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iOptron CEM40/GEM45 Firmware Upgrade User Manual

CEM40/GEM45 Firmware Upgrade

The firmware of both the 8407 hand controller (HC) and mount can be upgraded. The upgrading is only supported by Windows. Please check iOptron's website, **www.iOptron.com,** under Support, for the most up-to-date firmware.
The firmware upgrade will be done via:

- Mount: USB port on mount mainboard.
- Hand controller: RS232 serial port on the hand controller.

  To upgrade the firmware, you need some or all of the following software/hardware, depending on the upgrading you are performing:
- iOptron Upgrade Utility Program (Version 2.01)
- Mount firmware upgrade:

  o CEM40/GEM45 mount firmware package

  o USB cable #8416 (included)

  o FTDI VCP (Virtual COM Port) driver for CEM40/GEM45 mount USB port
- Hand controller firmware upgrade:

  o 8407 hand controller firmware

  o option RS232 to RJ9 serial cable

  #8412 (included)

  o USB to RS232 converter and driver for hand controller firmware upgrade. If your computer does not equip an RS232 port (9-pin D-shape connector) except the USB port, you need to buy a USB to RS232 converter, from a computer hardware store or online. We recommend using a converter.

Contents

Prepare the hardware

CEM40/GEM45 Mount Firmware

1. Connect the USB cable to the mount USB port on the mainboard, NOT the one next to the polar scope.
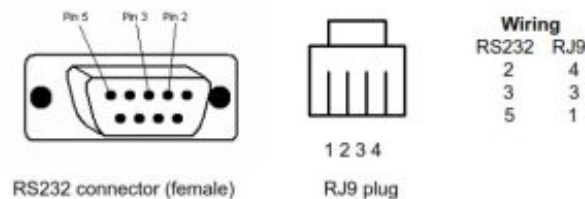2. Download and install FTDI VCP driver

Hand Controller Firmware

1. **RS232 to RJ9 serial cable**

The mount comes with an RS232 cable. Please do not use a cable other than the iOptron one. They may look exactly the same but wired differently.

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

(2) 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 desktop (right). It is a 9-pin D-shaped (DB9) connector. The assigned port number usually is COM1. Minimum 5.0VDC output power at the serial connector is needed to ensure reliable data transmission.

(3) USB to RS232 converter

If your computer only has USB ports, as 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 an RS232 port. Here are two examples of USB2COM converters.

Download and install FTDI VCP driver.

We recommend using a USB to RS232 converter even your computer has a native RS232 port. A converter with an FTDI chipset is preferred to ensure a reliable operation.

Find the serial port (COM port) number

The Upgrade Utility for CEM40/GEM45 should detect the COM port number automatically after the USB VCP driver is installed. You may skip this step unless the Upgrade Utility could not find the COM port #.

CEM40/GEM45 Mount Firmware

Directly connect the USB cable between the mount USB port and the computer.
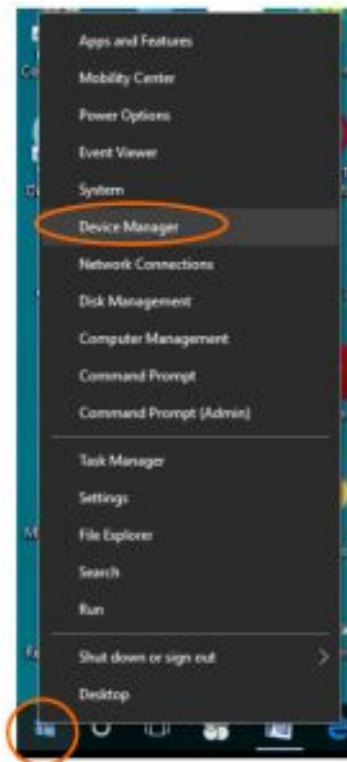
Hand Controller Firmware

The default assigned number is COM1 if your computer has a serial port (9-pin D-shape male connector on the back, If you are using a USB to COM converter or direct USB connection, you can find the computer

assigned COM port number as described below. Set up your mount. Connect the hand controller to the HBX socket, NOT the imported socket, on the CEM40/GEM45 mount. Plug the USB to RS232 converter into one of the available USB ports on your computer and connect the RS232-RJ9 serial cable onto the serial port (D-shaped) of the converter. Connect the RJ9 telephone jacket into the RS232 port of 8407 HC for a hand controller firmware upgrade.

