

SmartEQ Pro+ with Go2Nova[®] 8408 Hand Controller Firmware Upgrade

The firmware of a SmartEQ Pro+ main board and Go2Nova[®] 8408 hand controller can be upgraded by a customer. Please check iOptron's website, www.iOptron.com, under **Support**, 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 Upgrade Utility Program (Version 1.22 or higher)
- 8408 hand controller firmware for SmartEQ Pro+
- Main board firmware for SmartEQ Pro+
- iOptron RS232 to RJ9 serial cable #8412
- 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. **We recommend using a converter with a FTDI chipset.**

1. Prepare the hardware

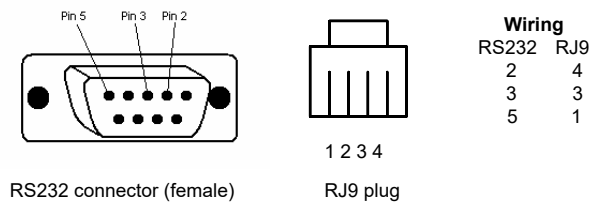
In order to perform the firmware upgrade, as well as to use planetarium software to control the mount via an 8408 hand controller, the communication between the PC and hand controller has to be established.

RS232 to RJ9 serial cable

The firmware upgrade and computer controller is through a RJ9 serial port on a Go2Nova[®] 8408 hand controller. You need a cable to connect this port to the serial port of a computer. Here is a sample of a RS232 to RJ9 serial cable. **Please do not use other brand cable other than iOptron. They may look exactly same but wired differently.**

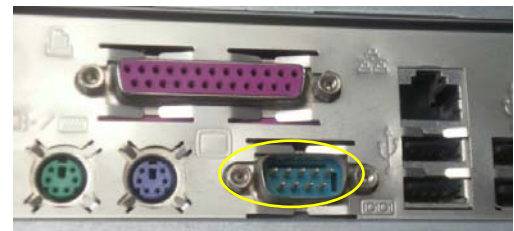


If you are making your own cable, here is the wiring instruction:



Serial (RS232) Port on a Computer

The first step is to find if your computer has a serial port (or RS232 port). The following photos show a native (built-in) serial port on a laptop (left) and a desk top (right). It is a 9-pin D-shaped (DB9) connector. The assigned port number usually is COM1. Minimum 5.0V DC output power at serial connector is needed to ensure reliable data transmission. **If you have difficult to upgrade main board firmware with native RS232 port, use a USB-RS232 converter.**



USB to RS232 converter

If your computer only has USB ports, like most late PC and laptops do, or the native RS232 port does not perform, you need a USB to COM (RS232) converter to convert one USB port to a RS232 port. Here are two examples of USB2COM converters. Here are two examples of USB2COM converters. We recommend having a converter that uses high quality chipset, such as one from FTDI or Silicon Labs, to ensure a reliable operation.



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

If your computer has a serial port (9-pin D-shape male connector on the back, the default assigned number is COM1.

If you are using a USB to COM converter to convert one USB port to a COM port, you can find the computer assigned COM port number.

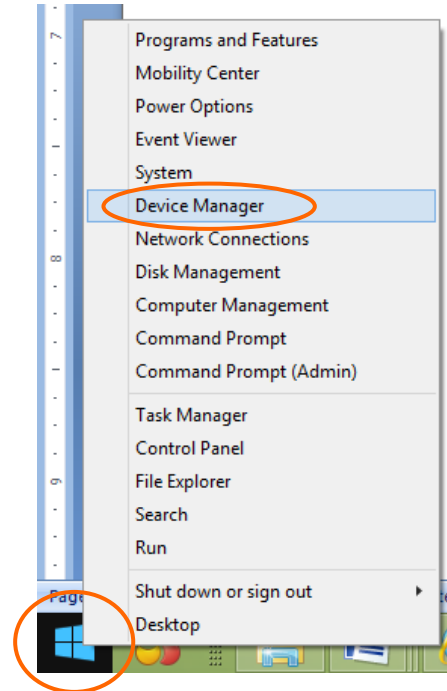
Set up you mount. Connect the hand controller to the HBX socket on the SmartEQ Pro+ mount (**NOT the GUIDE socket!**)

Plug the USB to RS232 converter into one of available USB port and connect the RS232-RJ9 serial cable onto the serial port of the converter.

