



# iOptron CEM120 Firmware Upgrade Instructions

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## iOptron CEM120 Firmware Upgrade



To upgrade a CEM120 mount with a 8410 hand controller, you need the following:

- A Windows based computer with a USB port
- A USB 2.0 cable
- Latest firmware and Upgrade Utility from CEM120 product page.
- FTDI USB-VCP driver

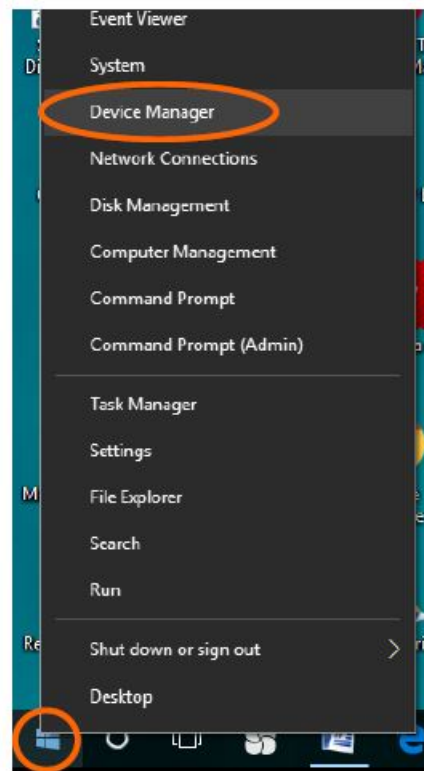
### Prepare Upgrade

1. Download and install FTDI USB-VCP driver
2. Connect USB cable between the mount USB port and a PC

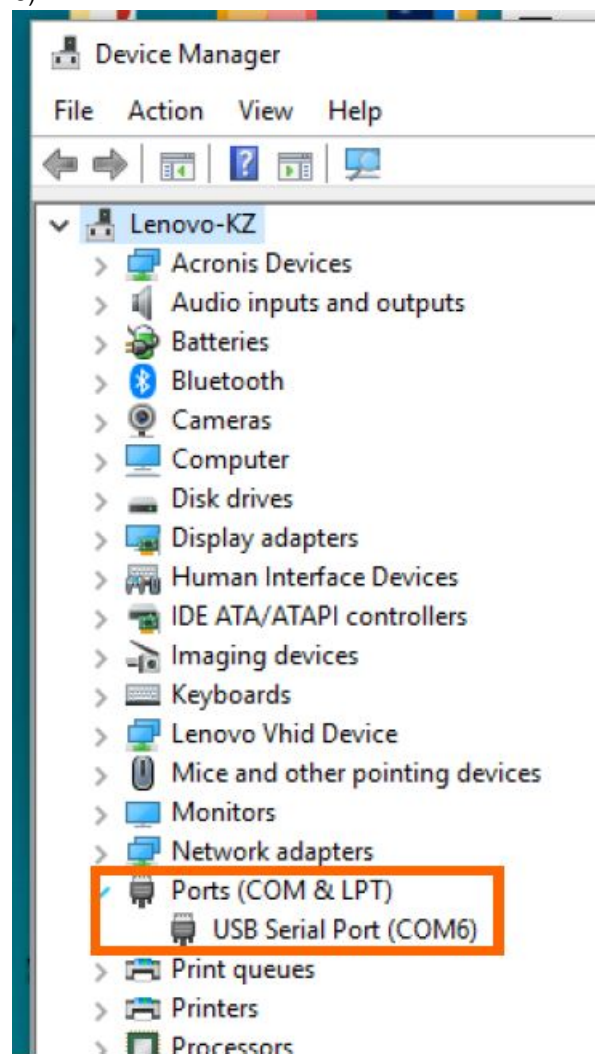


3. Power the mount on. Plug in the 8410 hand controller if its firmware needs be upgraded.
4. Find assigned COM

Use your mouse' right button to click on Windows sign located on the left bottom corner of your computer's screen (Windows 10 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)

