

App and Program Transfer Guidebook

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Overview

This guidebook is a step-by-step guide to loading apps and programs onto your TI graphing calculator. If you follow these steps sequentially you will be ready to collect data in little time. Tips are also included so you can cut down on future work.

Calculator data collection is controlled by applications (apps) or programs loaded on your calculator. The app or program you need depends on the technology (calculator, interface, and sensor) you wish to use.

The individual applications and programs listed on page 4 can be downloaded from the Vernier web site or a CD and then transferred to your graphing calculator from the computer using a TI Connectivity cable and software. If your data collection does not require the sensors or uses listed on page 4, you don't need this guidebook.

Step 1: Required Materials

To load Vernier applications and supplemental programs onto your TI graphing calculator, you will need:

- A Texas Instruments graphing calculator
- TI Connectivity Cable or TI USB cable (for use with the TI-84 Plus, TI-84 Plus Silver Edition, and TI-89 Titanium graphing calculators)
- TI Connect™, TI Device Explorer™, or TI-GRAPH LINK™ software
- Vernier supplemental programs
- A PC® or Macintosh® computer

Supported TI Graphing Calculators

- TI-82
- TI-73
- TI-73 Explorer
- TI-83
- TI-83 Plus
- TI-83 Plus Silver Edition
- TI-84 Plus
- TI-84 Plus Silver Edition
- TI-85
- TI-86
- TI-89
- TI-89 Titanium
- TI-92
- TI-92 Plus
- Voyage 200

Cables to Connect the Calculator to the Computer

To connect a TI graphing calculator to a computer, you will need a connecting cable and computer software. The cable you need depends on both the calculator and the computer you are using. All cables come supplied with the TI Resource CD, which contains the required software (see below). Some TI calculators come supplied with a cable.

TI-GRAPH LINK Serial (TI Connectivity) cable for Macintosh (gray)
Order Code: GLC-MAC

TI-GRAPH LINK Serial (TI Connectivity) cable for Windows (black)
Order Code: GLC-WIN

TI-GRAPH LINK USB (TI Connectivity) cable for Windows and Macintosh (silver). This is commonly called the TI-Connectivity Kit.
Order Code: GLC-USB



TI USB Cable that comes with the TI-84 Plus , TI-84 Plus Silver Edition, and TI-89 Titanium calculators.

Software

For loading the programs onto your calculator, there are three programs to choose from, depending on the calculator and computers you are using.

- TI Connect for Windows supports all TI graphing calculators except the TI-82 and TI-85. If you have one of those calculators, you will need the TI-GRAPH LINK program (Note: TI-GRAPH LINK for Windows cannot use the TI Connectivity USB cable. Use a TI Connectivity serial cable for Windows).
- TI Connect for Macintosh supports all TI graphing calculators.
- TI Device Explorer (a program found in the TI Connect package) for Mac OS X supports all TI graphing calculators.

Instructions for loading TI Connect or TI-GRAPH LINK onto your computer are available on page 5.

Applications and Programs

Special sensors, such as photogates and radiation monitors, or special uses, such as motion matching or managing the Flash memory of your interface, require supplemental programs. They are available for download from www.vernier.com and include Readme files providing details. These programs will work with CBL 2 and LabPro.

