Using the DaRotary Program

The DaRotary data-collection program for the TI Graphing Calculators is used to collect, examine, analyze, and graph rotary motion sensor data. DaRotary is a single program, not a group.

**The DaRotary program for the TI-92 calculator, however is a group (DaRotary.92g). It contains the darotary.p and darotarz.p subprograms.*

Use the link cable to connect the LabPro or CBL 2 to the TI Graphing Calculator. Firmly press in the cable ends. Turn on the calculator. Follow these steps to start the DaRotary program on your calculator:

TI-73, TI-83 or TI-83 Plus Calculators

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

TI-86 Calculators

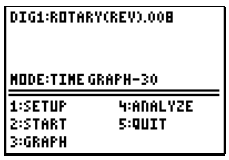
Press [PRGM] and then press [F1] to select <NAMES>, and press the menu key that represents DaRotary. (<DAROT> is usually [F1]). Press [ENTER], and wait for the main screen to load.

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

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

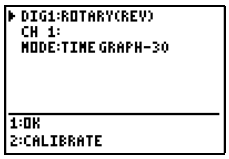
Main Screen

The main screen of DaRotary is shown at the right. The top half of the screen shows the current sensor setup and data collection mode. The portion below the double bar displays the menu options. The current status of the rotary motion sensor is shown. This status display is useful to verify that the sensor is functioning properly



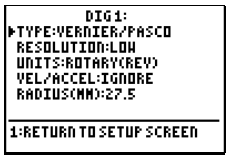
SETUP

Choose SETUP from the main screen to select which rotary motion sensor you wish to use, add another sensor, and change the data-collection mode.



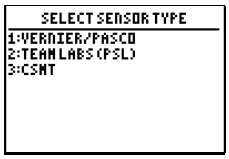
DIG 1

Here you can change various details about the rotary motion sensor. Using the up or down arrow keys on your calculator, position the arrow by the feature you want to change and press the ENTER key.



TYPE

Select which rotary motion sensor you are using: Vernier, PASCO, Team Labs, or CSMT

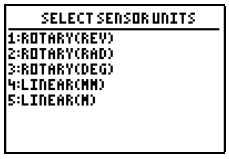


RESOLUTION

Press the ENTER key to toggle the resolution between low and high.

UNITS

Select the number corresponding to the unit of measurement you will be using.

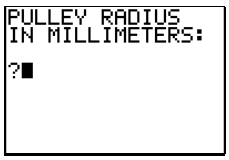


VEL/ACCEL

Press the ENTER key to record the velocity and acceleration of your data.

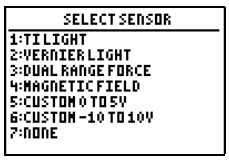
RADIUS (MM)

Here you can change the radius of the pulley being used.



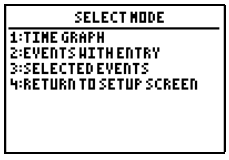
CH 1

Here you can select an additional sensor to be connected to Channel 1. After selecting the sensor, you will be returned to the Setup screen where you can calibrate it. This is especially helpful when selecting a custom sensor.



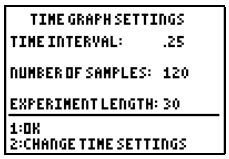
MODE

The default data collection mode for the rotary motion sensor is Time Graph (collecting 120 samples, one every .25 seconds). Position the cursor using the arrow keys opposite MODE and press ENTER to see the Select Mode screen. Press the number corresponding to the mode you want.



TIME GRAPH

Choose CHANGE TIME SETTINGS to enter a new time interval or number of samples. Choose OK to return to the Main Menu.



EVENTS WITH ENTRY

Data collection occurs one point at a time and only when the ENTER button on the calculator is pressed. You are then prompted to enter the corresponding value.

SELECTED EVENTS

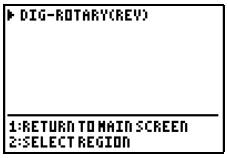
This mode collects data from each channel in response to pressing the ENTER key, but the user does not enter any values. Point numbers are plotted vs. data.

START

Select Start to begin collecting data using the existing sensor setup and data collection mode.

GRAPH

The GRAPH screen automatically appears when you are finished collecting data or when GRAPH is chosen from the main screen. To view a graph, select the appropriate channel from the list by using the ▲ and ▼ keys on the calculator and pressing ENTER.

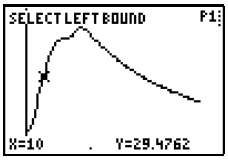


If you want to view another graph, press ENTER. The graph screen appears again so you can choose another channel.

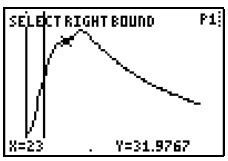
SELECT REGION

This option is used to remove unwanted data from lists, *i.e.* data that are outside the region of interest. This option may be necessary for data analysis. Data outside the selected region are permanently deleted.

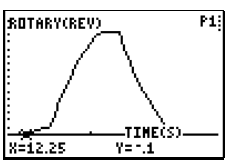
• Select the left bound, as viewed on the bottom, using the ◄ and ► keys. When the values you want for the left bound is displayed, press ENTER.



• Repeat for the right bound and press ENTER

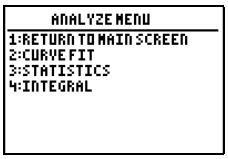


• The new graph will automatically be displayed.



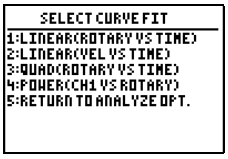
ANALYZE

The ANALYZE option on the main screen produces this list of options. You can perform a curve fit, determine statistics over a region of data, and determine the integral over a region of data.



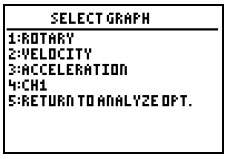
CURVE FIT

Choosing **CURVE FIT** from the ANALYZE OPTIONS menu produces a list of curve fit options.



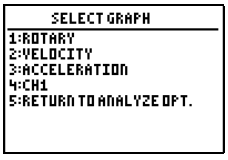
After a curve fit is performed, the fitted curve is drawn as a continuous line, and the data points are shown with box point protectors.

STATISTICS



This option finds the mean, min, max, standard deviation, and number of data points of a selected region. After selecting this option, choose a graph from the displayed list. Use the arrow keys to move the cursor and select the left bound of the region and press ENTER. A vertical line will be drawn on the graph. Now move the cursor to select the right bound and press ENTER. After the calculator has finished determining the statistics, a message will be displayed instructing you to press ENTER to continue. The numerical results will be displayed. Calculating statistics does not delete data.

INTEGRAL



The integral function is used to integrate a section of the graph. After selecting this option, choose a graph from the list. Use the arrow keys to move the cursor and select the left bound of the region and press ENTER. A vertical line will be drawn on the graph. Use the cursor to select the right bound and press ENTER. The numerical results will be presented.

QUIT

Select Quit to leave DataMate and return to the home screen of the calculator. On the TI-89, TI-92 and TI-92 Plus calculators you must press F5 or HOME to return to the home screen. To see the last graph select zoomstat as appropriate for the calculator model.