

# Go2Nova<sup>®</sup> 8408 Hand Controller Star Catalog Upgrade

The CEM25 mount uses the same 8408 hand controller as the one used for a ZEQ25/SmartEQ mount. If you want to use a ZEQ25/SmartEQ 8048 hand controller for a CEM25 mount, the Star Catalog of the 8408 hand controller needs be. A message like in the following photo will be displayed on hand controller LCD upgraded after hand controller firmware upgrading:



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

- **Hyper Terminal** application that will talk to the hand controller via serial port (RS232). Since only the Windows XP and older operation system carries this application (Click on **All Programs => Accessories => Communications => Hyper Terminal**). We recommend downloading an open source program called **TeraTerm**: <https://tssh2.osdn.jp/index.html.en>.
- 8408 hand controller star catalog file: [8408 Catalog Data for CEM25.bin](#)
- iOptron RS232 to RJ9 serial cable #8421 (included with the ZEQ25 mount)
- 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

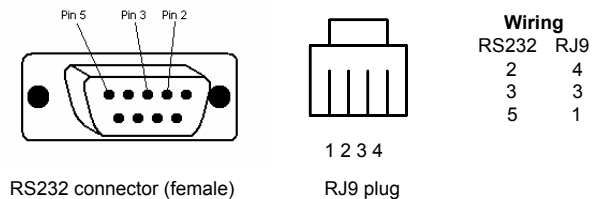
communication between the PC and hand controller has to be established.

### RS232 to RJ9 serial cable

The firmware upgrade and computer controller is through a RJ9 serial port on a Go2Nova<sup>®</sup> 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.**

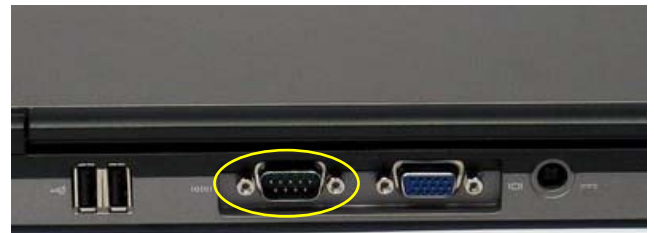


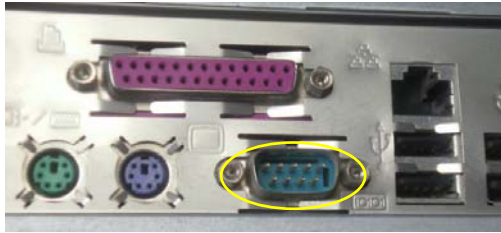
If you are making your own cable, here is the wiring instruction:



### 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 5.0VDC output power at serial connector is needed to ensure reliable data transmission.





## 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.

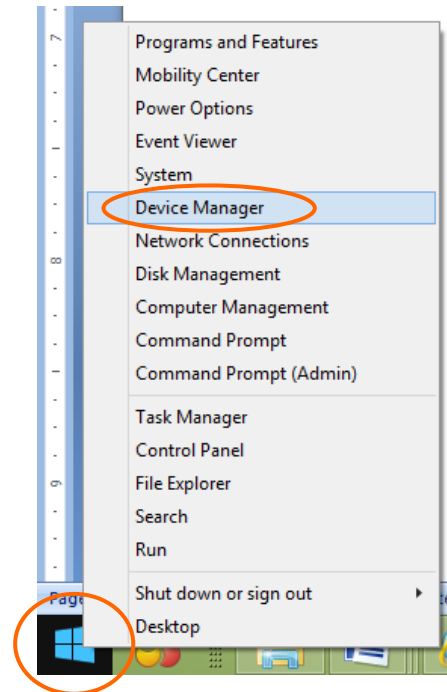
If you are using a USB to COM converter to convert one USB port to a COM port, you can find the computer assigned COM port number.

Set up your mount. Connect the hand controller to the HBX socket on the CEM25 mount (**NOT the PORT socket!**)