EasyData ¹	The EasyData app is a graphing calculator application that comes loaded on the TI-84 Plus and TI-83 Plus. It lets you collect, view, and analyze real-world data on TI-84 Plus and TI-83 Plus graphing calculators using Vernier USB devices (EasyTemp and EasyLink for the TI-84 Plus) and other data collection devices, such as Texas Instruments CBR 2, CBL 2 System, or Vernier Go!Motion, and LabPro. Older versions of these calculators may not come loaded with EasyData.
DataGate	Use DataGate to collect data with photogates or Smart Pulleys™.
DatMatch	The DatMatch program is a special purpose program used with the Motion Detector. The program presents distance vs. time and velocity vs. time graphs, and challenges the students to match the graph by moving in front of the Motion Detector.
DataRad	This program is used with our Student Radiation Monitor and our Radiation Monitor to monitor nuclear radiation. A variety of data collection modes are supported.
DaRotary	This program is used when you want to collect data with the Vernier, Pasco or Team Labs rotary motion sensors. It supports a variety of collection modes including simultaneous analog and rotary sensor data collection. There are also a number of analysis features.
FunctGen	This program allows your graphing calculator to command a LabPro Interface to behave like an analog function generator. Among other things, it can be used to study harmonic oscillation in strings and LRC circuit response. This program will work only with LabPro and requires LabPro operating system 6.22 or higher.
DataDrop	This program counts drops and measures pH in titration experiments using the Drop Counter.
DataDir	This special purpose program is used to manage programs in the Flash memory of your CBL 2 or LabPro. You can save programs to the interface and load programs from the interface. This program will work with all the graphing calculators except the TI-82 and TI-85.
VST Apps	It is a neatly wrapped application for the TI-83 Plus, TI-83 Plus Silver Edition, TI-84 Plus, and TI-84 Plus Silver Edition that includes the following specialty programs: DatMatch, DataGate, DataRad, DaRotary, DataDrop and FunctGen.

The next step is loading software and downloading the applications or programs onto your computer.

¹ TI-84 Plus requires an operating system version 2.3 or later to run EasyData. TI-83 Plus requires an operating system version 1.6 or later to run EasyData. You can download a free copy of the latest operating system software for your calculator from education.ti.com/latest.

STEP 2: Load Programs onto Your Computer

Now load the TI Connect or TI-GRAPH LINK software and supplemental programs onto your computer.

Important: You will need TI Connect unless you are a Windows user and you are using TI-82 or TI-85 graphing calculators. If that's the case, you will need the TI-GRAPH LINK software for Windows.

A: Load TI Connect or TI-GRAPH LINK onto Your Computer

There are two sources of these programs—the Resource CD that comes with the TI Connectivity Kit and the Texas Instruments web site.

From the TI Resource CD

The TI Resource CD is included with the TI Connectivity Kit (USB) for Windows/Mac (order code GLC-USB), and with the TI-GRAPH LINK package for Windows / Macintosh (order codes GLC-WIN and GLC-MAC).

If your computer doesn't automatically launch the CD, double-click on the CD then double-click TICD.exe. From there, click on Computer Software and Documentation, then click on TI Connect or TI-GRAPH LINK. Accept the locations. A folder named TI Education containing TI Connect or TI-GRAPH LINK will be placed on your hard drive.

From the Texas Instruments Web Site

If you do not have the CD, but you do have the cable, you can download and install the TI Connect or TI-GRAPH LINK program for free from the Texas Instruments web site:

http://education.ti.com/educationportal/sites/US/productDetail/us_ti_connect.html

Click on the platform (Windows or Macintosh) and then click on the download link.

- The Windows program will select a folder on your hard drive to which the setup program will be sent.
- The Macintosh version will be saved on your desktop or your hard drive depending on the settings of the internet browser.

Leave the web site and double-click the setup icon. The instructions will lead you through the installation process. A folder named "TI Education" containing the program file will be created on your hard drive. A shortcut icon will be placed on your desktop.

B: Load the Applications and Programs onto Your Computer

The applications and supplemental programs should be saved on your computer before you transfer them to your graphing calculator. We recommend that you load them onto your desktop. There are a number of sources for these programs:

- Vernier web site (<http://www.vernier.com/calc/programs.html>). Click the type of program, graphing calculator, and computer (Macintosh or Windows) you are using.
- CDs in the back on Vernier lab manuals. DataGate and DatMatch are available on the CD that comes in the back of the *Physics with Calculators* and *Physics with Computers* lab manuals. DataRad is available on the CD that comes in the back of the *Nuclear Radiation with Computers and Calculators* lab manual.

