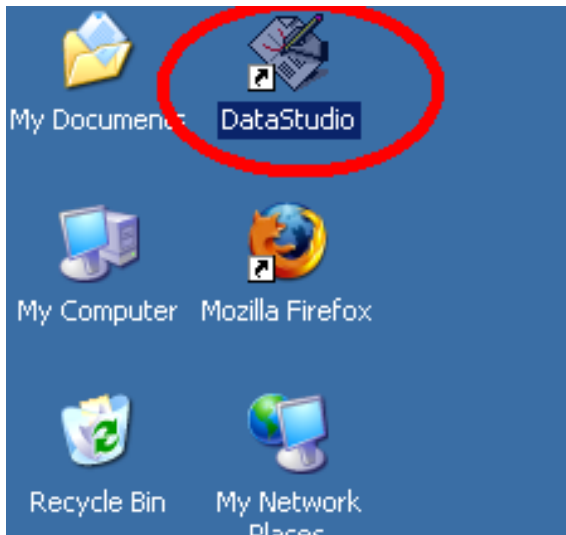


How to use DataStudio

Physics 23 Lab 04

Missouri University of Science and Technology

DataStudio icon on desktop



Create Experiment

DataStudio

File Edit Experiment Window Help


Summary Setup Start STOP 00:00.0 Calculate

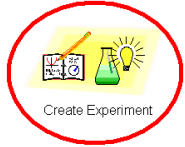
Data


Displays

Welcome to DataStudio

How would you like to use DataStudio?

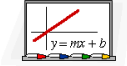
 Open Activity

 Create Experiment



| X | Y |
|---|-----|
| 1 | 2.3 |
| 2 | 2.7 |
| 3 | 5.9 |

Enter Data


$$y = mx + b$$

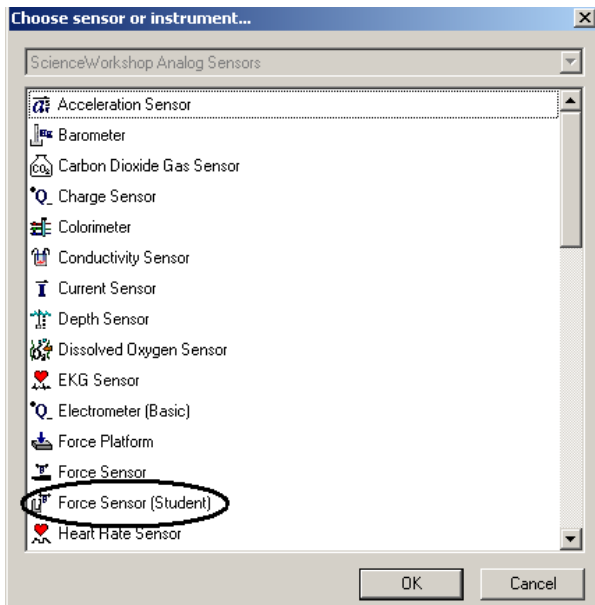
Graph Equation

Show each time this program starts.

Left-click input 1



Add Force Sensor > OK



Set sensor rate to 200

Experiment Setup

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

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Force Sensor (Student) CI-6519

Measurements

Visibility, Name

Voltage, Ch A

Force, Ch A

Unit of Measure

V

N

Sample Rate

200 Hz

Low (1x)

Sensor Sampling Options

Reduce sample rate by averaging

Effective Sample Rate 100 Hz

Zero sensor automatically on start


Zero Sensor

Reverse sign of all samples.

Calibrate Sensors

Experiment Setup

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



Force Sensor (Student) CI-6519

Measurements

Visibility, Name Unit of Measure

Voltage, ChA V

Force, ChA N

Sample Rate

10 Hz

Low (1x)

Sensor Sampling Options

Reduce sample rate by averaging
Effective Sample Rate _____ Hz

Zero sensor automatically on start Zero Sensor

Reverse sign of all samples.

No mass on force sensor = 0 Newtons

Calibrate Sensors [X]

Sensor, Measurement, Unit
Force Sensor (Student) [v]
Force, Ch A (N) [v]
 Calibrate all similar measurements simultaneously.

Previous Calibration
Slope: 0.17500 V/N Offset: 00000 V

Present Sensor Measurement
9.9089 N -0.031873 V

Calibration Type
 2 Point (Adjust Slope and Offset)
 1 Point (Adjust Offset Only)
 1 Point (Adjust Slope Only)

Calibration Point 1
Standard Value: 0 N Sensor Value: -3.5000 V [Read From Sensor]

Calibration Point 2
Standard Value: 20.000 N Sensor Value: 3.5000 V [Read From Sensor]

New Calibration
Slope: 0.35000 V/N Offset: -3.5000 V

[OK] [Cancel]

Read from force sensor

Calibrate Sensors

Sensor, Measurement, Unit
Force Sensor (Student)
Force, Ch A (N)

Calibrate all similar measurements simultaneously.

