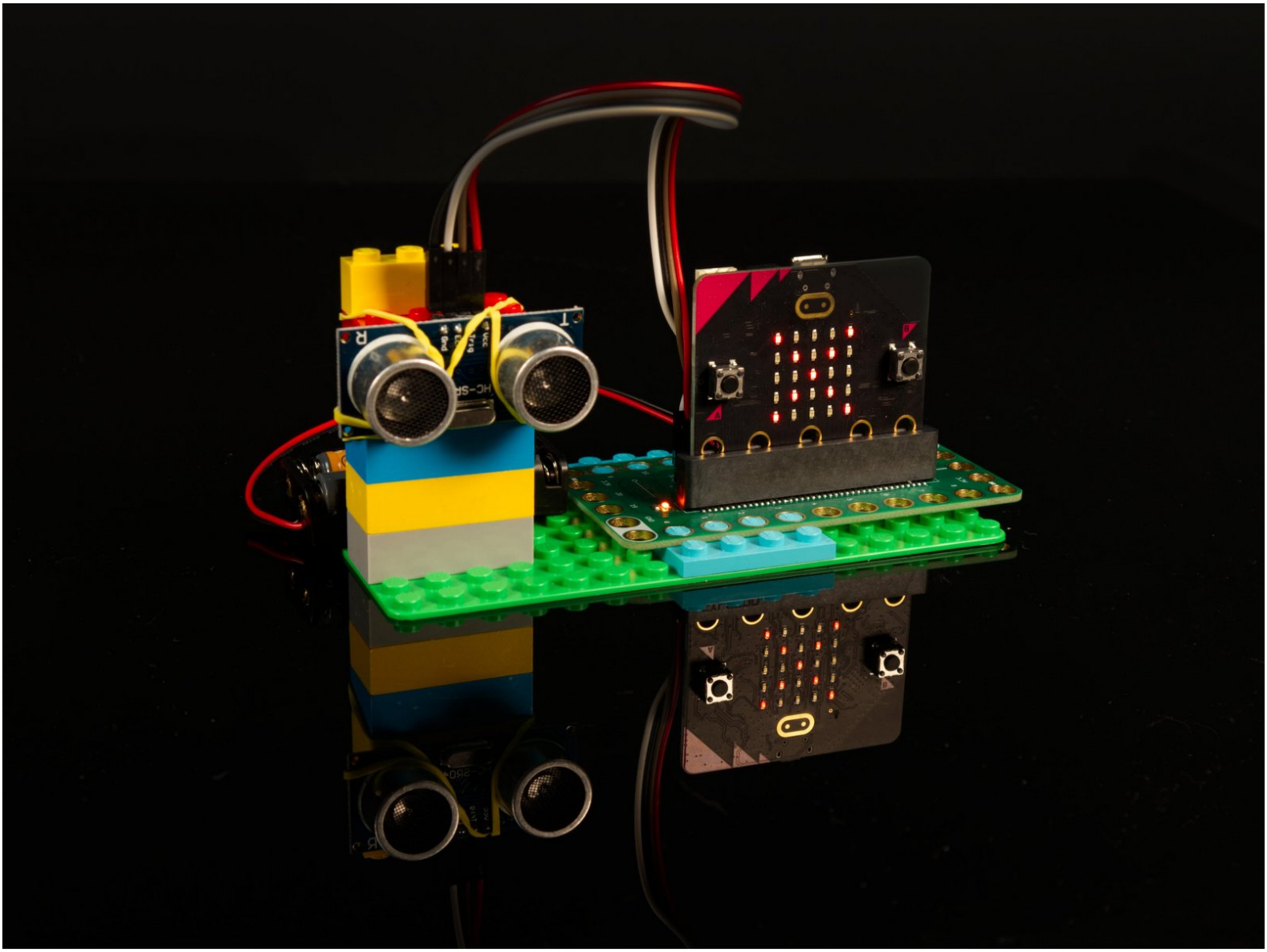
Distance Sensor

Learn how to connect an Ultrasonic Distance Sensor to the Bit Board and read its output with a micro:bit.

Written By: Pete Prodoehl



INTRODUCTION

Learn how to connect an Ultrasonic Distance Sensor to the Bit Board and display its output with a micro:bit.

