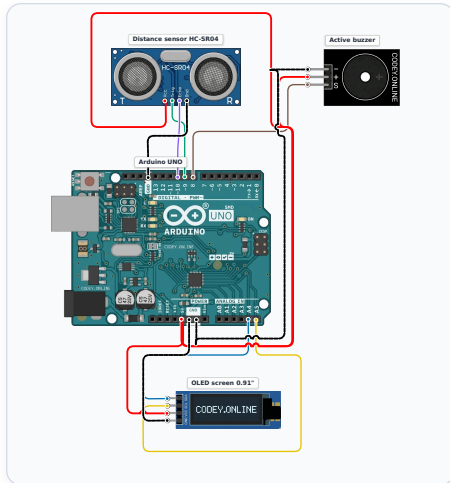


★★★★ Challenge ⌚ 30 minutes

Deluxe parking sensor

The deluxe version of the parking sensor! It beeps faster when you get closer, and the OLED screen shows the distance in centimeters. With a little bar that gets longer when you get closer.

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 buzzer: S to pin 8, + to 5V and – to GND.
3. Connect the OLED screen: SDA to A4, SCL to A5, VCC to 5V and GND to GND.
4. Three parts need 5V and GND. Use the + and – strips on your breadboard.

The code

```
// Deluxe parking sensor
// Just like the normal parking sensor, but now you also see the distance on
// the OLED screen.

#include <Wire.h>
#include <Adafruit_GFX.h>
#include <Adafruit_SSD1306.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 BUZZER_PIN = 8;  // S of the buzzer on pin 8

Adafruit_SSD1306 display(128, 32, &Wire, -1); // OLED: SDA = A4, SCL = A5

// Measure the distance in centimeters
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; // No echo: nothing nearby
  return time / 58;
}

// Put the distance big on the screen, with a little bar below it
void showDistance(long distance) {
  display.clearDisplay();
  display.setCursor(0, 0);
  display.setTextSize(2);
  if (distance >= 999) {
    display.print(F("---"));
  } else {
    display.print(distance);
    display.print(F(" cm"));
  }
  // Little bar: the closer, the longer
  int length = map(constrain(distance, 0, 100), 0, 100, 128, 0);
  display.fillRect(0, 24, length, 8, SSD1306_WHITE);
  display.display();
}

void setup() {
  pinMode(TRIG_PIN, OUTPUT);
  pinMode(ECHO_PIN, INPUT);
  pinMode(BUZZER_PIN, OUTPUT);
  display.begin(SSD1306_SWITCHCAPVCC, 0x3C);
  display.setTextColor(SSD1306_WHITE);
}

void loop() {
  long distance = measureDistance();
  showDistance(distance);

  if (distance < 5) {
    digitalWrite(BUZZER_PIN, HIGH); // Very close: one long tone
    delay(100);
  } else if (distance < 50) {
    digitalWrite(BUZZER_PIN, HIGH); // Short beep
    delay(50);
    digitalWrite(BUZZER_PIN, LOW);
    delay(distance * 10); // Closer = beeps faster
  } else {
    digitalWrite(BUZZER_PIN, LOW);
    delay(100);
  }
}
```

What does the code do?

- `measureDistance()` measures the distance in centimeters with the HC-SR04.
- `showDistance()` puts the number big on the screen and draws a little bar with `fillRect()`.
- The buzzer beeps faster as the distance gets smaller.

Try this...

- Show "STOP!" on the screen when you are closer than 5 cm
- Show the distance in meters when something is more than 1 meter away
- Add the LED ring that changes from green to red

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