# iEQ45 with 8406 Hand Controller
# Firmware Upgrade

The firmware of an 8406 hand controller and the main control board can be upgraded by the customer. Please check iOptron's website, www.iOptron.com, under Support Directory, for the most up-to-date firmware.

To upgrade the firmware, you need some or all of the following software/hardware, depends on the upgrading you are performing:

- iOptron Downloader Program

- 8406 hand controller firmware

- iEQ45 main board firmware

- USB cable (included, for hand controller upgrade)

- RS232 cable (included, for control boards upgrade)

- USB to RS232 converter and driver. If your computer does not equip a RS232 port (9-pin D-shape connector) except the USB port, you need to buy a USB to RS232 converter, form a computer hardware store or on-line.

## 1. Find the serial port (COM port) number from your computer:
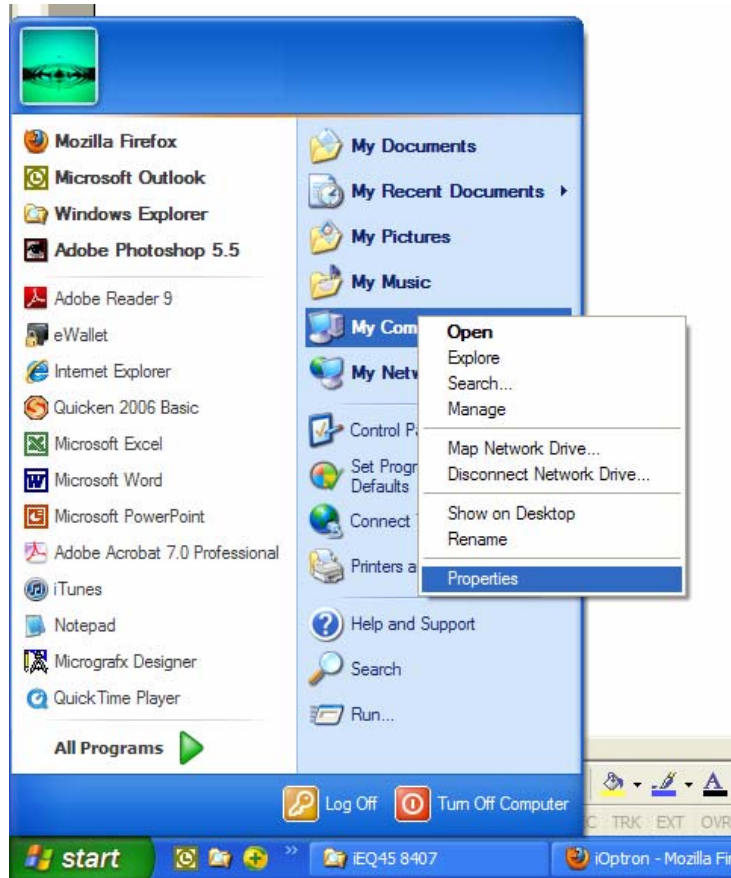
In order to perform the main board firmware upgrade (as well as to use planetarium software to control the mount), the communication between the PC and the mount has to be established.

