

The HP Connectivity Kit

Introduction

The HP Connectivity Kit is a software application designed to help you create and manage data for your HP graphing calculator. There are specialized editors for creating and editing lists, matrices, notes, and programs. You can also view all the real variable values (A-Z and θ) at the same time and edit any of them. Likewise, you can view and edit all the complex variables Z1-Z9 and Z0.

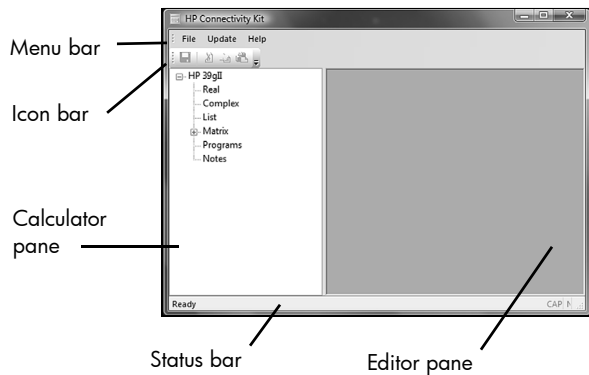
Getting started

To use the HP Connectivity Kit, follow these steps:

1. Connect your HP graphing calculator to your PC using the USB-to-miniUSB cable that came in your product package. The USB end of the cable plugs into your PC and the miniUSB end plugs into your HP graphing calculator.
2. Turn on your HP graphing calculator.
3. Go to the **Start** menu on your PC, locate the **HP Connectivity Kit** folder, and launch the **HP Connectivity Kit** application.

The HP Connectivity Kit application window has 5 parts as shown in the figure below:

1. The menu bar at the top.
2. The icon bar below the menu bar.
3. The calculator pane on the left below the icon bar.
4. The editor pane on the right below the icon bar.
5. The status bar at the bottom.



When you launch the HP Connectivity Kit with your HP graphing calculator attached, the HP Connectivity Kit copies your calculator data (lists, matrices, programs, etc.) to the calculator pane on the left. The calculator pane will show an icon for your calculator and the status bar will show the message, **Ready**. The editor pane will be empty as no calculator objects have been selected for editing. The HP Connectivity Kit is designed to allow you to edit your calculator data objects and create new ones, as well as to save the new data objects back to your calculator. You may use the new or edited objects on your attached HP graphing calculator (run programs, etc.), but any changes you make to the data on your HP graphing calculator after launching the HP Connectivity Kit will not be recognized by the HP Connectivity Kit. If by mistake you edit the data directly on your HP graphing calculator, you will have to disconnect the calculator, close the HP Connectivity Kit, and restart the application as well as reconnect the calculator in order for those changes to be recognized by the HP Connectivity Kit. The next two sections describe the menu and icon bars.

The menu bar

The menu bar contains the following familiar menu items:

- **File**
- **Update**
- **Help**

The File menu

The File menu contains options for managing the application.

- **Check for Updates:** checks for updated versions of the application and the calculator software
- **Language:** choose a language for the application
- **Exit:** closes the application

The Update menu

The Update menu contains two items:

- **Update Calculator:** manually updates the HP graphing calculator software
- **Format & Update Calculator:** formats the calculator flash memory and then manually updates the software

The Help menu





The Help menu gives you access to this documentation as well as version information.

The icon bar

The icon bar contains the following standard icons:

- **Save:** saves the data in the current editor to the attached HP graphing calculator
- **Cut:** cuts the selected data from the current editor and places it in the clipboard
- **Copy:** copies the selected data from the current editor and places it in the clipboard
- **Paste:** pastes the clipboard contents into the current editor, starting at the current cursor location

Using the editors

To view and edit data on your calculator, click on the plus sign icon (+) to expand the list of calculator data object types. If you give your HP graphing calculator a name, the name will appear next to the icon in the calculator pane. To name your HP graphing calculator, simply click next to the calculator icon in the calculator pane and type the name you want to give your calculator. On the calculator, this name appears on the second page of the Modes menu. On the calculator, press    to see the new name. Press  to return to the Home view.

Once the calculator icon is expanded, you will see a list of six object types:

1. **Real**, for the real variables A-Z and θ .
2. **Complex**, for the complex variables Z0-Z9.
3. **List**, for the list variables L0-L9.
4. **Matrix**, for the matrix variables M0-M9.
5. **Programs**, for user programs.
6. **Notes**, for user notes.

The Real, Complex, and List entries each start an editor that shows all the variables of that type at once. The Matrix entry has a plus sign icon (+) to indicate that it can be expanded to edit each of the matrix variables separately. If your calculator is new, it will not have any user programs or notes, so the last two entries will not have the plus sign icon that the Matrix entry has. Once you create objects of these types, the icons will appear.

