TEXAS
INSTRUMENTS

# TI-SmartView™ Emulator
# for the
# TI-84 Plus Family
# (Windows® and Macintosh®)

This guidebook applies to TI-SmartView™ for the TI-84 Plus loaded with OS 2.55 and TI-84 Plus C Silver Edition loaded with OS 4.0. To obtain the latest version of the documentation, go to *education.ti.com/guides*.

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# Introduction to TI-SmartView™

## Overview of the TI-SmartView™ Software

TI-SmartView™ software lets you display the selected TI-84 Plus family graphing calculator to an audience without using graphing calculator-specific projection equipment and gives you additional functionality that aids in presentations.

- Supplement the current graphing calculator screen by using the View[3]™ pane to show three additional screens simultaneously. You can select any three of the following graphing calculator screens: Y= editor, table, graph, stat plot, list, and window.

- Repeat presentations quickly and easily by recording and playing scripts to automatically play back a series of keystrokes.

- View the history of your Key Press entries as well as a large version of the current graphing calculator screen, and open a script by displaying the key press history window.

- Capture screen shots that you can save and use in other documents or keep a history of screens created during the investigation of a math or science concept.

- Set up the TI-SmartView™ software window for convenient physical access to TI-SmartView™ features when projecting on an interactive whiteboard.

| Emulator (Pane 1) | View³™ (Pane 2) | Key Press History tab (Pane 3) |

You can remotely press the emulator keys on the TI-SmartView™ software using TI-84 Plus Silver Edition or TI-84 Plus C Silver Edition graphing calculator that is connected with a USB Computer cable and is running the SmartPad™ App. When you press keys and perform calculations on the graphing calculator, those actions are repeated automatically on the emulator in the TI-SmartView™ software. The connected graphing calculator acts as a remote keypad.

**Note:** TI-84 Plus/TI-84 Plus Silver Edition and the TI-84 Plus C Silver Edition each have their own version of the SmartPad™ App. Select the appropriate version of the SmartPad App for your graphing calculator. See education.ti.com/go/download to download Apps.

## Things You Need to Know

### The mouse pointer takes the place of your finger pressing keys on the graphing calculator.

You must click the keys on the TI-SmartView™ emulator as you would press the keys on the graphing calculator. The graphing calculator screen in the TI-SmartView™ software is *not* fully interactive. You must click the arrow keys to move the cursor to the desired setting and then click

**ENTER** to select it.

### Typing text using the computer keyboard does not work unless you first place the keyboard in its alpha typing mode.

By default, the graphing calculator keyboard is in its normal mode, in which keys are simply shortcuts to graphing calculator keys. For example,

pressing **[ A ]** on your computer keyboard is the same as clicking **MATH** on the graphing calculator. In this mode, you cannot enter the letters A through Z on the graphing calculator screen by typing these letters on your computer keyboard.

To enter a letter or other alpha character, first click **ALPHA** on the graphing calculator keyboard (or press **[ F7 ]** on your computer keyboard) to put the graphing calculator in alpha mode. For example, typing **[ F7 ] [ A ]** on your computer keyboard enters an A on the

graphing calculator screen. If you only type **[ A ]**, the **MATH** menu is displayed. After you type the character, the keyboard returns to its normal mode.

To lock the alpha key so you can type more than one character at a time, click 2nd [A-LOCK] on the graphing calculator keyboard or press **[ F6 ] [ F7 ]**

on your computer keyboard. To return to the normal mode, click **ALPHA** or press **[ F7 ]**.

In alpha typing mode, pressing **[ 0 ]** through **[ 9 ]** on your computer keyboard act as shortcuts to the alpha functions associated with these keys on the graphing calculator keyboard. Pressing **[ 1 ]** enters Y (the alpha character associated with ①) on the graphing calculator screen. To type a number, be sure the keyboard is not in the alpha typing mode. These keys do enter the digits 0 through 9 in the normal mode.

**Hold down an arrow key to scroll the cursor continuously.**

When you use an arrow key to move the cursor, you can hold down the key to scroll the cursor continuously, instead of having to press the key repeatedly. In the key press history and in a script, the icon for a repeating arrow key has a clock symbol attached to it. For example:



**Pressing an arrow key multiple times in a row displays an arrow with a repeat counter.**

When you press an arrow key multiple times in a row, one arrow key is displayed in the key press history. This arrow key has a number attached to it that shows the number of times the arrow key was pressed. For example:



**When you record a script, you record only key presses on the graphing calculator. These key presses can be difficult to interpret when viewed by themselves.**

Because you record key presses, editing a script can be a little tricky. For example, if you change the mode to parametric, the script records

 . The script does not explicitly tell you that you changed the mode to parametric. For this reason, it can be quite helpful to step through a script one key press at a time, or to play the script back at a slower speed so that you can see exactly where an edit needs to be made.

Scripts must run on the same emulator OS on which they were created to guarantee success.

# Choosing a Display Option

By default, the TI-SmartView™ software displays the TI-84 Plus C Silver Edition graphing calculator emulator large screen. You can show or hide these optional panes, or change the type of information displayed in each one.



When open, the View³™ pane shows the Y= editor, table, and graph screens. However, you can select which graphing calculator screen you want to show for each of the three displays. (The stat plot, list, and window screens are also available.) The screens automatically update to reflect tasks you complete on the graphing calculator.

A third pane includes tabs that you can click to see either the key press history, a large screen display of what the device screen is displaying, or an open script. When you display the large screen in the third pane default large screen, you can hide or show the key press history information at the bottom of the pane.

| Display Option | Click: |
|---|---|
| View³™ pane | |
| | **View > Show/Hide View**³ or  to show or hide the pane. |
| | **View > View**³ **Options** to select a graphing calculator screen for each display. |

| Display Option | Click: |
|---|---|
| Key press history, large screen, and script pane | **View > Show/Hide Key Press History** or 🔄 to show or hide the pane. |
| Graphing Calculator Model View | **View > Graphing Calculator Model** ▾ to select either the TI-84 Plus or TI-84 Plus C emulator view. |
| Key pad + Large Screen view | 📷 this key sets up the keypad with Large Screen view. View[3]™ will be opened or closed depending on the user setting. |
| Emulator position Left/Right | ◀📱▶ to switch between left and right hand display of the graphing calculator screen. This is convenient when projecting an Interactive White Board. |
| Tool Bar Top/Bottom | ⬍ to toggle the tool bar between the top and the bottom of the screen. This is convenient when projecting an Interactive White Board. |
| Scripts | **File > Open** or 📂 to open an existing script.<br><br>**File > New Script** or 🗐 to open a new, blank script.<br><br>The close button on the script's tab (**Script 1 x**) to close a script. |

**Note:**

- Hiding the key press history pane does not clear the key press history.
- Hiding the key press history pane does not delete or close an open script.
- You can record a script without displaying the key press history pane.
- There is no menu access for the Emulator Position Left/Right, Tool Bar Top/Bottom, and Screen Capture Top/Bottom options. These options can only be accessed from their respective buttons on the tool bar.

## Changing the Size of the TI-SmartView™ Screen

When you first use the TI-SmartView™ software, a full-screen shot for 1024 x 768 screen resolution is displayed. You can use whichever size you want, but the small, medium, and large versions are optimized for the following screen resolutions.

| If your screen resolution is: | Click: |
| --- | --- |
| 800 x 600 | **View > Size > Small Emulator** |
| 1024 x 768 | **View > Size > Medium Emulator** |
| 1280 x 1024 | **View > Size > Large Emulator** |

The graphing calculator screens in the TI-SmartView™ program are freely scalable. In addition to choosing small, medium, and large emulator sizes, you can click and drag the TI-SmartView™ window borders to display the application in a window that is a custom size.