Find the COM port number

Use your mouse's right button to click on the 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 screenshot below. Move the

mouse to Device Manager and click on it.

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

Download software and firmware from the iOptron website:

Go to CEM40/GEM45 product page on the iOptron website, **www.iOptron.com**, click on the Support Documents tab. Download and save the iOptronUpgradeUtility.exe program, Hand Controller firmware, and CEM40/GEM45 mount firmware.
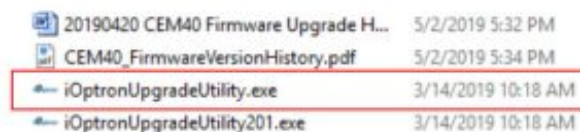
8407 hand controller firmware upgrade:

1. Connect the 8407 hand controller to the HBX port on CEM40/GEM45 mount. Make sure the mount power is OFF;
2. Connect 4-pin RJ9 plug into the serial port of an 8407 hand controller and the 9-pin RS232 connector to your
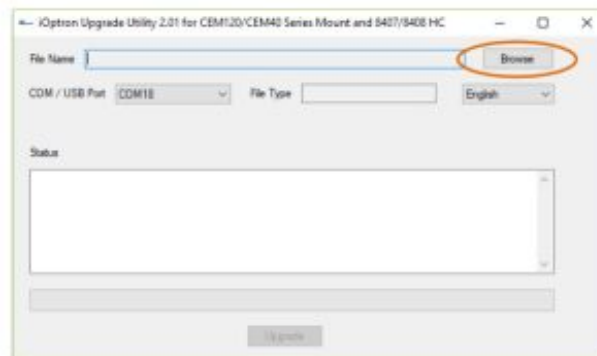
computer's RS232 port (or RS232 port of the USB2COM converter);

3. Hold ENTER button of the hand controller while switching the ON/OFF button to turn the mount power on. The HC will enter upgrading mode.

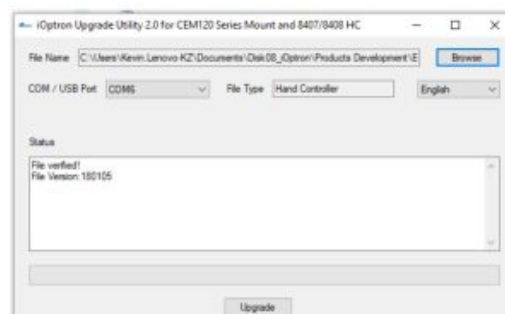4. Locate downloaded software and click on iOptronUpgradeUtility.exe:

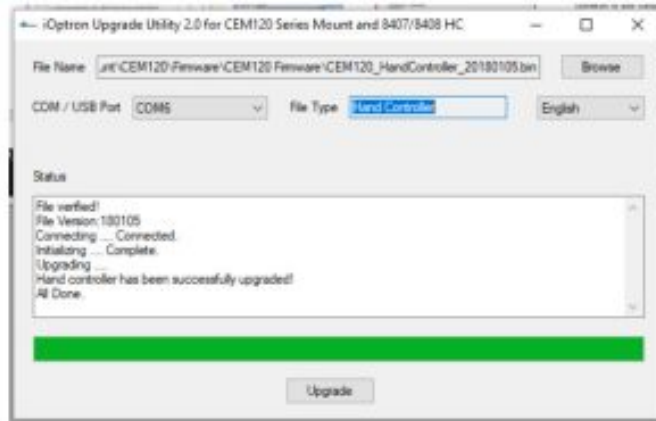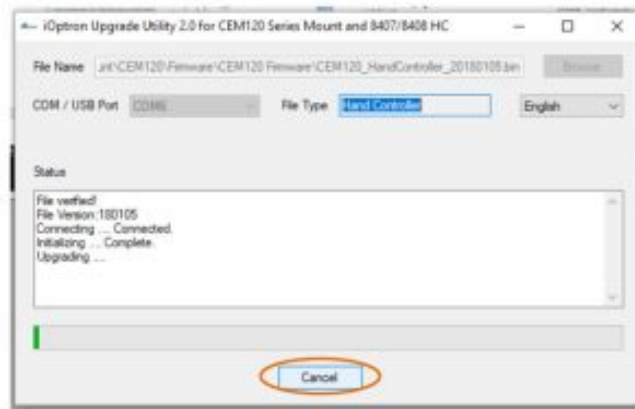5. An option Upgrade Utility window will display. Click on Browse:

(5) Select 8407 hand controller firmware, such as CEM40_HandController_YYYYMMDD.bin, and click Open.

