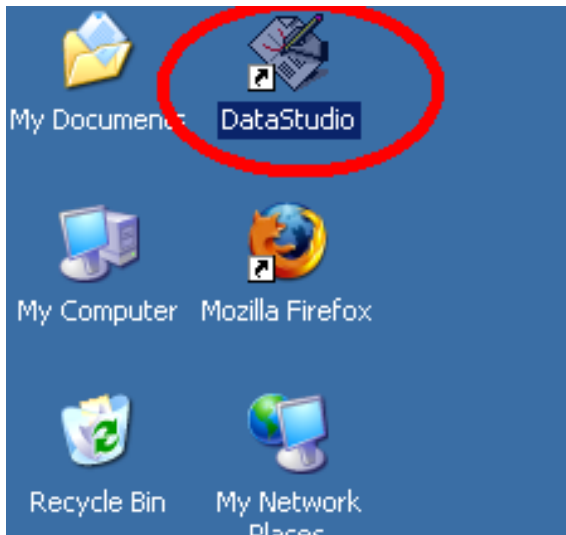


# DataStudio for Generator

## Physics 24 Lab 05

Missouri University of Science and Technology

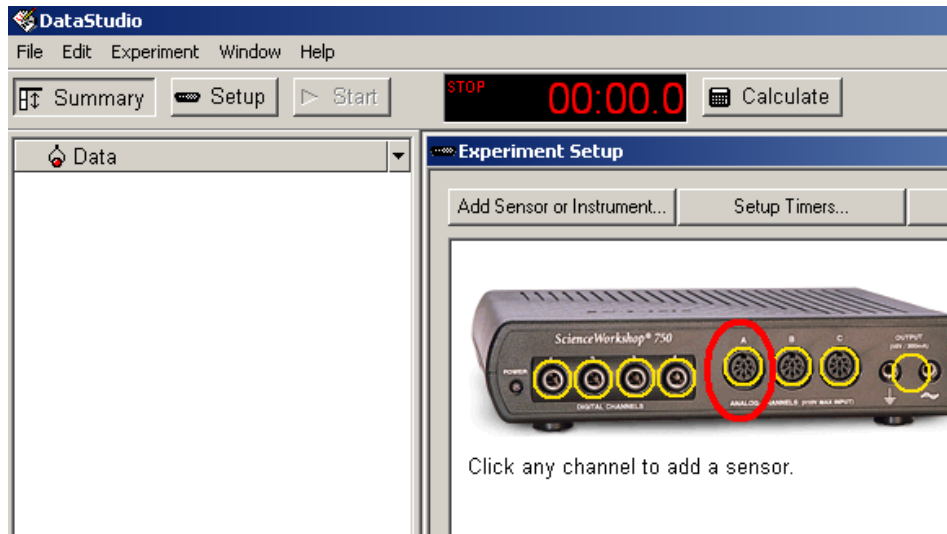
# DataStudio icon on desktop



# Create Experiment

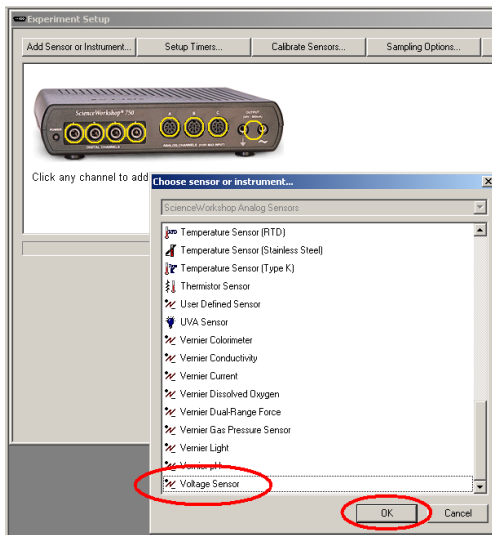
The screenshot shows the DataStudio application window. The title bar reads "DataStudio" and the menu bar includes "File", "Edit", "Experiment", "Window", and "Help". Below the menu bar, there are buttons for "Summary", "Setup", "Start", a digital display showing "STOP 00:00:00", and a "Calculate" button. On the left side, there are two panels: "Data" (empty) and "Displays" (containing a grid icon). The main workspace is a large gray area. A "Welcome to DataStudio" dialog box is open in the center, featuring a cartoon atom character and the text "How would you like to use DataStudio?". It offers four options, each with an icon: "Open Activity" (books), "Create Experiment" (a beaker and lightbulb, circled in red), "Enter Data" (a clipboard with a table), and "Graph Equation" (a graph with the equation  $y = mx + b$ ). At the bottom of the dialog, there is a checked checkbox labeled "Show each time this program starts."

