Using FunctGen

The FunctGen program allows you to use your calculator to control the analog output signal of a LabPro interface, making it behave like a function generator. The analog signal comes from CH 4 of LabPro. A standard voltage probe connected to CH 4 is the best way to use the analog output.

Load FunctGen to Your Calculator

There are two methods of sending the FunctGen program to your Texas Instruments graphing calculator.

A. Send FunctGen from LabPro interface using the DataDir program.

This method will only be possible if your LabPro interface has operating system version 6.22 or higher. Updates for your interface can be found on the Vernier web site at vernier.com and on the TI web site at education.ti.com.

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

TI-73, TI-82, TI-83, TI-83 Plus and TI-83 Plus S.E.
Turn on your calculator and press 2nd [LINK] (on the TI-73, press APPS, then select 1:Link). Press ▶ to select RECEIVE, then press ENTER.

TI-86
Turn on your calculator and press 2nd [LINK]. Select <RECV>.

TI-89, TI-92, and TI-92 Plus
Turn on your calculator and go to the home screen.

3. Press and hold the TRANSFER button on LabPro for about 5 seconds.

   "Receiving…", followed by "DataDir", is displayed on the calculator.

   The "Done" message on the calculator and two beeps from LabPro indicates the transfer is complete. Press 2nd [QUIT].

4. With your calculator still connected to the LabPro, start the DataDir program. To load the FunctGen program, choose LOAD PROGRAM from the main screen of DataDir. A list of available programs should appear on the calculator screen. Choose FUNCTGEN, and then follow the on-screen instructions to transfer it to you calculator.

B. Send FunctGen from your computer using a TI-Graph Link™ cable.

The FunctGen program is available on the Vernier web site at www.vernier.com and can be loaded to your calculator via the TI-Graph Link cable and program[1].

[1] For calculator loading instructions, consult the manual *CBL Made Easy*, available on the Vernier web site at www.vernier.com/cbl/easy.html.

Start the FunctGen Program

To use the FunctGen program to make your LabPro into a function generator, your TI Graphing Calculator must be connected to your LabPro interface.

TI-73, TI-82, TI-83, TI-83 Plus or TI-83 Plus S.E. Calculators

Press [PRGM], then press the calculator key for the *number* that precedes FUNCTGEN (usually [1]). Press [ENTER] and wait for the main screen to load.

TI-86 Calculators

Press [PRGM], press [F1] to select <NAMES>, and press the menu key that represents FUNCTGEN. (<FUNCT> is usually [F1]). Press [ENTER], and wait for the main screen to load.

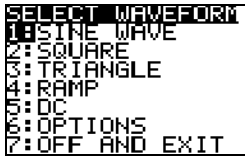
TI-89, TI-92, or TI-92 Plus Calculators

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

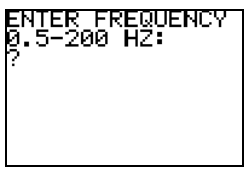
An introductory screen appears briefly, reminding you to use channel 4 for the output. Press [ENTER] to continue to the Main Menu.

Setting up a Waveform as Output

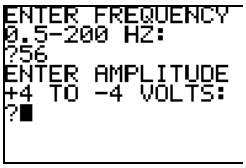
The FunctGen program allows you to command a LabPro to output an analog signal in a number of different patterns. The following instructions will guide you through this task. The key presses and screenshots in this section refer specifically to the TI-83 Plus calculator. Although the steps will be similar if you are using a different type of calculator, be sure to read and closely follow the instructions shown on your own calculator screen.



1. On the Directory Main Menu, select one of the waveform types (SINE WAVE, SQUARE, TRIANGLE, RAMP, or DC). If you choose SINE WAVE, you will need to select an amplitude. Currently, there are only two amplitudes available for the sine waves, 2 Volts and 4 Volts. If you choose RAMP, you will need to select a direction, RAMP UP or RAMP DOWN.
2. You will be prompted to enter the frequency you desire. Type in a value between 0.5 Hz and 200 Hz and press [ENTER] to continue. This prompt will not appear if you are using a DC (Direct Current) waveform, since it has no periodic form.



3. You will be prompted to enter the amplitude of your selected waveform. Type a number between –4 Volts and +4 Volts and press [ENTER] to continue.



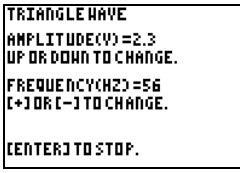
(This prompt will not appear if you are using a SINE WAVE waveform, as you selected the amplitude previously.)

4. The Display screen now appears, showing you the type of waveform, its frequency (if any) and its amplitude.

Adjusting Amplitude and Frequency on the Display Screen

The Display screen shows the current status of the analog output signal. You can easily adjust the amplitude and frequency of the signal by following the on-screen instructions. If the frequency or amplitude is not displayed on the screen, it cannot be adjusted.

1. To decrease the amplitude of the analog output signal, press [▼].



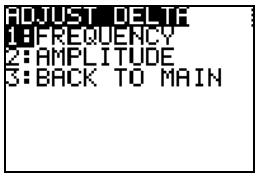
2. To increase the amplitude of the analog output signal, press [▲].
3. To decrease the frequency of the signal, press [–].
4. To increase the frequency of the signal, press [+].

Note: Each of the above key presses will alter the amplitude or frequency by a default of 5% of its value. To increase or decrease this delta, see below.

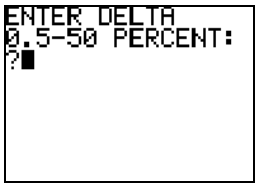
FunctGen Options

The FunctGen program provides the option of setting your own delta values used in changing the frequency and amplitude on the Display Screen. The default value (every time the program is started) is 5%.

1. From the Main Menu choose OPTIONS.
2. Choose FREQUENCY or AMPLITUDE to set your custom delta value.



3. Type in a value between 0.5 % and 50 %, and press [ENTER] to continue.



4. Choose BACK TO MAIN to return to the Main Menu.

Exit the Program

On the Main Menu, select OFF AND EXIT to quit the program and turn off the output signal and LabPro. The calculator displays the message Done.

Note: If you wish to let the LabPro continue generating the analog output signal, use the [ON] button of the calculator to crash out of the program instead of choosing OFF AND EXIT.