

iEQ45 Pro™ Mount Firmware Upgrade

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The firmware of an 8407+ hand controller, as well as the iEQ45 Pro 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 1.22)
- 8407+ hand controller firmware
- iEQ45 Pro main board firmware
- iEQ45 Pro 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.

Please manually set the mount to zero position using Set Zero Position. Otherwise, the mount may not perform go to properly.

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.

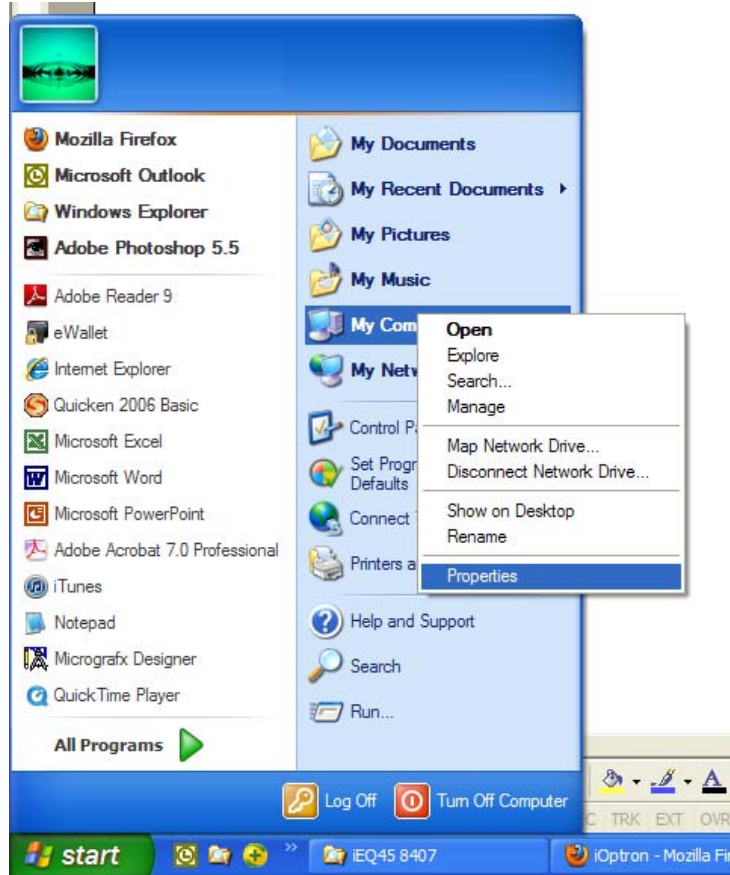
If your computer only has USB ports, like most laptops do, you need a USB to COM converter to convert one USB port to a COM port. Here are two examples of USB2COM converters.



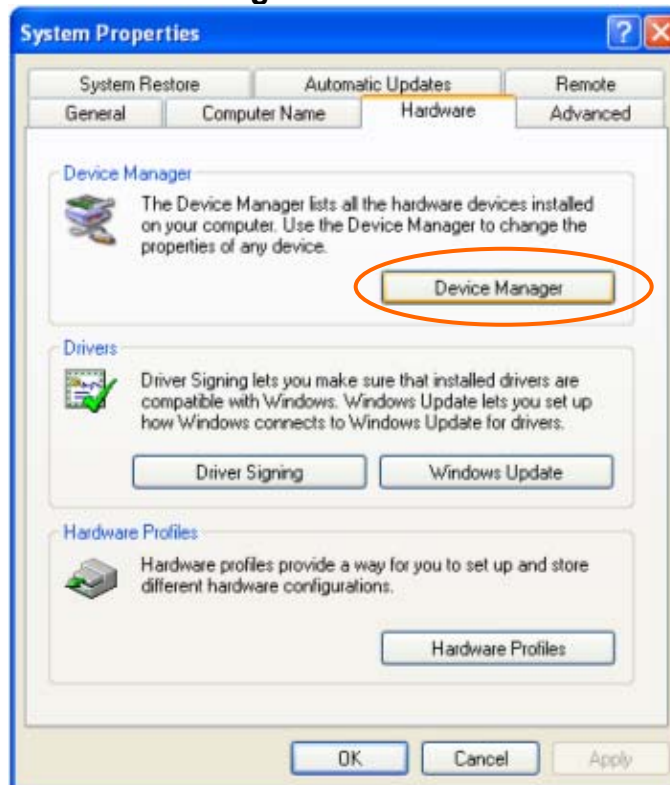
To ensure a reliable operation, it is suggested to select a converter with the followings:

- Preferred processor chip: FTDI or Silabs (very reliable)
- Preferred serial driver chip: ZyWyn, Maxin or NI (very reliable)
- Minimum 5.0VDC output power at serial connector for a laptop that has a 25pin RS232 port (ensures reliable data transmission)