## Changing Calculator Models

By default, the TI-84 Plus C Silver Edition graphing calculator is displayed the first time you start the TI-SmartView™ software. The next time you start the application, the last graphing calculator model you used is displayed.

Click **View > Graphing Calculator Model** or click the calculator model switch tool bar button and then select the desired calculator model option.

Warning:

Switching graphing calculator models will not share data between the TI-SmartView™ emulator views. Both the TI-84 Plus Silver Edition and the TI-84 Plus C Silver Edition will return to the last used emulator state for each graphing calculator.

To share files between the two views, use **File > Load File** to load calculator files that are allowed for those calculator models.

## Changing the Color of the Face Plate

You can change the face plate on the TI-SmartView™ graphing calculator to improve visibility in the classroom. Options may include various faceplate colors, Contrast, and Outline. Face plate colors are only available in the TI-84 Plus emulator view. The TI-84 Plus C only has standard contrast and outline.

Click **View > Color** and then click a color option to change the color of your graphing calculator screen in the emulator.

# Saving and Loading an Emulator State

When you save the emulator state, a file is created that stores the graphing calculator settings with all of the changes that you have made to its setup.

For example, you might want to set up a class presentation by entering functions in the Y= editor and changing Window and Zoom settings. When you save your changes in an emulator state file, you simply load the file to show your presentation. If you want to create different presentations for different classes, you can create multiple emulator state files. There is no limit on the number of emulator states that you can save.

**Note:** The key press history, screen capture shots, any open script, the face plate color, and the emulator size are *not* saved in the emulator state file. Emulator state files may be large. Contact your IT department if your storage capacity is an issue.

### Saving the Emulator State

Emulator state files are specific to each calculator model. You cannot save a TI-84 Plus Silver Edition emulator state file as a TI-84 Plus C Silver Edition emulator state file or the other way around.

1.  Click **File > Save Emulator State**.

2.  In the dialog box:

    a)Navigate to the folder in which you want to store the emulator state file.

    b)Type a file name. Use a name that describes the emulator state.

    c)Click **Save**.

    The emulator state names will have the form *filename*.84state (for TI-84 Plus) or *filename*.84cstate (for TI-84 Plus C) where *filename* is the name you gave the file and 84state or 84cstate indicates that the file is an emulator state created by the TI-SmartView™ software.

### Loading an Emulator State

Because emulator state files are specific to each calculator model, you can only load an emulator state file for the active calculator model.

1. Click **File > Load File**.

2. In the dialog box:

    a)Navigate to the folder that contains the emulator state file.

    **Note:** Only the emulator state files for the active calculator model will be displayed.

    b)Click the emulator state name to highlight it.

    c)Click **Open**.

## Restoring the Emulator State

Restoring the emulator state returns the TI-SmartView™ software to the TI-84 Plus Family graphing calculator factory-default settings and restores the operating system version that was running when the TI-SmartView™ software was first installed. The key press history is cleared. If a script is open, it is stopped, but remains open.

1. Click **Tools > Restore Default State**.

2. In the dialog box, click **Yes** to confirm that you want to reset the emulator state.

## Saving Data to the Computer

By saving data (lists, matrices, programs, etc.) from the TI-SmartView™ emulator to files on the computer, you can make backup copies of that data. If you delete the data from the TI-SmartView™ emulator, you can load the graphing calculator files from the computer at any time.

**Note:** Not all TI-84 Plus C graphing calculator files are compatible with other TI-84 Plus Family graphing calculator files because of the high resolution of the TI-84 Plus C color screen. In general, numeric files (not limited to lists, variables, matrices, and functions) are shared between these graphing calculators but Apps are not shared between these graphing calculators even if they have the same title. When not compatible, the file extensions for the TI-84 Plus C are different from a similar variable from the TI-84 Plus/TI-84 Plus Silver Edition graphing calculators.

When you switch between the TI-84 Plus C and the TI-84 Plus Silver Edition emulators contained in TI-SmartView™, each view retains the emulator's individual memory.

For example, a list created while using the TI-84 Plus C view must be saved and loaded into the TI-84 Plus Silver Edition view if you are switching to that view.

1. Click **File > Save Calculator File**.

2.  Click an item to highlight it.

    • To select multiple items, hold down **Ctrl** on a PC keyboard or
      **CMD** on a Macintosh® keyboard as you click each additional
      item.

    • To select a range of items, click the first item in the range. Then
      hold down **Shift** and click the last item in the range.

3.  Click **Save Selected Item(s)**.

4.  In the dialog box, navigate to the folder in which you want to store
    the files.

    • Be sure to either open the folder or click the folder to highlight
      it. The folder name must be shown in the **File name** box at the
      bottom of the dialog box.

    • If necessary, create a new folder.

5.  Click **Save**.

    Each selected item is saved as a separate file on the computer. File
    names are assigned automatically. The file name's extension
    identifies the data type.

    If the folder already contains a file with the assigned name, you are
    prompted whether to overwrite the existing file.

    The Device Contents dialog box stays open so you can select and save
    additional data items.

6.  Click **Close**.

**Note:** In the Device Contents dialog box, you can sort the list by clicking
a heading. For example, click **Name** to sort by name and switch between
ascending (a-z) and descending (z-a) order.

| Name | Type | Size | Ram/Archive |
|------|------|------|-------------|
| Y_2_ | Equation | 6 | RAM |
| Y_1_ | Equation | 4 | RAM |
| Y | Real | 9 | RAM |
| X | Real | 9 | RAM |

# Loading a Graphing Calculator File from the Computer

If you previously stored graphing calculator files containing lists, programs, applications, and so forth, on your computer, you can load them into the appropriate graphing calculator emulator view in the TI-SmartView™ software. The files may be backups saved by the TI-SmartView™ program or files transferred to the computer from a graphing calculator.

Common App titles are available for both the TI-84 Plus/TI-84 Plus Silver Edition and the TI-84 Plus C but the file types are different.

1.	Click **File > Load File**.

2.	In the dialog box:

   a)Navigate to the folder that contains the file you want to load.

   b)Click the file name to highlight it.

   c)Click **Open**.

### Graphing Calculator File Names on the Computer

For files that are shared with the TI-84 Plus C, TI-84 Plus Silver Edition, TI-84 Plus, and TI-83 Plus, graphing calculator file names have the form:

*filename*.8x*

where *filename* is as close as possible to the data item's name on the graphing calculator, 8x indicates the file was created by the TI-SmartView™ program or a supported graphing calculator, and * is a letter that identifies the type of data.

**Note:** If a graphing calculator file is specifically a TI-84 Plus C file, then the file type is *filename*.8c*.

### Transferring Files from Supported Graphing Calculators

The TI-SmartView™ software can load files transferred to your computer from the following graphing calculators to the appropriate graphing calculator model view: TI-84 Plus Silver Edition, TI-84 Plus C, TI-84 Plus, and TI-83 Plus.

To transfer files from a graphing calculator to the computer, use TI Connect™ software and an appropriate TI Connectivity Cable available from education.ti.com. Some graphing calculators come with a TI Connectivity Cable, which lets you connect the graphing calculator to the computer.

