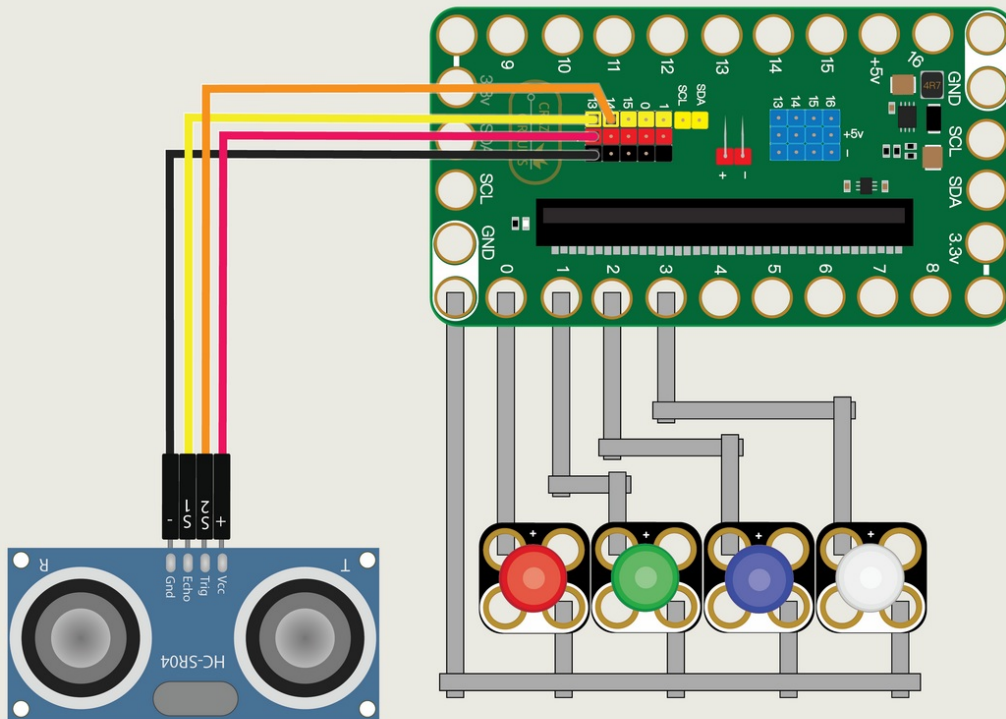




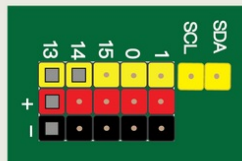
CH35-C - Distance Sensor LEDs Meter

Connect a Distance Sensor to a Bit Board and view the output using four LEDs.

Written By: Pete Prodoehl



DIST	Bit Board
VCC	-> + (Positive) Pin
TRIG	-> PIN 14 (S2)
ECHO	-> PIN 13 (S1)
GND	-> - (Negative) Pin



INTRODUCTION

Connect a Distance Sensor to a Bit Board and view the output using four LEDs.



TOOLS:

- Computer (1)
- Scissors (1)