Previous Calibration
Slope: 0.17500 V/N Offset: 00000 V

Present Sensor Measurement
-8.6595E-4 N -0.031911 V

Calibration Type
 2 Point (Adjust Slope and Offset)
 1 Point (Adjust Offset Only)
 1 Point (Adjust Slope Only)

Calibration Point 1
Standard Value: 0 N Sensor Value: -0.031758 V **Read From Sensor**

Calibration Point 2
Standard Value: 20.000 N Sensor Value: 3.5000 V **Read From Sensor**

New Calibration
Slope: 0.17659 V/N Offset: -0.031758 V

OK Cancel

Calibrate force sensor with mass hanging from arm

Calibrate Sensors [X]

Sensor, Measurement, Unit
Force Sensor (Student) [v]
Force, Ch A (N) [v]
 Calibrate all similar measurements simultaneously.

Previous Calibration
Slope: 0.17500 V/N Offset: 00000 V

Present Sensor Measurement
-2.4648 N -0.031911 V

Calibration Type
 2 Point (Adjust Slope and Offset)
 1 Point (Adjust Offset Only)
 1 Point (Adjust Slope Only)

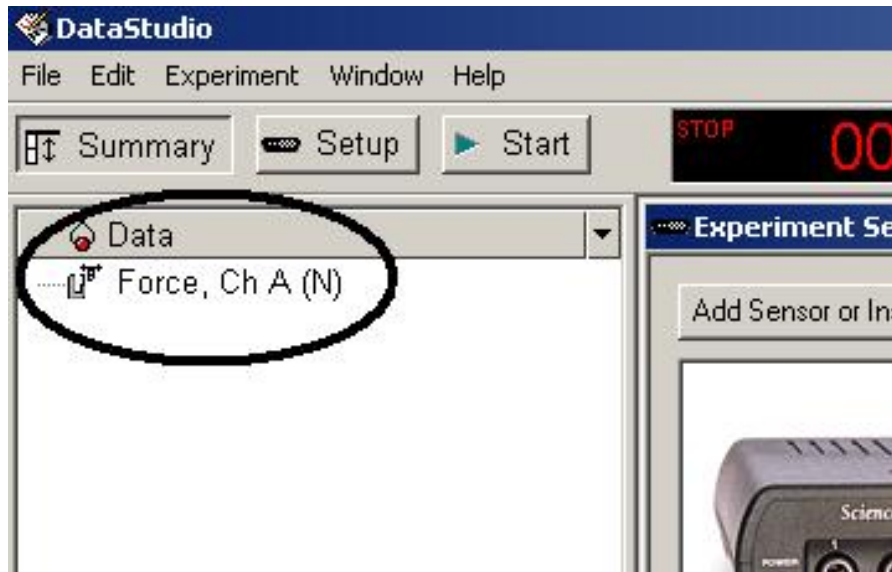
Calibration Point 1
Standard Value: 0 N Sensor Value: -0.031758 V Read From Sensor [b]

Calibration Point 2
Standard Value: 2.45 N Sensor Value: -0.031606 V Read From Sensor [b]