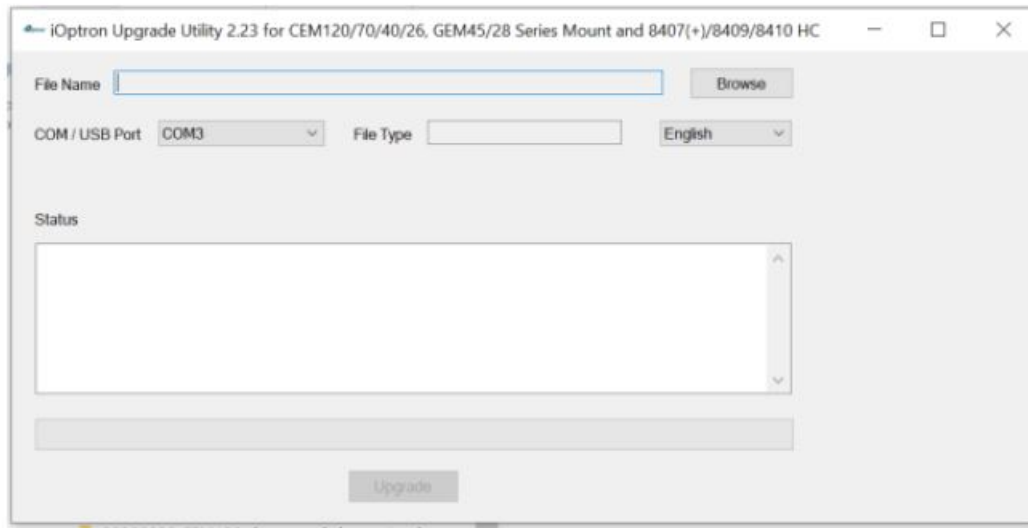


**Firmware upgrade**

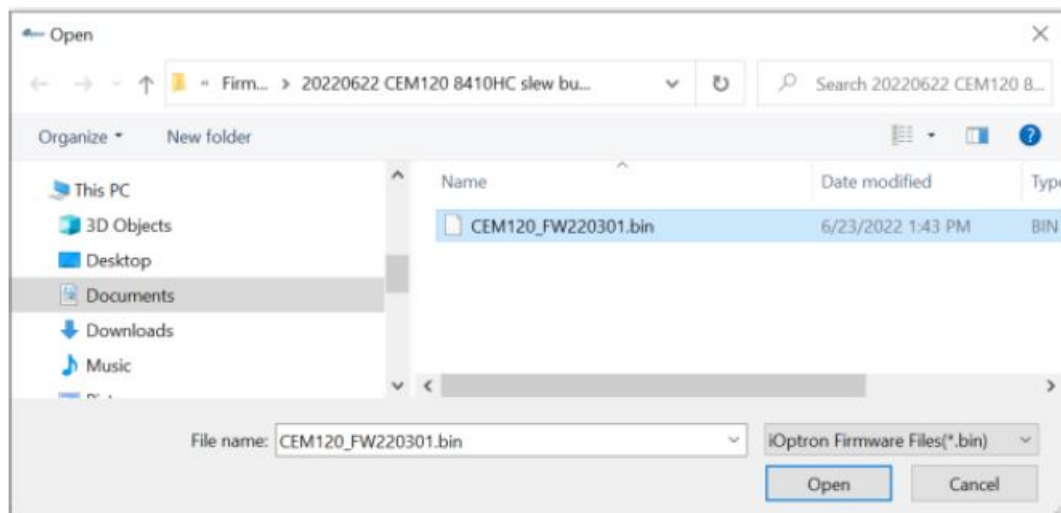
1. Locate downloaded software and click on iOptronUpgradeUtility.exe:

Name	Date modified
 CEM120_FirmwareVersionHistory.pdf	11/9/2022 9:17 AM
 CEM120_FW220301.bin	6/23/2022 1:43 PM
 CEM1207040_GEM45_8407_HandController_20210420.bin	8/18/2021 4:09 PM
 iOptronUpgradeUtility223.exe	10/22/2021 10:43 PM

