

Astro-Physics

USB/Serial Utilities

Print this page for reference during the procedure.

The USB/Serial Utilities application is designed to allow easy access to these handy features while using nearly any computer:

- Review and update Ethernet and Wi-Fi networking settings for GTOCP4 and GTOCP5 (referred to as CP4/5).
- Firmware loads for CP4/5. Check for new versions and upgrade with quick-and-easy one-step process.
- Command terminal for CP3, CP4 and CP5.
- Data tab for CP3, CP4 and CP5. Ability to read and write NVM (non-volatile memory) files, containing the details of a PEM curve, so that digital boards can be replaced without a costly return to manufacturer or upgrade to a new control box.

Install Java and FTDI Drivers

USB/Serial Utilities can be used on any operating system that can run Java. At AP, we have tested Windows 10, Windows 7, Ubuntu 20, and several Mac versions. To use it, you must first **install the latest version of Java**, and any adapter drivers your computer needs such as **FTDI or Keyspan Drivers**

Install Java

Download Java from www.java.com and run the exe or dmg file. Installation takes just a few clicks. Be sure to use the latest version for your operating system.

Install Drivers

Drivers should be installed BEFORE making the initial connection between the computer and the CP4/5.

- USB port on the CP4/5. You must have the FTDI driver installed for your operating system. Download links can be found at www.astro-physics.com/software-updates.
- Keyspan USB-Serial adapter to connect over serial. Be sure the Keyspan driver is installed, if using.

Download and Save Zip File

Windows

On Windows, download the zip file for the latest version and save it to a convenient location. Extract the zip file to a new folder by right clicking the zip file and selecting **Extract All**. You will be given the option to select a destination, with the default destination being your downloads folder. Simply click **Extract** and Windows will unzip the file.

Next, open the unzipped folder and find the **USBserialUtilities.jar** file. It is an Executable Jar File.

Double click the executable to run the USB/Serial Utilities program.

Mac

On Mac, download the program zip file. Extract the zip file to a new folder by double clicking the zip file. This should create a folder of the same name in the directory.

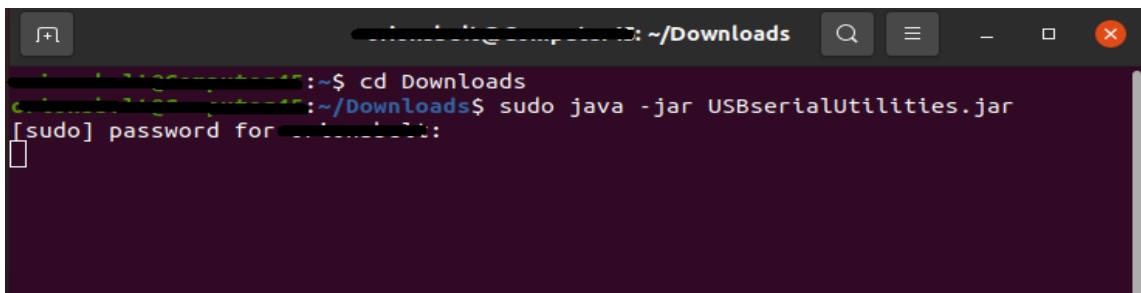
Next, open the unzipped folder and find the executable USBserialUtilities.jar. It should be labeled as an Executable Jar File. Double click the file, and the program should open. If the program does not open, then you will need to run the executable from the command line, as shown below. First open terminal, then proceed to the folder that holds the **KeypadLoader** file with the `cd` command. Then, type `'/usr/libexec/java_home'/bin/java -jar USBserialUtilities.jar` and the program should run.



Linux

On Linux, download the program zip file. Extract the zip file to a new folder by clicking the zip file and then clicking **Extract** in the upper corner of the window.

Next, open Terminal and use the `cd` command to get into the extracted folder. Finally, type `sudo java -jar USBserialUtilities.jar` to run the program, as shown in the screenshot. Enter your password if needed. The keypad loader must be run as root to have access to the serial ports.



Beyond this point, each operating system will follow the same routine regardless of whether it is a Windows, Mac, or Linux.

Establish Connection with the Unit Tab

Regardless of what tab is selected, when no device is connected the app will display **No Unit Selected** in the top of the window. When a device is selected, the display will change to show the serial number and firmware info of the connected CP4 or CP5.

The Unit tab allows you to establish the serial or USB connection between the computer and CP4/5. If you already know the COM port of the CP4/5, you can simply select the port in the **Choose by COM Port** dropdown. The dropdown also provides the option to "disconnect". If you do not know the needed COM port number, clicking **Scan Ports** will detect and connect to your CP4 or CP5. When multiple CP4s or CP5s are detected, it will list the devices under the **Choose by Unit** dropdown.

