CEM40/GEM45 w/8410HC Firmware Upgrade

This firmware upgrade instruction is for CEM40/GEM45 mounts with an 8410 hand controller. The upgrading is only supported by **Windows**. Please check product page on iOptron's website for the most up to date firmware. You may also check www.iOptron.com, under **Support** for it.

Both mount control board and 8410 hand controller firmware upgrade will be done via the mount USB port.

To upgrade the firmware, you need the following software/hardware:

- iOptron Upgrade Utility Program (*Check the Firmware Upgrade page*)

- Mount firmware upgrade:

  - CEM40/GEM45 mount firmware package include 8410
  - USB cable #8416 (included)
  - FTDI VCP (Virtual COM Port) driver for CEM40/GEM45 mount USB port. It can be downloaded from firmware upgrade page or from manufacture:
    https://ftdichip.com/drivers/vcp-drivers/

1. Download software and firmware from iOptron website

- Go to the **CEM40 Firmware** or **GEM45 Firmware** page under the **Support Documents** directory on a CEM40/GEM45 product page.

- Download and save ***iOptronUpgradeUtility.exe*** program and CEM40/GEM45 mount firmware.

- Download and install FTDI VCP driver, if this is the first time for firmware upgrade

2. Firmware upgrade

If only upgrading the mount firmware, it does not need a hand controller be plugged in. If the HC is plugged in, please ignore any error message shown on the HC screen during upgrading process.

(1) Connect the mount to a computer via a USB cable through mount USB port.

USB port on the main board

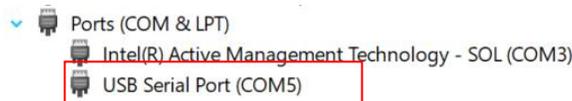(CGEM4x mount with a universal dovetail saddle)
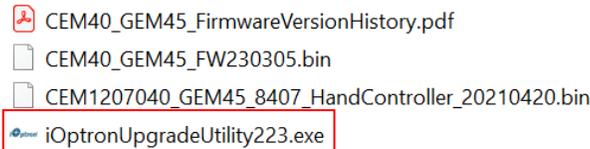

USB port on dovetail saddle

(CGEM4X-NUC)

USB port on back of RA axis (CMS input)

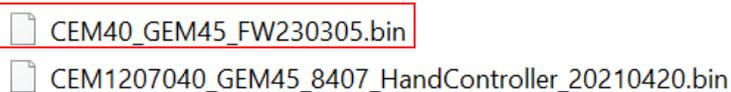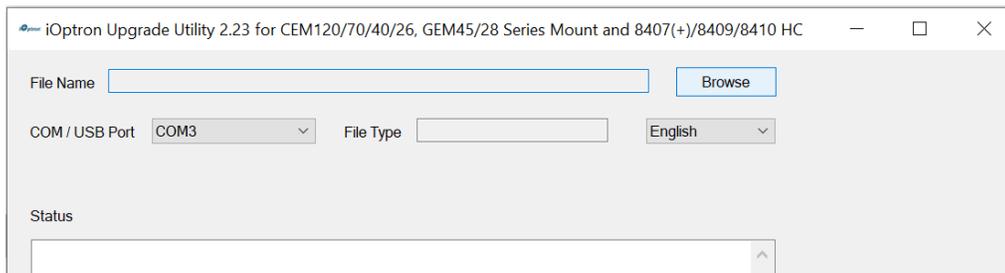Later version of CEM40 (Left) and GEM45 (right)

(2) Turn the mount power on. Go to Windows Device Manager=>Port (COM & LPT) to find the COM Port assigned to the mount.
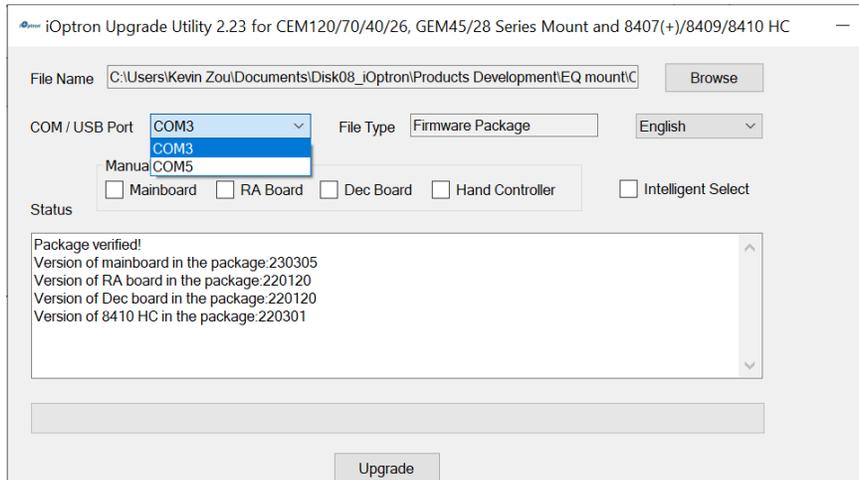

(3) Locate downloaded software and click on *iOptronUpgradeUtility.exe*:

(4) Click on **Browse** in iOptron Upgrade Utility window. Select the mount firmware package, such as CEM40_GEM45_FWYYMMDD.bin, and click **Open;**

(5) The **File Type** and **Version** will be verified and displayed. Click on the pull down menu of the *COM/USB Port* and select the COM5 port.