To transfer data directly between the TI-SmartView™ program and an appropriate graphing calculator for the view, use the USB Silver Edition cable. Then use the Link menu between the emulator and the graphing calculator to transfer data between them.

## Updating the Graphing Calculator OS Views in TI-SmartView™ Software

Visit education.ti.com/go/download for free software updates that are periodically available for downloading. This implementation of the TI-SmartView™ software operates using the TI-84 Plus/TI-84 Plus Silver Edition or TI-84 Plus C Silver Edition software emulation. If you update the graphing calculator operating system software, you must update it with the latest TI-84 Plus family or TI-84 Plus C operating system software.

**Note**: RAM is cleared after you load a new operating system onto the emulated graphing calculator. You can avoid losing data by saving the calculator file to your computer.

To load the operating system software for a particular graphing calculator model view:

1.  Download the graphing calculator OS from education.ti.com/go/download:

    a) *.8xu for TI-84 Plus/TI-84 Plus Silver Edition

    b) *.8cu for TI-84 Plus C Silver Edition

    Note: *.8xu and *.8cu are computer file extensions.

2.  Click **File > Load File**.

3.  In the dialog box:

    a) Navigate to the folder that contains the operating system software file.
    **Note**: You may need to select **\*.8x\*** or **\*.8c\*** in the **Files of type** drop-down list to be able to see the operating system software file.

    b) Click the operating system software name to highlight it.

    c) Click **Open**.

4.  **Important:** Save the state file with this new graphing calculator emulator operating system.

**Note:** If TI-SmartView™ software is ever set back to the default state of the computer software, it will run with the original graphing calculator operating system(s). By saving the state file with the new emulator operating system(s), you can easily reload the TI-SmartView™ state file instead of loading each individual emulator operating system again.

# Compatibility with graphing calculators

Note: Not all TI-84 Plus C Silver Edition graphing calculator files are compatible with other TI-84 Plus Family graphing calculator files because of the high resolution of the TI-84 Plus C Silver Edition color screen. In general, numeric files (not limited to lists, variables, matrices, and functions) are shared between these graphing calculators but Apps are not shared between these graphing calculators even if they have the same title. When not compatible, the computer file extensions for the TI-84 Plus C Silver Edition are different from a similar variable from the TI-84 Plus/TI-84 Plus Silver Edition graphing calculators.

| File Type | Link from TI-84 to TI-84 Plus C | Link from TI-84 Plus C to TI-84 | 84P computer file type | 84PC computer file type |
|---|---|---|---|---|
| Operating System | No | No | 8xu | 8cu |
| Apps | No | No | 8xk | 8ck |
| AppVar* | Yes | Yes | 8xv | 8xv |
| Programs - TI Basic* | Yes | Yes | 8xp | 8xp |
| Assembly Programs* | Yes | No | 8xp | 8xp |
| Pictures | No | No | 8xi | 8ci |
| Background Images | N/A | No | N/A | 8ca |
| Group Files | Yes | Yes | 8xg | 8cg |
| User Zoom | Yes | Yes | 8xz | 8xz |
| String | Yes | Yes | 8xs | 8xs |
| Table | Yes | Yes | 8xt | 8xt |
| Function file | Yes | Yes | 8xy | 8xy |
| GDB* | Yes | Yes | 8xd | 8xd |
| List | Yes | Yes | 8xl | 8xl |
| Matrix | Yes | Yes | 8xm | 8xm |

| File Type | Link from TI-84 to TI-84 Plus C | Link from TI-84 Plus C to TI-84 | 84P computer file type | 84PC computer file type |
|---|---|---|---|---|
| Number | Yes | Yes | 8xn | 8xn |
| Complex | Yes | Yes | 8xc | 8xc |
| Window Setup | Yes | Yes | 8xw | 8xs |
| Certificate | No | No | 8xq | 8cq |
| Backup | No | No | 8xb | 8cb |

* Programs created using commands available only in the latest OS version will not transfer to graphing calculators with an earlier OS version.

* App Vars and Programs should be reviewed for use after the transfer between the TI-84 Plus Family and the TI-84 Plus C Silver Edition graphing calculators. Some App Vars may not setup an App as expected. Some Programs will need to be modified due to the difference in screen resolution and new commands.

** You may receive a version error if you used DOT-THIN line style. Change the line style to avoid the error.

# Working With Graphing Calculator Screens

You can capture the current graphing calculator screens using the TI-SmartView™ screen capture tool.

Note: Use TI Connect™ Screen Capture on the PC or TI Connect for the Mac® Device Explorer for image conversion to TI-84 Plus C Image Vars.

## Capturing Graphing Calculator Screens

When you capture a screen, the Screen Capture window is displayed. In this window, you can view, manipulate, and save screen images.

▶ Click **Tools > Take Screenshot** or click ![icon] .

A border is automatically added to each image when you capture it, but you can remove the border.

You can capture up to 44 screens at a time. Each unsaved screen image is stored in memory until you close the main TI-SmartView™ window. To capture additional images, delete images from the Screen Capture window.

Closing Screen Capture gives a prompt to save your screen captures. You can start a new Screen Capture session during a TI-SmartView™ session.

## Adding or Removing a Border

The toolbar button for adding or removing a border toggles between

add ![icon] and remove ![icon] depending on whether or not the selected screen capture contains a border.

### Adding or Removing a Border on a Single Screen Capture

1. Click the screen capture to select it.

2. Click **Edit > Remove Border** or click ![icon] to remove the border.

   —or—

   Click **Edit > Add Border** or click ![icon] to add a border.

### Adding or Removing a Border from a Group of Screen Captures

1. Switch to thumbnail view.

2. Select the group of screen captures.

3. Click **Edit > Remove Border** or click [icon] to remove the border

   —or—

   Click **Edit > Add Border** or click [icon] to add a border.

**Note:** To select all of the screen captures, click **Edit > Select All**.

## Saving a Screen Capture

You can save screen captures in TIF, GIF, PNG, or JPEG, formats. The screen captures are saved in your My Documents folder unless you specify a different location to save them. All screen captures are saved at the size they are currently displayed.

1. Click the screen capture you want to save.

2. Click **File > Save Screen** or click [icon].

3. In the dialog box:

   a)Navigate to the folder in which you want to store the screen capture file.

   b)Select the file type for the appropriate screen capture format format.

   c)Type a file name. Use a name that describes the screen capture.
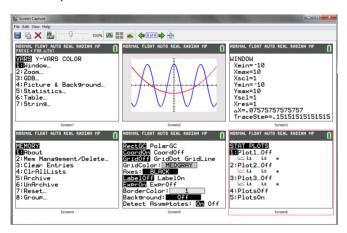
   d)Click **Save**.

**Note:**

- If you have previously saved the selected screen capture, clicking **File > Save Screen** or [icon] overwrites the previous file. To save the file in a different location, with a different name, or as a different file format, you must click **File > Save Screen As**.

- To save all the screen captures at once, click **File > Save All Screens**. When you do this, you select the location to save the files in the Save All window, but do not specify file names. Each screen capture is saved with its default file name. If that name already exists, you are prompted whether to overwrite the existing file.

## Viewing Screen Captures

When you capture a screen, that screen captures opens in the Screen Capture window. You can view the screen capture individually or as a group of screen captures. A reference name is displayed under each screen capture.



▶ To view screen capture thumbnails, click **View > Thumbnails** or click .

▶ To view individual screen captures, click **View > Single Screen** or click .

### Navigating Among Screen Images

▶ To view the previous screen capture, click **View > Previous Screen** or click .