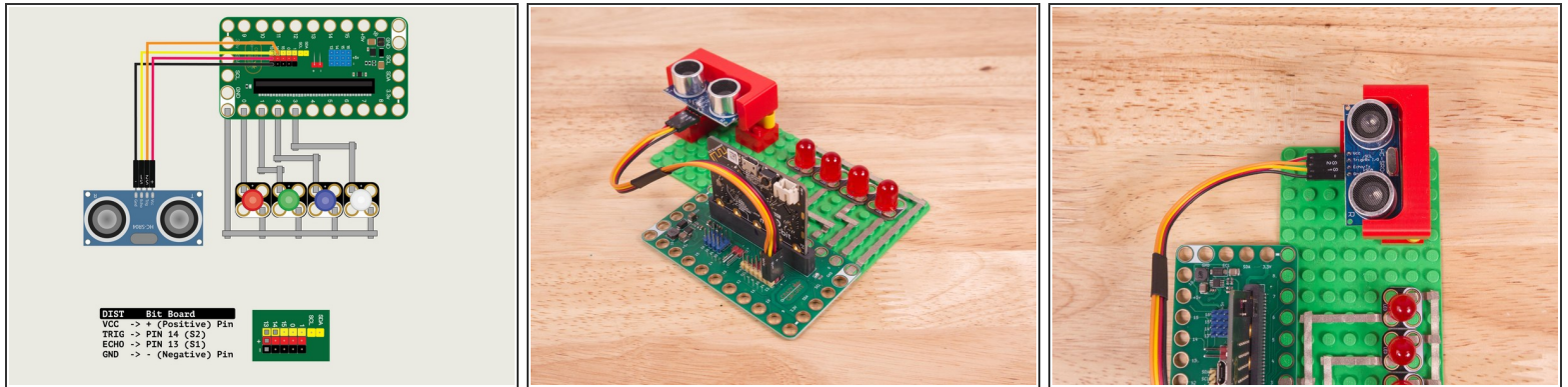


PARTS:

- Crazy Circuits Bit Board (1)
- micro:bit (1)
- Crazy Circuits Ribbon Cable (1)
- Distance Sensor (1)
- Crazy Circuits LED Chip (4)
- Maker Tape (1)