The first step is to find the COM port number. If your computer has a serial port (9-pin D-shape male connector on the back, next to the 25 pin printer connector), the default assigned number is COM1.
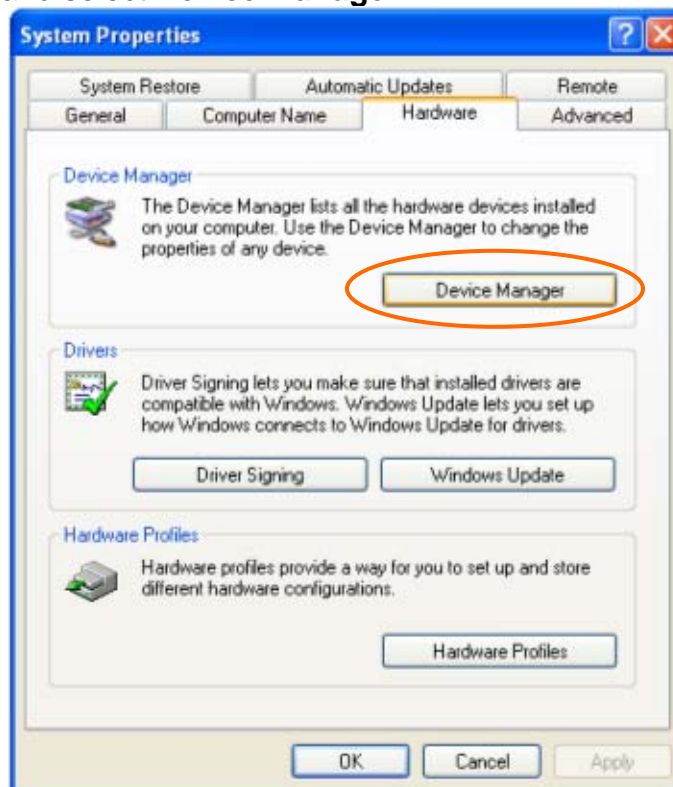
If your computer only has USB ports, like most laptops do, you need a USB to COM converter to convert one USB port to a COM port. Here are two examples of USB2COM converters.
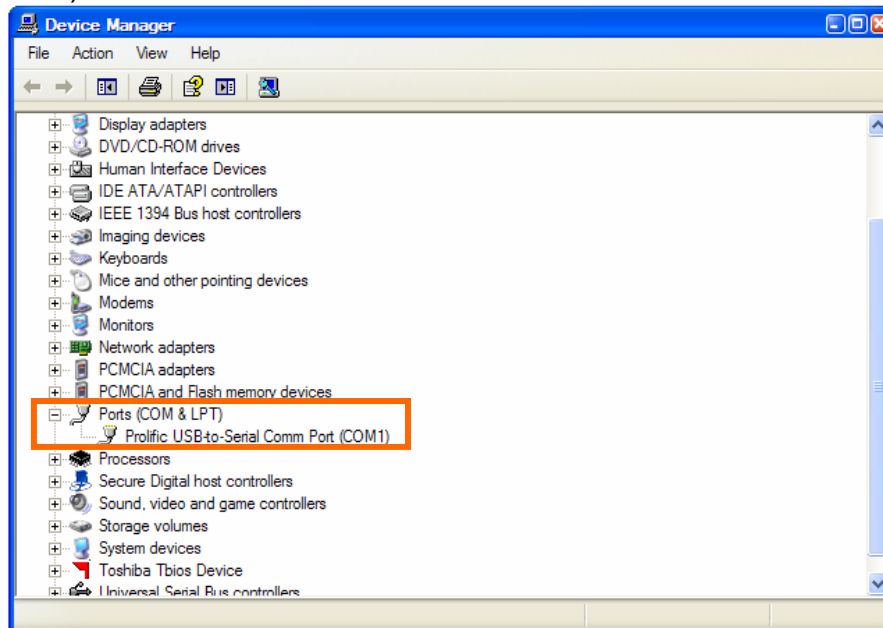


After install the USB2COM driver that comes with the device, click on **Start** located on the left bottom corner of your compute screen. Move the mouse to **My Computer** and right click on it. Move the mouse down and click on **Properties.**

Click on **Hardware** and select **Device Manager**.

Double click on **Ports(COM & LPT),** find out the COM number and write it down (in the following figure, the USB2COM converter uses a Prolific chipset and the assigned port number is COM1)



## 2. Download software and firmware from iOptron website:

Go to iOptron website, www.iOptron.com, click on **Support** tab. Locate **iEQ45 with 8406 hand controller** under **Software/Firmware Upgrades** catalog on the left part of the screen, and click on it.

Download and save iOptron Downloader, 8406 hand controller software (*i8406.iop*) and/or iEQ45 main board software (*iEQ45_Main_VXXXXXX.bin*) as needed.
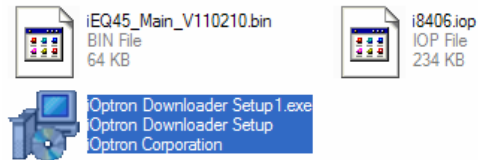
## 3. Upgrade 8406 hand controller firmware:

(1) Connect 8406 hand controller to the HBX port of an iEQ45 mount. Make sure the mount power is OFF;

(2) Connect 8406 hand controller to your computer's USB port using included USB cable;

(3) Turn on the mount;

(4) Press MENU button on the hand controller. Select "***Set Up Controller***," scroll down to "***Upgrade Firmware***" and press ENTER. The following message will be displayed: "Now hand controller is in mass storage mode. You can upgrade firmware or catalog. Please restart HC when you finished." A new storage drive with a drive number, *e.g.* "IOPTRON(E:)", will be shown under "My Computer." If it is the first time you have connected the hand controller to the computer, it may take few minutes to get computer reorganize it.

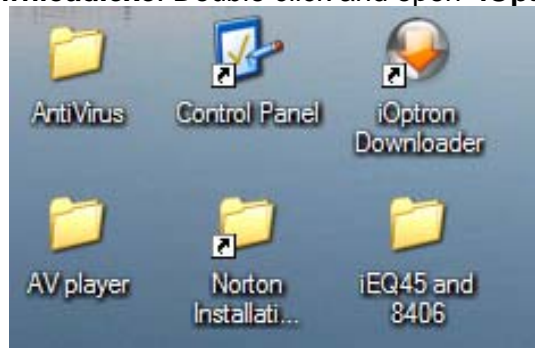(5) Copy the downloaded firmware, i8406.iop, into "sys" folder under IOPTRON(E:) drive to replace the original one;