▶ To view the next screen capture, click **View > Next Screen** or click .

### Zooming In or Zooming Out

You can zoom in or out on any single screen capture to view a larger or smaller version of it.

You can save a larger or smaller version of a screen capture by zooming in or out before you save it. For example, to save a screen capture that is larger than the standard size, zoom in until the screen capture is the size you want and then save it.

▶ To display a larger screen capture, click the slider bar

 and drag the pointer to the left.

▶ To display a smaller screen capture, click the slider bar and drag the pointer to the right.

## Dragging and Dropping a Screen Capture to Another Application

You can drag and drop any TI-SmartView™ screen capture to paste it into another application. You can also drag a screen capture from the View$^3$™ pane to Screen Capture so that you can then save the screen capture for future use.

**Note:** The TI-SmartView™ image drag-and-drop capabilities provide a convenient way to drag a screen capture to a presentation when using an interactive whiteboard.

The TI-SmartView™ screen capture that can be dragged and pasted include the following:

• Saved or unsaved screen captures

• View$^3$™ pane screens

• The Large Screen image

**Note:** In the Screen Capture window, the selected screen capture has a red border. However, the borders on the Large Screen image and the View$^3$™ screens do not change color when you select them.

To drag and drop a screen capture into another application:

1. Adjust the sizes of the windows of the two applications so that both of them fit on the computer screen.

2. To drag-and-drop the screen capture:

a)Click the screen capture to select it.

Note: The DragScreen hover text will appear over the image that you are going to drag-and-drop.

b)Drag the screen capture from the TI-SmartView™ program and then drop it into the other application.

Dragging a screen to another application

- from the emulator—drags the screen without a border.
- from Large Screen—drags the screen with a border.
- from View$^3$™—drags the screen with a border.

**Note:** You an drag a View$^3$™ screen into Screen Capture and use Screen Capture as a history of important screens during a class session.

# Converting and Sending Image Vars to a TI-84 Plus C

The TI-84 Plus C has the ability to display background images (Image Vars) as well as the familiar Pic Vars functionality of the TI-84 Plus. These variables display in the graph area. TI-84 Plus C Image and Pic Vars will not link to a TI-84 Plus given the difference in the screen resolution of the two graphing calculators.

## Image Vars

A TI-84 Plus C Image Var is created by converting your picture (gif, tif, png, jpg, or bmp) to 83 x 133 pixels (width by height) using the TI Connect™ software. You can then send the Image Var to your TI-84 Plus C or save it to your computer as an *.8ca file. An Image Var can also be loaded into the TI-84 Plus C emulator view in TI-SmartView™ software.

Your picture may not display in the graph area as expected given the conversion to the pixel dimensions of 83 x 133. The conversion to the Image Var uses 16-bit color.

On the TI-84 Plus C, an Image Var displays as the background in the graph area only. An Image Var will display scaled for the MODE screen settings of Full, Horizontal, and Graph-Table preserving any mathematical modeling done on an Image Var. Image Vars cannot be edited while working on the TI-84 Plus C. Image Vars run and are stored in Archive memory.

Note: A screen capture of the graph area includes the full screen of the TI-84 Plus C, status bar, graph border, and the graph area. TI Connect™ software allows you to crop the graph size area only to create an Image Var if desired.

## Pic Vars

Pic Vars are created and modified on the TI-84 Plus C. Pic Vars are 266 x 166 pixels and use the 15 colors available on the TI-84 Plus C. Pic Vars display as an overlay on the graph screen area exactly as on the TI-84 Plus. Pics Vars display from the upper left hand corner of the graph area and do not scale for the MODE screen settings Full, Horizontal, and Graph-Table. Pic Vars can be opened to view in the TI Connect™ Screen Capture software. They can be saved as computer files with the file extension *.8ci. Pic Vars run and are stored in Archive memory. Note that Pic Vars on the TI-84 Plus run and are stored in RAM memory but also can

be stored in Archive memory. Please note this difference when clearing RAM.

**Note**: TI Connect™ software will not convert a Pic Var (*.8ci) to an Image Var (*.8ca).

## Creating and Sending Image Vars to your TI-84 Plus C

Background Image Vars are created, sent, or saved using either:

- TI Connect™ software for the Mac® using Device Explorer or Create a Group

- TI Connect™ software for the PC using Device Explorer or Screen Capture

## Creating and Sending an Image Var to a Connected TI-84 Plus C

The following steps show you how to create an Image Var if you have a TI-84 Plus C graphing calculator connected to your computer. You can create the Image Var, save it to your computer, and display it in the graph area of the TI-84 Plus C.

1. Choose the image you want to convert. Allowed picture file types are tif, gif, png, jpg, or bmp.



2. Open TI Connect™ software.

3. Using the USB Computer Cable, connect the TI-84 Plus C to the computer. Turn on the TI-84 Plus C.

4. Open Device Explorer.

5. Drag the picture to the Device Explorer.

6. Select an Image# name from the drop-down menu, such as Image0 - Image9. This will be the name of the image on the TI-84 Plus C.

   **Note**: Since this Image# name is internal to the conversion process, it is important to remember what Image# name you assigned. It is recommended that you keep this information in the filename so you know where the Image Var will be stored on the TI-84 Plus C if you send or share this file in the future.

7. Click **OK**.

You can preview the Image Var, save it on your computer, and display it in the graph area of the TI-84 Plus C.

- To preview the Image Var:

  – On a PC, open **Background** and double-click the Image#. The Image Var preview opens in the Screen Capture window.

  – On a Mac®, expand the calculator directory and double-click the Image#. The Image Var preview opens in a Preview window.

- To save the Image Var on your computer, drag the Image# from the TI Connect™ Device Explorer to your desktop, or to the folder where you want to save it.

- To display your new Image Var in the graph area of the TI-84 Plus C, press 2nd [FORMAT], change the **Background** setting to the Image# you just sent to the device (example: Image5), and press GRAPH.

## TI Connect™ software for the PC: Creating an Image Var Without a Connected Device

The following steps show you how to create an Image Var if you do not have a TI-84 Plus C graphing calculator connected to your PC. You can create the Image Var, save it to your computer, and load it into TI-SmartView™ software to view.

1.  Choose the image you want to convert. Allowed picture file types are tif, gif, png, jpg, or bmp.
2.  Open TI Connect™ software.
3.  Open Screen Capture.
4.  Drag the picture to Screen Capture.
5.  Click **File > Save As**.
6.  Choose the directory where you want to save the file.
7.  Choose TI-84 Plus C Image (.8ca) as the file type.
8.  Click **Save**.
9.  Select an Image# name from the drop-down menu, such as Image0 - Image9. This will be the name of the image on the TI-84 Plus C.

    **Note**: Since this Image# name is internal to the conversion process, it is important to remember what Image# name you assigned. It is recommended that you keep this information in the filename so you know where the Image Var will be stored on the TI-84 Plus C if you send or share this file in the future.

10. Click **OK** to convert the image to a TI-84 Plus C (.8ca) file.

See the steps below for loading the Image Var into the TI-SmartView™ software.

## TI Connect™ software for the Mac®: Creating an Image Var Without a Connected Device

The following steps show you how to create an Image Var if you do not have a TI-84 Plus C graphing calculator connected to your Mac®. The **Create a group** feature is used to convert an image without a connected device. You can create the Image Var, save it to your computer, and load it into TI-SmartView™ software to view.

1.  Choose the image you want to convert. Allowed picture file types are tif, gif, png, jpg, or bmp.
2.  Open TI Connect™ software.