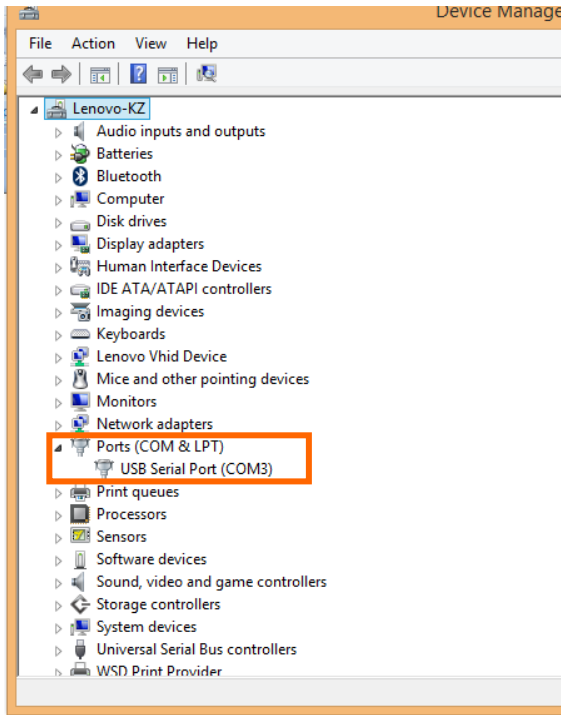
Plug the USB to RS232 converter into one of the available USB ports and connect the RS232-RJ9 serial cable onto the serial port of the converter.



After installing the USB2COM driver that comes with the device, use your mouse's 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 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 **COM3**)



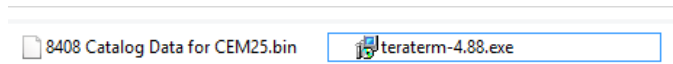
Connect the 8408 hand controller to the HBX port of a CEM25 mount. Make sure the mount power is OFF;

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);

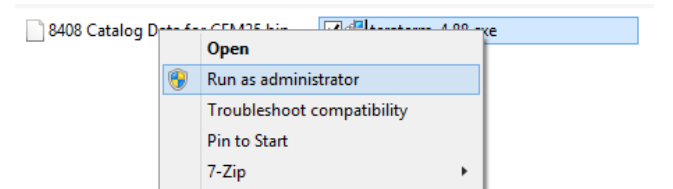


### 3. Download and install software and firmware:

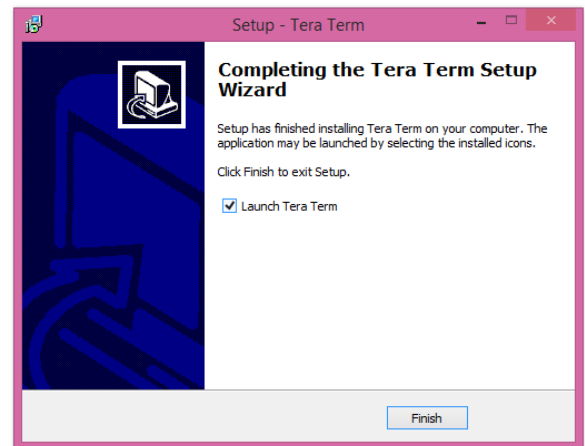
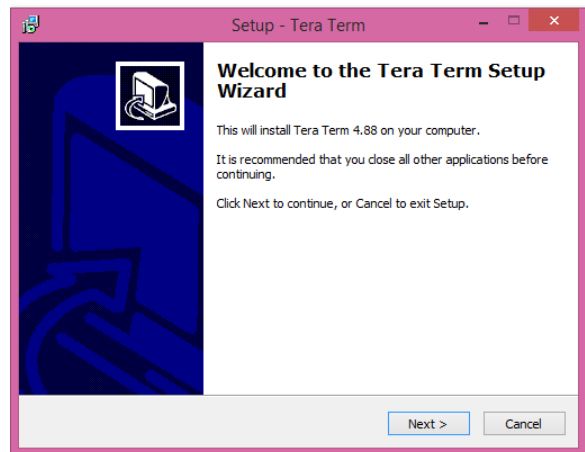
- (1) Go to iOptron website, [www.iOptron.com](http://www.iOptron.com), click on **Support** tab. Locate **CEM25** under **Firmware/Software** catalog and click on it. Download the **8408 Catalog Data for CEM25**. And save it on your computer.
- (2) Download **TeraTerm** software, from website <https://tssh2.osdn.jp/index.html.en> and save on your computer.
- (3) Locate downloaded **TeraTerm** software.




Use mouse right button to click on it, and select **Run as administrator**.

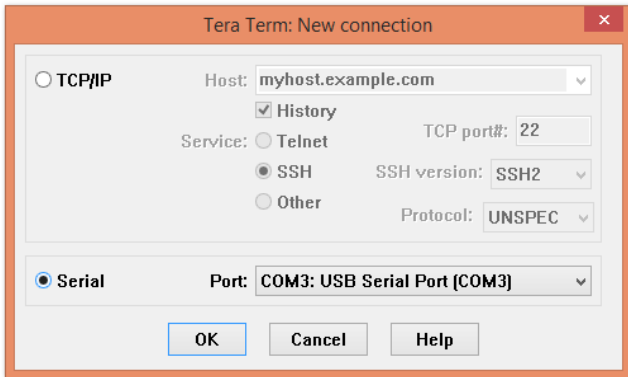


- (4) Just click on the **Next** button and follow the instruction to finish the software installation, with default settings.