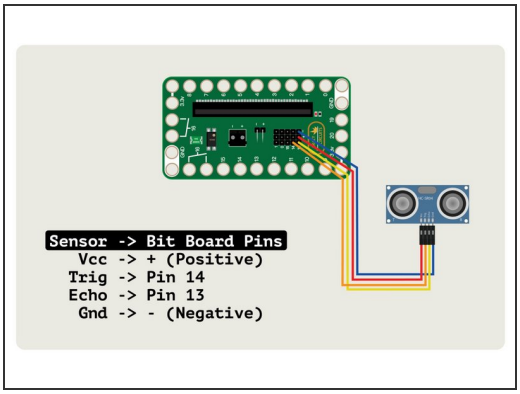
TOOLS:

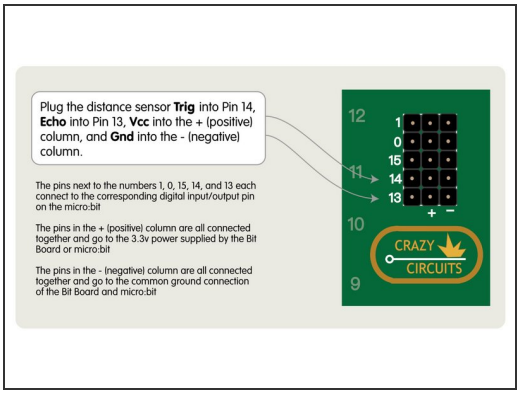
- Computer (1)

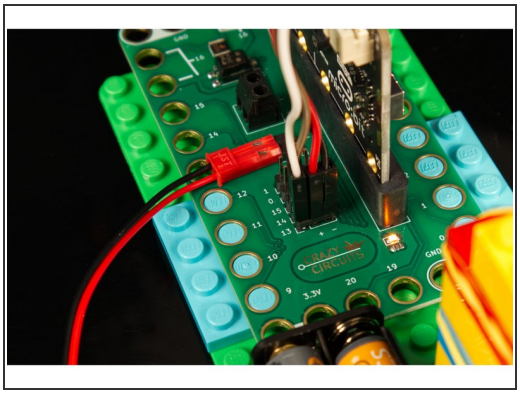
PARTS:

- Crazy Circuits Bit Board (1)
- micro:bit (1)
- Distance Sensor (1)
- Crazy Circuits Ribbon Cable (1)

Step 1 — Connect Distance Sensor







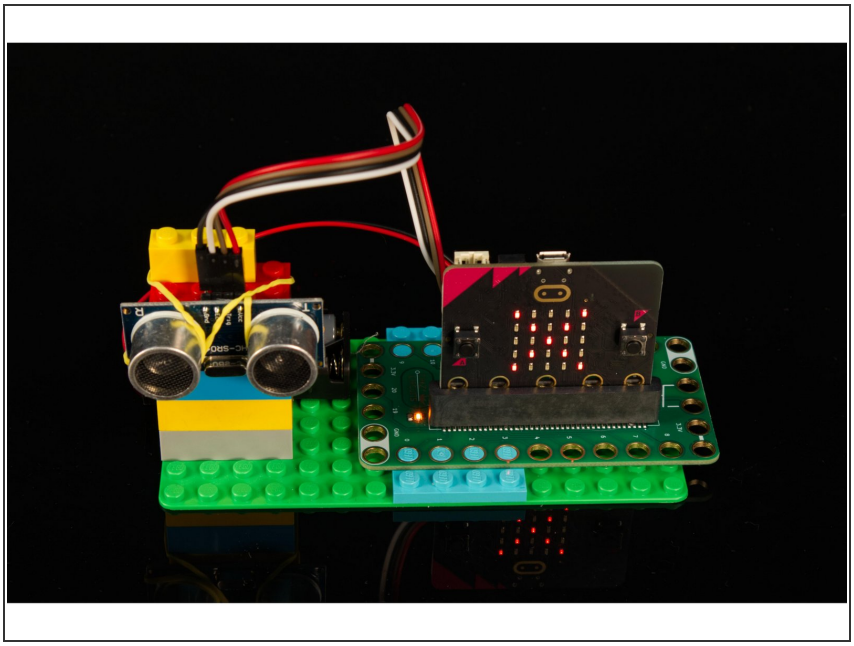
- Add the Ultrasonic Distance Sensor by connecting it to the header pins on the back of the Bit Board using jumper wires.

You can use any color jumper wires for your connections, just make sure they are connected to the correct pin.

It can be easier to plug in all the jumper wires before plugging your micro:bit into the Bit Board.

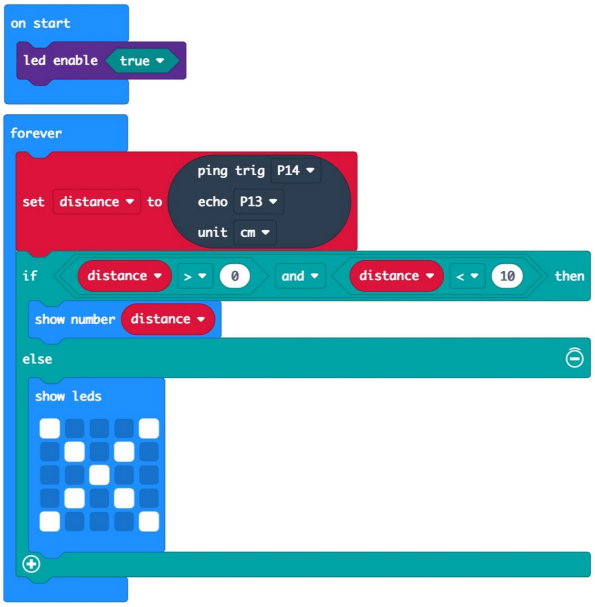
- After you've added the sensor you can plug the micro:bit into the Bit Board. (Make sure it is facing the right way!)