Left click input which has red and black wires plugged in



The screenshot shows the DataStudio software interface. At the top, there is a menu bar with 'File', 'Edit', 'Experiment', 'Window', and 'Help'. Below the menu bar, there are buttons for 'Summary', 'Setup', and 'Start'. A digital display shows 'STOP' and '00:00.0'. To the right of the display is a 'Calculate' button. On the left side, there is a 'Data' panel. The main area is titled 'Experiment Setup' and contains buttons for 'Add Sensor or Instrument...' and 'Setup Timers...'. Below these buttons is an image of a ScienceWorkshop 750 interface. The interface has several input channels: 'DIGITAL CHANNELS' (four channels), 'ANALOG CHANNELS (100V MAX INPUT)' (three channels labeled A, B, and C), and 'OUTPUT (10V / 500mA)'. A red circle highlights channel A in the analog section. Below the image, the text reads 'Click any channel to add a sensor.'

# Select "Voltage Sensor"



# Increase "Sample Rate" to 1000 Hz

STOP 00:00.0 Calculate

Experiment Setup

Add Sensor or Instrument... Setup Timers... Calibrate Sensors... Sampling Options...

ScienceWorkshop® 750

Voltage Sensor

Measurements

Visibility, Name

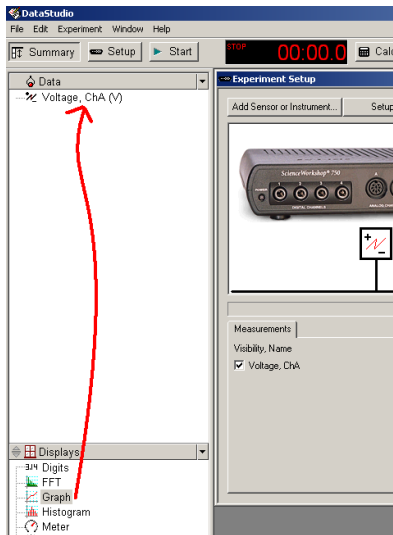
Unit of Measure

Sample Rate

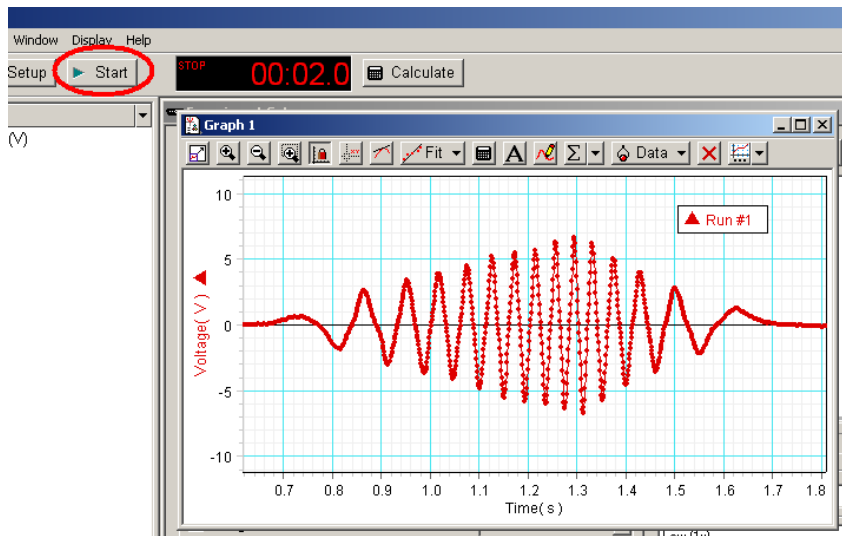
1000 Hz

Low (1x)

