

Astro-Physics

Upgrading Your Keypad to V4.19.5 – Code Load Only

Java Keypad Loader

Print this page for reference during the procedure.

This Java Loader REQUIRES a GTOCP4 control box with version P02-01 or later firmware for the loading process.

- **What keypad serial numbers can upgrade to v4.19.5.** Only keypads with serial number 1565GTO or higher can be updated due to memory requirements for this version. Some repaired keypads with earlier serial numbers preceded by R may have sufficient memory. Contact Astro-Physics for more information.
- **Who should upgrade to v4.19.5?** All GTOCP4 control boxes that have P02-01 firmware or later versions.
- **Why upgrade?** A new rate table was introduced in P02-01. If GTOCP4 control boxes with this or later versions use a keypad with v4.19.3, the button rates will not display correctly on the keypad (when you select 600x, the mount will move at 200x and selecting 1200x will result in 600x).
- **What control boxes can be used with v4.19.5?** Use with GTOCP4 and all earlier Astro-Physics control boxes: GTOCP1, GTOCP2 and, GTOCP3. Do not use v4.19.5 with the GTOCP5 and Mach2GTO. You should use v5.xx to take full advantage of the capabilities of the mount and utilize the proper startup sequence for the Mach2GTO.

What is Program vs Database Firmware for the GTO Keypad?

The GTO Keypad firmware consists of two separate parts that occupy two separate memory areas in the Keypad:

- **Code (Program) firmware:** This firmware contains all program logic for the functions, menus, entry screens and all other aspects concerned with the operation of the keypad. It also includes the calculated values of the solar system objects and calibration stars. The keypad version number displays when you start your keypad. This page contains links and information regarding the program firmware.
- **Database firmware:** The database firmware contains the information in the object database. This includes the catalog name, common name, RA and Declination coordinates, magnitude, object type, and constellation where the object is located. All keypads up to and including versions of 4.19.5 of the program firmware have the database level:1. The database remains in memory even when the program version changes. It does not need to be reloaded unless the database corrupts. This procedure does not reload the database.

Install Java and FTDI Drivers

The Java Keypad Loader can be used on any operating system that can run Java. At AP, we have tested Windows 10, Windows 7, Ubuntu 20, and Mac 10. To use it, you must first install the latest version of Java, and any USB-serial adapter drivers your computer needs.

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 GTOCP4.

- USB port on the CP4. 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.

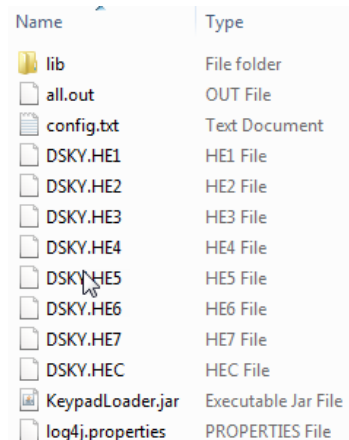
Download and Save the ZIP File

Windows

On Windows, download the keypad loader zip file. 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 file **KeypadLoader**. It will be labeled as an Executable Jar File.

Double click the executable to run the keypad loader program.

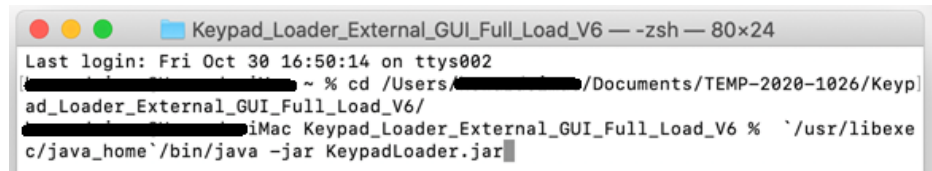


| Name | Type |
|------------------|---------------------|
| lib | File folder |
| all.out | OUT File |
| config.txt | Text Document |
| DSKY.HE1 | HE1 File |
| DSKY.HE2 | HE2 File |
| DSKY.HE3 | HE3 File |
| DSKY.HE4 | HE4 File |
| DSKY.HE5 | HE5 File |
| DSKY.HE6 | HE6 File |
| DSKY.HE7 | HE7 File |
| DSKY.HEC | HEC File |
| KeypadLoader.jar | Executable Jar File |
| log4j.properties | PROPERTIES File |

Mac

On Mac, download the keypad loader 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 **KeypadLoader**. 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 KeypadLoader.jar` and the program should run. Note, the screen sample is from an earlier version of the keypad loader.