To edit the real, complex, or list variables, simply double-click on the corresponding entry in the calculator pane to open the editor for that variable type. Edit the variable values using your PC keyboard. When you are done, click on the **Save** icon in the icon bar, or press Ctrl+S on your PC keyboard, to save your changes to the calculator. If you wish, you can check the contents of the variable(s) on your HP graphing calculator. If you are editing a calculator object using the Connectivity Kit and have the corresponding editor open on your HP graphing calculator to view the same object that you have just







edited using the HP Connectivity Kit, then you will have to click on the **Save** icon in the Connectivity Kit icon bar to see the changes reflected in the corresponding editor on your HP graphing calculator.

The following sections cover each of the editors.

The real variable editor

Your HP graphing calculator has 27 real variables, named A-Z and θ . To see the values of these variables, double-click on the **Real** entry in the list of your HP graphing calculator in the calculator pane to launch the real variable editor. This editor is designed to let you view the values of all the real variables at the same time and to let you edit those values easily. The editor shows the list of real variables in a single column on the left and the corresponding values of these variables in a single column on the right. If your calculator is new, the variables are all set to zero.





Suppose you wish to store 5 in A and 32 in B. Follow these steps:

1. Expand your calculator icon in the calculator pane.
2. Double-click on **Real** in the calculator pane.
3. Click on the cell to the right of A in the editor window and enter 5.
4. Use either the down-arrow key to move to the cell to the right of B or click on that cell and enter 32.
5. Click on the **Save** icon in the icon bar to transfer the data to your HP graphing calculator.
6. To check your calculator, press    in the Home view to see 5 and press    to see 32.
7. When you are done, you can close the real variable editor in the editor pane.

The complex variable editor

Your HP graphing calculator has ten complex variables, named Z0-Z9. To see the values of these variables, double-click on the **Complex** entry in the list of your HP graphing calculator in the calculator pane to launch the complex variable editor. This editor is designed to let you view the values of all the complex variables at the same time and to let you edit those values easily. The editor shows the list of complex variable names in a single column on the left and the corresponding values of these variables in two columns on the right. The first of these columns contains the real part of each complex variable and the second contains the imaginary part of the complex variable. If your calculator is new, the variables are all set to zero.




Suppose you wish to store $5+3i$ in Z1. Follow these steps:

1. Expand your calculator icon in the calculator pane.
2. Double-click on **Complex** in the calculator pane.
3. Click on the cell to the right of Z1 in the editor window and enter 5.
4. Use either the right-arrow key to move to the cell to the right or click on that cell and enter 3.
5. Click on the **Save** icon in the icon bar to transfer the data to your HP graphing calculator.
6. To check your calculator, press   3  1  in the Home view to see $5+3*i$.
7. When you are done, you can close the complex variable editor in the editor pane.

The list variable editor

Your HP graphing calculator has ten list variables, named L1 through L9 and L0. To see the values of these variables, double-click on the **List** entry in the list of your HP graphing calculator in the calculator pane to launch the list variable editor. This editor is designed to let you view the values of all the list variables at the same time and to let you edit those values easily. The editor shows the list variable names in a single row at the top of the window. Below each list name is a blank cell. When you enter data in this cell, another cell will appear below it. In this way, you can create a list of any length.




Suppose you wish to store the list {1, 2, 3, 4, 5} in L1. Follow these steps:

1. Expand your calculator icon in the calculator pane.
2. Double-click on **List** in the calculator pane.
3. Click on the cell below L1 and enter 1.
4. Press the down-arrow key to move to a new cell and enter 2.
5. Repeat Steps 3-4 with 3, 4, and 5 to complete the list.
6. When you are done, click on the **Save** icon in the icon bar.
7. To check your calculator, press   1  in the Home view to see {1, 2, 3, 4, 5}.
8. When you are done, you can close the list editor in the editor pane.

The matrix variable editor

Your HP graphing calculator has ten matrix variables, named M1-M9 and M0, which can be edited via the HP Connectivity Kit. To see the list of matrix variables in the HP Connectivity Kit, click on the plus sign icon (+) next to the **Matrix** entry in the calculator pane. Then double-click on any of the M0-M9 entries shown to open the matrix variable editor for that matrix.

Suppose you wish to enter the matrix $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ in M1. Follow these steps:

1. Expand your calculator icon in the calculator pane.
2. Click on the plus sign next to **Matrix** in the calculator pane.
3. Double-click on **M1**.
4. If M1 has data in it, then select the data and press the Delete key on your PC keyboard; otherwise, if M1 has no data, it will open with a zero in M1(1,1).
5. Click on the cell with the zero to see the edit cursor and press the Backspace key on your PC keyboard to delete the zero.
6. Type 1 and press the Enter key.
7. Use the arrow keys to move from cell to cell and enter the values 2, 3, and 4 -or just click on each cell and enter its value.
8. When you are done, click on the **Save** icon in the icon bar.
9. To check your calculator, press   1  in the Home view to see $[[1, 2], [3, 4]]$.
10. When you are done, you can close the matrix editor in the editor pane.