Step 3: Loading Your TI Graphing Calculator

Using TI Connect

TI Connect for Windows and Macintosh is very easy to use. It works with all TI graphing calculators unless you are using a TI-82 or TI-85 and a Windows computer. In that case, TI-GRAPH LINK must be used. The TI-83 Plus and TI-83 Plus Silver Edition need to be running the operating system 1.15² or newer to work with TI Connect.

Windows Computers running Windows 98, NT 4.x, 2000 or ME, and XP

1. Connect the TI Connectivity Cable to the serial or USB port of your computer and to the port at the bottom edge of the TI-73, TI-83, TI-83 Plus, TI-83 Plus Silver Edition, TI-86, TI-89, or top edge of the TI-92, TI-92 Plus, or Voyage 200 graphing calculator.

If you are using the TI-84 Plus, TI-84 Plus Silver Edition, or TI-89 Titanium connect the TI USB Cable to the USB port of your computer and to the USB port at the top edge of your graphing calculator.



2. Start the TI Connect software on your computer. Click on Device Explorer.
3. The program will identify the attached device and call up a window representing the contents. (See the troubleshooting appendix if the program fails to detect your graphing calculator.)



4. Loading programs and applications onto a TI graphing calculator is very easy. All you have to do is drag the program or application from wherever you have it on your computer to the Device Explorer window, and it will copy onto your graphing calculator.
5. The program should now be loaded into your calculator. To confirm this, press **PRGM** on the TI-73 series, TI-83, and TI-86, **PRGM** or **APPS** on the TI-83 Plus, and TI-83 Plus SE, TI-84 Plus, and TI-84 Plus SE, or **2nd** [VAR-LINK] on the TI-89, TI-89 Titanium, TI-92, TI-92 Plus, or Voyage 200.



² The latest operating system for the TI-83 Plus and TI-83 Plus Silver Edition can be downloaded from Texas Instruments: education.ti.com/latest

3. Turn on the TI-82 and press 2nd [LINK]. Press , then select 1:receive from the RECEIVE menu (“Waiting” appears on the TI-82 screen).
4. On the computer, open the folder that contains your program (for example, “TI-82”), then click the appropriate file (for example, “datagate.82p” or “physics.82.g”). The “g” in the name denotes a group file.
5. Click on OK. The group of programs is now loaded onto your graphing calculator. When the file transfer is complete, click on OK.

TI-85

1. Connect the TI Connectivity Cable to the serial port of your computer and to the port at the bottom edge of the TI-85 graphing calculator.
2. Start the TI-GRAPH LINK (85) software on your computer and choose Send from the Link menu.
3. Turn on the TI-85 graphing calculator and press 2nd [LINK], then select <RECV>. “Waiting” appears on the TI-85 screen.
4. Open the folder that contains your program (for example, “TI-85”).
5. Click the appropriate file (for example, “datagate.85p” or “physics.85g”) and click on OK. The “g” in the name denotes a group file. The Sending window appears. When the file transfer is complete, click on OK. The program or group of programs is now loaded into your graphing calculator.

The program should now be loaded into your graphing calculator. To confirm this, press  on the TI-82 and TI-85.

Timesaving Tips

Once you have the supplemental programs or applications loaded onto your graphing calculator, you can use the DataDir program to store them on the LabPro or CBL 2 interface for later retrieval. You can also archive programs on the TI-83 Plus, TI-83 Plus Silver Edition, TI-84 Plus, TI-84 Plus Silver Edition TI-89, TI-92, TI-92 Plus, and Voyage 200. Using either of these two methods, you can free up graphing calculator memory as well as avoid having to reload programs from the computer.