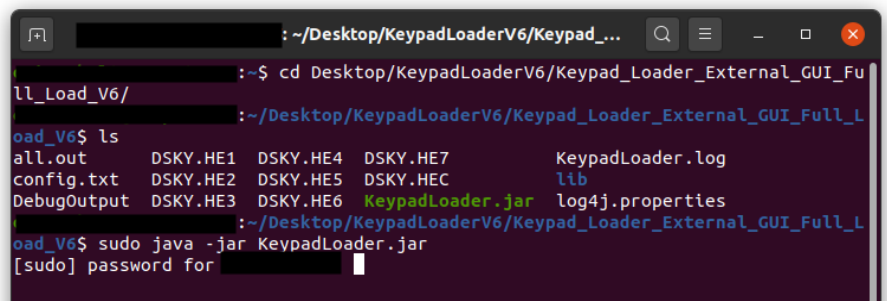


```
Last login: Fri Oct 30 16:50:14 on ttys002
~ % cd /Users/[redacted]/Documents/TEMP-2020-1026/Keyp
ad_Loader_External_GUI_Full_Load_V6/
[redacted]@iMac Keypad_Loader_External_GUI_Full_Load_V6 % ` /usr/libexe
c/java_home`/bin/java -jar KeypadLoader.jar
```

Linux

On Linux, download the keypad loader 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 KeypadLoader.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. Note, the screen sample is from an earlier version of the keypad loader.



```
:~$ cd Desktop/KeypadLoaderV6/Keypad_Loader_External_GUI_Fu
ll_Load_V6/
~/Desktop/KeypadLoaderV6/Keypad_Loader_External_GUI_Full_L
oad_V6$ ls
all.out      DSKY.HE1  DSKY.HE4  DSKY.HE7      KeypadLoader.log
config.txt   DSKY.HE2  DSKY.HE5  DSKY.HEC      lib
DebugOutput  DSKY.HE3  DSKY.HE6  KeypadLoader.jar log4j.properties
~/Desktop/KeypadLoaderV6/Keypad_Loader_External_GUI_Full_L
oad_V6$ sudo java -jar KeypadLoader.jar
[sudo] password for [redacted]
```

Setup the System for the Upgrade

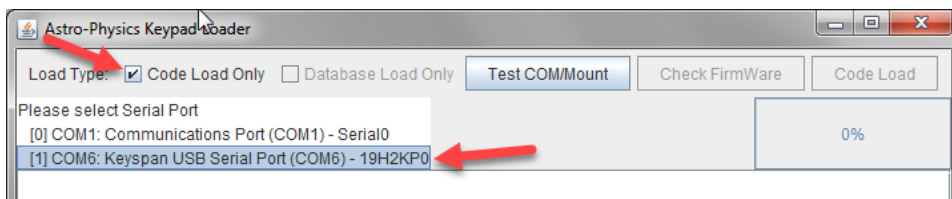
Each operating system will follow the same routine regardless of whether it is a Windows, Mac, or Linux.

1. For this code load, your keypad serial number must be 1565GTO or higher. However, if your older keypad was repaired and the new serial number begins with the letter "R", it is possible that the repaired unit has the higher memory capacity required for this upgrade. Contact Astro-Physics for further information. The older keypads do not have sufficient memory for the new code load.
2. Your GTOCP4 control box **MUST** have version VCP4-P02-01 or later for this download. If you do not have a P02-xx version or you are attempting to use a GTOCP1, 2 or 3, the keypad will not recognize your control box.
3. Connect the power cable to the GTO control box. Since the motor cables are not needed for the download, you can use just the GTO control box and a power supply or battery. You may wish to remove the control box from the mount for this procedure. The mount does not need to be present.
4. Connect your GTOCP4 to your computer with one of these options:
 - a. USB Cable. Remember that USB cables should be no longer than 15' (5 meters). To use the USB connection, make sure that you install the FTDI driver on your computer **BEFORE** connecting cables. The driver can be found at <http://www.ftdichip.com/Drivers/VCP.htm>. Once the driver is installed, simply plug your computer into the GTOCP4 using a USB cable. The computer will take a moment to make sure it has the proper driver and designate a COM port.
 - b. Straight-through serial cable. You may plug the cable into either of the two RS-232 ports on the control box. Your serial cable must be "straight-through" (as opposed to a "null modem or cross-wired"). We have 15' Straight-Through Serial Cables available for purchase if you do not already have one. Mounts shipped in recent years included one of these cables. If you require a USB-to-serial adapter, we recommend that you use one with an FTDI chip or the Keyspan adapters. We do **NOT** recommend USB-to-serial adapters with Prolific chips.

