CEM60^{TM} Mount Firmware Upgrade

The firmware of an 8407 hand controller, as well as the CEM60 main control board, R.A. and DEC motor control boards can be upgraded by the customer. Please check iOptron's website, www.iOptron.com, under Support Directory, for the most up to date firmware.

There are only slight procedure differences among different firmware upgrading procedures. Please read the instruction carefully.

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

- iOptron Upgrade Utility Program (Version 1.2)

- 8407 hand controller firmware

- CEM60 main board firmware

- CEM60 R.A. /DEC motor control board firmware

- RJ9 serial port to RS232 cable (included)

- 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.

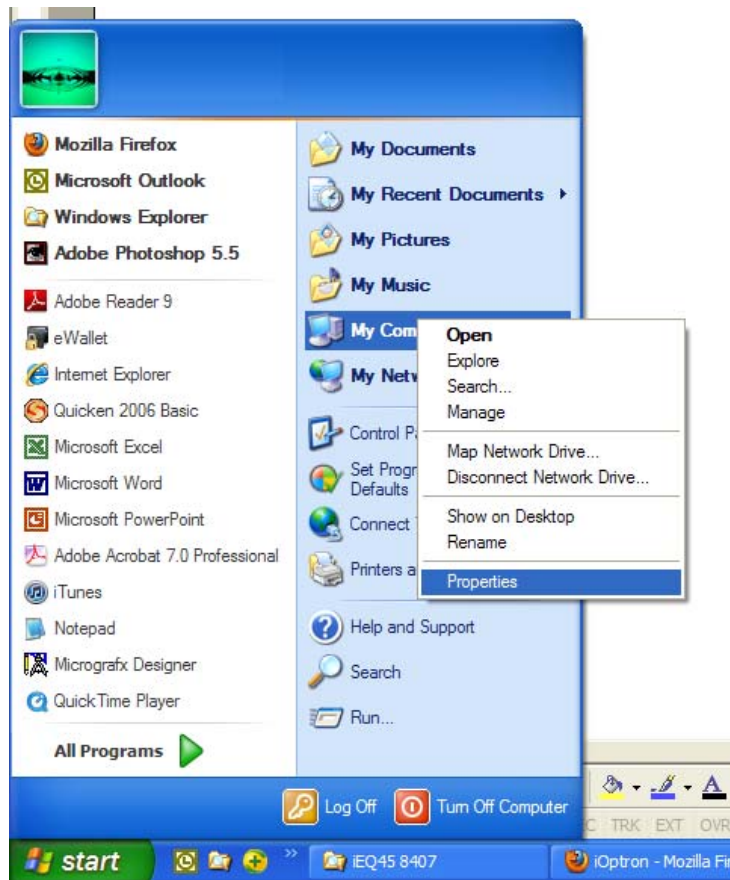## 1. Find the serial port (COM port) number from your computer:

In order to perform the firmware upgrade (as well as to use planetarium software to control the mount), the communication between the PC and hand controller or 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.
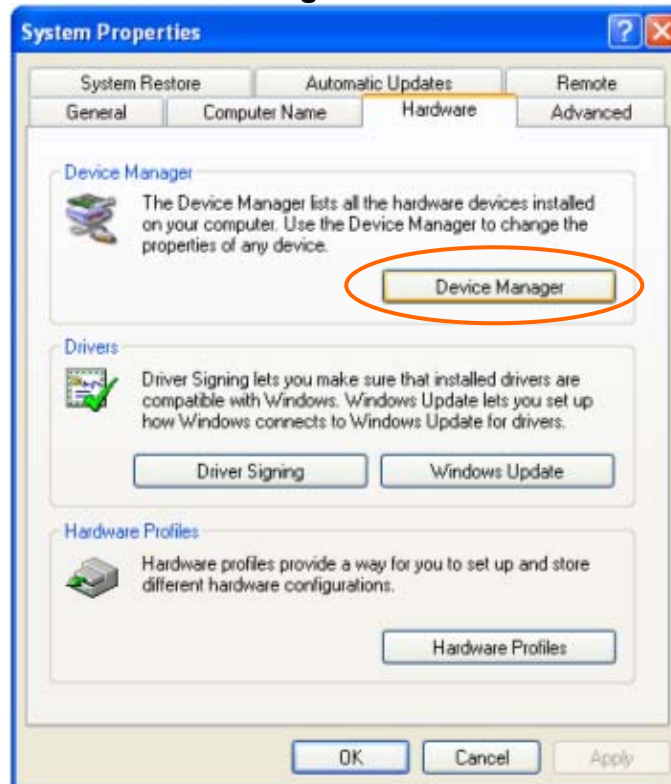
If your computer only has USB ports, like most laptops do, you need a USB to COM converter to convert one USB port to a COM port. Here are two examples of USB2COM converters.
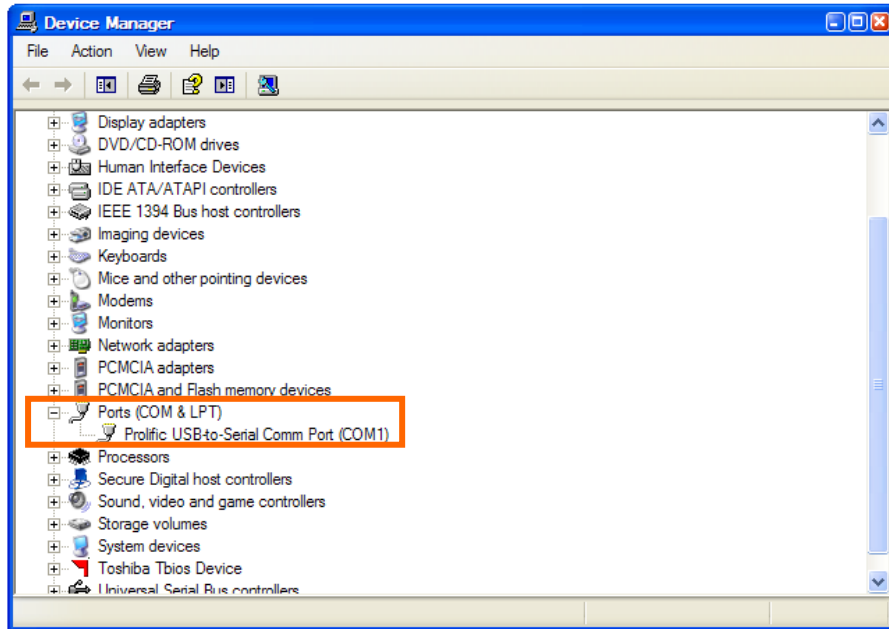

After install the USB2COM driver that comes with the device, click on **Start** located on the left bottom corner of your compute screen. Move the mouse to **My Computer** and right click on it. Move the mouse down and click on **Properties.**

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)

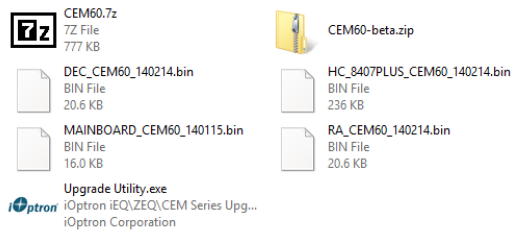## 2. Download software and firmware from iOptron website:

Go to iOptron website, www.iOptron.com, click on **Download** tab. Locate **CEM60 Firmware** under **Software/Firmware Upgrades** catalog on the left part of the screen, and click on it.

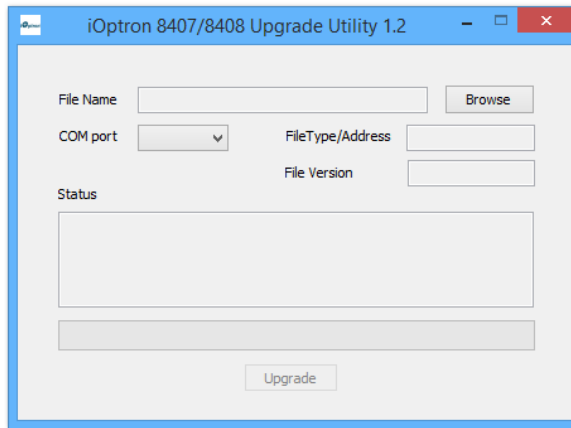Download and save Upgrade Utility software, 8407 and/or iEQ45 board software as needed.