3. Click the **Create** drop-down menu at the bottom of the TI Connect™ window and choose **Create a group**.

4. Drag the picture from your desktop to the Group window.

5. Select the calculator you want to use.

6. Select an Image# name from the drop-down menu, such as Image0 - Image9. This will be the name of the image on the TI-84 Plus C.

   **Note**: Since this Image# name is internal to the conversion process, it is important to remember what Image# name you assigned. It is recommended that you keep this information in the filename so you know where the Image Var will be stored on the TI-84 Plus C if you send or share this file in the future.

7. Click **OK** to convert the image to a TI-84 Plus C (.8ca) file.

8. To save the Image Var on your computer, drag the Image# from the Group window to your desktop, or to the folder where you want to save it.

See the steps below for loading the Image Var into the TI-SmartView™ software.

## Loading an Image Var into the TI-SmartView™ software for the TI-84 Plus C Emulator View

Once your create and save an Image Var (.8ca) file using TI Connect™ software, you can load that file into the TI-84 Plus C emulator view in TI-SmartView™ software, similar to any calculator file.

1. Select **File** > **Load File** in TI-SmartView™ software.

2. Select All Calculator Files (*.8c?).

3. Locate your Image Var. Remember that the internal image name of Image# is in the file. In this example, the file was named BRIDGE_IMAGE5.8ca. You will receive no prompt to pick a new Image# calculator name.

4. Select **Open** and the file will load to the emulator.

5. To display your new Image Var in the graph area of the TI-84 Plus C emulator, press $\boxed{\text{2nd}}$ $\boxed{\text{FORMAT}}$, change the **Background** setting to the Image# you just sent to the device (example: Image5), and press $\boxed{\text{GRAPH}}$.

# Using Key Press History

## What is the Key Press History?

Each key you click on the graphing calculator is recorded automatically in the key press history. You can see the key press history from the key press history pane and the large screen pane.

The key press history shows some key sequences in a different form than they are shown in the user guides for the TI-84 Plus family graphing calculators. For example, suppose you display the graphing calculator's **MEMORY** menu.

- The user's guide shows the key sequence as [2nd] [MEM], where [MEM] is the 2nd function of the [+] key.

- The key press history shows the key sequence as , the actual keys you click.

Similarly, suppose you select the **round(** function from the **MATH NUM** menu.

- The user's guide shows the function as **round(**.

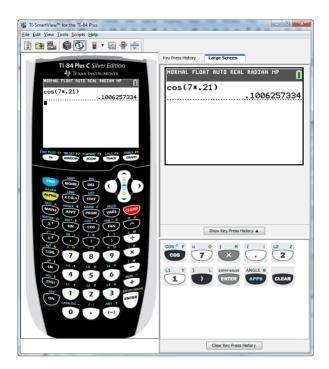- The key press history shows  because those are the keys you click.

## Showing or Hiding the Key Press History

▶ Click **View > Show/Hide Key Press History** or click .

When the TI-SmartView™ right pane is showing, you may need to click the Key Press History tab to activate it. The right pane also shows tabs for Large Screen and any open scripts. The active tab has a colored line across its top.

When the key press history is shown on the large screen pane, you can click **Clear Key Press History** to clear the list of keys pressed.

## Clearing the Key Press History

▶ Click **Edit > Clear Key Press History**, or click **Clear Key Press History** on the key press history or large screen pane.

Clearing the key press history does not affect the contents of an open script in the TI-SmartView™ right pane.

## Copying the Key Press History to Another Application

You can copy all or only a selected portion of the key press history to another application such as a word processor. You can copy the key graphics as they are shown in the key press history pane, or you can copy the key presses as font text characters.

**Note:** When you copy keys as font text characters, those characters use the TI84EmuKeys font. This font is installed on your computer automatically when you install the TI-SmartView™ software.

## Copying Keys as Graphics

1. Select the keys you want to copy. To select all the keys, click **Edit > Select All**.

2. Click **Edit > Copy**, switch to the other application, and paste the keys at the appropriate location.

**Note:**

• You can also drag the selected keys to the new application.

• You can resize the keys after you copy or drag them to a new application.

## Copying Keys as Font Text Characters

1. Select the keys you want to copy. To select all the keys, click **Edit > Select All**.

2. Click **Edit > Copy As Font**.

3. Switch to the other application, and paste the characters at the appropriate location.

   In some applications, the pasted characters may be shown in the font that is in effect at that location, so they may not look anything like graphing calculator keys.

4. If necessary, apply the TI84EmuKeys font to the characters. See the help file for the application you are using for details on how to apply a font to the characters.
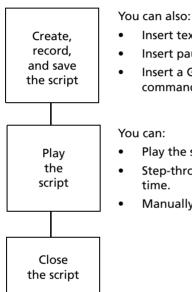
**Note:** The script icons for text points, delays, pauses, and Go To Home commands cannot be copied as font text characters. They are ignored when you paste the copied characters into the other application.

# Using Scripts

## What is a Script?

By using Windows Explorer with the TI Connect™ software, you can send device files and group files to your TI graphing calculators. You can send files stored on your computer to the RAM or Flash/Archive of a connected TI graphing calculator.

### Overview of using a script

Create,
record,
and save
the script

You can also:

- Insert text points.
- Insert pauses and delays.
- Insert a Go To Home command.

Play
the
script

You can:

- Play the script normally.
- Step-through one key at a time.
- Manually pause the script.

Close
the script

After performing one or more calculations on the graphing calculator, you can create a script that performs those same calculations without repeating the key presses to record a new script.

## Showing or Hiding the Script Pane

The open script is shown in the TI-SmartView™ right pane. To toggle the right pane on and off:

▶ Click **View > Show/Hide Key Press History** or click .

The right pane shows tabs for the Key Press History, Large Screen, and an open script. Click the appropriate tab to show its contents.

# Recording a New Script

1. Click **File > New Script** or click [icon].

   The TI-SmartView™ right pane opens automatically if it is not already open, and a new blank script appears in the pane. The new script has a tab at the top of the pane, with a colored line across its top to indicate it is active. The tab shows the script's default name.

2. Click **Scripts > Record** or click [icon] on the script's toolbar.

3. Click the keys on the graphing calculator to record the key presses for your script.

4. When you are finished, click **Scripts > Stop** or click [icon].

# Playing a Script

After recording a new script or opening an existing one, you can play it.

1. Select the tab for the appropriate script. The active tab has a colored line across its top.

2. Click **Scripts > Play** or click [icon].

# Adjusting the Script Speed

You can vary the speed at which each key press in a script is executed, from Slow (approximately one key press every 5 seconds) to Fast (approximately one every 1/2 second).

1. Click **Scripts > Adjust Script Speed**.

2. In the submenu, click a speed in the displayed range.

**Note:**

- You can also use the slider in the script's toolbar. Drag the slider to the appropriate position.

• The speed setting affects every key press in the script, which may not be what you want. Suppose the script enters numbers such as 425,237,234. Setting the speed to one key press every 2 seconds takes 18 seconds to enter the number. Instead, you may want to use a faster speed and insert pauses or delays at certain points in the script.

## Saving a Script

After recording a new script or editing an existing one, save the script.

1. Select the tab for the appropriate script.

2. Click **File > Save Script** or click ![floppy disk icon].

3. If you see the dialog box:

   a) Navigate to the folder in which you want to store the script file.

   b) Type a file name.

   c) Click **Save**.

