

# ADVANCED EV3 PROGRAMMING LESSON

## Data Logging (Part 2)

By Droids Robotics



# Lesson Objectives

1. Learn what data logging is
2. Learn the different ways of doing data logging on the EV3
3. Learn how to use the Data Logging Block

Prerequisites: Must own Edu version of EV3 Software

# What is Data Logging?

- The EV3 software provides a simple way to continuously record sensor readings to a file and to plot the values later. This is called *Data Logging*.
- Why use Data Logging:
  - Great for science experiments. In this lesson, we will show how you can record values like temperature for a science project.
  - Great for understanding robot programming blocks. In the next lesson, we will show how to use data logging to measure the difference between turns.
  - Great for understanding sensor behavior. In the third lesson, we will show how to use data logging to understand the details of sensors such as the gyro sensor.

# How do you data log on an EV3?

There are 4 ways to data log using the EV3 MINDSTORMS:

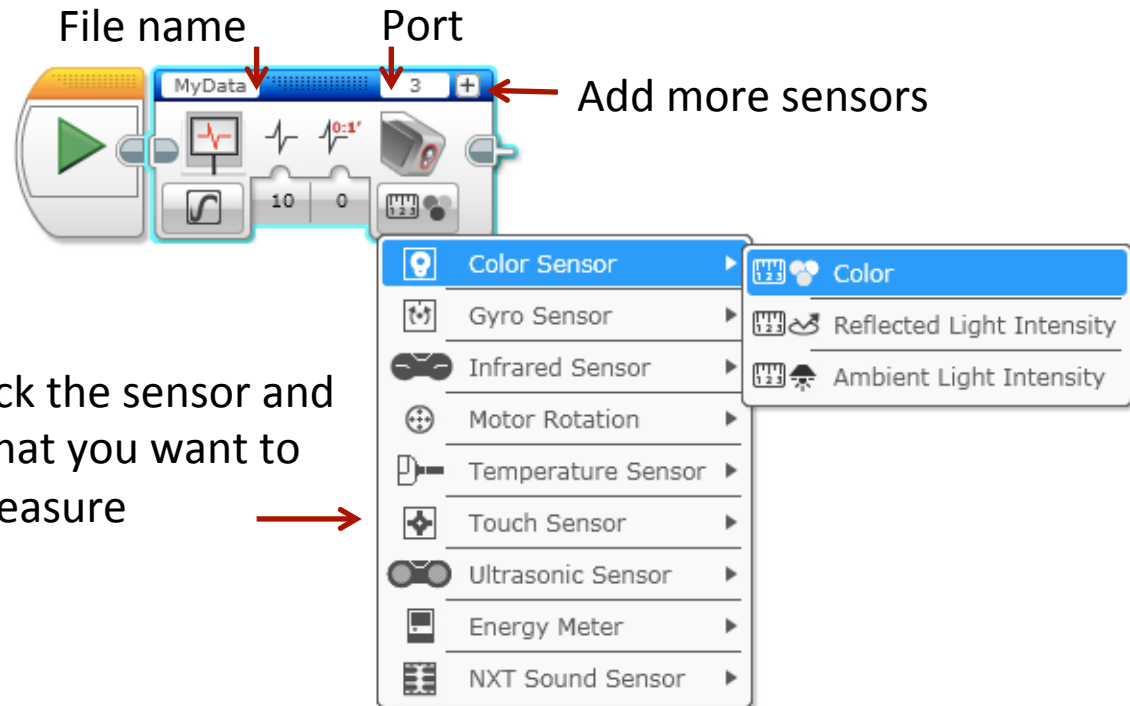
Lesson 1:  
Temperature  
Sensor  
Experiment

1. Live Data Logging: Real time data collected directly in the EV3 software
2. Remote Data Logging: Use the the brick to collect data, and transfer the data to the computer for analysis
3. Brick Data Logging: Run the experiment directly from the brick
4. Autonomous. Collect data with the Data Logging block. The data is stored on the brick.