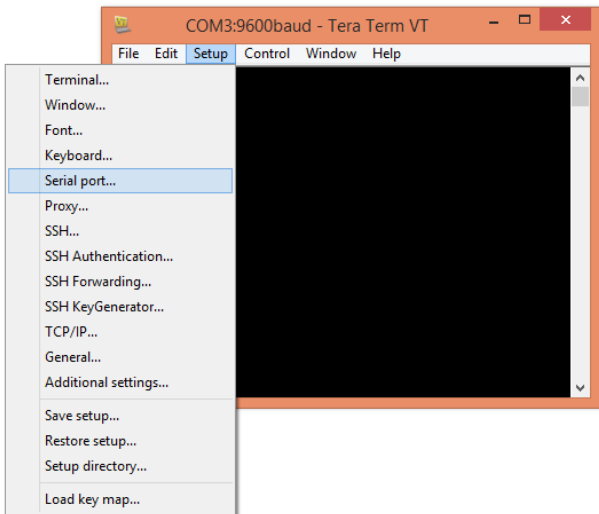


### 4. Upgrade Catalog:

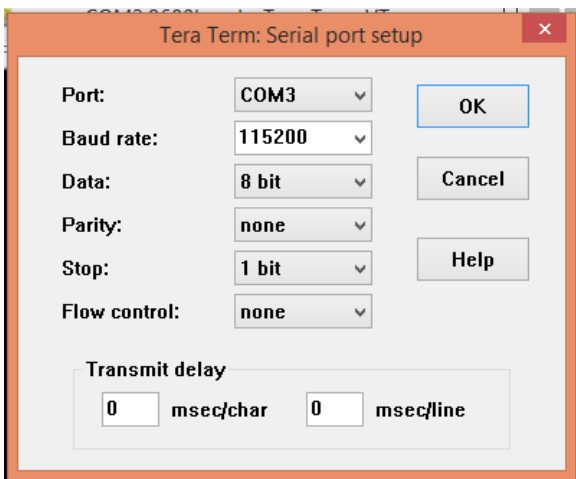
- (1) Launch the **Tera Term** by click on the  icon.
- (2) Select **Serial** connection. The software will automatically detect the available serial port. Select **COM3** as we identified before. Click **OK**.



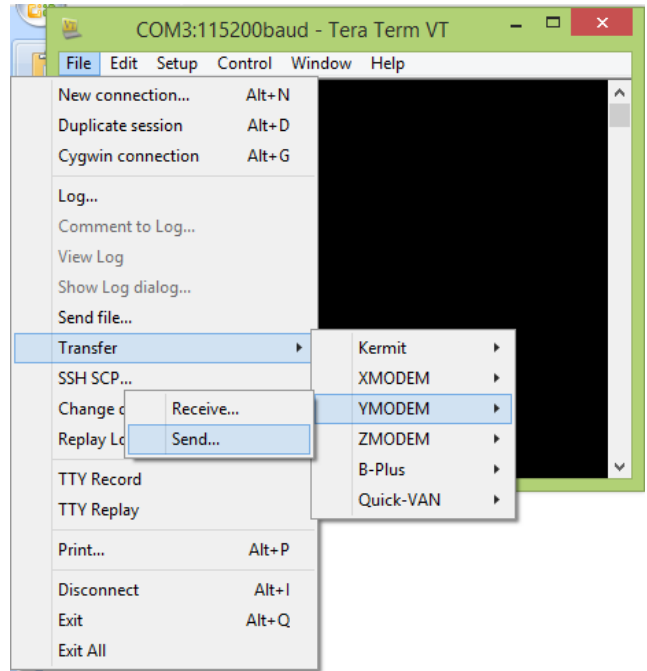
(3) Click on **Setup** bar and select **Serial port...** from pull-down menu to set up the serial port.