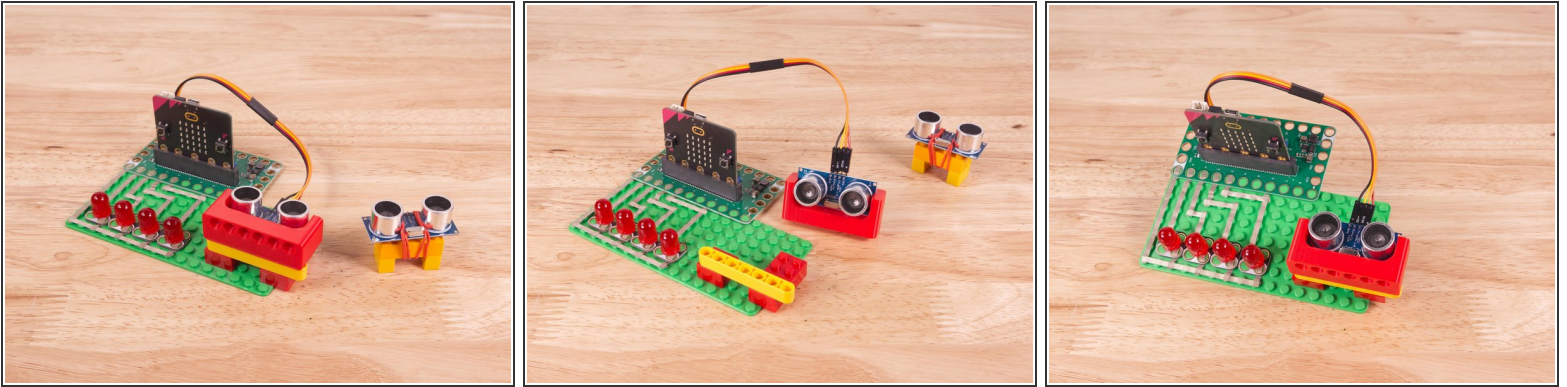
1/8" Wide

Step 1 — Connect the Distance Sensor and LEDs



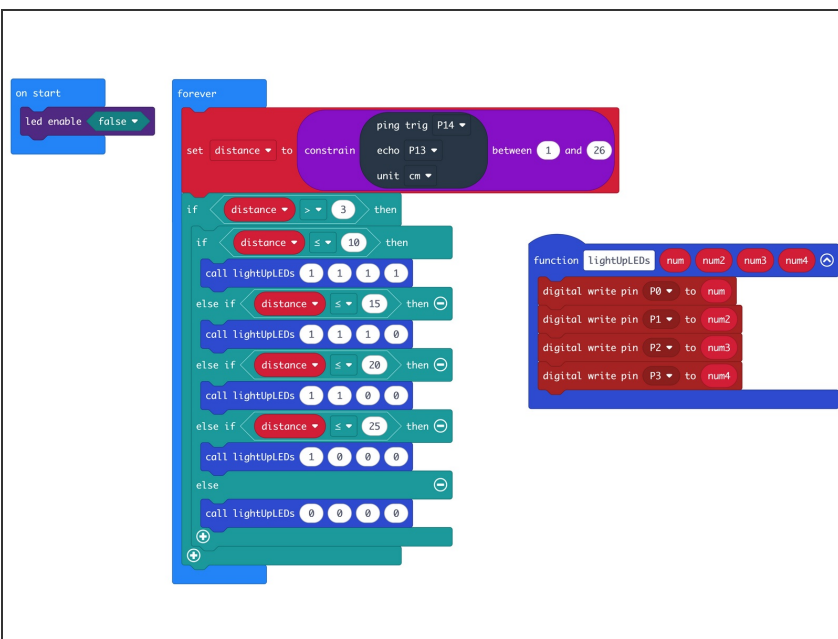
- We'll connect the **Distance Sensor** with a **Crazy Circuits Ribbon Cable** using all four wires.
- Plug the three-wire connector of the **Crazy Circuits Ribbon Cable** into the row with **Pin 13** on the Bit Board. The wire colors should match the pin header colors, with **S1** (yellow) going to the yellow pin.
- Next, plug **S2** (orange) into **Pin 14**. (*S2 is separated from the three-wire connector to allow you to plug it into another row.*)
- Plug **+** (red) into **VCC**; **S2** (orange) into **TRIG**; **S1** (yellow) into **ECHO**; and **-** (black) into **GND**.
- We'll use **Maker Tape** to connect the LEDs to the Bit Board on a LEGO baseplate.
- Connect the **Negative** (-) side of each LED to a **Ground** (GND) hole on the Bit Board.
- Connect the **Positive** (+) side of the LEDs as shown, so each LED connects to one of the following pins on the Bit Board: **Pin 0**, **Pin 1**, **Pin 2**, and **Pin 3**.

Step 2 — Mounting the Sensor



- We used a 3D printed part we designed to hold the Distance Sensor in place on the LEGO baseplate.
- A few Technic pins, a Technic beam, and some LEGO bricks are all that is needed.
- Alternately you can use some LEGO bricks and a rubber band or tape to hold the sensor in place. *(But don't use anything conductive!)*
- 3D print your own [Distance Sensor Holder with Holes](#). (It's the same one we use in our Bit Board Rover Kit).

