



OBJECTIVE: This experiment will demonstrate the how to detect motion using the Snapduino.

Parts List

Quantity	ID	Name	Part #
1		Base Grid Base Grid (11" x 7.7")	6SCBG
9	2	2-snap wire	6SC02
1	3	3-snap wire	6SC03
1	6	6-snap wire	6SC06
1	UA	Snapduino	
1		Snap-FTDI Cable	
1	S1	Slide Switch	6SCS1
1	D1	Red LED	6SCD1
1	R1	100 Ω Resistor	6SCR1
1	U7	Motion Detector	6SCU7
1		Jumper Wire (Black)	6SCJ1
		Jumper Wire (Red)	6SCJ2
1	B5	9V holder & SW	6SCB5
1		9V Battery	

Step by Step Guide

- 1) Place the upper-left corner of the Snapduino at **D4**.
- 2) Snap component **R1** between position **E1** and **E3**.
- 3) Snap component **D1** between **F1** and **F3**.
- 4) Snap a 2-snap wire over the components between **E1** and **F1**.
- 5) Snap a 2-snap wire over the components between **E3** and **E4**.
- 6) Snap a 6-snap wire between **G3** and **G8**.
- 7) Snap a 2-snap wire over the components between **F3** and **G3**.
- 8) Snap a 2-snap wire over the components between **F4** and **G4**.
- 9) Snap component **S1** between **D7** and **F7**.
- 10) Snap component **U7** between **C3** and **C5**.
- 11) Snap component **B5** between **C8** and **E8**.
- 12) Snap a 2-snap wire between **C6** and **C7**.

- 13) Snap a 2-snap wire over the components between **C5** and **C6**.
- 14) Snap a 2-snap wire over the components between **C7** and **C8**.
- 15) Snap a 2-snap wire over the components between **D6** and **D7**.
- 16) Snap a 2-snap wire over the components between **C7** and **D7**.
- 17) Snap a 3-snap wire over the components between **E8** and **G8**.
- 18) Snap one end of the black jumper on the component at **C3**.
- 19) Snap the other end of the black jumper on the component at **G8**.
- 20) Snap one end of the red jumper on the component at **C4**.
- 21) Snap the other end of the red jumper on the component at **E6**.
- 22) Connect the **black** lead of the FTDI cable to the **GND** snap marked with a black ring on the Snapduino (*snap it over the top of any components that may already be connected to this snap*).
- 23) Connect the **green** lead of the FTDI cable to the **Reset** snap marked with a green ring on the Snapduino (*snap it over the top of any components that may already be connected to this snap*).
- 24) Connect the **yellow** lead of the FTDI cable to the **PB0** snap marked with a yellow ring on the Snapduino (*snap it over the top of any components that may already be connected to this snap*).
- 25) Connect the **white** lead of the FTDI cable to the **PB1** snap marked with a white ring on the Snapduino (*snap it over the top of any components that may already be connected to this snap*).
- 26) **DIFFERENT:** Connect the **red** lead of the FTDI cable to the switch **S1** at position **F7**.
- 27) Place the switch **S1** in the ON position.
- 28) Place the switch on **B5** in the OFF position.
- 29) Connect the 9V battery to component **B5**.
- 30) Open the sketch for this project in the Arduino IDE and upload it to the board.

- 31) When the upload has completed, place the switch **S1** into the OFF position.
- 32) The Motion Detector in this circuit requires 5V to operate. The FTDI cable provides 3.3V which is not enough. We do not want to provide 5V to the circuit while the FTDI cable is connected. This is the reason for the switch S1, it “disconnects” the FTDI power lead when it is in the OFF position. Leaving all the FTDI cables connected to the circuit, double check that S1 is in the off position and move the switch on **B5** to the **ON** position.
- 33) Open the serial port monitor in the Arduino IDE to see the messages sent from the Snapduino.
- 34) After the Snapduino initializes the red LED will light up when the circuit detects motion. When motion is no longer detected the red LED will turn off. The middle snap on the motion detected s **HIGH** when there is motion and **LOW** when there is no motion detected. This signal is being monitored by digital pin 2. Look at the code to try to see how it works.
- 35) What could you change in the code if you wanted the LED to be on when there is no motion, and off when it detects motion?