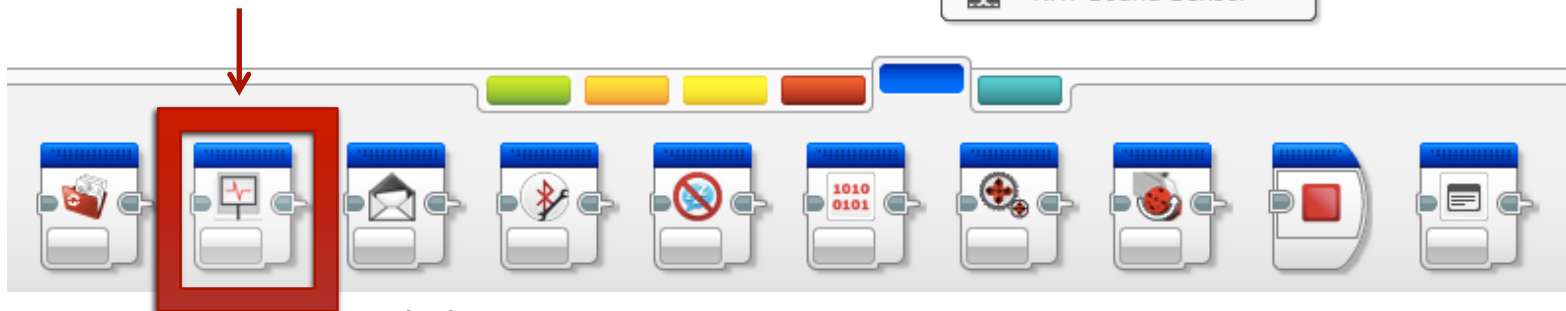
Lesson 2:  
Differences  
Between Turns

# Autonomous Data Logging

Autonomous Data Logging requires the Data Logging Block

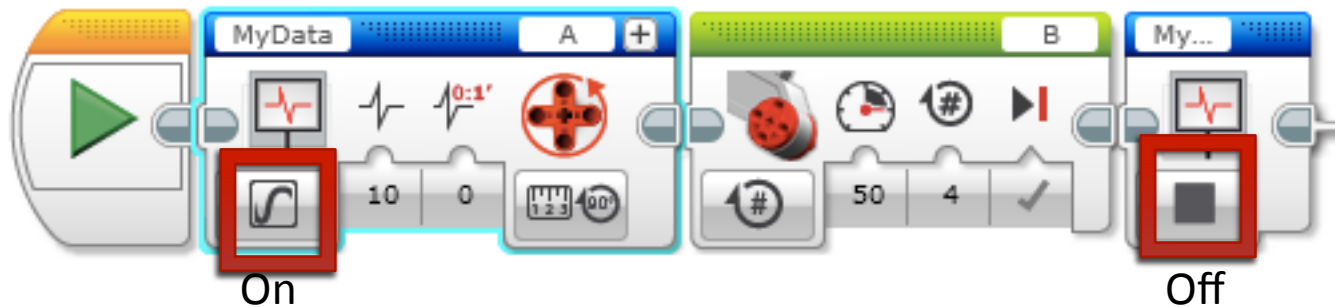


Data Logging block is in the blue tab



# How do you use the data logging block?

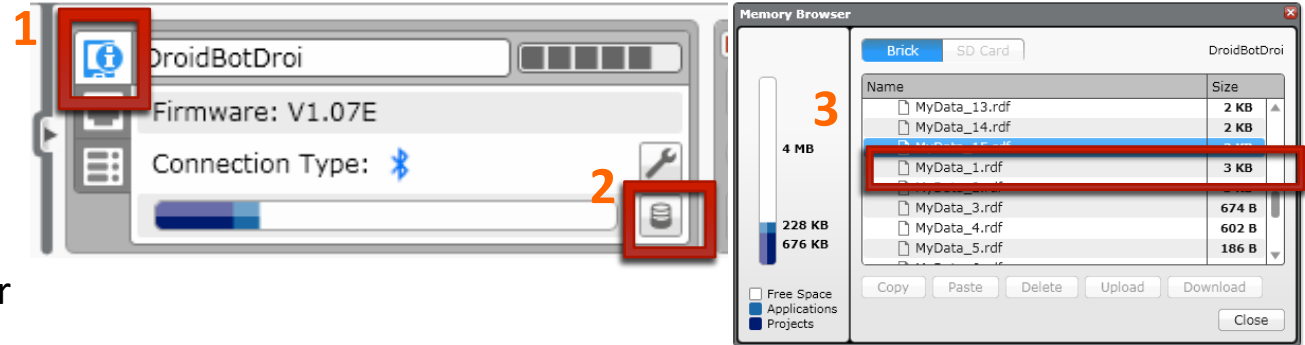
- To use this block, simply drag a Data Logging Block in front of the code you want to log and turn it “on”. To stop logging, add another Data Logging Block set to “off”.
- Pick all the other parameters – the ports, the sensors you want to log, what you want to record (rotations/degrees, etc.)
- Download and run program