You can also collapse the list of matrix variables by clicking on the minus sign icon (-) next to the Matrix entry in the calculator pane.

The program editor

You can create and edit programs for your HP graphing calculator using the HP Connectivity Kit.

Suppose you wish to create a program named X2M1 that contains a user-defined function which returns x^2-1 .

Follow these steps:

1. Right-click on the **Programs** entry in the calculator pane and select **NEW** from the context-sensitive menu.
2. Type the name X2M1 and press the ENTER key.
3. Double-click on **X2M1** to start the program editor.
4. Enter commands, etc. directly using your PC keyboard.

The program editor starts with the following template for your program:

```
EXPORT X2M1()  
BEGIN
```

```
END;
```



The **EXPORT** line exports the name of your user-defined function so that it appears in the Commands menu and is available throughout your HP graphing calculator. The **BEGIN...END** pair marks the body of the program. You will insert your function definition in this pair, using the **RETURN** command.




5. Complete the first line of the program so the user-defined function takes a real number, X, as input:

```
EXPORT X2M1(X)
```

6. In the middle of the **BEGIN...END** pair (that is, between **BEGIN** and **END**), define the function:

```
RETURN X^2-1;
```

7. When you are done, click on the **Save** icon in the icon bar.
8. To check your calculator, open the Program Catalog (press  ) to see your program listed or enter X2M1(8) in the Home view to see the calculator return 63.



You may also look in the Commands menu to see your new user-defined function. Press   to open the Commands menu and press the USER menu key () to see X2M1 listed as a new function.

For more information on programming your HP graphing calculator, see the Programming chapter of the User Guide.

The note editor

Your HP graphing calculator can store any number of notes, depending on available memory. You can create and edit notes for your HP graphing calculator using your PC keyboard and the note editor of the HP Connectivity Kit.

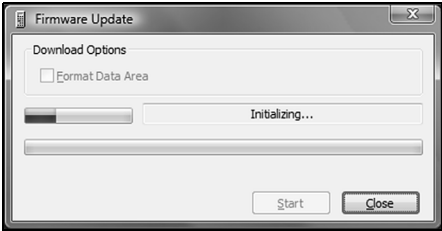
To create a note named MYTODOLIST, follow these steps:

1. Right-click on the **Notes** entry in the calculator pane and select **NEW** from the context-sensitive menu.
2. Type in the name MYTODOLIST and press the ENTER key.
3. Double-click on **MYTODOLIST** to start the note editor.
4. Enter the text of your note using your PC keyboard.
5. When you are done, click on the **Save** icon in the icon bar.
6. To check your calculator, open the Notes Catalog (press  ) to see your note listed.

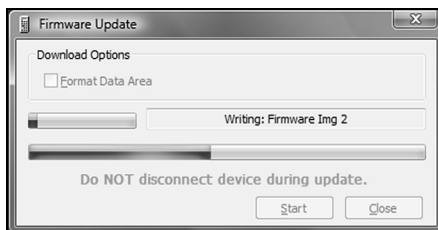
Update the HP graphing calculator software

The HP Connectivity Kit automatically helps you update your HP graphing calculator software. This software includes all of the built-in HP apps, as well as the list, matrix, note, and program editors, etc. It is important to update your software whenever there is a newer version to give you access to any new features included in the latest version.

1. When you launch the HP Connectivity Kit with your HP graphing calculator attached via the USB cable, it automatically looks for an update to either the Connectivity Kit or your HP graphing calculator software. Of course, you can always manually check for updates as well by clicking on the **File** menu and choosing the **Check for Updates** option. If a newer version of either is found, you will be prompted to install the newer version. Click on the **Get It** button to proceed to download the update(s) or the **Not Now** button to cancel.
2. The Firmware Updater application will go through a number of steps. The first step is initialization, shown in the figure below.



3. Once the Firmware Updater is ready, click on the **Start** button. You will then see a series of messages on the progress of the update. This part of the update process includes the steps of erasing the old software, writing the new software, and verifying. It is important that the HP graphing calculator remains connected to the PC via the USB cable until the software update finishes.

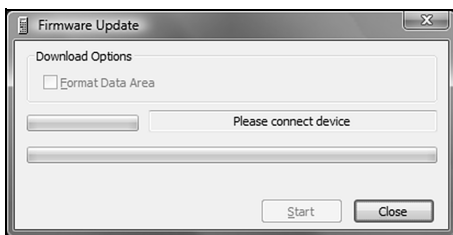


4. When the update process completes, the Firmware Updater will close automatically. It is now safe to disconnect and use your HP graphing calculator with its new software.