Method #1: Using the DataDir Program to Store Programs on LabPro or CBL 2

The DataDir program allows you to send programs from the graphing calculator to the LabPro or CBL 2 interface for safe keeping. For example, suppose you teach physics and every year you want to use the DataGate and DatMatch programs. Once you have the programs on a calculator, you can use DataDir to store them in a LabPro or CBL 2 interface. This is like having an external hard drive. If the programs get deleted from the calculator you can use DataDir to retrieve them from the CBL 2 or LabPro; i.e. you won't have to go back to the computer and use a cable to reload them onto your calculator. LabPro or CBL 2 interface has approximately 600K of FLASH ROM available for storing experiment files and programs.

Load DataDir onto Your TI Graphing Calculator

There are two methods of sending the DataDir program to your TI graphing calculator.

Method A: Send DataDir from a LabPro or CBL 2 interface Interface.

This method will only be possible if your LabPro or CBL 2 interface has operating system version 1.2 or higher. To determine the version of your operating system, connect a graphing calculator to your LabPro or CBL 2 interface and start the DataMate program or one of our supplemental programs. As it starts up, watch for the ROM number in the lower left of the screen. The number that appears is the version of the interface operating system. Updates for your interface can be found on the Vernier web site at www.vernier.com and on the TI web site at education.ti.com.

1. Connect the graphing calculator to the LabPro or CBL 2 interface using the short, black link cable.
2. Prepare the graphing calculator to receive DataDir.

TI-73, TI-73 Explorer, TI-83, TI-83 Plus, TI-83 Plus Silver Edition, TI-84 Plus, and TI-83 Plus Silver Edition

Turn on your graphing calculator and press $\boxed{2nd}$ [LINK] (on the TI-73, press \boxed{APPS}), then select 1:Link). Press $\boxed{\blacktriangleright}$ to select RECEIVE, then press \boxed{ENTER} .

TI-86

Turn on your graphing calculator and press $\boxed{2nd}$ [LINK]. Select <RECV>.

TI-89, TI-89 Titanium, TI-92, TI-92 Plus, and Voyage 200

Turn on your graphing calculator and go to the home screen.

3. Press and hold the TRANSFER button on LabPro or CBL 2 interface for about 5 seconds. "Receiving...", followed by "DataDir", is displayed on the graphing calculator.

Two beeps from LabPro or CBL 2 interface and/or the "Done" message on the graphing calculator indicates the transfer is complete. Press $\boxed{2nd}$ [QUIT].

Method B: Send DataDir from your computer using a TI Connectivity Cable.

1. The DataDir program is available on the Vernier web site at <http://www.vernier.com/calc/software/index.html> and can be loaded to your graphing calculator via a TI Connectivity Cable and TI-GRAPH LINK software or TI Connect software.
2. Follow the directions on page 6 to load DataDir onto your calculator.

Start the DataDir Program

To use the DataDir program to store and retrieve programs, your TI graphing calculator must be connected to your LabPro or CBL 2 interface.

TI-73, TI-73 Explorer, TI-83, TI-83 Plus, TI-83 Plus Silver Edition, TI-84 Plus, and TI-84 Plus Silver Edition

Press **PRGM**, then press the calculator key for the *number* that precedes DATADIR. Press **ENTER** and wait for the Main screen to load.

TI-86

Press **PRGM**, press **F1** to select < NAMES >, and press the menu key that represents DataDir. (< DATAD > is usually **F1**.) Press **ENTER**, and wait for the Main screen to load.

TI-89, TI-89 Titanium, TI-92, TI-92 Plus, and Voyage 200

Press **2nd** [VAR-LINK]. Use the cursor pad to scroll down to “datadir”, then press **ENTER**. Press **)** to complete the open parenthesis that follows “datadir” on the entry line and press **ENTER**. Wait for the Main screen to load.