   Script names will have the form *filename*.84script where *filename* is the name you gave the file and 84script indicates that the file is a script created by the TI-SmartView™ software.

## Saving a Copy of a Script

1. Open the script you want to copy. The active tab has a colored line across its top.

2. Click **File > Save Script As**.

3. In the dialog box:

   a) Navigate to the folder in which you want to store the copy.

   b) Type a file name. Use a name that indicates the purpose of the script.

   c) Click **Save**.

**Note:** If you change a script and want to keep those changes in the existing script, click **File > Save Script** or ![floppy disk icon] before selecting **Save Script As**. Otherwise, the changes are saved in the copy but not in the original script.

## Opening an Existing Script

To open an existing script:

1. Click **File > Open Script** or click  .

2. In the dialog box:

    a) Navigate to the folder that contains the script file.

    b) Click the script name to highlight it.

    c) Click **Open**.

The script opens in the TI-SmartView™ right pane. A tab with the script name appears at the top of the pane along with tabs for Key Press History and Large Screen. You can click any of those tabs to jump from one to the other.

## Closing a Script

▸ Click **File > Close Script** or click the **X** on the script tab.



TestScript **X** ◀────── Click to close the script.

## Stepping Through a Script

You can step through a script one key press at a time.

### Stepping Through a Script from the Beginning

In the script pane, instead of playing the script:

1. Click **Scripts > Step Through** or click  to start the script.

    **Note:** Do not click **Scripts > Play** or  .

    The script pauses automatically after every key press.

2. Click  repeatedly to step through each key press.

3. After stepping through a series of key presses, you can click  to play the remaining key presses continuously.

### Stepping Through Part of a Script

In the script pane:

1. Click **Scripts > Play** or click  .

2. Click **Scripts > Pause** or click ⏸ to pause at a location before you want to start stepping through.

3. Click **Scripts > Step Through** or click ⏭ repeatedly to step through each key press.

4. After stepping through a series of key presses, you can click ▶ to play the remaining key presses continuously.

### Stopping a Script While Stepping Through it

While you are stepping through a script, **Scripts > Stop** or ⏹ may not be available. If not, you can:

1. Click ▶ to play the script.

2. Then click ⏹.

## Stopping a Script

When you finish recording a script, you need to stop recording.

▶ Click **Scripts > Stop** or click ⏹.

Unlike when you pause a script, you cannot continue playing the script from the location where it stopped. You can only replay the script from the beginning.

## Pausing a Script

At various times while a script is running, you may want to halt it temporarily. You can either pause the script manually or insert a pause command directly into the script.

### Pausing the Script Manually

In the script pane, while the script is playing:

▶ Click **Scripts > Pause** or click ⏸.

The **Play** ▶ button changes to **Pause** ⏸ when you play the script. After you pause the script, the button changes back to **Play**. Click **Play** again when you are ready to continue the script.

### Inserting a Pause Command in the Script

In the script pane:

1. Click the location where you want to insert the pause.

2. Click **Scripts > Insert Pause** or click ⏸ at the bottom of the script pane.

⏸ appears in the script to mark the location of the pause. When you play the script, it always halts at this pause command.

To continue, click **Scripts > Play** or click ▶.

### Deleting an Existing Pause Command

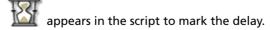Delete the ⏸ icon the same way you would delete any other key press in the script.

# Inserting a Delay into a Script

In some cases, you may want to delay the script a specified period of time before it continues to the next key press. For example, you may want to display a result or graph for a few extra seconds before the script executes the next key press.

### Inserting a Delay

In the script pane:

1. Click the location where you want to insert the delay.

2. Click **Scripts > Insert Delay** or click ⌛ at the bottom of the script pane.

⌛ appears in the script to mark the delay.

A delay has the same effect as a blank key press.

For a longer delay, insert more than one delay. To delay five seconds, insert five delays.

**Note:** If you do not know how long to delay the script, consider inserting a pause instead. After the script pauses, it does not start again until you click **Scripts > Play** or click ⊙ to continue.

### Deleting an Existing Delay

Delete the ⧗ icon the same way you would delete any other key press in the script.

## Inserting a Text Point into a Script

If you use a script to show a presentation, you may want to display a text screen at certain locations to explain a result or describe what the script will be doing next.

### Inserting a New Text Point

In the script pane:

1.  Click the location where you want to insert the text point.

2.  Click **Scripts > Insert Text** or click **T** at the bottom of the script pane.

3.  In the dialog box:

    a)  Type the text using your computer's keyboard.

    b)  Click **Enter**.

**T** appears in the script to mark the text point.

### Editing an Existing Text Point

In the script pane:

1.  Double-click the **T** marker.

2.  Edit the text as necessary.

3.  Click **Enter**.

### Deleting an Existing Text Point

Delete the **T** marker the same way you would delete any other key press in the script.

# Inserting a Go to Home Command

A script executes each key press in sequence. However, these key presses may have different effects depending on what screen (Home, Graph, Table, etc.) is shown on the graphing calculator when you play the script. By using a Go To Home command at the beginning of a script, you can ensure that it begins on the Home screen.

### Inserting a New Go To Home Command

In the script pane:

1.  Place the cursor at the beginning of the script.

2.  Click **Scripts > Insert Go To Home Screen** or click ![icon] at the bottom of the script pane.

**Note:** You can insert a Go To Home command at any location in your script. While you are recording key presses inside a script, however, it is usually better to record the actual key presses used to display the Home screen.

### Deleting an Existing Go To Home Command

Delete the ![icon] icon the same way you would delete any other key press in the script.

# Editing a Script

Editing a script is similar to editing a text document.

### Inserting Key Presses or Script Elements

With the script shown in the right pane:

1.  Click **Scripts > Record** or click ![icon].
2.  Click the location where you want to insert the keys or script elements.

    **Note:** Be sure to position the cursor after you start recording.

3.  You can:

    *   Click the keys you want to insert.

        – or –

    *   Use the buttons at the bottom of the script pane to insert a text point, delay, pause, or Go To Home command.

4. Click **Scripts > Stop** or click ⬤ .

## Deleting Key Presses or Script Elements

With the script shown in the right pane, either:

- Place the cursor immediately to the left of the items you want to delete. Then press **Delete** on your computer keyboard.

  – or –

- Place the cursor immediately to the right of the items you want to delete. Then press **Backspace** on your computer keyboard.

  – or –

- To delete multiple items at one time, highlight the items. Then click

  **Edit > Cut** or click ✂ on the script's toolbar.

## Moving Items to a Different Location

With the script shown in the right pane:

1. Highlight the items you want to move.

2. Click **Edit > Cut** or click ✂ .

3. Click the location where you want to insert the items.

4. Click **Edit > Paste** or click 📋 .

## Copying Items to a Different Location

With the script shown in the right pane:

1. Highlight the items you want to copy.

2. Click **Edit > Copy** or click 📋 .

3. Click the location where you want to insert the copy.

4. Click **Edit > Paste** or click 📋 .

# Copying a Script to Another Application

You can copy all or only a selected portion of a script to another application such as a word processor. You can copy the key graphics as they are shown in the script pane, or you can copy the key presses as font text characters.

**Note:** When you copy as font text characters, those characters use the TI84EmuKeys font. This font is installed on your computer automatically when you install the TI-SmartView™ software.