The text box will display relevant information, for instance, what device is connected or COM errors and alert you to available firmware updates. It will also let you know if any special feature licenses are installed.

Load Tab - Upgrading Your GTOCP4 or GTOCP5

The **Load** tab is used when new firmware for the CP4 or CP5 is released. It can also be used to install other individual files such as firmware feature licenses, authentication tokens, or command sequence files.

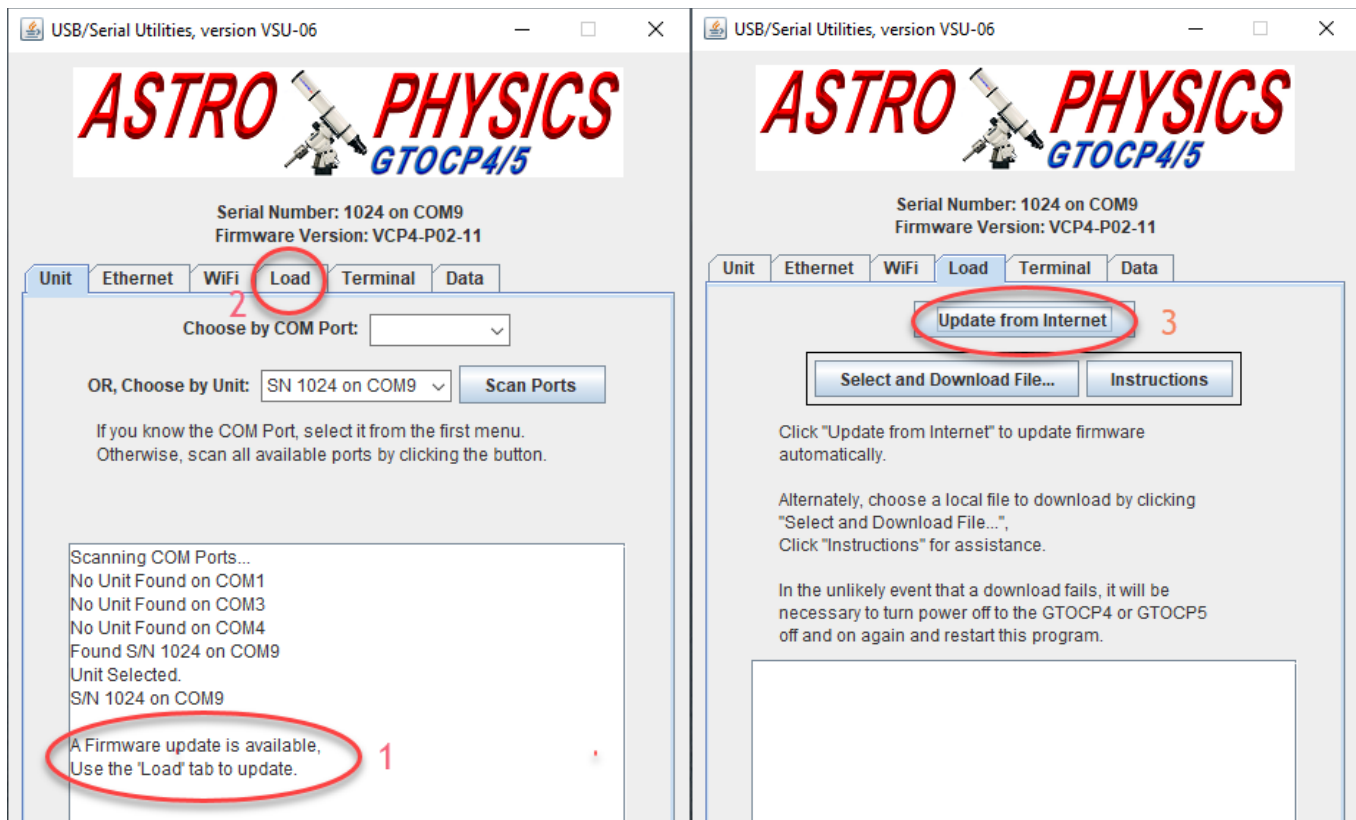
When the connection is established to the CP4/5, you may see a message indicating that a firmware update is available. If so, and you wish to update the firmware, click on the **Load** tab.

Automatic Update from Internet

The Load tab will have a button labeled **Update from Internet**. Click this button to update the CP4/5 automatically. This is the method that we recommend for most situations. It is quick and extremely easy, does not require the user name or password or file downloads. You will love it!