New Calibration
Slope: 6.2041E-5 V/N Offset: -0.031758 V

OK [b] Cancel

Force measurement

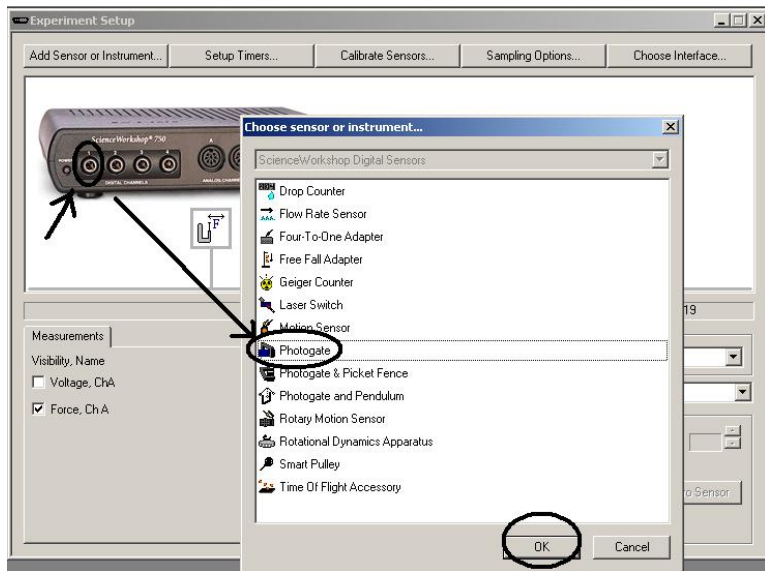


Set Precision to 4 digits

The screenshot shows the 'Data Properties' dialog box with the 'Numeric' tab selected. The 'Precision' field is set to 4, and the 'OK' button is highlighted with a black circle. Other fields include Measurement Name: 'Force, Ch A', Description: 'Force Description', Variable Name: 'Force', Units: 'N', Type: 'Other', Display Minimum: '-20.0', Display Maximum: '20.0', and Accuracy: '0.5'.


| Field | Value |
|-------------------|-------------------|
| Measurement Name: | Force, Ch A |
| Description: | Force Description |
| Variable Name: | Force |
| Units: | N |
| Type: | Other |
| Display Minimum: | -20.0 |
| Display Maximum: | 20.0 |
| Accuracy: | 0.5 |
| Precision: | 4 |

Add Photogate to Port 1



Provide flag length

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



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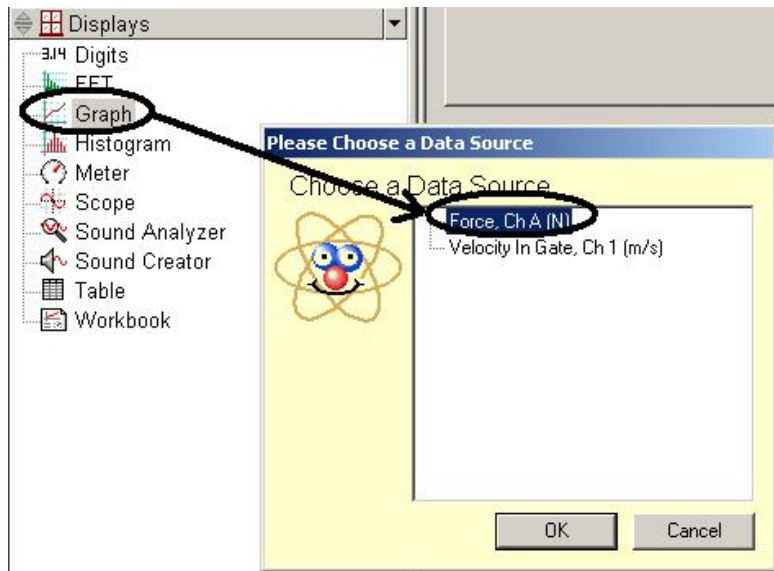
DIGITAL CHANNELS A B C ANALOG CHANNELS (100K OHM INPUT) OUTPUT (100K OHM)

Photogate ME-9204B

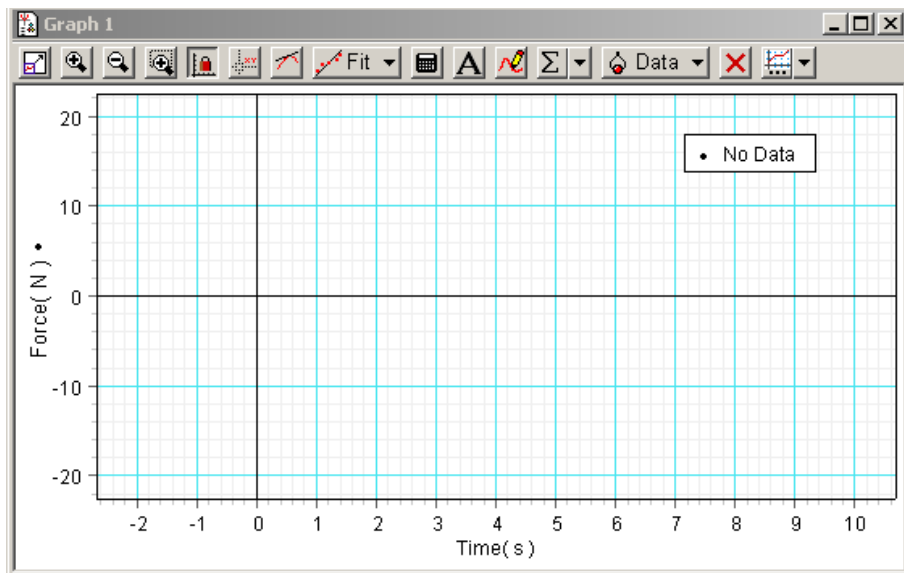
Measurement Constants

Flag Length m

New graph of force



Graph of force versus time



Integrate area of plot