### Copying Keys as Graphics

1. Open the appropriate script.

2. Select the keys you want to copy. To select all the keys, click **Edit > Select All**.

3. Click **Edit > Copy**, switch to the other application, and paste the keys at the appropriate location.

### Copying Keys as Font Text Characters

1. Open the appropriate script.

2. Select the keys you want to copy. To select all the keys, click **Edit > Select All**.

3. Click **Edit > Copy As Font**.

4. Switch to the other application, and paste the characters at the appropriate location.

   In some applications, the pasted characters may be shown in the font that is in effect at that location, so they may not look anything like graphing calculator keys.

5. If necessary, apply the TI84EmuKeys font to the characters.

**Note:** The script icons for text points, delays, pauses, and Go To Home commands cannot be copied as font text characters.

# Locating Common Scripts

If you have access to scripts written by other people, you can open and play those scripts on your own computer. Texas Instruments provides a number of scripts that perform commonly used operations. Check the Texas Instruments web site at education.ti.com.

By using available scripts and viewing their content, you can get ideas about how to create additional scripts for automating your own operations.

# Connecting a Calculator

## Using Connected Graphing Calculator and the SmartPad™ App for Remote Key Press Access of Emulators

You can connect a TI-84 Plus C Silver Edition or a TI-84 Plus graphing calculator to your computer using a USB Computer cable, run the SmartPad™ application, and use the graphing calculator as a remote keyboard for the emulators in TI-SmartView™ software.

Note: The TI-84 Plus/TI-84 Plus Silver Edition and the TI-84 Plus C each have their own version of the SmartPad™ App. Select the appropriate version of the SmartPad™ App for your graphing calculator. See education.ti.com/go/download to download Apps.

If you press a series of keys on the graphing calculator, those same key presses are repeated on the graphing calculator emulator in the TI-SmartView™ software.

**Notes:**

- The appropriate version of SmartPad™ App must be installed on a TI-84 Plus/TI-84 Plus Silver Edition or TI-84 Plus C Silver Edition graphing calculator.

- The graphing calculator must have the latest operating system for best results.

- The graphing calculator with SmartPad™ App running will not display the calculations or graphs. This app makes the graphing calculator a keypad only.

### Checking the Graphing Calculator's Operating System

To avoid problems while using a connected graphing calculator to control the TI-SmartView™ software, update the graphing calculator's operating system to 2.55MP or later for TI-84 Plus/TI-84 Plus Silver Edition, or 4.0 for the TI-84 Plus C graphing calculators. To check your graphing calculator's operation system:

▶ Press [2nd] [MEM] and then select **1:About**.

The operating system number, displayed immediately below the graphing calculator name. For example:
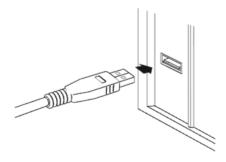


If you need to upgrade your operating system, go to education.ti.com/go/download.

### Connecting the Graphing Calculator to the Computer

You must use the USB Computer Cable that comes with your TI-84 Plus or TI-84 Plus C graphing calculator. Other TI Connectivity Cables are not supported. If you need to purchase a cable, go to education.ti.com/go/en.



1.  Firmly insert the cable's standard USB connector into a USB port on the computer.

2. Insert the cable's mini USB connector into the graphing calculator's USB port.



3. Turn on the graphing calculator.

   If you are prompted for a driver, cancel the wizard or dialog box and return to the desktop. The graphing calculator will use the computer's default USB driver.

## Controlling TI-SmartView™

1. Once the graphing calculator and USB Computer cable are properly connected, start the TI-SmartView™ software.

   **Note:** Do not start the TI-SmartView™ software until the USB Computer cable is securely connected.

2. On the connected graphing calculator, press APPS. Scroll down to and select the SmartPad™ App. The SmartPad™ title screen appears.

3. Press keys on the connected graphing calculator to control the TI-SmartView™ software. All key presses and results appear on the computer only. You may need to use your mouse and click an emulator key to force focus onto the computer window.

4. When you are finished, either:

   • Press 2nd [OFF] on the connected graphing calculator.

     – or –

   • Disconnect the USB Computer cable.

5. (The application will not run if the graphing calculator is not connected.)

   The SmartPad™ title screen appears.

- While a graphing calculator is connected, you can continue to perform operations by clicking keys on the TI-SmartView™ graphing calculator screen. You can also run applications (such as Inequality Graphing, or Transformation Graphing) or any programs stored in the TI-SmartView™ emulator state.

- All calculations use the TI-SmartView™ emulator state, not the connected graphing calculator. If the connected graphing calculator contains data, applications, or programs that are not in TI-SmartView™ emulator state, you cannot access those items.

- Even if the TI-SmartView™ emulator state contains the same application or program as the graphing calculator, it may be in a different location on the menu.

- The connected graphing calculator turns off automatically if not used for about five minutes. To continue using it, you may need to disconnect the graphing calculator, close TI-SmartView™ software, reconnect the graphing calculator and then open TI-SmartView™ software. The graphing calculator APD will disturb the USB connection with the computer.

## Transferring Data To and From a Connected Graphing Calculator

You can transfer data between TI-SmartView™ software and a connected graphing calculator.

The TI-84 Plus/TI-84 Plus Silver Edition view is compatible with the following graphing calculators:

- TI-84 Plus Silver Edition

- TI-84 Plus

- TI-83 Plus

The TI-84 Plus C view is compatible with the TI-84 Plus C graphing calculator.

1. Plug the cable's USB connector into any USB port on the computer, and plug the other end of the cable into the graphing calculator's I/O link port.

   **Note:** You do not need TI Connect™ software on your computer to control the TI-SmartView™ software.

2. Click **Tools > Establish Connection**.

   A dialog box lists all devices connected to the computer with a USB Silver Edition cable.

If the device is not listed, check both ends of the cable and make sure they are connected properly, and then click **Refresh** to update the list.

3. Click the applicable device to highlight it, and then click **Select**.

The TI-SmartView™ software connects the device and displays **Device Connected** on the title bar. The **Establish Connection** menu item changes to **Disconnect**.

4. Use [2nd] [LINK] to transfer the data by using the detailed instructions given in the Communication Link chapter of the relevant TI-84 Plus family graphing calculator guidebook. The general steps are:

   a) Set the receiving unit to receive.

   b) On the sending unit, select the applicable data items and transmit them.

   You can download TI-84 Plus family guidebooks from education.ti.com/go/download.

5. When you are finished transferring data, click **Tools > Disconnect**.

You can use the TI-SmartView™ software when the graphing calculator is connected, but it is a good practice to use the disconnect tool when you are done. Do not just unplug the cable.

**Note:** For TI-84 Plus family graphing calculators, if you unplug the USB connector from the computer while the graphing calculator connection is active, the computer may lock up and need to be rebooted.

## Using a Connected CBL 2™ or CBR 2™ Device

**Note:** DataMate™ and CBL/CBR are not supported on the TI-84 Plus C graphing calculator. While the TI-84 Plus /TI-84 Plus Silver Edition graphing calculators can use either the DataMate™ or the EasyData® App for data collection, the TI-84 Plus Silver Edition uses only the EasyData® App.

You can connect a Calculator-Based Laboratory™ 2 (CBL 2™) or Calculator-Based Ranger™ 2 (CBR 2™) data collection device to your computer. By using one of the following applications on the TI-SmartView™ emulator, you can then collect and analyze real-world data.

**TI-84 Plus:**

• **DataMate**™ App — Used for a CBL 2™ device. This application comes with the CBL 2™ device and needs to be transferred to the TI-SmartView™ application before you can use it.

