

## Inclined Plane

### EV3 program description

In program "07", once the Energy Meter has been charged to 100 J, the vehicle traverses a 70 cm section, first on a level plane and then on an inclined plane. By turning the orange directional switch on the Energy Meter, the vehicle will begin moving toward the EV3 Brick.

Press the Touch Sensor to issue a high-pitched signal.

We would like to measure average consumption in watts using the Energy Meter. To do so, current value W1 (in watts) is added to the previous measured value, W0. Half of the summed measured value yields the average increase in watts. Now an average value must be determined from the measurement series in order to determine average total consumption. If we had one total value from which we had to determine the average value, this would make up 50% of the total value, but because we are dealing with two measured values, we use 25% of the total value, or  $\frac{1}{4}$ . The result of our calculation will be saved to a further variable W. Press the rear Touch Sensor to stop the program; the EV3 Brick Display will show how many watts were consumed and in how much time (in seconds) during the current traverse.

Fewer watts should be consumed on the level plane than on the inclined plane.

### Abbreviations used

M Measurement - Measurement loop

W0 Current value measured in watts

W1 Previous value measured in watts

W Total value measured in watts

### Program summary



### Start program

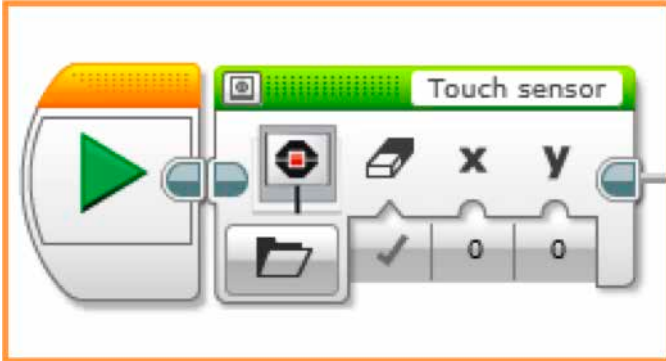
Start the program by touching the front Touch Sensor.

### Exit program

Center Button on the EV3 Brick (see program part F) or Cancel.

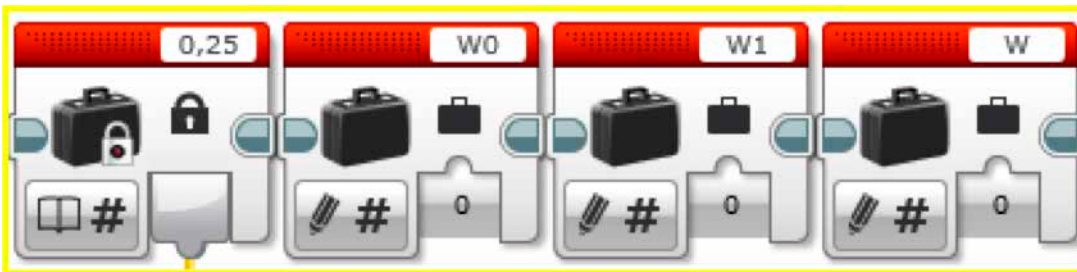
## Program parts

### Program part A



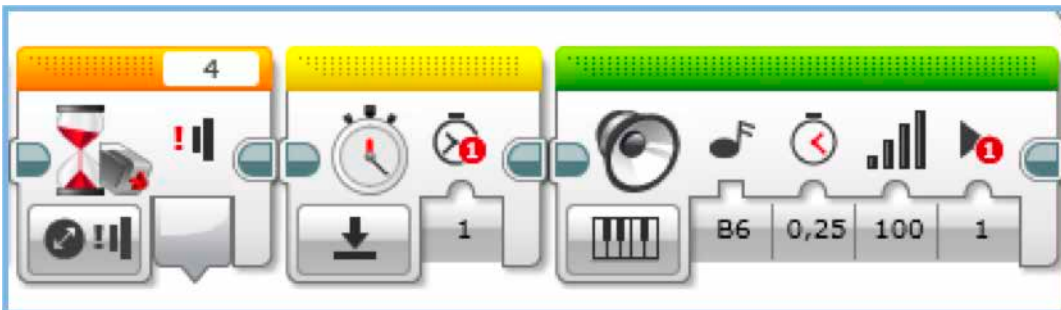
Start the program, show Touch Sensor on the EV3 Brick Display.

### Program part B



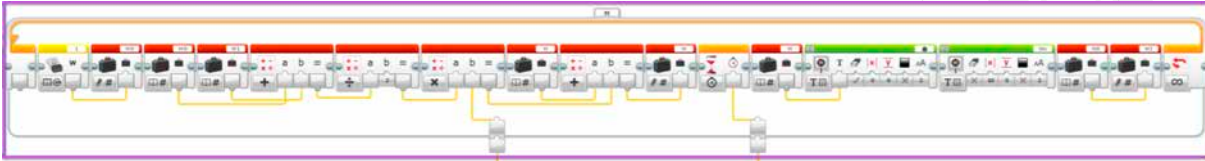
Read values 0, 25. Set values W0, W1, W to 0.