Store a Program

The program(s) you want to store on your LabPro or CBL 2 interface must be on your graphing calculator, either by sending them from another graphing calculator or transferring them from a computer using a TI Connectivity Cable and TI-Connect or TI-GRAPH LINK software. With DataDir you can transfer one or more programs from your graphing calculator to your LabPro or CBL 2 interface at the same time. Follow the instructions below. The key presses and screenshots in this section refer specifically to the TI-83 Plus. Although the steps will be similar if you are using a different type of graphing calculator, be sure to read and closely follow the instructions shown on your own graphing calculator screen.

1. On the DataDir Main screen, select STORE PROGRAMS and follow the directions shown on the screen.



```
STORE PROGRAM(S)
PRESS 2ND LINK, THEN
CHOOSE PRGM. SELECT
THE PROGRAMS TO STORE,
THEN CHOOSE TRANSMIT.
COMPLETE THIS IN
1 MINUTE.
```

2. Press **2nd** [LINK].



```
SEND RECEIVE
1: All+
2: All-
3: Prgm...
4: List...
5: Lists to TI82...
6: GDB...
7: Pic...
```

3. Press **3** Prgm.



```
SEND TRANSMIT
DATADIR PRGM
DATASHARE PRGM
DCUALARM PRGM
DCUAVOID PRGM
PHOERIVS PRGM
START PRGM
```

- Press  to move the cursor to the program you want to store and then press . A dot appears beside the program name. Repeat this instruction until you have selected all the programs you want to store.
- Press  to highlight TRANSMIT and press . When the program(s) have been stored, the graphing calculator displays the Done message.



Note: The graphing calculator exits the DataDir program to make the transfer. Run the DataDir program again to see the results of the transfer.

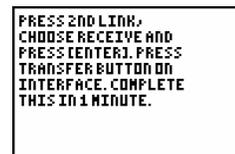
Retrieve a Program from Storage

The DataDir program allows you to retrieve a program from storage on LabPro or CBL 2. The following instructions will guide you through this task. The key presses and screenshots in this section refer specifically to the TI-83 Plus. Although the steps will be similar if you are using a different type of graphing calculator, be sure to read and closely follow the instructions shown on your own graphing calculator screen.

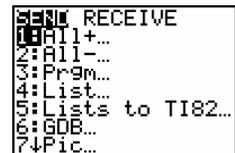
- On the DataDir Main screen, select LOAD A PROGRAM.



- Press the number beside the program you want to load.
- Press  [LINK].



- Press  to highlight RECEIVE and press .



- Press the TRANSFER button on LabPro or CBL 2.
- When the program has been loaded on the graphing calculator, the graphing calculator says DONE.

Note: There is a time limit on the transfer. You need to complete it within one minute. The graphing calculator exits the DataDir program to make the transfer.

Delete a Program from Storage

The DataDir program provides two options for deleting programs from storage. You can delete a single program or you can delete all the programs stored on LabPro or CBL 2.

You can only delete those programs that you have previously stored using DataDir. Deleting all programs will NOT delete the DataMate program.

Follow these instructions to delete a program that you have stored on LabPro or CBL 2:

1. On the DataDir Main screen, select DELETE A PROGRAM.



2. Press the number beside the program you want to delete. Only programs that you have stored on LabPro or CBL 2 are available to be deleted. The DataDir Main screen appears.

Follow these instructions to delete ALL the programs that you have stored on LabPro or CBL 2

1. On the DataDir Main screen, select DELETE ALL PROGRAMS.
2. The programs that you have stored are deleted and the DataDir Main screen appears.

Check Memory

The DataDir program also allows you to check available memory on the LabPro or CBL 2.

Follow the directions below to check memory:

1. On the DataDir Main screen select CHECK MEMORY.
2. When you finish viewing the screen, press **[ENTER]**. The DataDir Main screen appears.



Collect Garbage

As with most types of digital storage devices, repeated deleting and writing can lead to inefficient use of memory space. The DataDir program has a feature allowing you to clean up memory space on the LabPro or CBL 2.