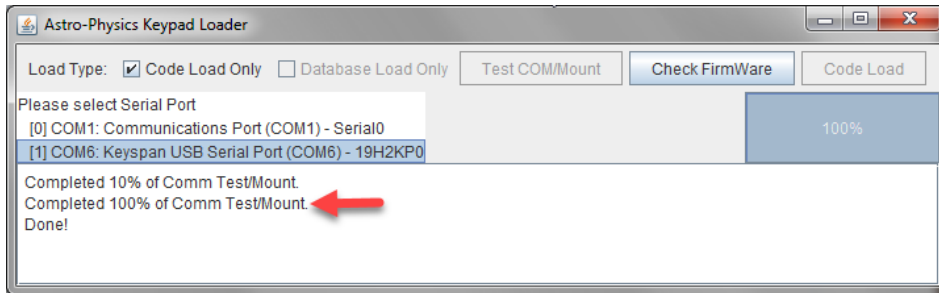
Mount and COM Port Test Procedure

You must follow these procedures **EXACTLY**. If you do, the process is quite easy. Pay particular attention to what is connected and powered on at various stages.

1. Double check to be sure your cables are connected: power and USB or serial cable. The keypad can be plugged in at this point, however it is not necessary since you will only be testing the mount firmware and COM port.
2. Turn on the power to your control box.
3. Locate and unzip the file that you downloaded onto your computer if you have not already done so. Refer to the instructions above for various computer systems.
4. Follow the directions above and click on the KeypadLoader.jar file.
5. The loader will display your download and COM port options.
 - a) Select Code Load Only to load just the program code.
 - b) Select the appropriate COM port.



6. Click Test/COM Mount button. Results should display as follows:



7. Click the Check Firmware button. The program will query the control box to be sure that it has the appropriate firmware proceed with the download. If you have the correct firmware, the box will display a second "Done!" and the Code Load button will become active.

- If successful, proceed to the Keypad Code Load section of these instructions.
- If you get an error message, check all cables and connections. Close the Keypad Loader program and start again.

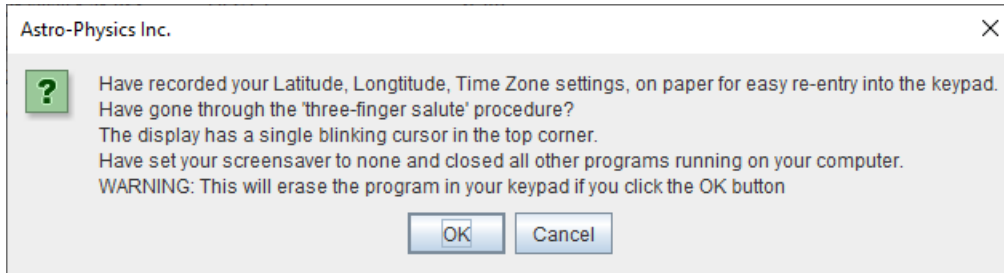
Keypad Code Load

Do not try this procedure unless you have successfully completed the test above. Otherwise, you will erase the current program from your keypad, the screen will be blank, and you will not be able to use your keypad.

Please follow these steps in order. If the process is interrupted, close the loader and restart from step 1 above.

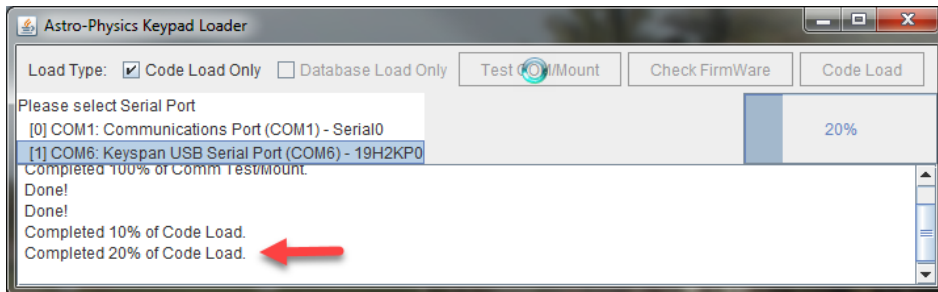
1. Turn off the power to the control box.
2. Plug in the keypad if not already done and be sure that the power cable is connected to the GTO control box and locked in place. The motor cables do not need to be attached.
3. Place the keypad on a solid surface and press any three buttons (except Stop) simultaneously and hold them down. The combination of <PREV, S and NEXT> work well for those of us with fat fingers! We call this a "three-finger salute". As you are holding these three keys, turn on the power to the control box.
4. A new display will appear on the window of the keypad. At this point, release the three buttons. Then, press the West button to indicate YES for the next four windows and press the E button to indicate NO for the window that displays "Test Flash". This will erase the current program. These are the screen displays and the responses (note, the display says "FN=No", however you will press the "E" button):
 - "Load defaults" - Choose Yes (West)
 - "Are you sure" - Choose Yes (West)
 - "Clear flash" - Choose Yes (West)
 - "Are you sure" - Choose Yes (West)
 - "Test flash" - Choose No (East)
5. Once you have completed the previous step, the keypad will be placed in a ready-to-receive mode. A blank window with the blinking cursor in the upper left corner of the screen will indicate this.