Step 2 — Mount Distance Sensor



- You'll want to place the Ultrasonic Distance Sensor in such a way that you've got clear space in front of it.
- We mounted ours to a few LEGO bricks with a rubber band so it can "see" straight ahead.
- If you've got it laying on a table make sure it's pointing in a direction (perhaps up) where there is nothing in front of it for at least 15 centimeters.

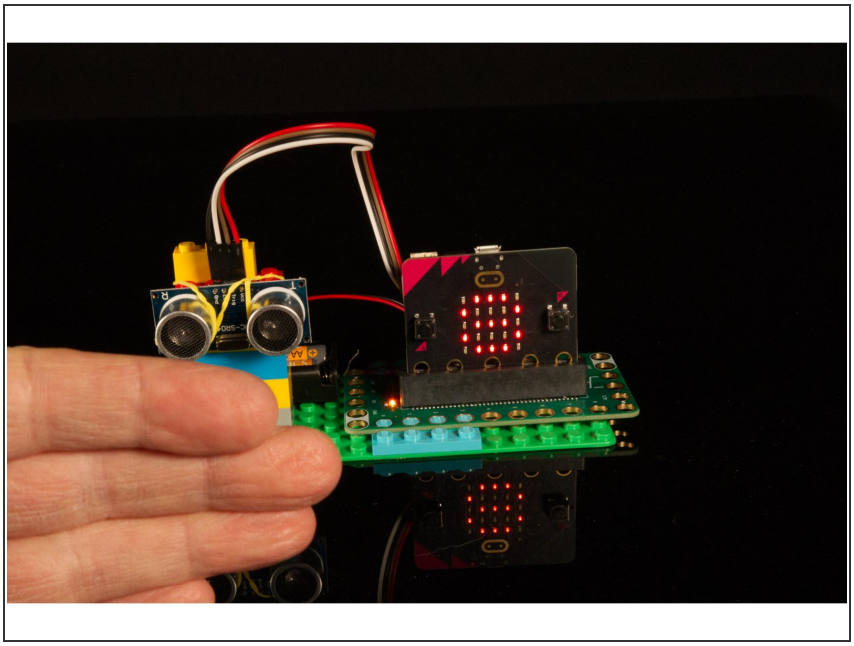
Step 3 — Load the Code



- Connect a USB cable to the micro:bit and then plug it into your computer.
- We'll be using makecode.microbit.org to program our board. It uses a simple drag and drop block interface.
- We're going to load the following code for our **Ultrasonic Distance Sensor** program: https://makecode.microbit.org/_9LWFUX67u...
- Once the code is loaded you should start to see something appear on the LED matrix on the front of the micro:bit

The included PDF has more information about the code if you want to dig deeper.

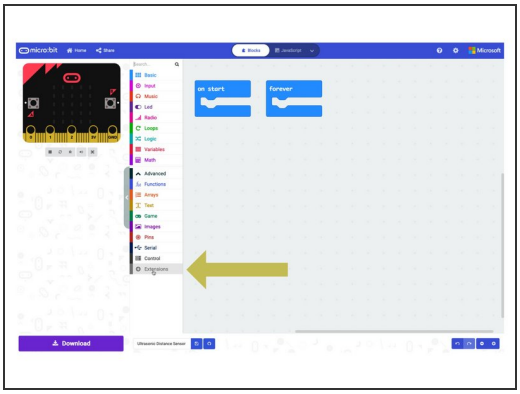
Step 4 — Test it Out!



- Place your hand about 15 centimeters in front of the distance sensor and move your hand slowly towards the sensor.
- You should see the LED display an 'X' to start with and then change to a number once you get closer than 10 centimeters from the sensor.
- You can use a distance sensor to trigger the micro:bit to do something just like you would with a button or a switch. You just need to check for specific distances.

⚠ If you look at our code you'll see we check that the distance is **greater than 0** (zero). This is because we found that on occasion the distance sensor would return a value of 0 even with no object in front of it, and if we only check for a value less than 10 we occasionally received a 0 which would mistakenly trigger our if/then statement.

Step 5 — A Note about Extensions



⚠ This step is meant to be informational. If you use the code we provide it will all *automagically* work.

- Our program uses the **Sonar** extension to allow the Ultrasonic Distance Sensor to work with the micro:bit
- When you add an extension it provides a new set of capabilities to your program.
- If you follow this guide and use the code we provide via the link to makecode.microbit.org the extension will be loaded already.
- If you start your own program from scratch you'll need to add the Sonar extension on your own.