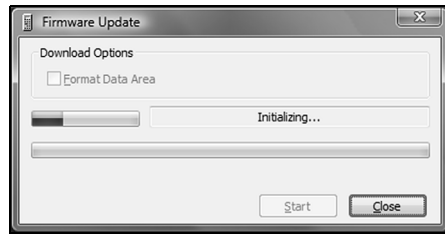
Update Manually

If the update process fails at any point, you can update the HP graphing calculator software manually. To update manually, follow these steps:

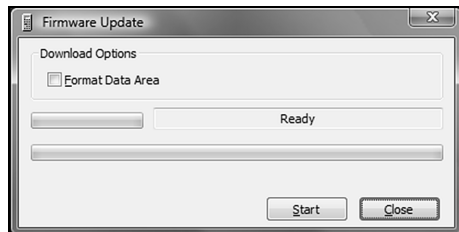
1. Your HP graphing calculator came with a USB cable. Plug this cable into an available USB port on your PC, but do not connect it to your HP Calculator at this time.
2. Click on your PC **Start** menu, navigate to the **HP Connectivity Kit** folder and select **Firmware Updater**.
3. The Firmware Update application will launch, but will not recognize the attached HP graphing calculator. You will see a message, **Please connect device**, as shown in the figure below.



- Turn off the calculator. With the calculator off, hold down the ON key and re-connect the calculator using the USB cable. Keep holding the ON key down until the Firmware Updater message changes to **Initializing...** (see figure below). If your HP graphing calculator turns back on when you plug in the cable, then disconnect and try this step again with the calculator turned off.

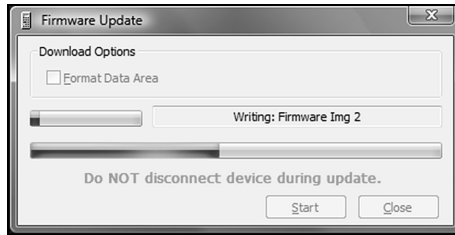


- Once your HP graphing calculator is detected and Firmware Updater has started initializing the update process, you may release the ON key. Once initialization is complete, the message changes to **Ready** and the **Start** button becomes active, as in the figure below. If the Ready message does not appear, try another USB slot on your PC, or see the section titled *Format and Update* below.







- Once the **Ready** message appears, click on the **Start** button to begin the update process.

7. Once Firmware Updater starts the update process, you will see a series of messages on the progress of the update (see figure below). This part of the update process includes the steps of erasing the old software, writing the new software, and verifying. It is important that the HP graphing calculator remains connected to the PC via the USB cable until the software update finishes.



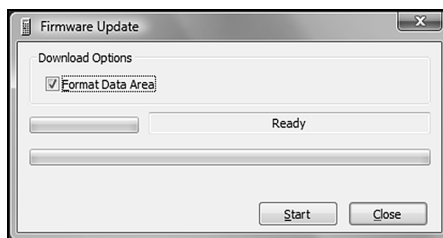
8. When the update process completes, the Firmware Updater application will close automatically. It is now safe to disconnect and use your HP graphing calculator with its new software.

Resetting your HP graphing calculator

If your HP graphing calculator freezes (for example, at the HP splash screen) or behaves erratically, you should try to reset it before updating the software as per the previous section. First, try removing and replacing the batteries; then turn the calculator back on. This is the simplest method and does not erase anything saved in memory. If this method does not work, press and hold ,  and  simultaneously. Release the keys and the HP graphing calculator should reset to normal. This reset method clears variables such as A, L1, and M1, etc. Finally, if neither of these methods works, remove and replace the batteries. Hold down  while you turn the calculator on. When the calculator proceeds past the HP splash screen, you can let go of the key. This method also clears variables such as A, L1, M1, etc.

Format and update

If you experience any difficulty during the update process (for example, the HP graphing calculator is disconnected during the update process, or your PC shuts down unexpectedly during the process) you may need to both format and update your HP graphing calculator. To format and update your HP graphing calculator, proceed with Steps 1-5 of the update process detailed in the previous section, *Update manually*. At Step 6 of that process, do not click on the **Start** button right away. Instead, look at the top of the Firmware Updater application and find the section titled, **Download Options**. Click on the **Format Data Area** option, as shown in the figure below.



Once the format option is selected, continue with Steps 7-8 of the update process, as detailed in the previous section. That is, click on the **Start** button to begin the software update. This part of the update process includes the steps of erasing the old software, writing the new software, and verifying. It is important that the HP graphing calculator remains connected to the PC until the software update finishes. Once the software update

finishes, the Firmware Updater application will close automatically. You may now safely disconnect and use your HP graphing calculator with its new software.