6. Look back to the Keypad Loader on your computer. Select the highlighted Code Load button. The following information screen will appear. Read and click OK. Note that in most cases, the programs running on your computer will not interfere. However, if the load is not successful, try closing other programs or audio files if any are open.

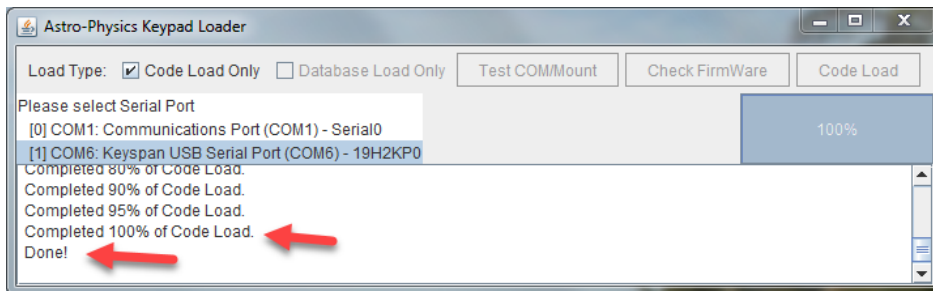


After a few seconds, you will hear a series of beeps from the keypad as uploading begins but will get no audible feedback during the remainder of the upload. At the beep, a "1" will appear in the upper left corner, and the blinking cursor will move to the second space of the second row. The load process is very slow due to the rate at which data can be downloaded into the keypad through the control box. Once you get it started it will take about 20 minutes for the code load to complete.

7. As the upload progresses, the white display box within the Keypad Loader will indicate the progress of the load.



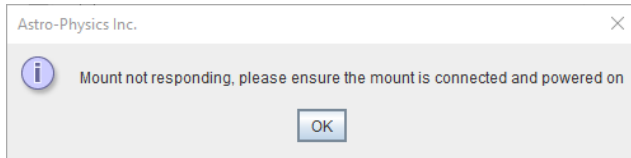
8. When the upload is complete, the Keypad will beep once and display the new version number. The computer dialog box will indicate that the process is "Done!". Cycle power to the mount and begin your session.



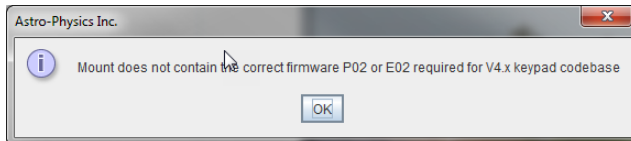
9. If you know that your database was also corrupt and needs to be reloaded, go to the Software Updates page of our website, and follow the procedures to reload the database. In most cases, this is not a necessary process. Do not attempt it unless you verify that the database is corrupt since the upload takes about an hour to complete. Refer to the website for additional information regarding corrupt databases.
10. Refer to either the 4.19.3 or 4.19.5 manuals for operational instructions for your keypad. These manuals are identical except for the revision notes. The actual function of the keypad did not change from one version to the other.

Error Messages

Control box not powered on, power cable not connected or serial cable not plugged in.



Control box does not have correct firmware to complete upgrade with this Java Keypad Loader.



Submit Log Files to if You Have any Loading Issues

If the program does not load properly, please locate the log file in the same folder that you found the KeypadLoader.jar program. A log file is automatically created during the download process. Submit this log file to Astro-Physics for evaluation. If you attempt to load the keypad multiple times and wish to keep all the information, please rename the log file before you try again. Otherwise, all information will be in a single log file, which makes analysis more difficult.

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