# How to view your data

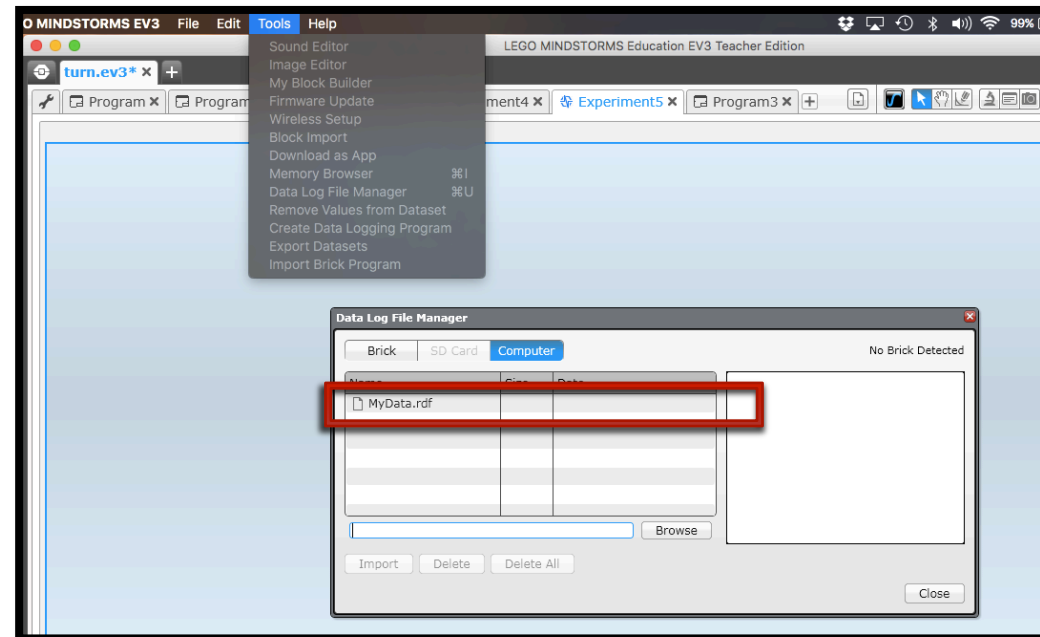
If you want to get the file from your brick to the computer:

- 1) Click on the Brick Information Icon
- 2) Press the Open Browser Memory Icon.
- 3) Find the correct .rdf file.



If you want to view the data file from either the brick or the computer:

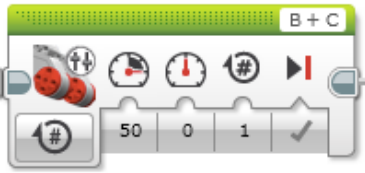
Tools → Datalog File Manager → Select BRICK or COMPUTER and pick the correct file



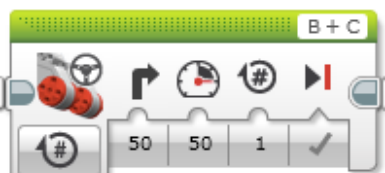
# Challenge 1: Comparing Turns

- ➔ Make four different programs that do a pivot turn and compare the data from the rotation sensor


Method 1: Uses Move Tank Block with one motor set to 0 and the other set to 50



Method 2: Uses Move Steering Block with steering set to 50.




Method 3: Uses Motor Blocks but stops Motor C



Motor C will not move. It is set to off.

Method 4: Uses one Motor Block to turn, and ignores Motor C's actions.

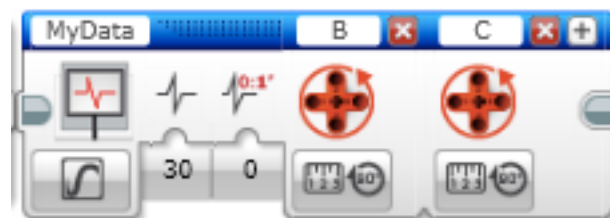


Motor C may move a bit because it is dragged along. Motor C's mode was not specified



# Steps to Remember

STEP 1: In the Data Logging My Block, select the sensor you are reading, the ports they are in.