(6) The FileType and Version will be verified and displayed. The COM port will be detected (here is COM6). If it does not show, click on the pull-down menu of the COM/USB Port and select the COM port number.

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

6. After the firmware is upgraded successfully, exit the Upgrade Utility program by clicking on ⊗ power cycle of the unit.

CEM40/GEM45 mount firmware upgrade:

1. Connect the mount to a computer via a USB cable through the mount USB port. Turn the mount power on.
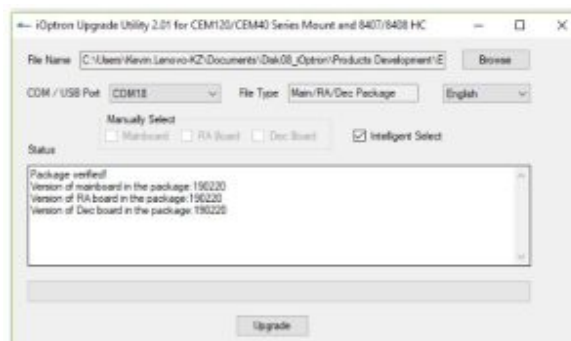

CEM40/GEN45 USB Port on main board

CEM40G

GEM45G

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

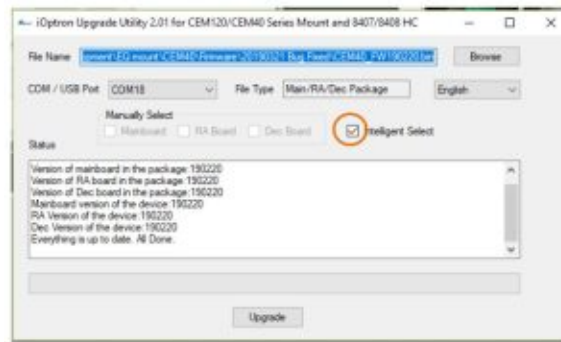|		
🖻 20190420 CEM40 Firmware Upgrade H...	5/2/2019 5:32 PM	
🖻 CEM40_FirmwareVersionHistory.pdf	5/2/2019 5:34 PM	
⬅ iOptronUpgradeUtility.exe	3/14/2019 10:18 AM	
⬅ iOptronUpgradeUtility201.exe	3/14/2019 10:18 AM	

3. Click on Browse in the iOptron Upgrade Utility window. Select the mount firmware package, such as CEM40_FWYYMMDD.bin, and click Open;

🗋 CEM40_8407_HandController_20190221.bin
🗋 CEM40_FW190220.bin

The FileType and Version will be verified and displayed. The COM port will be detected (here is COM18). f it does not show, click on the pull-down menu of the COM/USB Port and select the COM port number.

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

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

5. Power cycling the mount. Check your firmware version after all four firmware upgrade is finished by pressing MENU FiFirmware Information.

6. Exit the Upgrade Utility program.

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 the number "2" button on the hand controller when power on the mount. The calibration process will start 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 the eastern side to the 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 it on again.

4. Perform Search Zero Position or Set Zero Position.

Common errors during firmware upgrade:

(1) COM port cannot be opened:

- The wrong COM port is selected;
- A mount is not connected;
- The cable is not plugged in firmly
- A USB to RS232 converter driver is not installed or corrupted;
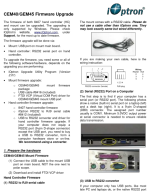- A USB to RS232 converter does not work properly.

    (2) Connection failed:

- Mount power is not turned on;
- The cable is not plugged in firmly;
- Broken RJ9 to RS232/USB cable;
- A USB to RS232 converter does not work properly;
- Malfunctioned control board;
- Wrong firmware selected.

(3) Upgrade stopped in the middle or failed:

- The cable is not plugged in firmly;
- Cable is moved during the process;
- Broken RJ9 or RS232 cable;
- A USB to RS232 converter does not work properly.

  Contact **support@ioptron.com** for technical support.

Documents / Resources

	iOptron CEM40/GEM45 Firmware Upgrade [pdf] User Manual iOptron, CEM40, GEM45, Firmware Upgrade