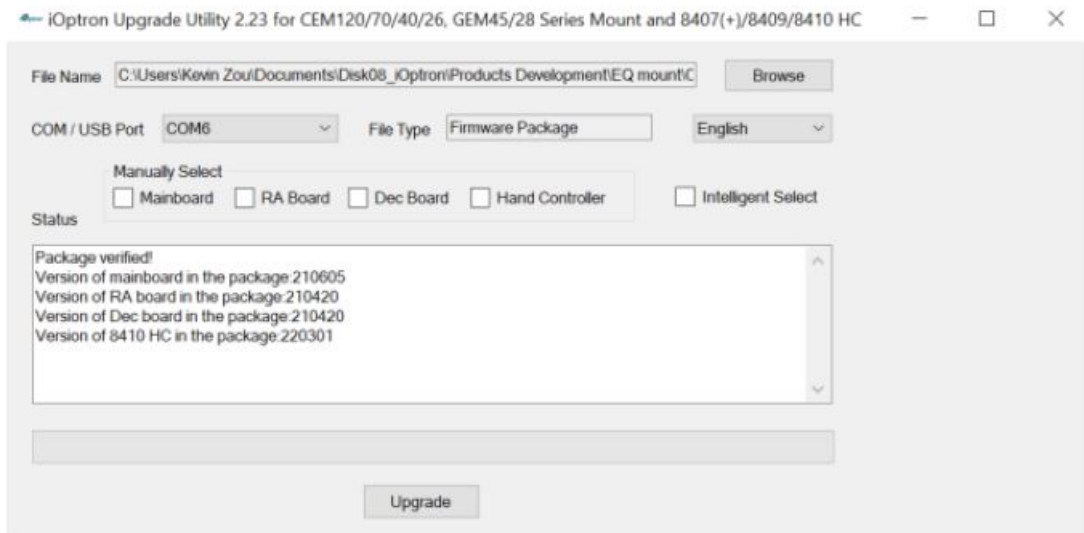
2. Click on Browse in iOptron Upgrade Utility window.



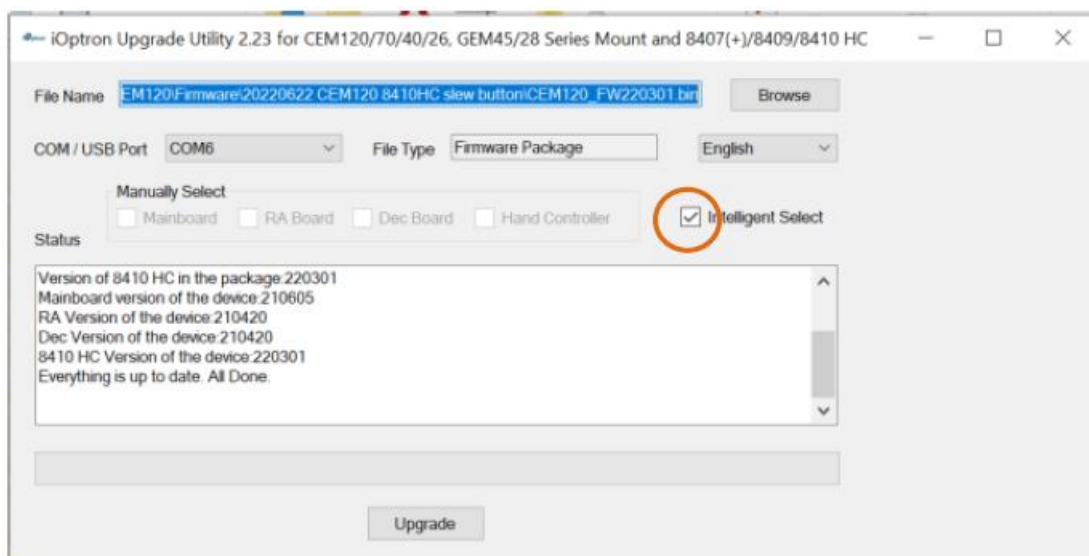
Select the mount firmware package CEM120\_FWYYMMDD.bin, and click **Open**



