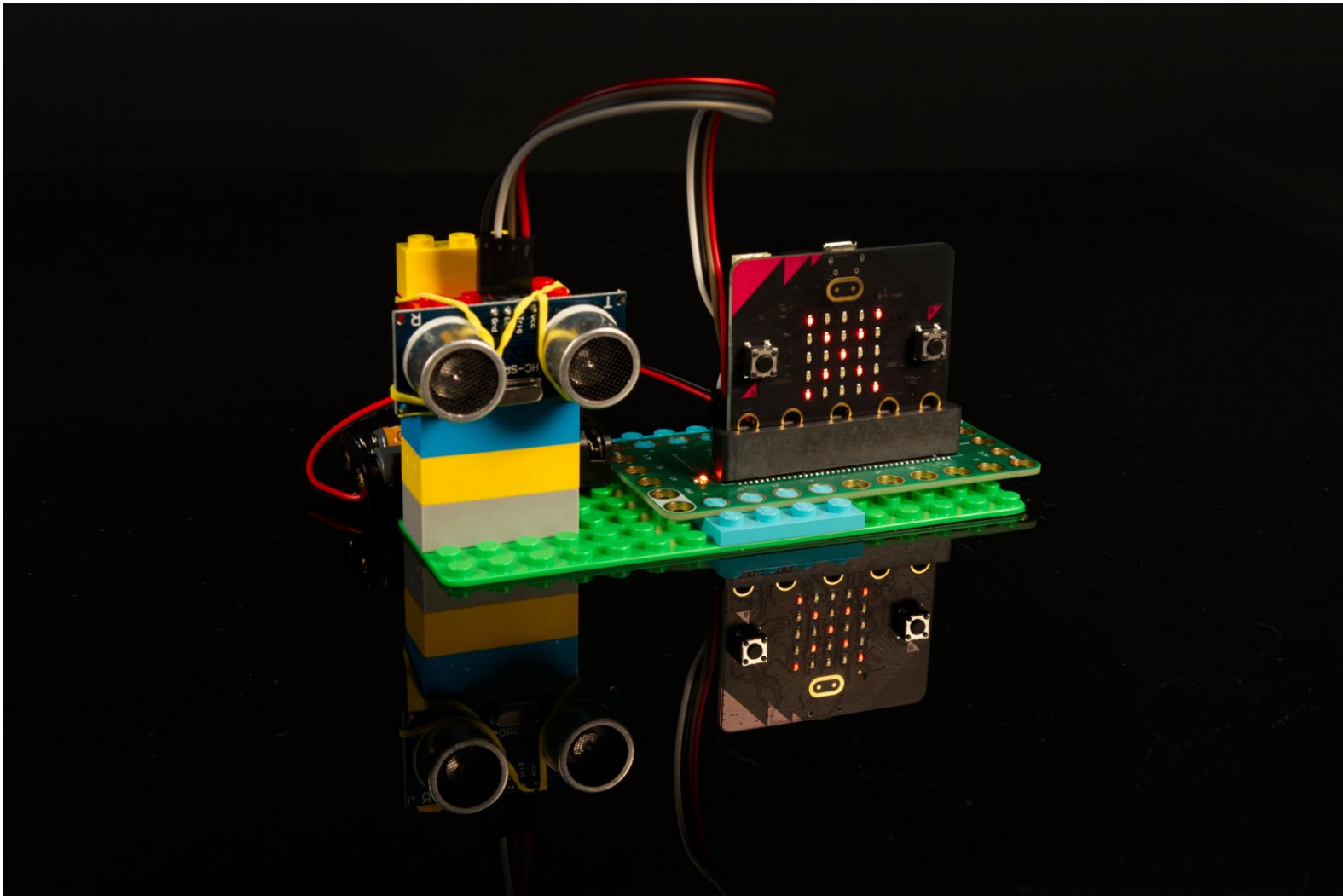




Ultrasonic Distance Sensor

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

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INTRODUCTION

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



TOOLS:

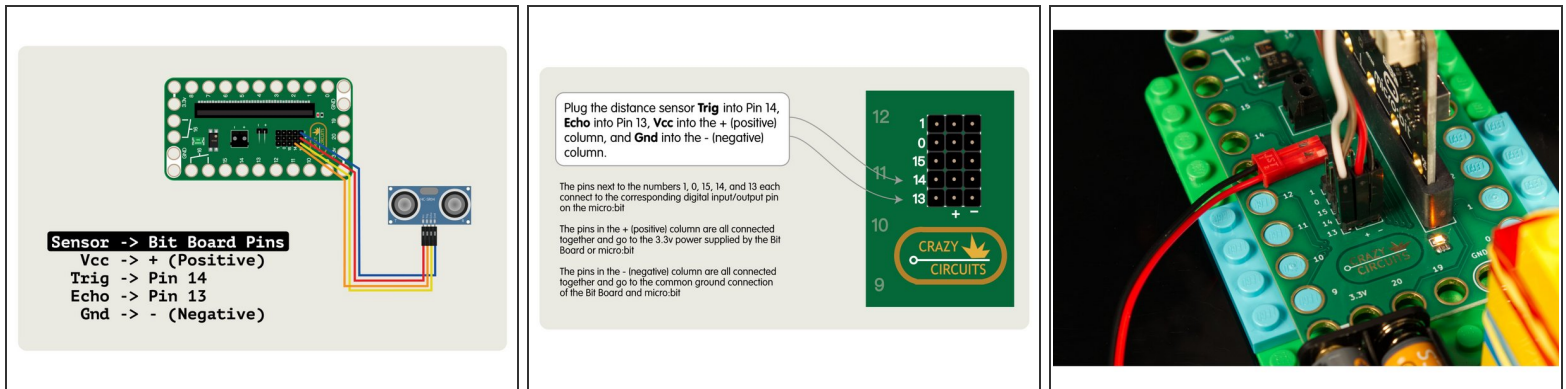
- [Computer](#) (1)



PARTS:

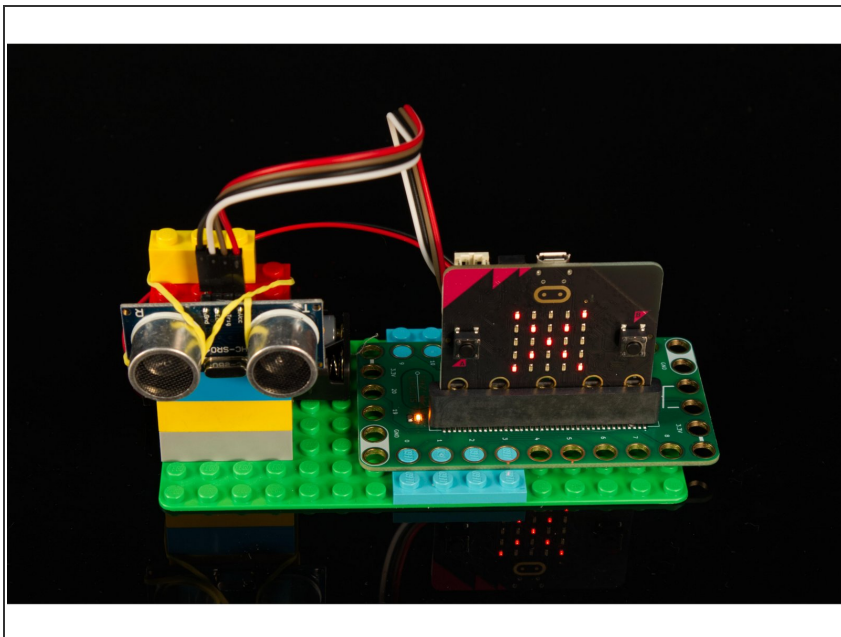
- [Crazy Circuits Bit Board](#) (1)
- [micro:bit](#) (1)
- [Ultrasonic Distance Sensor](#) (1)
- [Jumper Wires](#) (4)

Step 1 — Connect Distance Sensor



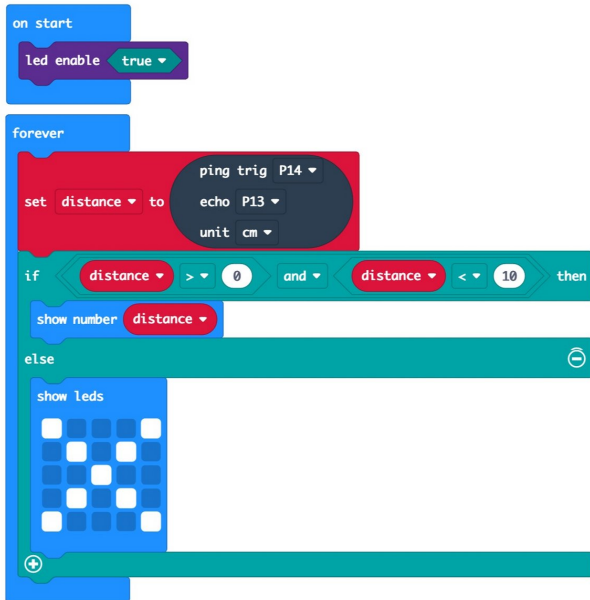
- Add the Ultrasonic Distance Sensor by connecting it to the header pins on the back of the Bit Board using jumper wires.
- ☑ You can use any color jumper wires for your connections, just make sure they are connected to the correct pin.
- ❗ It can be easier to plug in all the jumper wires before plugging 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