STEP 2: Select the duration and rate

STEP 3: Remember to stop data logging at the end of your code

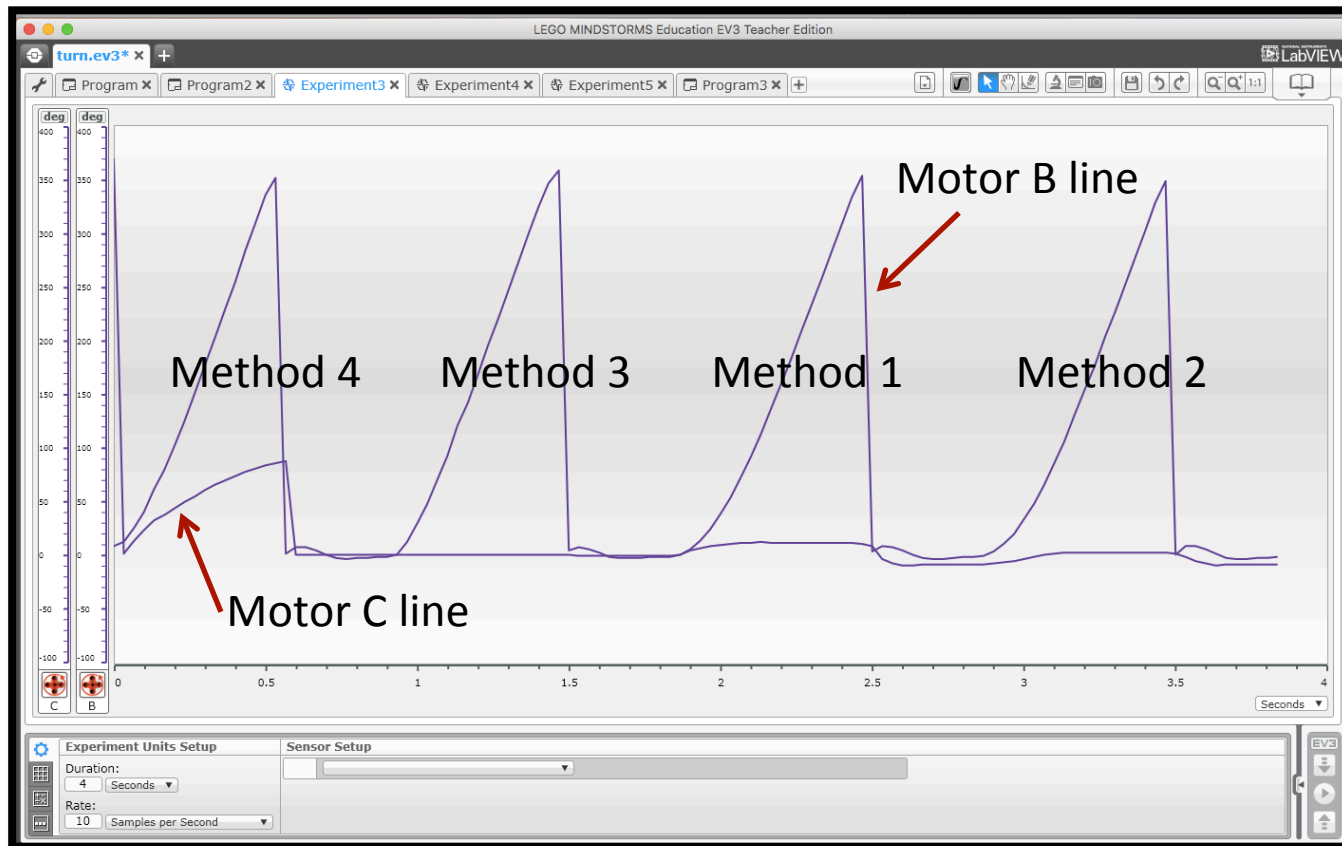
STEP 4: Remember to change the name of the file each time otherwise they will all be called MyData.



STEP 5: Import your data file and compare the graphs. Which type of pivot turn is the most reliable?

# Challenge 1 Solution

Below, we ran all 4 together, but you will find it easier to run each method separately (because you can avoid adding motor resets)



In Method 4, Motor C is dragged along.

Methods 1 and 2 are very similar.

Method 3 appears to be the most reliable. You may not notice much difference in real life, but the data log shows us the true reading.

# Credits

- This tutorial was written by Sanjay Seshan and Arvind Seshan from Droids Robotics
- More lessons at [www.ev3lessons.com](http://www.ev3lessons.com)



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