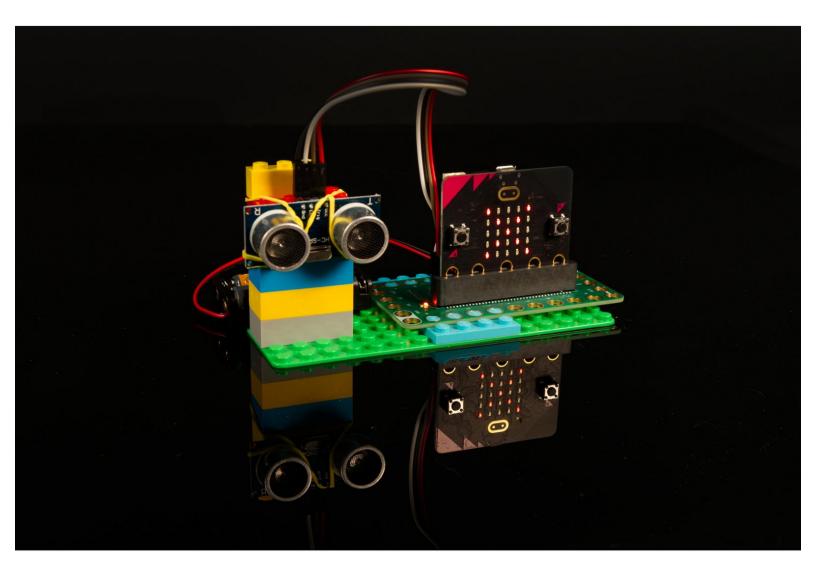# Distance Sensor

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

Written By: Pete Prodoehl
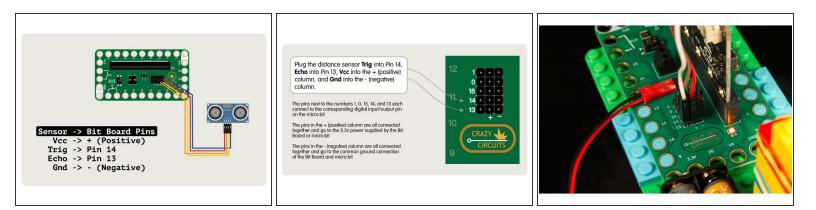
INTRODUCTION

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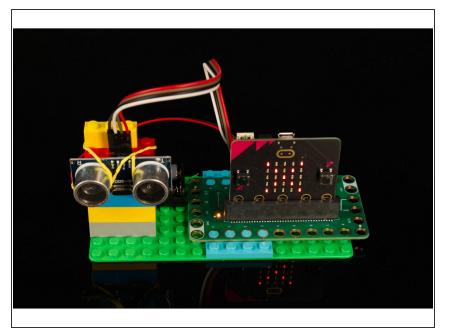
TOOLS:

- Computer (1)

PARTS:

- Crazy Circuits Bit Board (1)
- micro:bit (1)
- Distance Sensor (1)
- Jumper Wires (4)

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Step 1 — Connect Distance Sensor

Sensor -> Bit Board Pins
Vcc -> + (Positive)
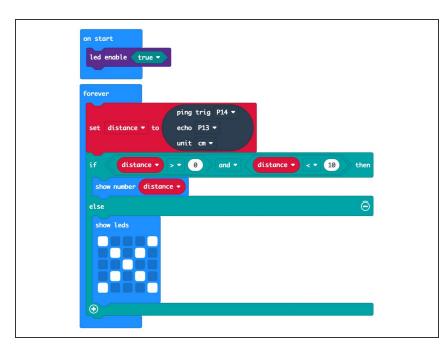Trig -> Pin 14
Echo -> Pin 13
Gnd -> - (Negative)

- 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!)
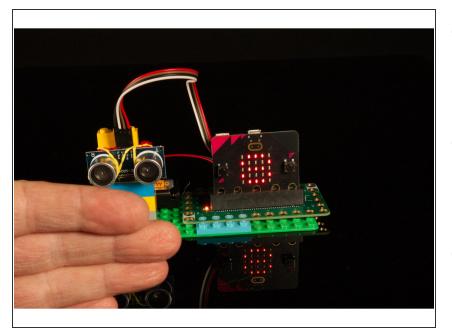
Step 2 — Mount Distance Sensor

- 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.

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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.