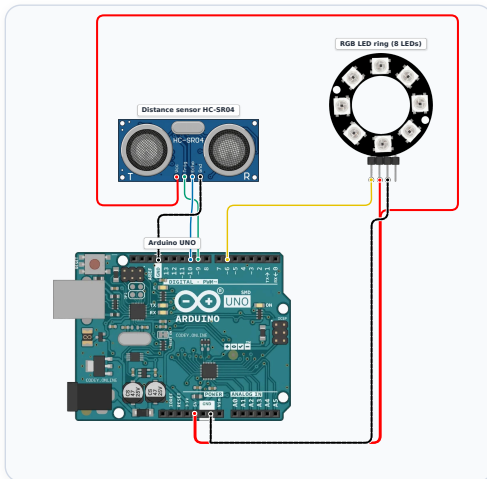


★★★ Challenge ⌚ 25 minutes

Distance meter with light bar

You make a light bar that shows how close something is. Far away: no lights. The closer it is, the more lights turn on. First green, then orange, and very close is red.

Wiring diagram



What do you need?



This is how you build it

1. Connect the HC-SR04: Trig to pin 9, Echo to pin 10, Vcc to 5V, and Gnd to GND.
2. Connect the LED-ring: DI to pin 6, 5V to 5V, and GND to GND.

The code

```
// Distance meter with light bar
// The closer you get, the more lights turn on: green, then orange, then red.

#include <Adafruit_NeoPixel.h>

const int TRIG_PIN = 9; // Trig of the HC-SR04 on pin 9
const int ECHO_PIN = 10; // Echo of the HC-SR04 on pin 10
const int RING_PIN = 6; // DI of the LED ring on pin 6
const int NUM_LEDS = 8;
const int MAX_DISTANCE = 80; // Farther than this (in cm): all lights off

Adafruit_NeoPixel ring(NUM_LEDS, RING_PIN, NEO_GRB + NEO_KHZ800);

long measureDistance() {
  digitalWrite(TRIG_PIN, LOW);
  delayMicroseconds(2);
  digitalWrite(TRIG_PIN, HIGH);
  delayMicroseconds(10);
  digitalWrite(TRIG_PIN, LOW);
  long time = pulseIn(ECHO_PIN, HIGH, 30000);
  if (time == 0) return 999;
  return time / 58;
}

void setup() {
  Serial.begin(9600);
  pinMode(TRIG_PIN, OUTPUT);
  pinMode(ECHO_PIN, INPUT);
  ring.begin();

  ring.setBrightness(40);
  ring.show();
}

void loop() {
  long distance = measureDistance();
  Serial.print(F("Distance: "));
  Serial.print(distance);
  Serial.println(F(" cm"));

  // How many lights should turn on? Close = 8, far away = 0
  int count = map(constrain(distance, 0, MAX_DISTANCE), 0, MAX_DISTANCE, NUM_LEDS, 0);

  for (int i = 0; i < NUM_LEDS; i++) {
    if (i < count) {
      if (i < 3) ring.setPixelColor(i, ring.Color(0, 255, 0));
      // Green
      else if (i < 6) ring.setPixelColor(i, ring.Color(255, 120, 0));
      // Orange
      else ring.setPixelColor(i, ring.Color(255, 0, 0));
      // Red
    } else {
      ring.setPixelColor(i, 0);
      // Off
    }
  }
  ring.show();
  delay(100);
}
```

What does the code do?

- `measureDistance()` measures the distance with the HC-SR04.
- `map()` changes the distance into a number of lights: 0 to 8.
- The first 3 lights are green, the next 3 orange, and the last 2 red.

Try this...

- Make all lights blink red when you are closer than 10 cm
- Add the buzzer that beeps at red
- Make the meter more sensitive: all lights on at 40 cm instead of 80 cm

🚀 Build this project with Codey: open codey.online/starter-kits/uno/projects/distance-light-bar and click MAKE THIS. Then the code and the wiring diagram are ready right away.