# Drag Graph to Voltage

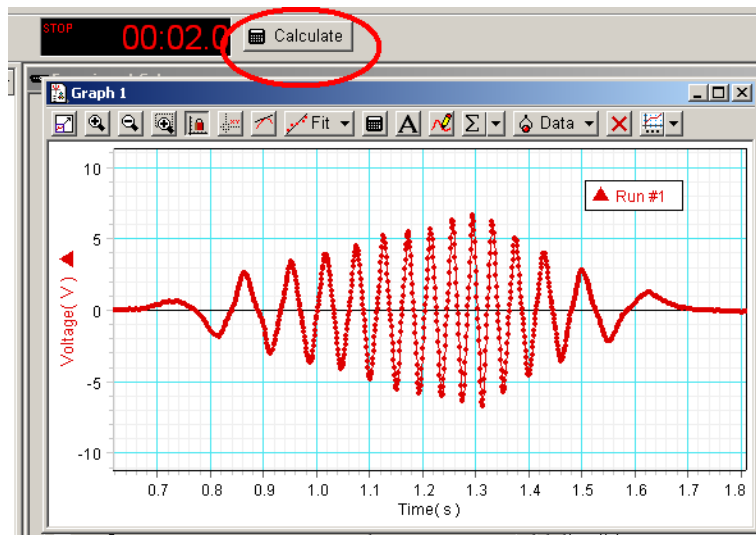


# Gather data by clicking Start

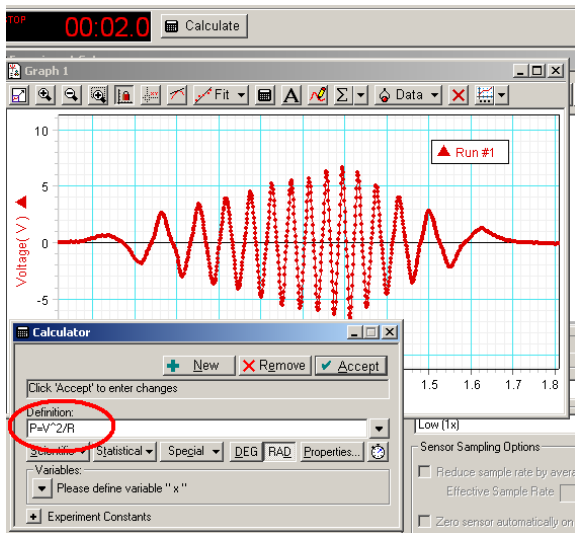




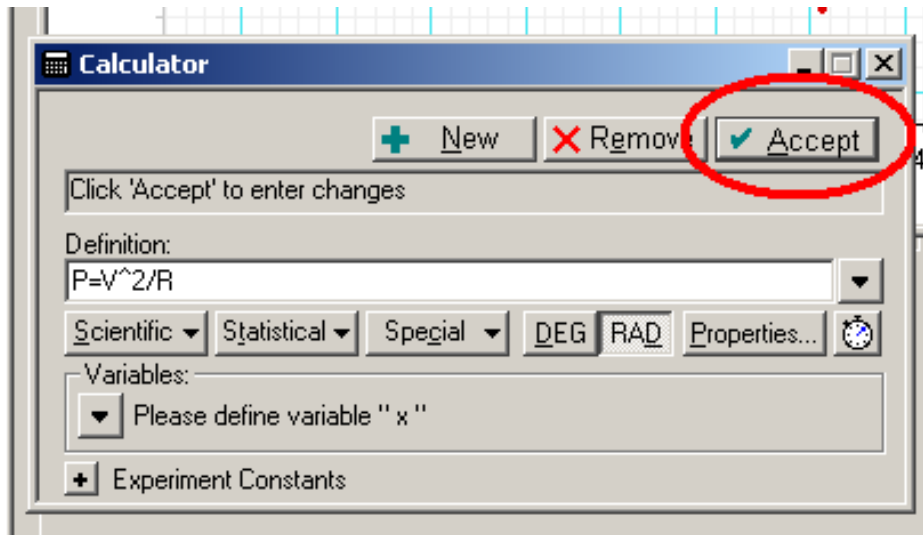
# Left click Calculate to add a dependent function