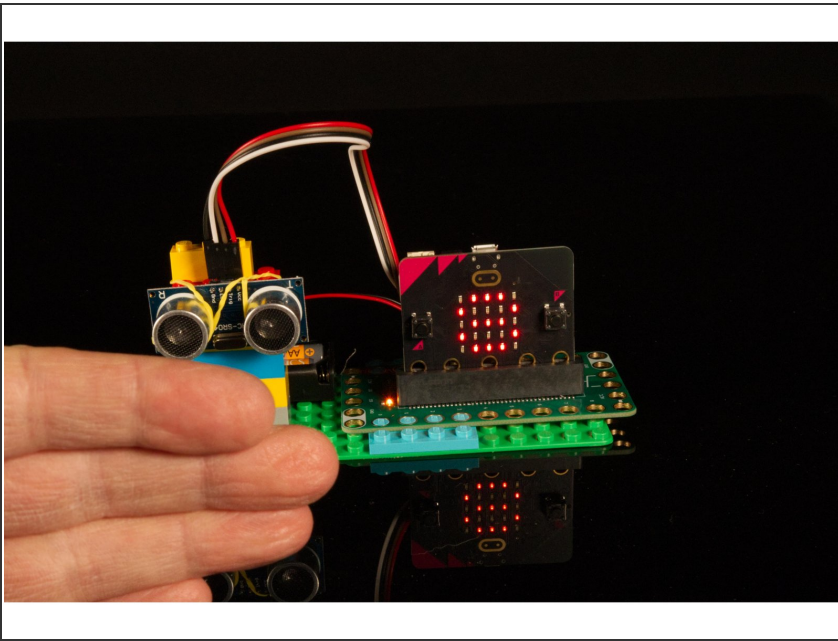
- You'll want to place the Ultrasonic Distance Sensor in such a way that you've got clear space in front of it.
- We mounted ours to a few LEGO bricks with a rubber band so it can "see" straight ahead.
- If you've got it laying on a table make sure it's pointing in a direction (perhaps up) where there 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.*

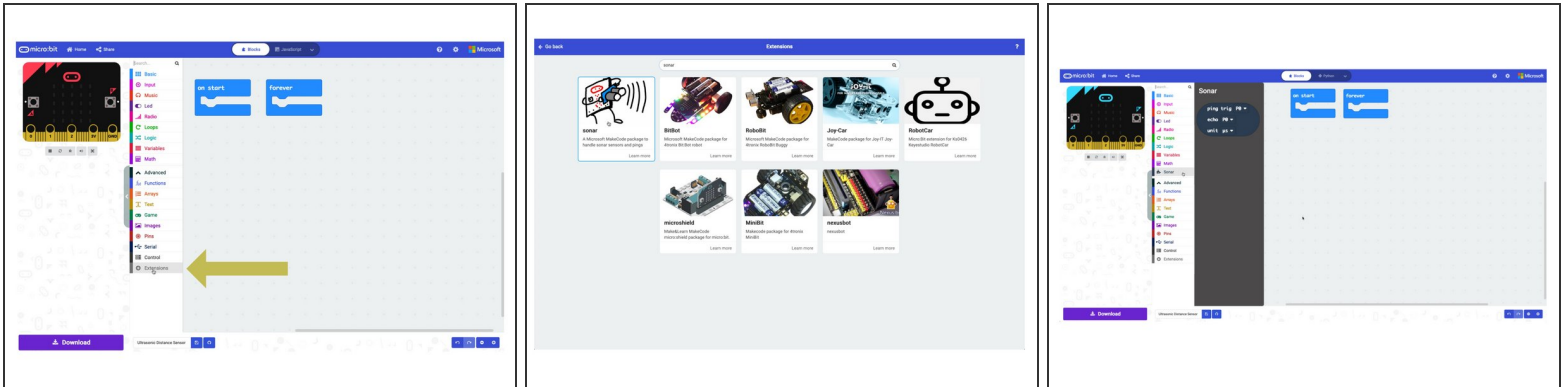
Step 4 — Test it Out!



- 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.