During this time, do not interrupt the serial connection or the firmware will not load correctly. This includes disconnecting the USB or serial cable, as well as attempting to do other tasks with the computer at the same time as performing the load.

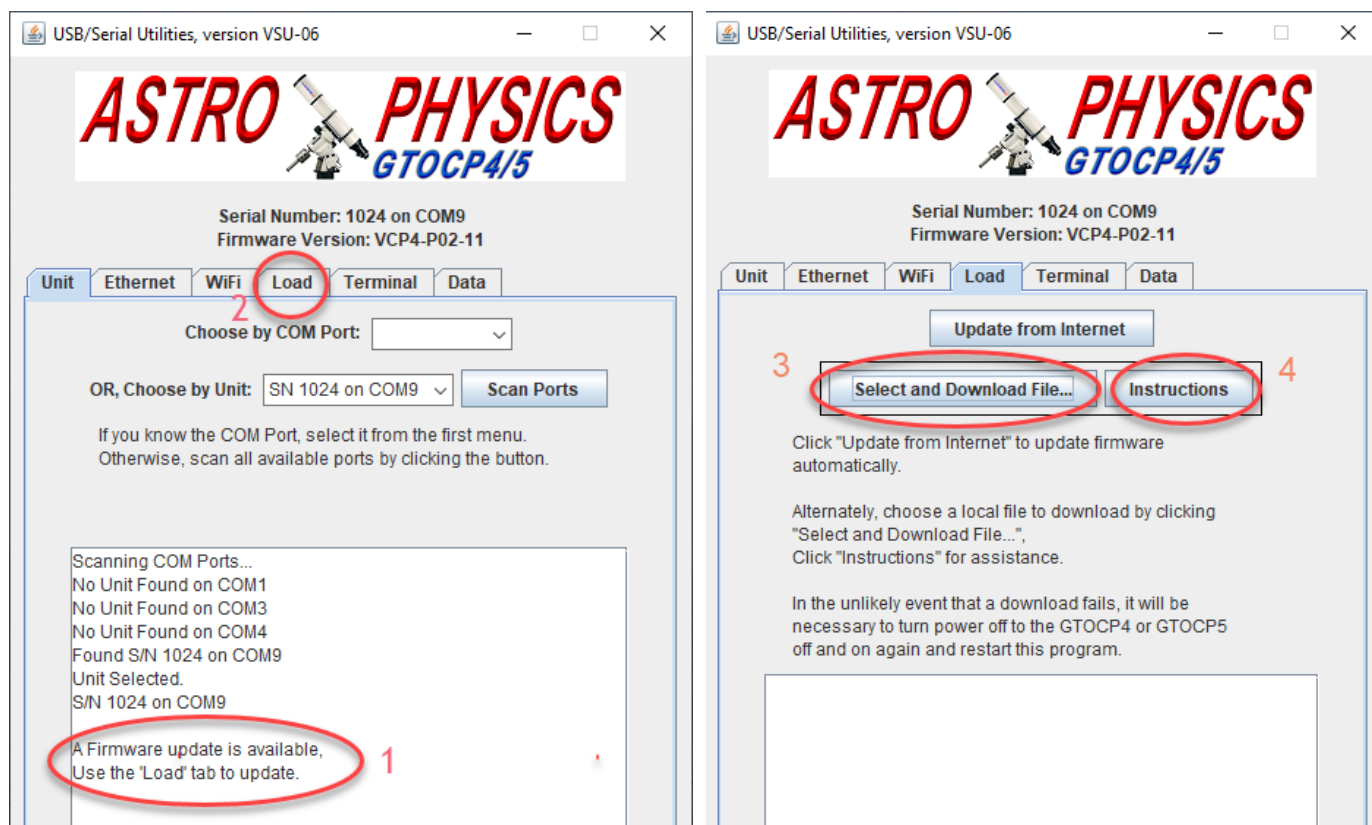
While each firmware file loads, a progress bar will be displayed to show the progress. The text box in the lower part of the window shows diagnostic information about the load of each file.



Select and Load File

In some circumstances, you may need to download files and install them one by one. This may be necessary if you do not have an internet connection while connected to your CP4/5, or if you are loading a file that is not a firmware update (i.e., a feature license). We do not recommend this in most circumstances since there are many more steps involved.

1. Be sure that you have the username and password handy since you will need it to download the file from the secure area of our website. This information was provided in the cover letter included with your mount. Please contact our office during regular business hours if you do not have it. Be sure to write it in your manual for future reference.
2. To load a specific file, it is first necessary to put the file on your computer. Firmware updates can be loaded on your computer by following the links from astro-physics.com/software-updates. Provide the username and password when required. Files that are provided via email attachments can be placed on your computer, usually by merely clicking on them.
3. Click on **Select and Download File** and pick the file you need to load, or simply select the firmware zip file itself without extracting it. Clicking the file will start the load. Once again, during this time, do not interrupt the serial connection or the firmware will not load correctly. While the file loads, a loading bar will be displayed to show the progress. Small files such as feature licenses may finish loading before the progress bar ever appears. The text box in the lower part of the window shows diagnostic information about the load.