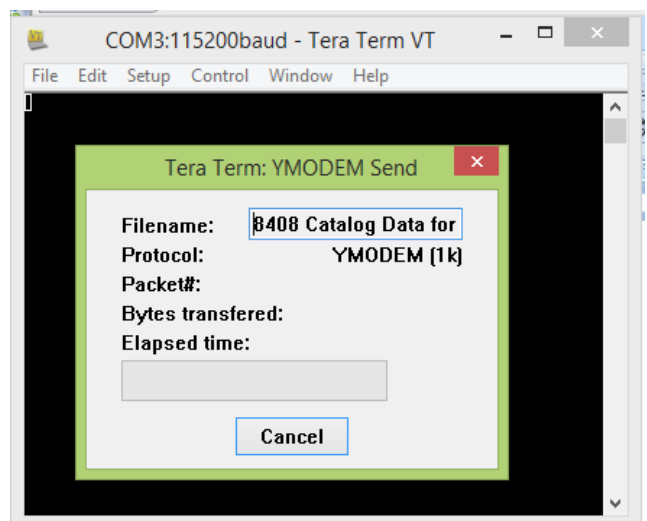
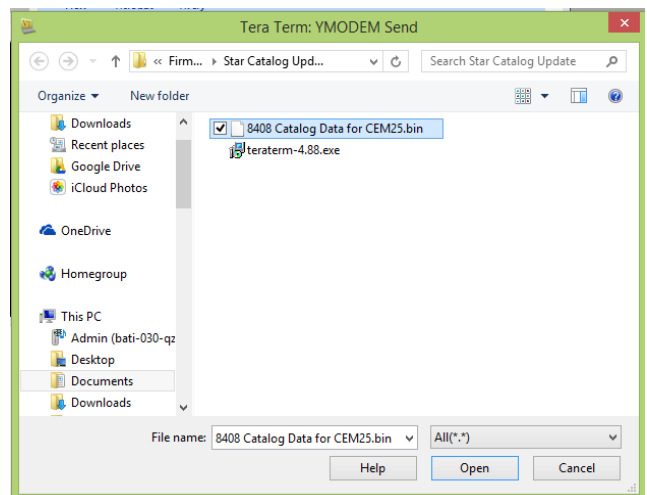
(4) Set the serial port parameters as following and click **OK**.



(5) Click on **File** bar to set up the way you want to **Transfer** the data. The **YMODEM** protocol should be selected.



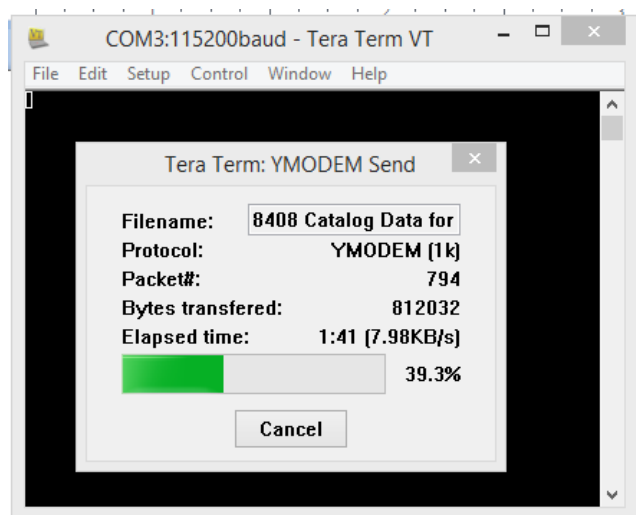
(6) Select **8408 Catalog Dada** for **CEM25.bin** and click **Open**.



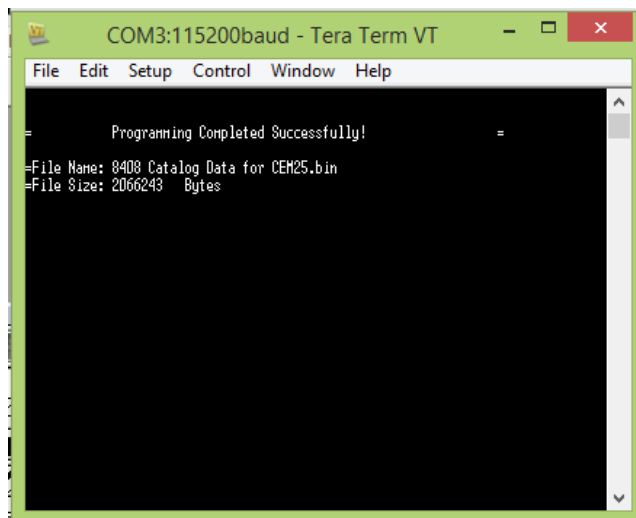
- (7) HOLD #3 button on hand controller while turn the mount power on. The hand controller will enter **Update the star catalog upgrade** mode:



- (8) The **Tera Term** will start to transfer the data to the hand controller.



- (9) If the file transfer is successful, hand controller will go back to the main screen and the **Tera Term** will display a "Transfer Completed Successfully!"



- (10) Exit the **Tera Term** program.

## **5. Common Errors During Firmware Upgrade:**

- (1) Can not find/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) Upgrade stopped in the middle or failed:
- Cable not plugged in firmly or touched during process;
  - Broken RJ9 or RS232 cable;
  - A USB to RS232 converter does not work properly.