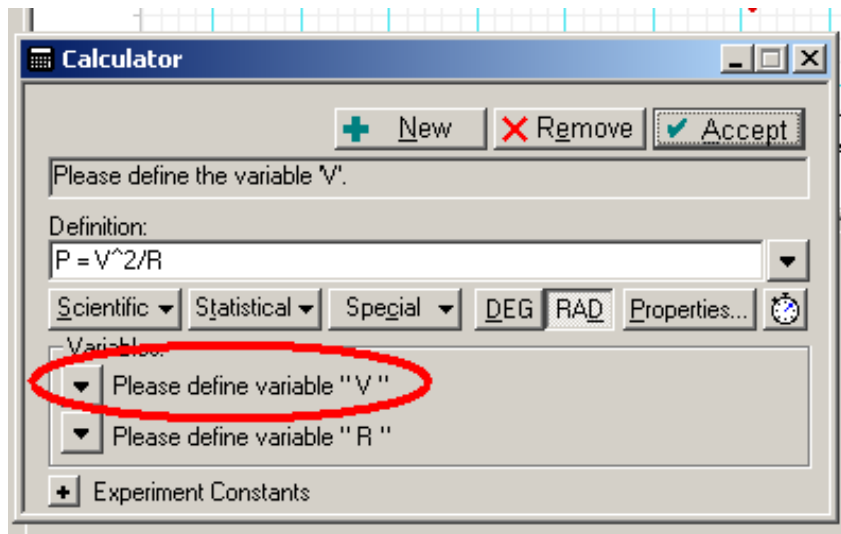
# Define equation $P = V^2/R$



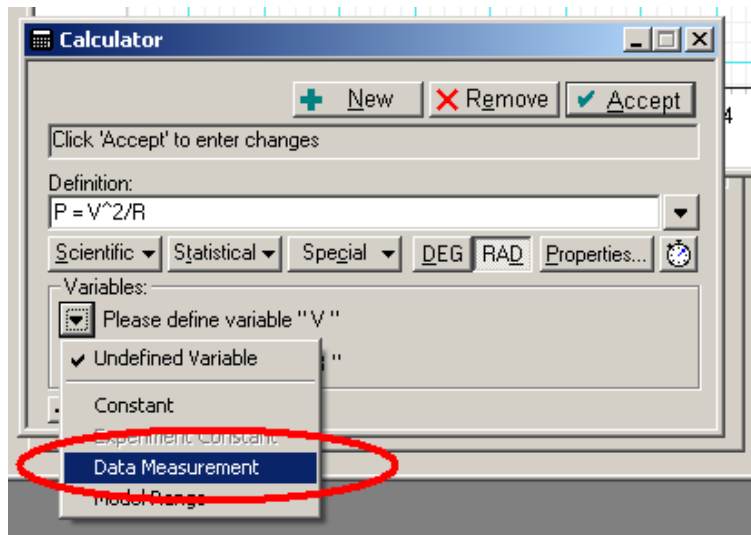
Accept (this resets Variables)



# Define "V" dropdown box



$V$  is from the data measurement you collected

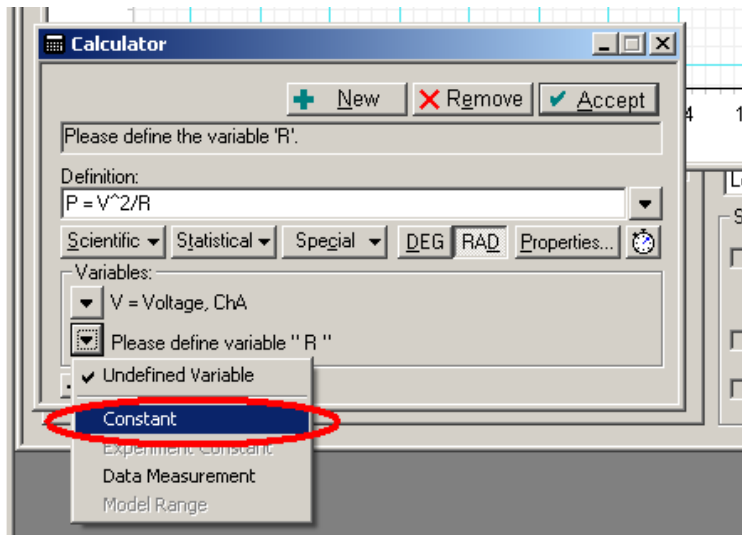


# Select generic Voltage rather than a specific run

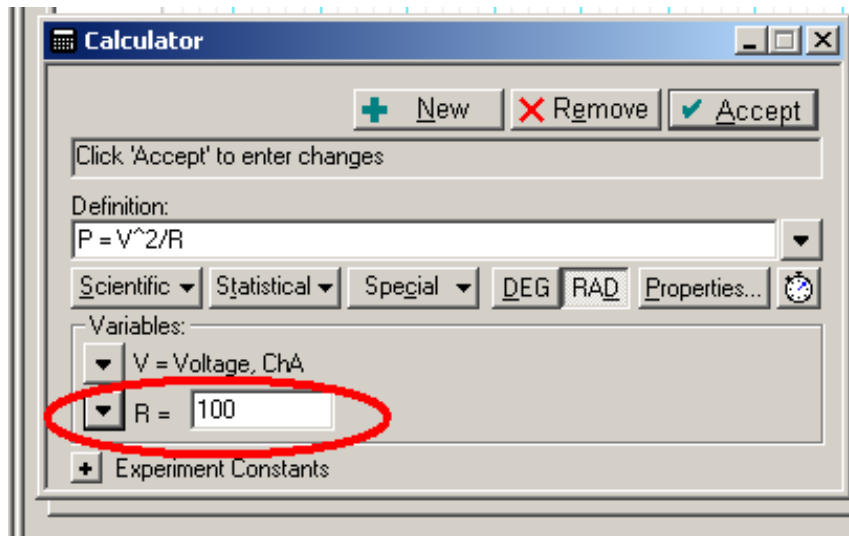
The image shows a software interface with two windows. On the left is a 'Calculator' window. It has a '+ New' button, a text field containing 'Click 'Accept' to enter changes', a 'Definition:' field with the equation  $P = V^2/R$ , and three dropdown menus labeled 'Scientific', 'Statistical', and 'Special'. Below these are 'Variables:' with two dropdowns: 'Please define variable "V"' and 'Please define variable "R"', and a '+ Experiment Constants' button.

On the right is a 'Please Choose a Data Source' dialog box. It has a blue title bar and a yellow background. It contains a cartoon atom character with a smiling face. Below the character is a list of data sources. The first item, 'Voltage, ChA (V)', is selected and circled in red. Below it is 'Run #1'. At the bottom of the dialog are 'OK' and 'Cancel' buttons.

# The Resistance $R$ is constant $100 \Omega$

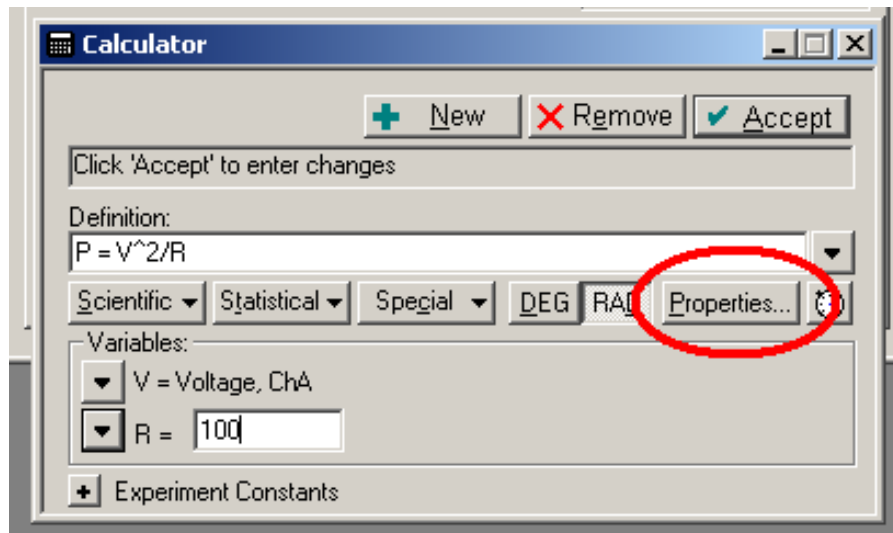


Input 100 for resistor value





# Properties refers to plot labels

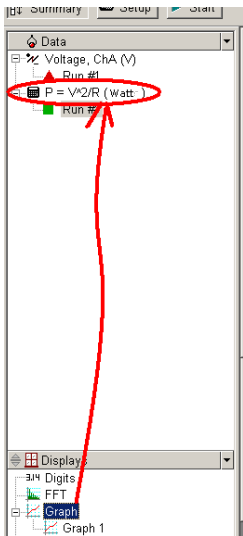


The vertical axis has label  $P$  and units

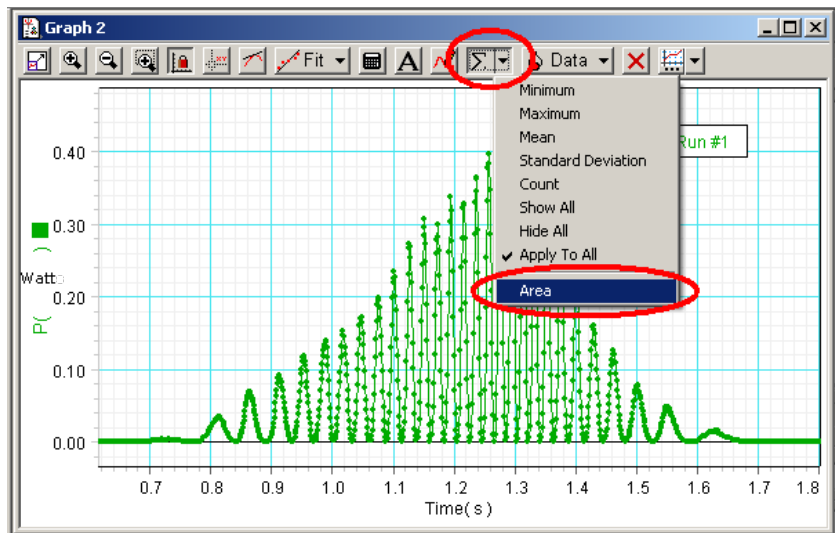
The image shows a 'Data Properties' dialog box with three tabs: 'General', 'Numeric', and 'Appearance'. The 'General' tab is selected. The fields are as follows:

- Measurement Name: P
- Description: (empty)
- Variable Name: P (circled in red)
- Units: Watt (circled in red)
- Type: Other
- Display Minimum: -1.000
- Display Maximum: 1.000
- Accuracy: 0.001
- Precision: 3
- Buttons: OK (circled in red) and Cancel

# Add new graph to equation



# To calculate area under curve



# Power versus time with area displayed