(6) Now you can choose "**Intelligent Select**" to let the software decided which board firmware needs be upgraded, or use "**Manually Select**" to select which firmware you want to upgrade.
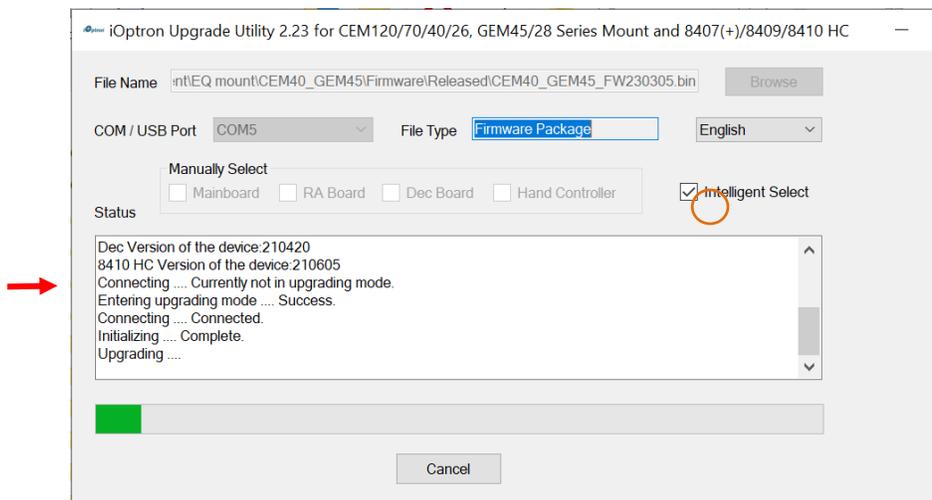
Click on **Upgrade** button. The **Upgrade Utility** will

- Check current firmware version, include 8410 HC version;
- Try to connect to the board that needs firmware upgrading and perform the firmware upgrade one by one;
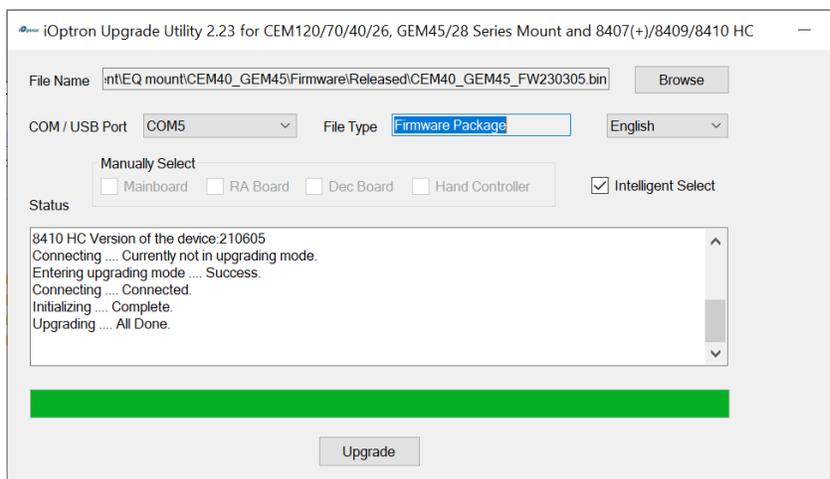
(7) Power cycling the mount. Check your firmware version after all four firmware upgrade is finished by press **MENU→Firmware Information**.

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

3. Calibration CEM40/GEM45 EC version high precision encoder

CEM40EC/GEM45EC version needs to perform encoder calibration after the firmware upgrade to ensure precise tracking.

To calibrate the encoder:

1) Turn off the mount;

2) Press and hold number "2" button on the hand controller when power on the mount. The calibration process will start automatically;

3) 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.

4) After the mount stopped, turn off the mount, and turn on again.

5) Perform **Search Zero Position** or **Set Zero Position**.

4. Common errors during firmware upgrade

(1) COM port cannot be opened:

- Wrong COM port is selected;
- A mount is not connected;
- Cable is not plugged in firmly
- A USB to RS232 converter driver is not installed or corrupted;

(2) Connection failed:

- Mount power is not turned on;
- Cable is not plugged in firmly;
- Malfunctioned control board;
- Wrong firmware selected.

Contact support@ioptron.com for technical support.