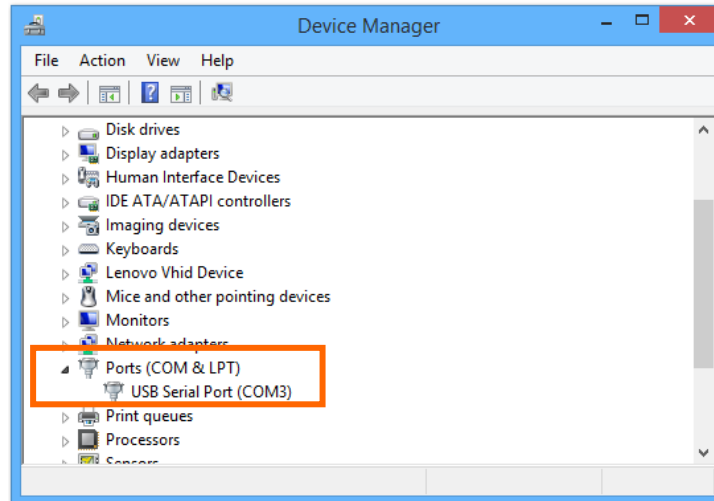
After install the USB2COM driver that comes with the device, click on **Start** located on the left bottom corner of your computer screen. Move the mouse to **My Computer** and right click on it. Move the mouse down and click on **Properties** (this may vary for different Windows system).



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 assigned USB2COM converter port number is COM3)



2. Download software and firmware from iOptron website:

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

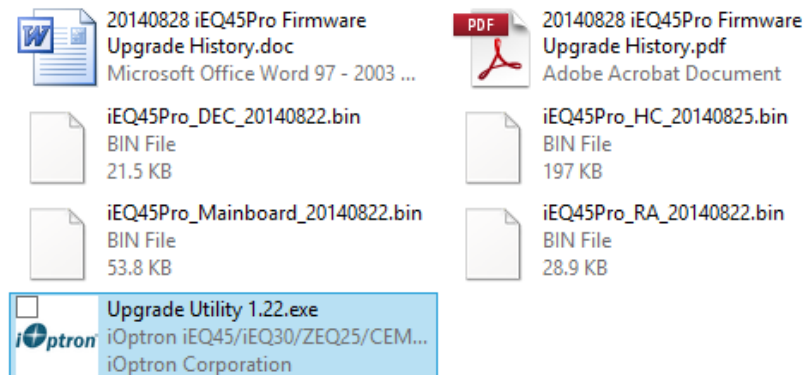
Download and save Upgrade Utility software, 8407+ and/or iEQ45 Pro board software as needed.

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

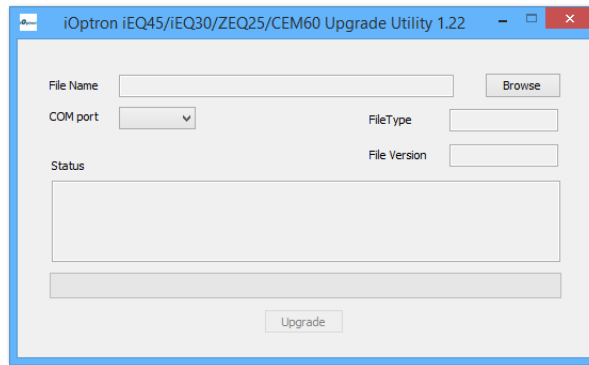
If the upgrade process was disrupted, wrong firmware was loaded, or the upgrade was failed, just start this process over again. Make sure a correct COM port is selected and the RJ9 cable is plug into the correct port on mount or hand controller.

3. Upgrade 8407+ hand controller firmware:

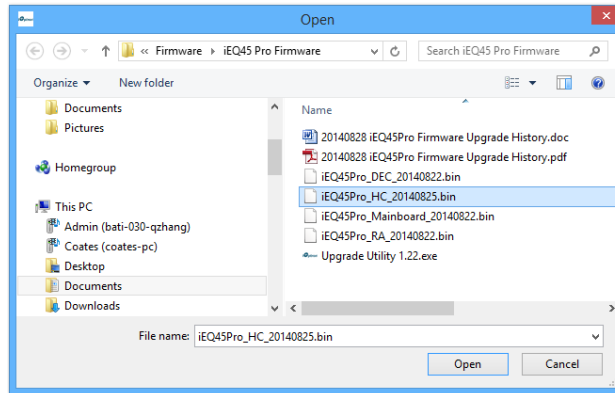
- (1) Connect 8407+ hand controller to the HBX port of an iEQ45 Pro mount. Make sure the mount power is OFF;
- (2) **Connect 4-pin RJ9 plug into the serial port of a 8407+ hand controller** and the 9-pin RS232 connector to your computer's RS232 port (or RS232 port of the USB2COM converter);
- (3) Hold **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**:



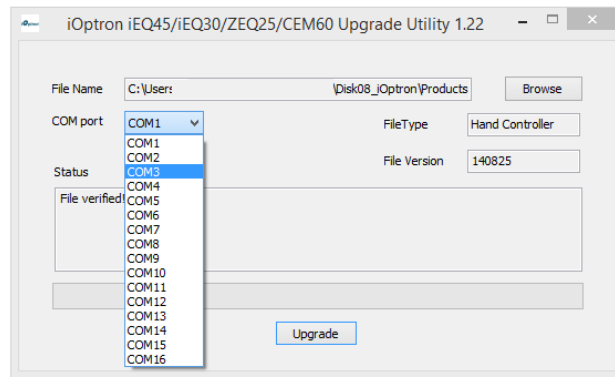
(5) An iOptron Upgrade Utility window will display. Click on **Browse**:



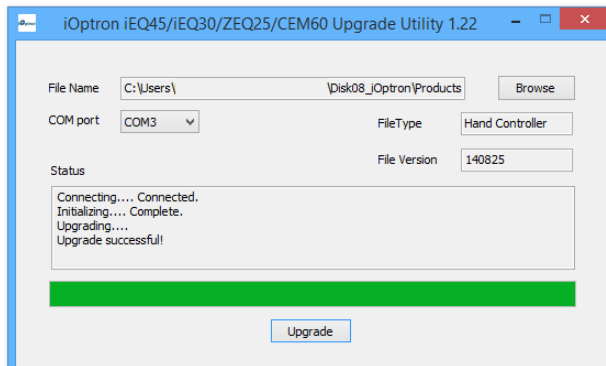
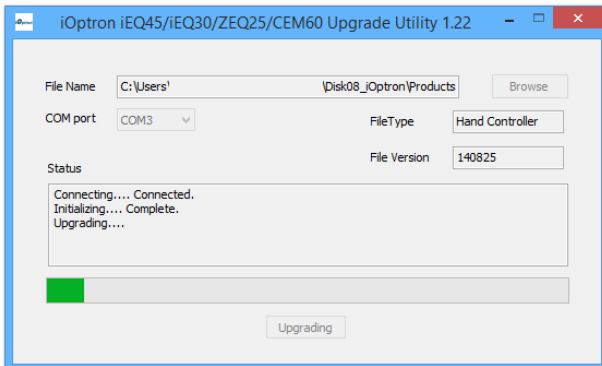
(6) Select hand controller firmware iEQ45Pro_HC_20140825.bin and click **Open**



(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 **COM3**.



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



- (9) Power cycle the mount. Depends on the firmware version, you may receive an error message on the hand controller. **Ignore any error message displayed on the hand controller.** It will disappear after all four firmware was upgraded.

4. Upgrade iEQ45 Pro main control board firmware:

- (1) Disconnect 8407+ hand controller cable from the HBX port of an iEQ45 Pro mount (No hand controller is needed during upgrade). Make sure the mount power is OFF;
- (2) **Connect RJ9 plug into the serial port (RS232 Port) on the iEQ45 Pro 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**
- (4) Click on **Browse** in iOptron Upgrade Utility window. Select main board firmware iEQ45Pro_Mainboard_20140822.bin and click **Open**;
- (5) Click on pull down menu of the COM port and select the COM port number. Here is **COM3**. 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.

5. Upgrade iEQ45 Pro 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 upgrading.

Make sure the main board is working properly.

- (1) Disconnect 8407+ hand controller cable from the HBX port of an iEQ45 Pro mount. Make sure the mount power is OFF;
- (2) Connect RJ9 plug into the serial port (RS232 Port) on the iEQ45 Pro 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 R.A. or DEC board firmware, such as iEQ45Pro_RA_20140822.bin and click Open;
- (5) Click on pull down menu of the COM port and select the COM port number. Here is **COM3**.
- (6) Switch the ON/OFF button to turn the mount power on and click on Upgrade button immediately. The upgrading process will begin. If the upgrade does not start, you may try it again with different waiting time. **The timing between powering ON and clicking the Upgrade button is critical.**
- (7) After the firmware upgrade finished, turn the mount power off. Turn on the mount and wait 10 second to allow upgraded RA/DEC board finishing initialization.
- (8) Upgrade the other motor control board.
- (9) Power cycling the mount. Check your firmware version after all four firmware upgrade is finished 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 (it should be the **RS232 port**, not the iOptron port);
- Broken RJ9 to RS232 cable;
- A USB to RS232 converter does not work properly;
- Hand controller not plugged in properly;
- Malfunctioned control board;
- RJ9 plugged into mount RS232 port when doing hand controller firmware upgrading, or RJ9 plugged into hand controller serial port when performing main board, RA/DEC upgrading.

(3) Upgrade stopped in the middle or failed:

- Cable not plugged in firmly;
- Broken RJ9 or RS232 cable;
- A USB to RS232 converter does not work properly.

(4) Hand controller and main board firmware upgraded successfully. But R.A. and DEC boards upgrade stopped in the middle or failed:

- Native COM port does not work properly. Use a USB to RS232 converter and try again;
- A USB to RS232 converter does not work properly.