• **CBL/CBR** — Used for both CBL 2™ and CBR 2™ devices.

**TI-84 Plus and TI-84 Plus C:**

•   **EasyData**® App — Used for both the CBL 2™ and CBR 2™ devices. This application is standard on TI-84 Plus calculators and is included with the TI-SmartView™ software. (On a TI-84 Plus, the EasyData® App launches automatically when you plug in a USB sensor. With the TI-SmartView™ software, however, the EasyData® App does not launch automatically.)

**Note:** To connect a CBL 2™ or CBR 2™ device, you must use the USB Silver Edition cable available from education.ti.com/go/en. Other TI Connectivity Cables are not supported for this type of connection.

## Connecting the Device and Running the Application

If you want to use the DataMate™ application (DataMate™ is not supported on the TI-84 Plus C), check that the application is already installed on the TI-SmartView™ emulator. Then:

1.   Plug the cable's USB connector into any USB port on the computer, and plug the other end of the USB Silver Edition cable into the device's I/O port.

2.   Click **Tools > Establish Connection**.

     A dialog box lists all devices connected to the computer with a USB Silver Edition cable, such as a CBL 2™ or CBR 2™ device and a calculator.

     If the device is not listed, check both ends of the cable and make sure they are connected properly, and then click **Refresh** to update the list.

3.   Click the applicable device to highlight it, and then click **Select**.

     The TI-SmartView™ software connects the device and displays **Device Connected** on the title bar. The **Establish Connection** menu item changes to **Disconnect**.

4.   Click [ANGLE B APPS], and then run the DataMate™, EasyData®, or CBL/CBR App.

     **Note:** DataMate™ and CBL/CBR are not supported on the TI-84 Plus C graphing calculator.

5.   Use the application to collect data. When you are finished, click **Tools > Disconnect**.

You can use the TI-SmartView™ software when the CBL 2™ or CBR 2™ device is connected, but it is a good practice to disconnect it when you are finished. Do not simply unplug the cable.

**Note:**

- If you unplug the USB connector from the computer while the connection is active, the computer may lock up and need to be rebooted.
- After a device is connected, you can disconnect the device and connect a new one without establishing a new connection in the software. For example, suppose you first use a CBR 2™ device and then want to switch to a CBL 2™ device. Unplug the cable from the CBR 2™ device and plug it into the CBL 2™ device.
- Other than a CBR 2™ device, you can only use probes connected to a CBL 2™ device. The TI-SmartView™ software does not use direct-connect probes.
- You can also collect data with a CBR 2™ device separately, and then transfer that data to the TI-SmartView™ software for analysis.
- For complete information about using the CBL 2™ or CBR 2™ devices, refer to the guidebook that comes with the device.

## Transferring the DataMate™ App to the TI-SmartView™ Emulator

**Note:** DataMate™ is not supported on the TI-84 Plus C. The TI-84 Plus C uses the EasyData® App for data collection.

If you use a CBL 2™ device, you should use the DataMate™ application that comes with the device. You only need to transfer it once.

1. Attach the CBL 2™ to the computer using the USB Silver Edition cable, and then establish a connection as previously described.

2. Click  to put the TI-SmartView™ software in Receive mode.

3. Press **TRANSFER** on the CBL 2™ device.

   The application and any supporting programs are transferred.

4. When the transfer is complete, click  on the TI-SmartView™ emulator.

The DataMate™ App is now available from the TI-SmartView™ APPLICATIONS menu on the TI-84 Plus /TI-84 Plus Silver Edition view, but is not supported on the TI-84 Plus C view.
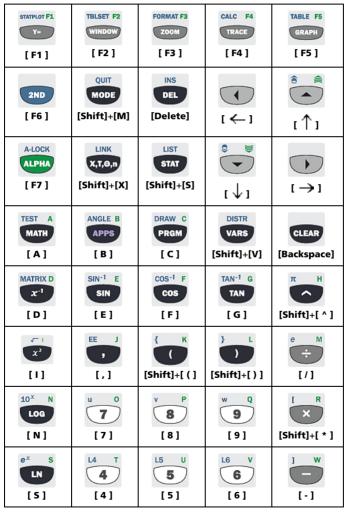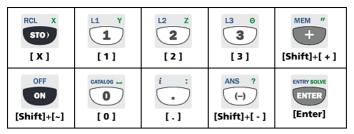
# Computer Keyboard Shortcuts

Using your computer keyboard, you can press the key(s) listed below the key icons instead of clicking those keys on the TI-SmartView™ handheld image. For example, you can press F1 on your computer keyboard instead

of clicking ![STATPLOT F1 / Y=] on the image to display the Y= editor.

| STATPLOT F1 / Y= | TBLSET F2 / WINDOW | FORMAT F3 / ZOOM | CALC F4 / TRACE | TABLE F5 / GRAPH |
|---|---|---|---|---|
| [ F1 ] | [ F2 ] | [ F3 ] | [ F4 ] | [ F5 ] |
| 2ND | QUIT / MODE | INS / DEL | ◄ | ▲ |
| [ F6 ] | [Shift]+[M] | [Delete] | [ ← ] | [ ↑ ] |
| A-LOCK / ALPHA | LINK / X,T,Θ,n | LIST / STAT | ▼ | ► |
| [ F7 ] | [Shift]+[X] | [Shift]+[S] | [ ↓ ] | [ → ] |
| TEST A / MATH | ANGLE B / APPS | DRAW C / PRGM | DISTR / VARS | CLEAR |
| [ A ] | [ B ] | [ C ] | [Shift]+[V] | [Backspace] |
| MATRIX D / $x^{-1}$ | $SIN^{-1}$ E / SIN | $COS^{-1}$ F / COS | $TAN^{-1}$ G / TAN | π H / ^ |
| [ D ] | [ E ] | [ F ] | [ G ] | [Shift]+[ ^ ] |
| $\sqrt{\phantom{x}}$ I / $x^2$ | EE J / , | { K / ( | } L / ) | e M / ÷ |
| [ I ] | [ , ] | [Shift]+[ ( ] | [Shift]+[ ) ] | [ / ] |
| $10^x$ N / LOG | u O / 7 | v P / 8 | w Q / 9 | [ R / × |
| [ N ] | [ 7 ] | [ 8 ] | [ 9 ] | [Shift]+[ * ] |
| $e^x$ S / LN | L4 T / 4 | L5 U / 5 | L6 V / 6 | ] W / − |
| [ S ] | [ 4 ] | [ 5 ] | [ 6 ] | [ - ] |

| | | | | |
|---|---|---|---|---|
| **RCL**  X<br>**STO)**<br>**[ X ]** | **L1**  Y<br>**1**<br>**[ 1 ]** | **L2**  Z<br>**2**<br>**[ 2 ]** | **L3**  Θ<br>**3**<br>**[ 3 ]** | **MEM**  "<br>**+**<br>**[Shift]+[ + ]** |
| **OFF**<br>**ON**<br>**[Shift]+[~]** | **CATALOG** ⌐<br>**0**<br>**[ 0 ]** | *i*  :<br>**.**<br>**[ . ]** | **ANS**  ?<br>**(–)**<br>**[Shift]+[ - ]** | **ENTRY SOLVE**<br>**ENTER**<br>**[Enter]** |

**Note:** Some  keys have more than one shortcut, but the table shows only the most straightforward ones. For example, you can also type 1 by pressing **[ Y ]** (because Y is the alpha character for $1$ on the handheld). However, it is much easier to press **[ 1 ]**.

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