(6) Restart iEQ45 mount to finish the hand controller firmware upgrade. Double check the settings.
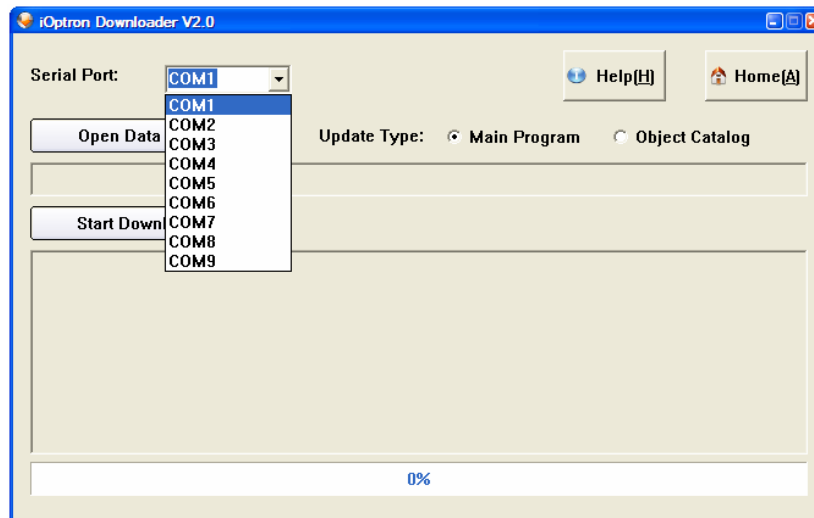
### *4. Upgrade iEQ45 main control board firmware:*

(1) Click on **iOptron Downloader Setup.exe** to install the **iOptron Downloader**;



(2) Connect 8406 hand controller to the HBX port of an iEQ45 mount.

(3) Connect the RS232 port on the mount main control unit to your computer's RS232 port (or RS232 port of the USB2COM converter) using supplied RS232 cable;

(4) Turn the mount power on;

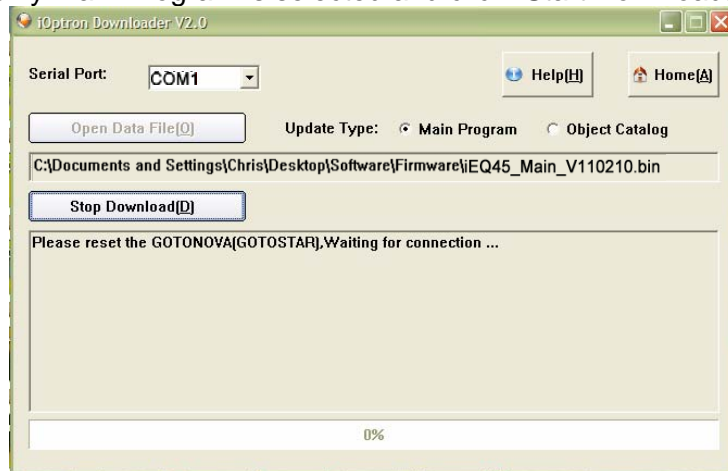(5) Locate **iOptron Download.exe**. Double click and open "**iOptron Downloader**"



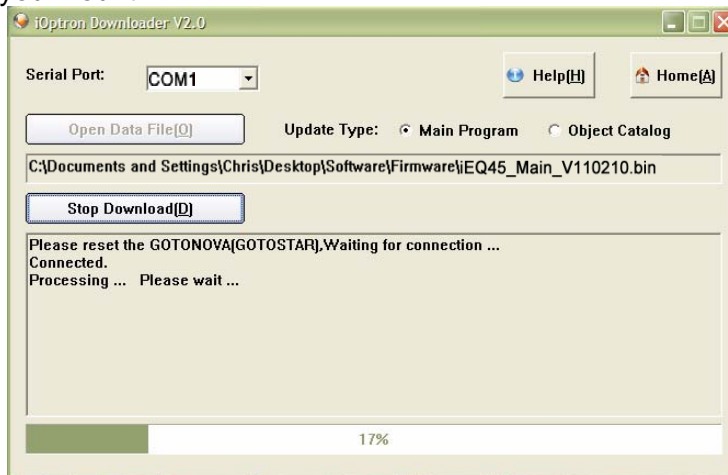(6) Click on pull down menu of the COM port and select the COM port number. Here is **COM1**.



(7) Click on "Open Data File", and select appropriate "iEQ45_Main_VXXXXXX.bin" file that you would like to upload, the click on "Open" button;

(8) Make sure only Main Program is selected and click "Start Download(D)";



(9) On the hand controller, press "MENU" button, and select "**Set Up Controller**," scroll down to "**Upgrade Firmware**" and press ENTER. The program will start to upload the firmware to you mount.



(10)     After the program prompts that "Download successfully finished," restart the mount to finish main control board firmware upgrade. Double check the settings.