### Program part C

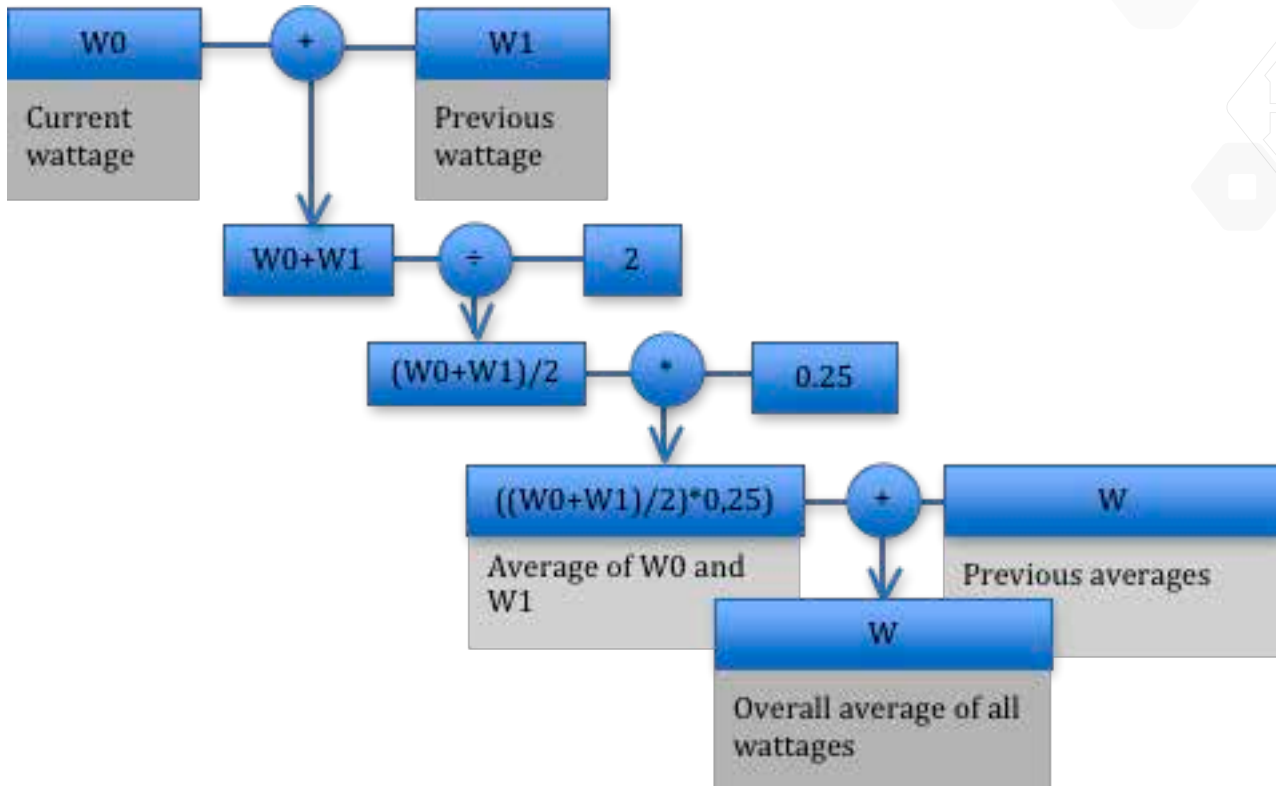


Press the front Touch Sensor to reset the Timer to 1; a high-pitched signal will sound.

Program part D

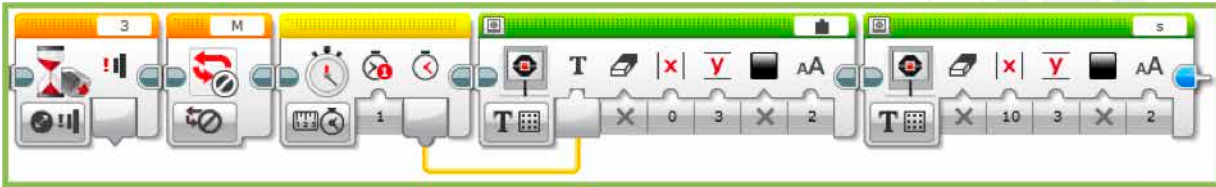


In a loop called M, the current power value in watts is written to variable W0. Subsequently, the overall average of all power values in watts is determined:



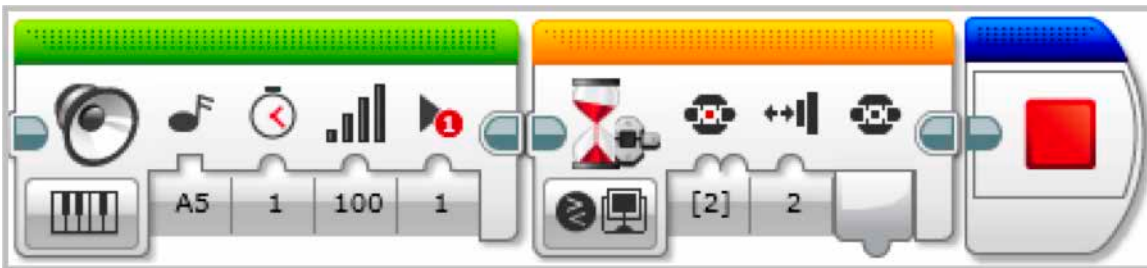
After 0.25 seconds, value W plus the descriptor "Ws" are output on the EV3 Brick Display, and finally W0 is saved to W1.

### Program part E



Pressing the rear Touch Sensor stops loop M (see program section D), and the measured time along with the descriptor s are output on the Brick Display.

### Program part F



The program ends with a low-pitched signal. Press the Center Button to exit the program.