Workshop: LCD Screen with I2C adapter

Figure 1: 16x2 LCD Screen

Required Materials

- 1x Arduino Uno board
- 1x LCD with I2C adapter
- Jumper wires
- Breadboard (optional)
- USB cable for Arduino

Part 1: Set Up the Circuit

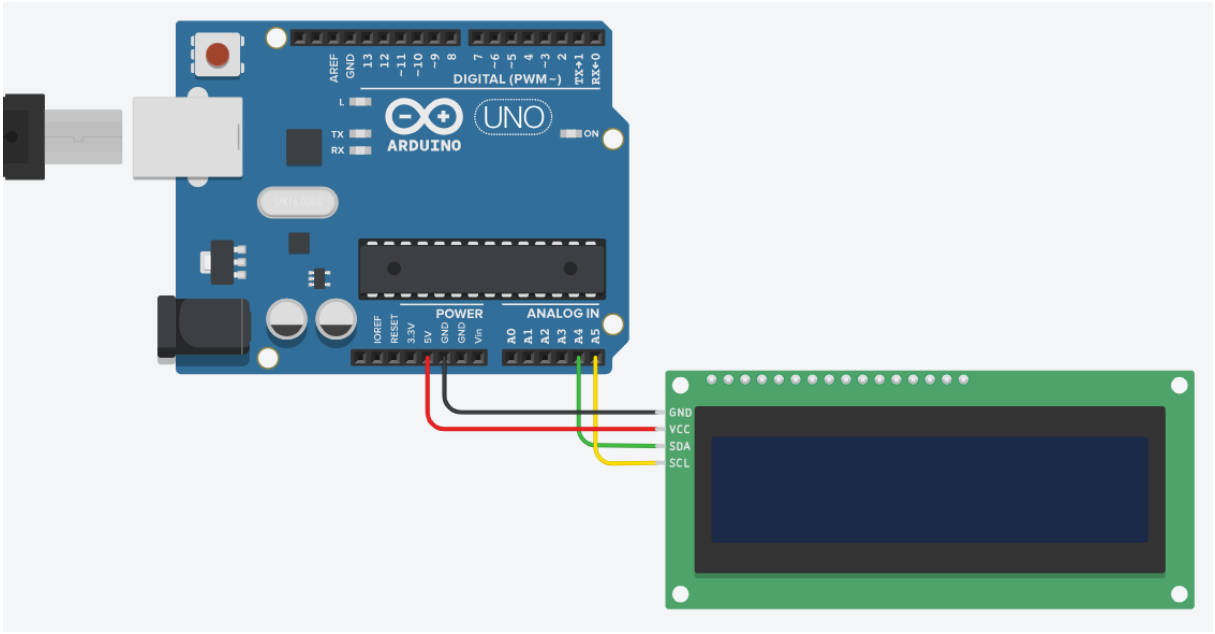

Figure 2: I2C LCD Circuit Setup

- **VCC Pin:** Connect it to the 5V pin on the Arduino.
- **GND Pin:** Connect it to a GND pin on the Arduino.
- **SDA Pin:** Connect it to the A4 pin on the Arduino.
- **SCL Pin:** Connect it to the A5 pin on the Arduino.

Part 2: Program the Arduino

Open the Arduino IDE and create a new “sketch.”

Step 1: Include Libraries

Include the necessary libraries to communicate with the LCD screen and the I2C adapter:

```
#include <LiquidCrystal_I2C.h>
```

Step 2: Declare the LCD Object

Declare an object of type `LiquidCrystal_I2C` by specifying the I2C address of the LCD screen:

```
LiquidCrystal_I2C lcd(0x27, 16, 2);
```

> The I2C address of your screen might be `0x3F` or `0x27`. There are other addresses, but they are less common.

Step 3: Initialize the LCD Screen

In the `setup()` function, initialize the LCD screen and turn on the backlight:

```
void setup()
{
  lcd.init();
  lcd.backlight();
}
```

Step 4: Display Text

Use the `setCursor()` and `print()` functions to display text on the LCD screen:

```
lcd.setCursor(0, 0);
lcd.print("Hello, World!");
```

Tips

Displaying a Formatted Message

Use the `print()` function to display a formatted message on the LCD screen:

```
lcd.setCursor(0, 1);
lcd.print("Temperature: ");
lcd.print(25);
lcd.print(" C");
```

This code will display `Temperature: 25 C` on the second line of the LCD screen.

Clear the Screen

Use the `clear()` function to erase the contents of the LCD screen:

```
lcd.clear();
```

Part 3: Exploration and Understanding

Questions to Explore

1. What is the difference between a standard LCD screen and an LCD screen with an I2C adapter, and what are the benefits of using the latter?
2. How can we display the value of a photoresistor on the LCD screen using the Arduino?