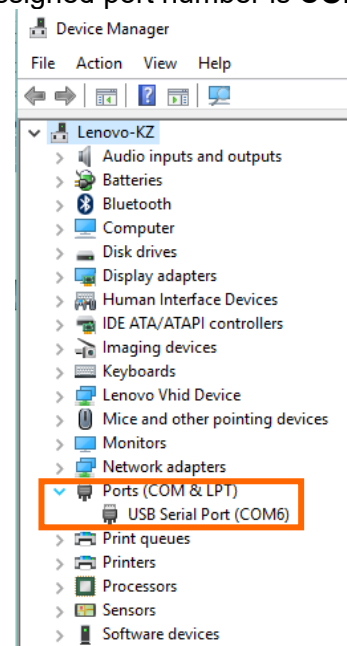


After install the USB2COM driver that comes with the device, use your mouse' right button to click on **Windows** sign located on the left bottom corner of your computer's screen (Windows 8 as an example). This will bring up a list of tasks as

shown in the screen shot below. Move the mouse to **Device Manager** and click onto it.



Click on **Ports (COM & LPT)**, find out the COM number and write it down (in the following screen shot, the assigned port number is **COM6**)



3. Download software and firmware from iOptron website:

Go to iOptron website, www.iOptron.com, click on **Support** tab. Locate **SmartEQ Pro+** under **Firmware/Software** catalog and click on it. You may also find the information in SmartEQ Pro+ product page.

Download and save **Upgrade Utility** program, SmartEQ Pro+ Hand Controller firmware and main control board firmware to your computer, in a designated folder.

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

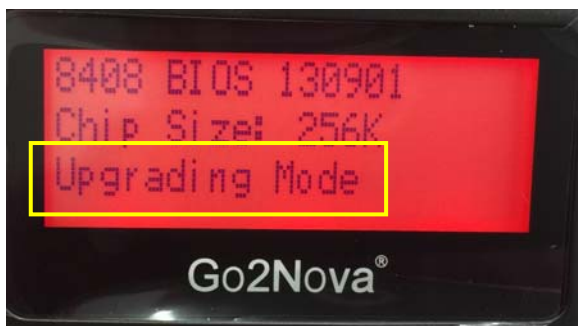
If the upgrade process was disrupted, wrong firmware was loaded, or the upgrade was failed, just start this process over again. Make sure a correct COM port is selected and the RJ9 cable is plug into the hand controller serial port.

4. Upgrade 8408 hand controller firmware:

- (1) Connect the 8408 hand controller to the HBX port of a SmartEQ Pro+ mount. Make sure the mount power is OFF;
- (2) Connect 4-pin RJ9 plug into the serial port of a 8408 hand controller and the 9-pin RS232 connector to your computer's RS232 port (or RS232 port of the USB2COM converter);



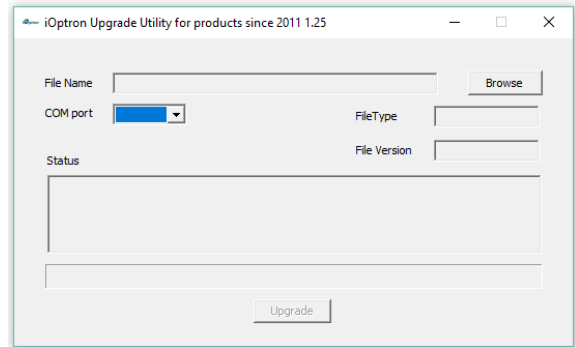
- (3) Hold **ENTER** button of the hand controller while switch the ON/OFF button to turn the mount power on. The hand controller will enter the upgrading mode, such as the following screen:



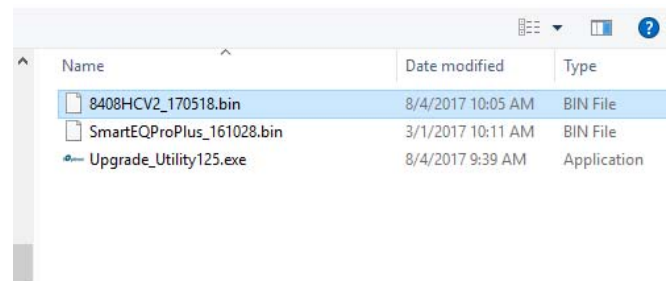
- (4) Locate download software on your computer and click on **Upgrade Utility.exe**:



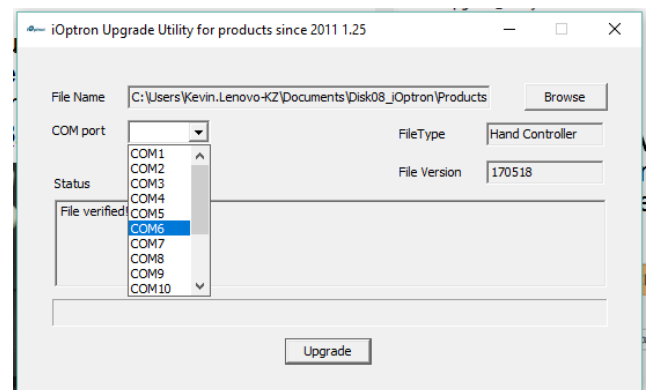
- (5) An iOptron Upgrade Utility window will display. Click on **Browse**:



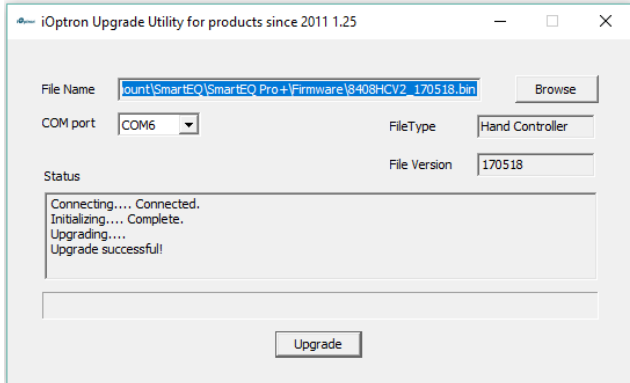
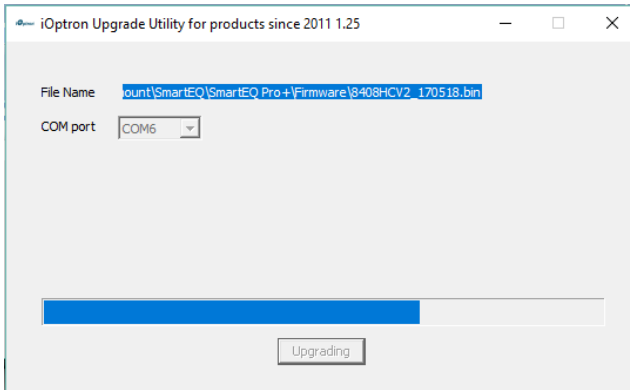
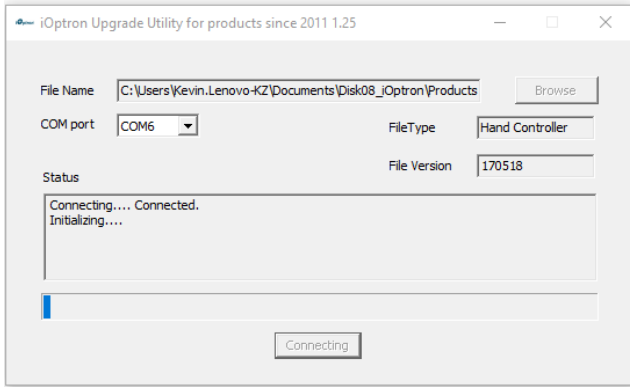
- (5) Navigate to the folder storing the downloaded files. Select 8408 hand controller firmware 8408HCV2_YYYYMMDD.bin and click **Open**.




- (6) 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 **COM6**.



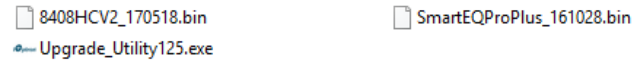
- (7) Click on **Upgrade** button to start the process;



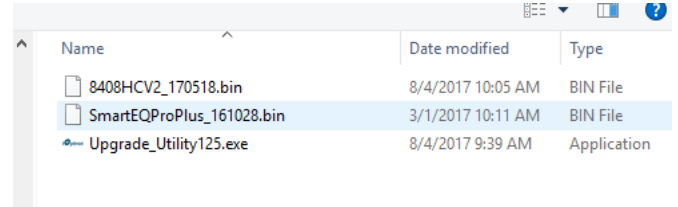
(8) After the firmware upgraded successfully, power cycle the mount. If no other firmware upgrade is needed, exit the Upgrade Utility program by click on .