Follow the directions below to collect garbage:

1. On the DataDir Main screen select COLLECT GARBAGE.



2. Depending on the state of the LabPro or CBL 2 memory, garbage collection can take up to 5 minutes. When garbage collection is complete, the DataDir Main screen appears.

Exit the Program

On the DataDir Main screen, select QUIT. The graphing calculator displays the message Done.

Supported Program Types

LabPro or CBL 2 interface and the DataDir program can handle the following graphing calculator variable types for the listed graphing calculators:

TI-73, TI-73 Explorer Store and retrieve programs. (*.73P) Store and retrieve applications. (*.73K)	TI-86 Store and retrieve programs. (*.86P)
TI-83 Store and retrieve programs. (*.83P)	TI-92 Store and retrieve programs. (*.92P)
TI-83 Plus, TI-83 Plus Silver Edition, TI-84 Plus and TI-84 Plus Silver Edition Store and retrieve programs. (*.8XP) Store and retrieve applications. (*.8XK)	TI-89, TI-89 Titanium, TI-92 Plus and Voyage 200 Store and retrieve programs (*.89P and *.9XP) Store and retrieve applications (*.89K and *.9XK) Store and retrieve assembly programs (*.89Z and *.9XZ)

Method #2: Using the Archive Feature of Flash TI Graphing Calculators

A good way to free up memory on your graphing calculator without having to delete and re-load programs is by archiving programs. When you archive a program, it removes the program from RAM and stores it in Flash memory. You can unarchive them when you are ready to use them again.

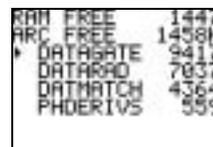
Supported Graphing Calculators

Only the following graphing calculators that have Flash memory can archive programs: TI-83 Plus, TI-83 Plus Silver Edition, TI-84 Plus, TI-84 Plus Silver Edition, TI-89, TI-89 Titanium, TI-92 Plus, and Voyage 200. If you have a graphing calculator other than the ones listed, you can store your programs using the DataDir program described above.

Archiving Procedure

TI-83 Plus, TI-83 Plus Silver Edition, TI-84 Plus, TI-84 Plus Silver Edition

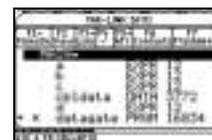
1. Press **2nd** [MEM], then select Mem Mgmt/Del...
2. Scroll down to Prgm... and press **ENTER**. A list of all available programs will be displayed.
3. Scroll the arrow beside the program that you want archived, and press **ENTER**. An asterisk will appear beside it. You will notice that the amount of free RAM will increase.
4. Press **2nd** [QUIT] to return to the home screen.



Unarchive the program by following the same procedure. The asterisk will disappear.

TI-89, TI-89 Titanium, TI-92 Plus, Voyage 200

1. Press 2 [VAR-LINK].
2. Scroll down until the program you want archived is highlighted.
3. Press **F1**. Scroll down the list to “archive variable” and press **ENTER**. An X will appear beside the program you selected.
4. Press **ENTER** to return to the home screen.



Unarchive the program by following the same procedure, except choose Unarchive Variable.

Appendix: Troubleshooting

If TI-GRAPH LINK or TI Connect cannot communicate with your graphing calculator, you will be presented with a screen with additional setup tips.



There are a number of things you should try to establish communication:

- Make certain you have selected the correct device, cable type, and port.
- Make certain the cable is firmly pushed into the ports.
- Be sure that the device is turned on and on the home screen.
- Is another program (Graphical Analysis, Logger Pro, or Palm HotSync Manager) currently running that is also using the serial or USB port? Quit those programs and try again.
- If you are using a Macintosh Powerbook, you need to turn off AppleTalk from the Chooser. Also, if you have an internal modem, turn it off in the Control Panel.
- Make sure you have enough memory on your graphing calculator before attempting to send over new programs.
- Try connecting another device, should you have one, to determine if the I/O port on your calculator is damaged.