Ethernet Tab

USB/Serial Utilities allows easy access to the Ethernet connection options of the CP4 or CP5. Switching to the Ethernet tab displays the **Basic Status** tab, with the current Ethernet link status of the CP4 or CP5, as well as the current used IP address of the device and DHCP mode - the most needed things while troubleshooting network issues. The **DHCP** dropdown can be used to select whether the CP4/5 should be connecting to a network, acting like a server, or keeping a fixed IP address for custom network topologies.

By selecting the **Advanced Settings** tab instead, you can access more Ethernet options. **Hostname** is the recognized name of the CP4 or CP5 while connected by Ethernet and is a permanently accessible device name for when DHCP is assigning new IP addresses to the CP4/5 regularly. You can also change the **Default IP Address** here, which is how the CP4 or CP5 is identified on a fixed IP address network. Most commonly, this is how the CP4 or CP5 will be addressed while directly connected to a computer with an Ethernet cable. **Subnet Mask** can be slightly modified as well. The **Default Gateway IP** are also displayed for convenience.

The text box on the Basic Status tab logs computer Ethernet activity.

Wi-Fi Tab

The Wi-Fi tab will display the **Basic Status** tab first, with the **Current SSID** and **Current IP Address** displayed. The **Operating Mode** is also displayed here, and can be changed by selecting between *Idle*, *Hot Spot*, *Network*, and *Off* in the dropdown menu. Finally, there is a **Ping** option that will attempt to ping the CP4 or CP5 over Wi-Fi. If connected to a network, the Ping button will allow you to verify that you can communicate with the CP4/5 Wi-Fi. Note: ping will only work if the computer and CP4/5 are connected over the same hotspot/network.

Next, the **Advanced Settings** tab allows you to see **Wi-Fi Firmware Version** and **Wi-Fi Mac Address** details, as well as edit the **Hostname**, **Hot Spot SSID**, **Hot Spot Password**, **Hot Spot Security**, **Channel**, **Country Code**, and the default action **When Network Unavailable**. These settings should only be changed when you are confident in your networking skills.

Finally, the **Join a Network** tab allows you to see the networks available for the CP4 or CP5 to join.

Terminal Tab

Terminal is used to manually send commands to the CP4 or CP5. There are three text boxes for typing commands, so that commonly used commands can be saved temporarily. After typing a command in a text box, clicking the **Send** button beside the text box will send that command to the CP4/5. Responses from the CP4/5 are displayed in the large text box at the bottom of the window.

The **Overwrite** option will have new responses from the CP4/5 overwrite older responses in the display text box. **Clear Window** will clear responses from the text display box. Clicking **Initialize Mount** sends the initialization command string below, giving the CPx a date and time, as well as an unpark command.

```
:SCxx/xx/xx#
```

```
:SLxx:xx:xx#
```

```
:PO#
```

DATA Tab

The **DATA** tab allows for reading and writing to the NVM (Non-Volatile Memory) of the digital board inside the CP4/5. This can be used with non-encoder control boxes to read the PE curve from the unit, or with an encoder control boxes, to read encoder settings and data. Keypad model databases are also read.

Note the following:

- If the PE curve is transferred from one CP4 to another (or from a CP3 to a CP4), the worm must remain stationary between reading the PE curve from one CP3/4 and writing the curve to the other CP3/44.
- Do not transfer data from a CP4 to a CP5, and do not transfer data from a CP5 to a CP4.
- There are items that do not transfer with NVM data. Unit serial numbers do not transfer, nor do network related items based on serial number (default IP address, SSID, MAC address, default passwords, etc.)

Read NVM buttons will have the program temporarily store NVM data. To get NVM data from a control box, select the **Read User Data From Unit** and the program will get the NVM data, creating a loading bar for the data transfer progress. If you want to load NVM data from a file into USB/Serial Utilities select **Read User Data from File** instead. You will be able to select a file from the computer.

Write Image will write the NVM image (data) stored in USB/Serial Utilities to either a permanent file or the NVM of a connected device. To send the stored NVM data to a CPx, click **Write Image to Unit** and a loading bar will display the load progress. To save the NVM data to a permanent file, click **Write Image to File** and give the file a path and name. Clicking **OK** will save the file.