5. Upgrade SmartEQ Pro+ main board firmware:

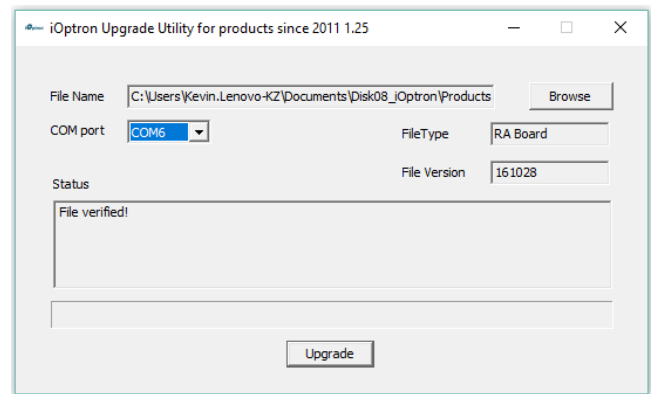
- (1) Connect 8408 hand controller to the HBX port of a SmartEQ Pro+ mount. Make sure the mount power is **OFF**;
- (2) Connect 4-pin RJ9 plug into the serial port of an 8408 hand controller and the 9-pin RS232 connector to your computer's RS232 port (or RS232 port of the USB2COM converter);
- (3) Locate downloaded software and click on **Upgrade Utility.exe**;



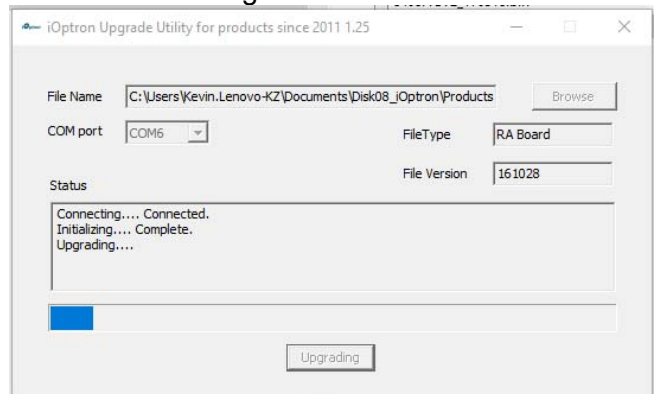
(4) Click on **Browse** in iOptron Upgrade Utility window. Select the main board firmware, SmartEQProPlus_YYYYMMDD.bin, and click **Open**;



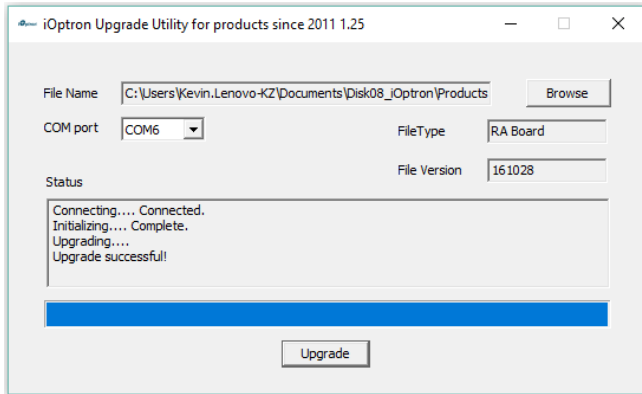
(5) Click on pull down menu of the COM port and select the COM port number. Here is **COM6**.



(6) Now turn the mount power on. *Wait a few second, click on **Upgrade** button.* The upgrading process will begin. If the upgrade does not start, you may try it over again with different waiting time.



(7) After the firmware upgrade finished, "Upgrade successful!" will be displayed.



- 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.

(6) I upgraded the hand controller firmware successfully. When do main board upgrade, the connection is failed.

- The steps of HC and main board firmware upgrade are different. Please double check the upgrade sequence.

(8) Power cycling the mount. The hand controller should be able to identify the mount as “8408 for SmartEQ Pro+” and goes into the main screen. Check your firmware version after all four firmware upgrade is finished by press **MENU→Firmware Information**.

(9) Exit the **Upgrade Utility** program.

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:

- Mount power is not turned on;
- COM port conflict or used by other program. Close other program and try it again;
- Serial cable is not connected to the hand controller;
- Broken RJ9 to RS232 cable;
- A USB to RS232 converter does not work properly;
- Hand controller not plugged in properly;
- Malfunctioned control board;

(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 upgrade is fine. But main board upgrade stopped in the middle or failed: