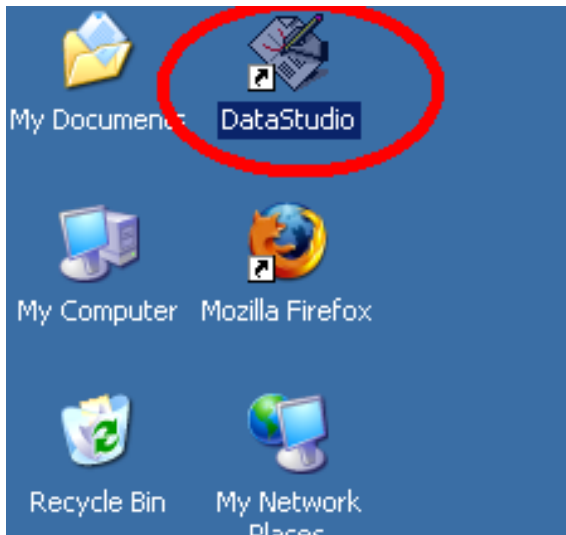


# How to use DataStudio

Physics 24 Lab O1

Missouri University of Science and Technology

# DataStudio icon on desktop



# Create Experiment

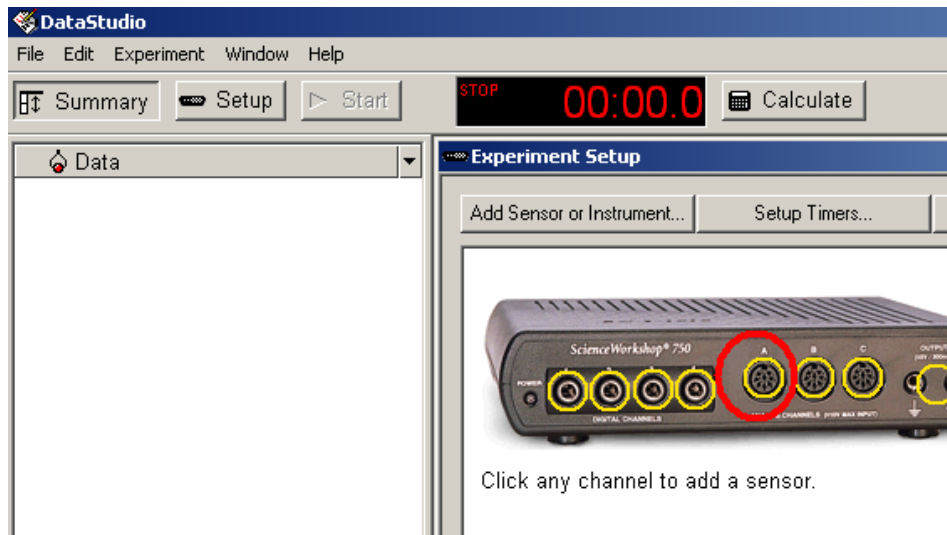
The screenshot shows the DataStudio software interface. At the top, there is a menu bar with 'File', 'Edit', 'Experiment', 'Window', and 'Help'. Below the menu bar, there are buttons for 'Summary', 'Setup', 'Start', a digital display showing 'STOP 00:00.0', and a 'Calculate' button. On the left side, there are two panels: 'Data' and 'Displays'. The main area is dominated by a 'Welcome to DataStudio' dialog box with the following content:

How would you like to use DataStudio?

- Open Activity**: Represented by an icon of four colored blocks and a document with a checkmark.
- Create Experiment**: Represented by an icon of a document, a pencil, a flask, and a lightbulb. This option is circled in red.
- Enter Data**: Represented by an icon of a clipboard with a table and a keyboard.
- Graph Equation**: Represented by an icon of a graph with a red line and the equation  $y = mx + b$ .

At the bottom of the dialog box, there is a checkbox labeled 'Show each time this program starts.' which is checked.

# Left-click input port A



The screenshot displays the DataStudio software interface. At the top, the title bar reads "DataStudio" with a menu bar containing "File", "Edit", "Experiment", "Window", and "Help". Below the menu bar are three buttons: "Summary", "Setup", and "Start". To the right of these buttons is a digital display showing "STOP" in red and "00:00.0" in red. Further right is a "Calculate" button. On the left side, there is a "Data" panel with a red and black icon. The main area is titled "Experiment Setup" and contains two buttons: "Add Sensor or Instrument..." and "Setup Timers...". Below these buttons is an image of a ScienceWorkshop 750 device. The device has several ports: a "POWER" port, four "DIGITAL CHANNELS" (each with a yellow circle), a "CHANNEL A (10V MAX INPUT)" port (circled in red), a "CHANNEL B (10V MAX INPUT)" port (with a yellow circle), a "CHANNEL C (10V MAX INPUT)" port (with a yellow circle), and an "OUTPUT (10V / 200mA)" port (with a yellow circle). Below the device image, the text reads "Click any channel to add a sensor."

# Add Voltage Sensor > OK

Experiment Setup

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

ScienceWorkshop 750

Click any channel to add

Choose sensor or instrument...

ScienceWorkshop Analog Sensors

- Temperature Sensor (RTD)
- Temperature Sensor (Stainless Steel)
- Temperature Sensor (Type K)
- Thermistor Sensor
- User Defined Sensor
- UVA Sensor
- Vernier Colorimeter
- Vernier Conductivity
- Vernier Current
- Vernier Dissolved Oxygen
- Vernier Dual-Range Force
- Vernier Gas Pressure Sensor
- Vernier Light
- Vernier pH
- Voltage Sensor**

OK Cancel

# Left-click input port C

The screenshot displays the DataStudio software interface. At the top, the menu bar includes File, Edit, Experiment, Window, and Help. Below the menu bar are buttons for Summary, Setup, Start, and a digital display showing STOP 00:00.0. The main window is titled "Experiment Setup" and contains buttons for "Add Sensor or Instrument...", "Setup Timers...", and "Calibrat...". On the left, a "Data" panel shows "Voltage, ChA (V)". The central area features an image of the Science Workshop 750 interface. The ports are labeled: DIGITAL CHANNELS (1-4), ANALOG CHANNELS (A, B, C), and OUTPUT (50V / 500mA). Port C is circled in red. Below the interface image is a voltage sensor icon with a red lightning bolt and a plus-minus sign.

# Add Power Amplifier > OK

The screenshot displays the 'Experiment Setup' window for a ScienceWorkshop 750. The main window shows a photograph of the device with a voltage symbol icon connected to its output terminals. Below the photo, the 'Measurements' section is visible, with 'Voltage, ChA' checked. A dialog box titled 'Choose sensor or instrument...' is open, listing various sensors. The 'Power Amplifier' option is highlighted with a red circle. The 'OK' button at the bottom of the dialog is also circled in red.

Experiment Setup

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

ScienceWorkshop 750

100MHz CHANNEL ANALOG CHANNELS (100V and 500V)

Voltage

Measurements

Visibility, Name

Voltage, ChA

Choose sensor or instrument...

ScienceWorkshop Analog Sensors

- Light Sensor
- Low Pressure Sensor
- Magnetic Field Sensor
- Oxygen Gas Sensor
- pH Sensor
- Power Amplifier**
- Pressure Sensor (Absolute)
- Pressure Sensor (Differential)
- Respiration Sensor
- Sound Sensor
- Sound Sensor (Student)
- Temperature Sensor
- Temperature Sensor (RTD)
- Temperature Sensor (Stainless Steel)
- Temperature Sensor (Type K)

OK Cancel

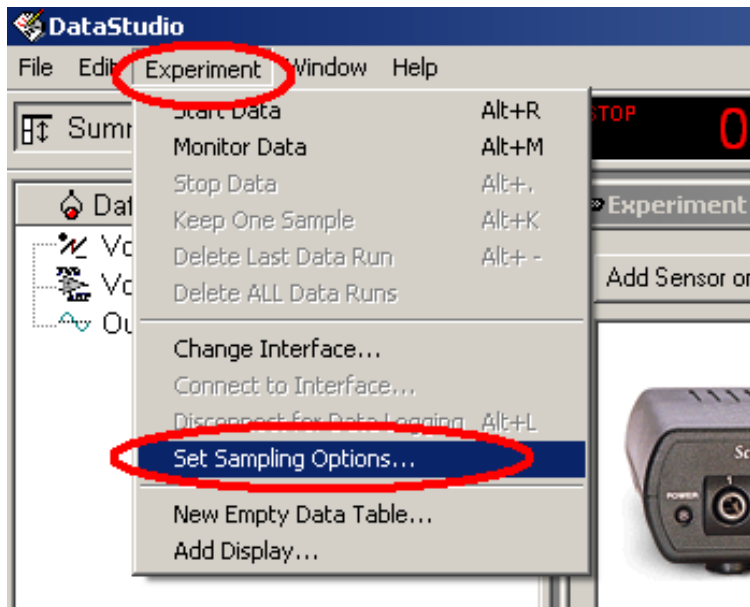
# Settings for signal generator

The screenshot displays the DataStudio software interface. The top menu bar includes File, Edit, Experiment, Window, and Help. Below the menu is a toolbar with buttons for Summary, Setup, Start, a digital display showing STOP 00:00.0, and Calculate. The main window is divided into several sections:

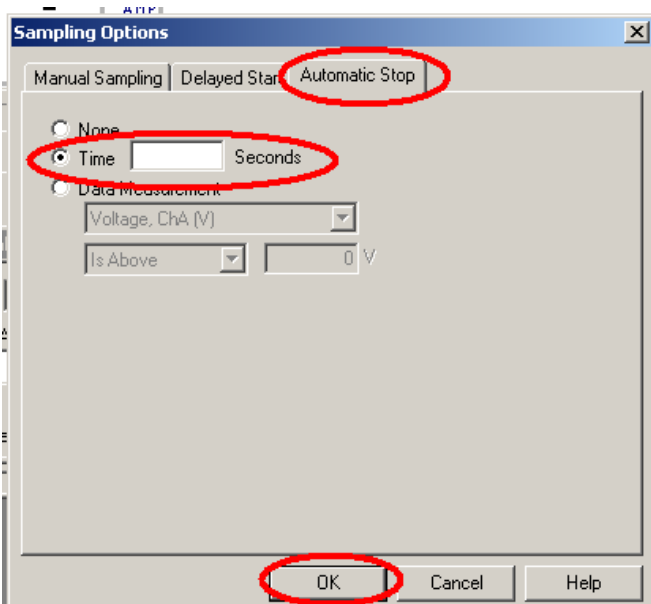
- Data:** A list of sensors including Voltage, ChA (V), Voltage, ChC (V), and Output Voltage (V).
- Experiment Setup:** A central area showing a photograph of a Science Workshop 750 interface box. Below the photo is a diagram of a signal generator connected to a power amplifier.
- Measurements:** A section with checkboxes for Visibility, Name, and Unit of Measure. The 'Voltage, ChC' checkbox is checked.
- Sample Rate:** A control set to 25 Hz.
- Signal Generator Dialog:** A floating window titled 'Signal Generator' with the following settings:
  - Waveform: Ramp up Wave
  - Amplitude: 5.000 V
  - Frequency: 1.000 Hz
  - Buttons: On, Off, Auto, and a 'Measurements And Sample Rate' button.



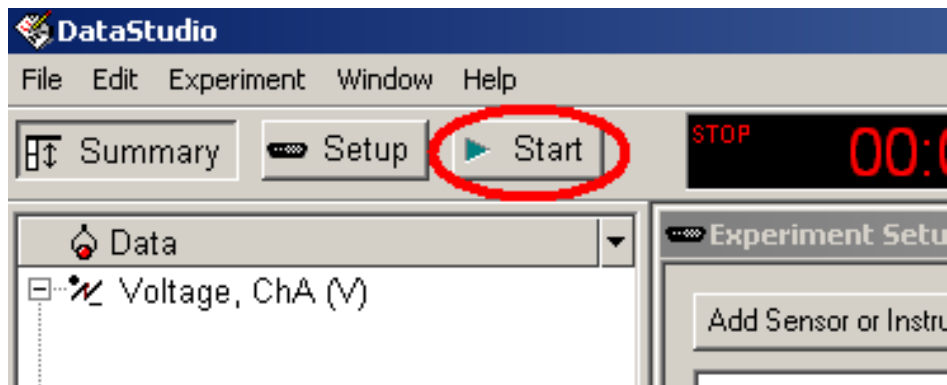
# Set sampling Options



Adjust how long to sample for (see lab report)



Click start to run



# Add Graph to see data output

The screenshot shows the DataStudio software interface. On the left, the 'Data' panel lists several data sources: 'Voltage, ChA (V)', 'Voltage, ChC (V)', and 'Output Voltage (V)'. Each source has a 'Run #1' entry. A red arrow points from the 'Graph' icon in the 'Displays' panel at the bottom left to the 'Run #1' entry under 'Output Voltage (V)'. The 'Experiment Setup' panel on the right shows a 'Science Workshop 750' interface with a 'Power Amplifier' diagram. A 'Signal Generator' dialog box is open, showing 'Ramp up Wave' selected, with an amplitude of 5.000 V and a frequency of 1.000 Hz. The 'Measurements' panel shows 'Voltage, ChC' checked. The top status bar shows 'STOP' and a timer at 00:05.0.

# Copy data to be exported to Excel

The screenshot shows the DataStudio interface. The 'Copy' option in the 'Edit' menu is highlighted with a red circle. The main window displays a graph of Voltage (V) vs Time (s) with a sawtooth waveform. The graph is titled 'Graph 1' and shows data for 'Run #1'. The y-axis ranges from -4 to 4 V, and the x-axis ranges from 0.0 to 5.0 s. The waveform has an amplitude of 5.000 V and a frequency of 1.000 Hz. The 'Experiment Setup' panel at the bottom shows controls for Amplitude, Frequency, and Sample Rate.

Time (s)	Voltage (V)
0.0	-4.0
0.5	-1.0
1.0	2.0
1.0	-4.0
1.5	-1.0
2.0	2.0
2.0	-4.0
2.5	-1.0
3.0	2.0
3.0	-4.0
3.5	-1.0
4.0	2.0
4.0	-4.0
4.5	-1.0
5.0	2.0