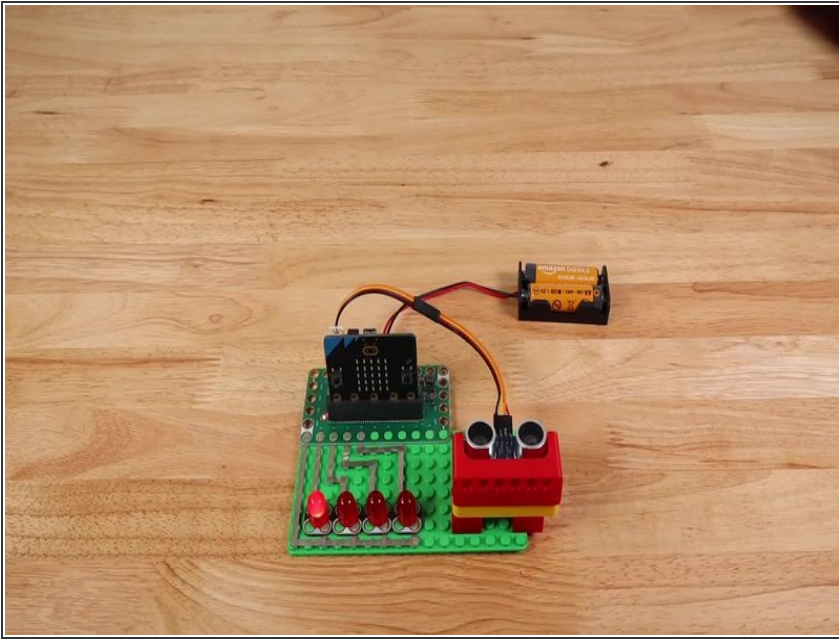
Step 3 — Load the Code



- If you've never used a micro:bit before you'll want to check out this guide: [Bit Board V2 Setup and Use](#)
- We're going to load the following code for our **Distance Sensor LEDs Meter** program: https://makecode.microbit.org/_ETgMiUYhL...

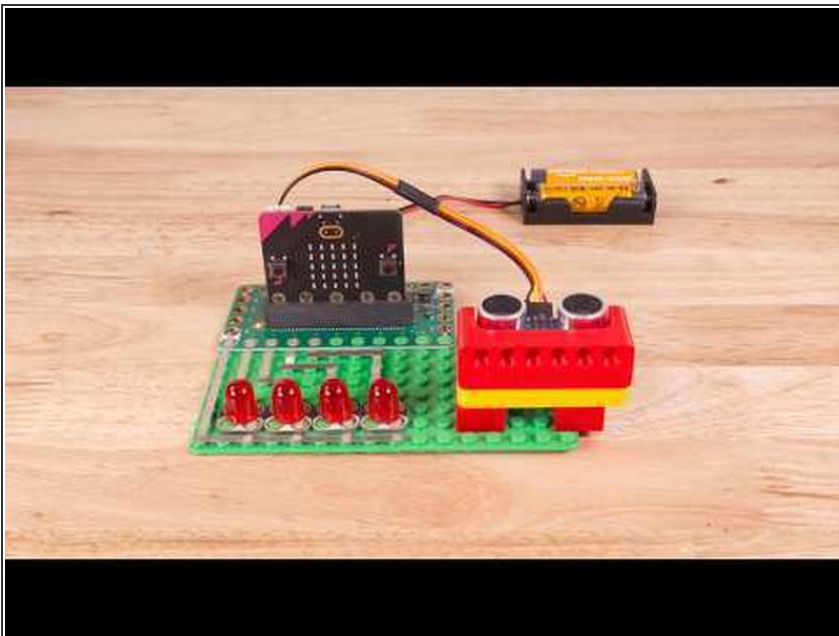
- In the forever block we'll set **Pin 14** and **Pin 13** to TRIG and ECHO (respectively) so we can read the Distance Sensor. This allows us to continually read the sensor and assign the value to **distance**.
- We first check if the **distance** is *greater* than **3**. In testing we've found that trying to measure 3cm or less can be a bit tricky, so we ignore any distance under 4cm.
- We then check the **distance** with a series of **if/then** statements to determine how many LEDs to light up.
- Our lightUpLEDs function accepts four values, of either 0 or 1, and then uses those to determine which LEDs will be lit up.
 - The function passes these values directly to the digital write pin statements to control the LEDs.
- In the **if/then** we start with our lowest value test (10) and if the distance is 10 or lower, we light up all four LEDs. If the distance is over 10 we move to the next test (15) and so on down the line.

Step 4 — Test it Out!



- Once the code is loaded it should start running immediately.
- ① You can power the micro:bit via the USB cable you used to load the code or you can use a battery pack plugged into the Bit Board.
- Move your hand (or a flat object) in front of the sensor. As you get closer more LEDs will light up.

Step 5 — Follow Along



- Follow along with our recorded Live Stream!
- ① You can watch the full video of us walking through this project, along with explaining and exploring the code:
<https://www.youtube.com/live/ZamfVb4u-f0>