Please ignore any prompt or error message displayed on the hand controller during firmware upgrading.

3. Upgrade 8407 hand controller firmware:
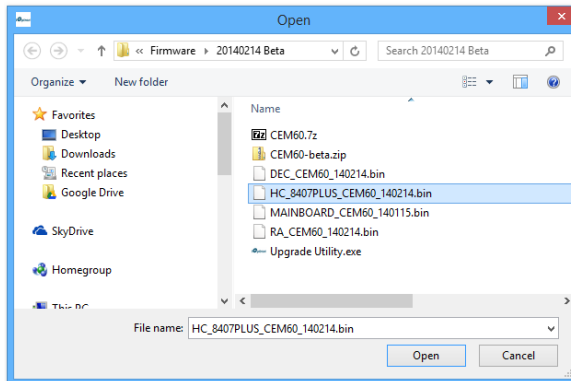
(1) Connect 8407 hand controller to the HBX port of a CEM60 mount. Make sure the mount power is OFF;

(2) Connect 4-pin RJ9 plug into the serial port of a 8407 hand controller and the 9-pin RS232 connector to your computer's RS232 port (or RS232 port of the USB2COM converter);

(3) Hold **ENTER** button of the hand controller while switch the ON/OFF button to turn the mount power on;

(4) Locate download software and click on **Upgrade Utility.exe**:

CEM60.7z
7Z File
777 KB

CEM60-beta.zip

DEC_CEM60_140214.bin
BIN File
20.6 KB

HC_8407PLUS_CEM60_140214.bin
BIN File
236 KB

MAINBOARD_CEM60_140115.bin
BIN File
16.0 KB

RA_CEM60_140214.bin
BIN File
20.6 KB

Upgrade Utility.exe
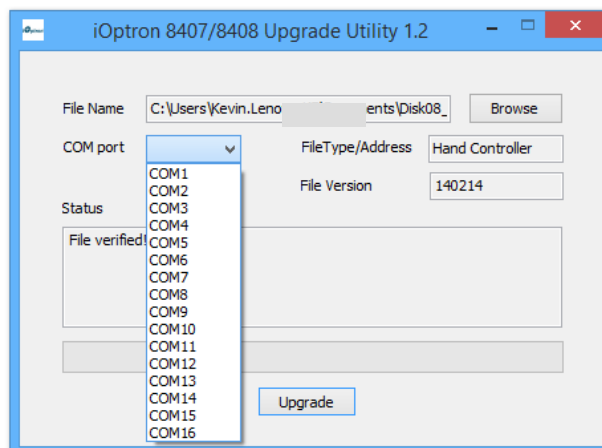iOptron iEQ\ZEQ\CEM Series Upg...
iOptron Corporation

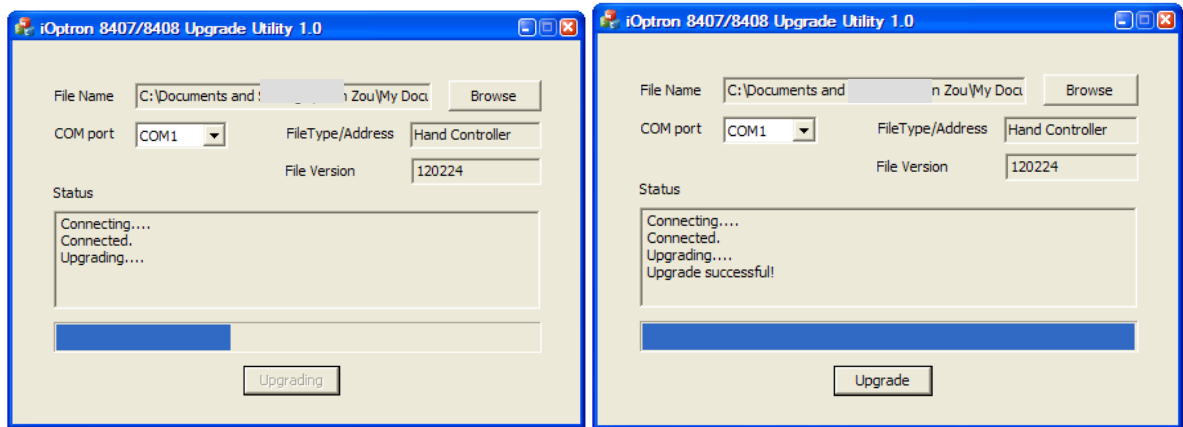(5) An iOptron Upgrade Utility window will display. Click on **Browse**:

(6) Select hand controller firmware HC_8407PLUS_CEM60_140214.bin and click **Open**

(7) The **FileType** and **Version** will be verified and displayed. Click on pull down menu of the COM port and select the COM port number. Here is **COM1**.

---

(8) Click on **Upgrade** button to start the process. Exit Upgrade Utility after upgrade successfully.

(9) Power cycle the mount.

If the upgrade process was disrupted, wrong firmware was loaded, or the upgrade was failed, just start this process over again. Make sure a correct COM port is selected.

4. Upgrade CEM60 main control board firmware:

(1) Connect 8407 hand controller to the HBX port of a CEM60 mount. Make sure the mount power is OFF;

(2) Connect RJ9 plug into the serial port on a CEM60 mount and the 9-pin RS232 connector to your computer's RS232 port (or RS232 port of the USB2COM converter);

(3) Locate download software and click on **Upgrade Utility.exe**:

(4) Click on **Browse** in iOptron Upgrade Utility window. Select main board firmware MAINBOARD_CEM60_140115.bin and click **Open;**

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

(6) Switch the ON/OFF button to turn the mount power on. The upgrading process will begin. After the firmware upgraded successfully, exit the Upgrade Utility program;

(7) Turn the mount power off. Turn on the mount and wait 10 second to allow upgraded main control board finishing initialization. Check your firmware version and proceed to RA/DEC firmware upgrading.

5. Upgrade CEM60 R.A. or DEC control board firmware:

You can only upgrade either R.A. or DEC control board firmware at a time. You have to power cycle the mount before upgrading the other board. Wait 10 seconds or so for system finishing initialization between upgradings.

Make sure the main board is working properly.

(1) Connect 8407 hand controller to the HBX port of a CEM60 mount. Make sure the mount power is OFF;

(2) Connect RJ9 plug into the serial port on a CEM60 mount and the 9-pin RS232 connector to your computer's RS232 port (or RS232 port of the USB2COM converter);

(3) Switch the ON/OFF button to turn the mount power on.

(4) Locate download software and click on Upgrade Utility.exe:

(5) Click on Browse in iOptron Upgrade Utility window. Select R.A. or DEC board firmware, such as RA_CEM60_140214.bin and click Open;

(6) Click on pull down menu of the COM port and select the COM port number. Here is **COM1**. Click on Upgrade button. The upgrading process will begin*.*

(7) After the firmware upgrade finished, exit the Upgrade Utility program.

(8) Turn the mount power off. Turn on the mount and wait 10 second to allow upgraded RA/DEC board finishing initialization. Check your firmware version by press **MENU→Firmware Information**.

6. Common Errors During Firmware Upgrade:

(1) Can not open COM port:

- Wrong COM port is selected;
- A mount is not connected;
- A USB to RS232 converter driver is not installed or corrupted;
- A USB to RS232 converter does not work properly

(2) Connection failed:

- COM port conflict or used by other program. Close other program and try it again;
- RJ9 plugged into a wrong socket
- Broken RJ9 to RS232 cable
- A USB to RS232 converter does not work properly

(3) Upgrade stopped in the middle or failed

- Broken RJ9 o RS232 cable
- A USB to RS232 converter does not work properly