptor card?

The KeyCarbon Raptor card is a Mini PCI card that captures keystrokes, from the motherboard of a standard Pentium class laptop.

The KeyCarbon Raptor card fits inside the Laptop.

Mini PCI Bluetooth Card – What is a a Mini PCI Bluetooth Card?

A PCI Modem is a device that plugs into a computer motherboard. The PCI modem allows one to dial up to a server to gain internet access.

USB Port – What is a USB port?

A USB port is the plug on the back of a computer that peripherals such as keyboards, MicroSD card readers, and digital cameras are plugged into.

See <http://www.usb.org/>.

See <http://en.wikipedia.org/wiki/USB/>.

PS/2 Keyboard – What is a PS/2 Keyboard?

A PS/2 keyboard is the older style of keyboard.

You can identify a USB keyboard, by looking at the plug on the end.

The plug is round.