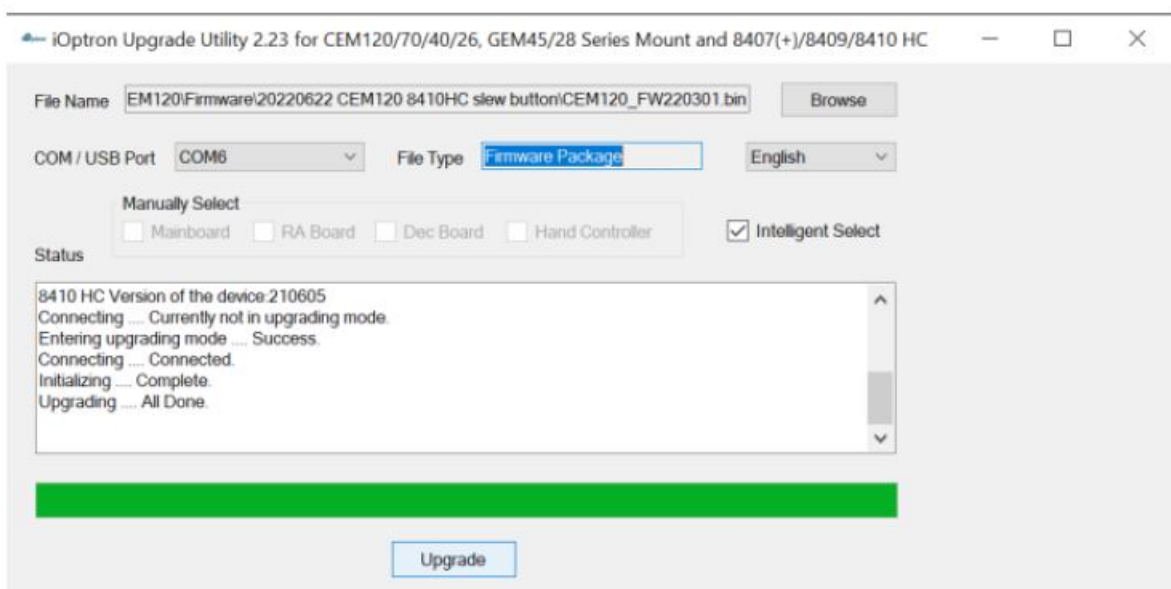
The File Type and Package will be verified and displayed. Click on pull down menu of the COM/USB Port and select the COM port number, here is COM6.



3. Now you can choose “Intelligent Select” to let the software decided which part of mount firmware needs be upgraded, or use “Manually Select” to select which firmware you want to upgrade. If chose “Intelligent Select”, check the small box in front of it and click on Upgrade button. If the software is up to date, you’ll see the following window.



If any or all firmware needs be upgraded, or “Manually Select” is chosen, the software will do so.



4. Power cycling the mount. Check your firmware version after all four firmware upgrade is finished by press MENU Firmware Information.

5. Exit the Upgrade Utility program.

## **Calibration CEM120 EC version high precision encoder**

**CEM120EC/EC2** version needs to perform encoder calibration after the firmware upgrade to ensure precise tracking.


To calibrate the encoder:

1. Turn off the mount;
2. For RA encoder calibration, hold number “2” on the hand controller, then turn the mount power on. Keep holding the #2 key until the calibration started automatically;  
The calibration mode will search the mount zero position first. Next the mount will swing to the eastern side quickly. Then the mount will slowly move from eastern side to western side to calibrate the encoder. It will return to Zero Position after the calibration is finished. The total procedure may take a few minutes.
3. After the mount stopped, turn off the mount, and turn on again.
4. For CEM120EC2 DEC encoder calibration, hold number “4” on the hand controller, then turn the mount power on. Keep holding the #4 key until the calibration started automatically;  
The calibration mode will search the mount zero position first. Next the mount will swing to the eastern side quickly. Then the mount will slowly move from eastern side to western side to calibrate the encoder. It will return to Zero Position after the calibration is finished. The total procedure may take a few minutes.
5. After the mount stopped, turn off the mount, and turn on again.
6. Perform Search Zero Position or Set Zero Position.

## **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;
  - Main board issue
2. Connection failed:
  - Mount power is not turned on;
  - Cable is not plugged in firmly;
  - Malfunctioned control board.
3. Upgrade stopped in the middle or failed:
  - Try upgrading again with manual upgrade.
  - Cable is not plugged in firmly;
  - Cable is moved during process.

## **Documents / Resources**

	<p><b>iOptron CEM120 Firmware Upgrade</b> [pdf] Instructions CEM120 Firmware Upgrade, CEM120, Firmware Upgrade</p>
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References

-  [iOptron.com](https://www.ioptron.com)