

# Water Turbidity Sensor

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# **Components:**

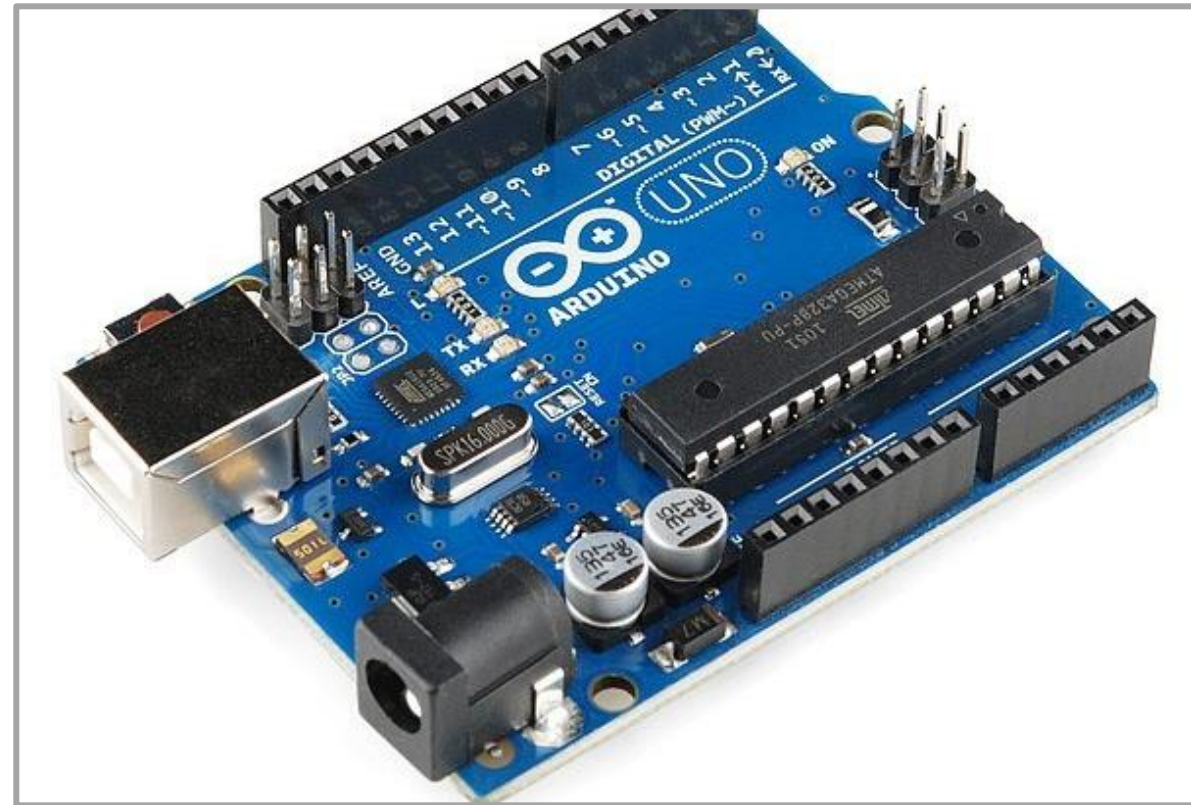
- Arduino Uno.
- Water turbidity probe
- 16 x 2 LCD connection (with i2c)
- Jumper wires
- Wire strippers
- 5V battery clip

# Arduino Uno Development Board

The UNO R3 Development Board is a popular and versatile microcontroller board, designed for embedded system projects. It is an official model of the Arduino Uno, offering compatibility with the Arduino IDE and libraries, making it ideal for a range of prototyping and small-scale projects. Here's a brief overview of its components and uses:

## Key Features:

- **Microcontroller:** ATmega328P, operating at 16 MHz.
- **I/O Pins:** 14 digital I/O pins (6 PWM-capable) and 6 analog input pins.
- **Connectivity:** USB-B port for programming and power, along with a DC power jack.
- **Memory:** 32 KB Flash, 2 KB SRAM, and 1 KB EEPROM.
- **Communication:** Supports UART, SPI, and I2C protocols.



# Water Turbidity Probe

The Water Turbidity Sensor Module is a compact liquid quality sensor widely used in embedded systems and IoT projects for measuring water clarity and detecting suspended particles. Here's a brief overview of its key components and functions:

## Key Features:

- ❑ **Optical Sensor:** Uses an infrared LED and a photodetector to measure light absorption and scattering in water.
- ❑ **<Required> Signal Processing Board:** Converts the raw sensor readings into an analog or digital output for microcontroller integration.
- ❑ **Connector Interface:** Typically includes VCC, GND, and signal output pins for easy connection to microcontrollers like Arduino or Raspberry Pi.

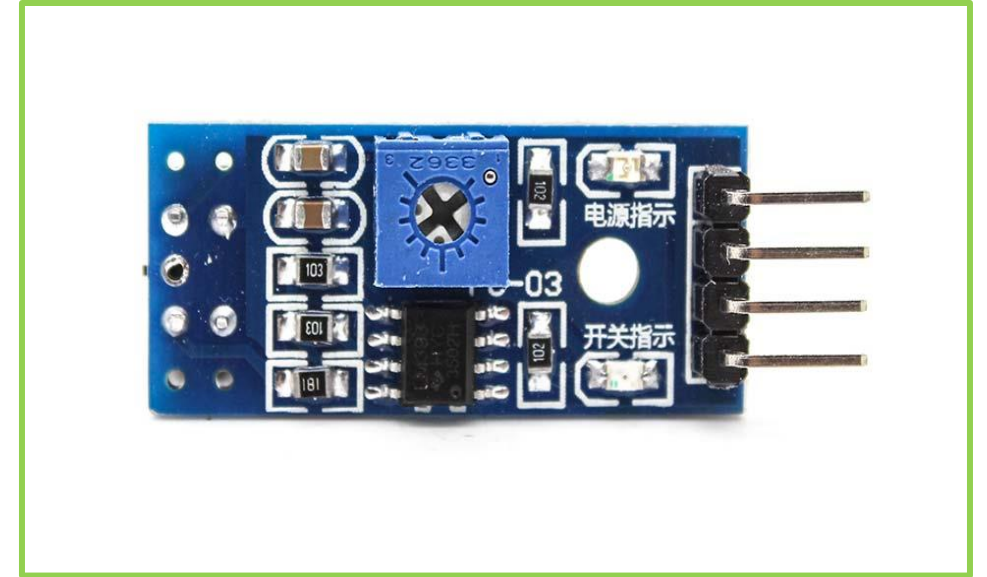


# Analog water InfraRed Sensing Output Module

The Signal Processing Board is a compact electronic module widely used in embedded systems and sensor applications for conditioning and interpreting raw sensor data. Here's a brief overview of its key components and functions:

## Key Components:

- ❑ **Analog-to-Digital Converter (ADC):** Converts raw analog signals from sensors into digital data for microcontroller processing.
- ❑ **Amplifier and Filters:** Enhances weak signals and removes noise for accurate readings.
- ❑ **Microcontroller or IC:** Processes the signal and generates meaningful output.
- ❑ **Connector Interface:** Includes power (VCC, GND) and signal output pins (analog/digital) for easy integration with development boards.

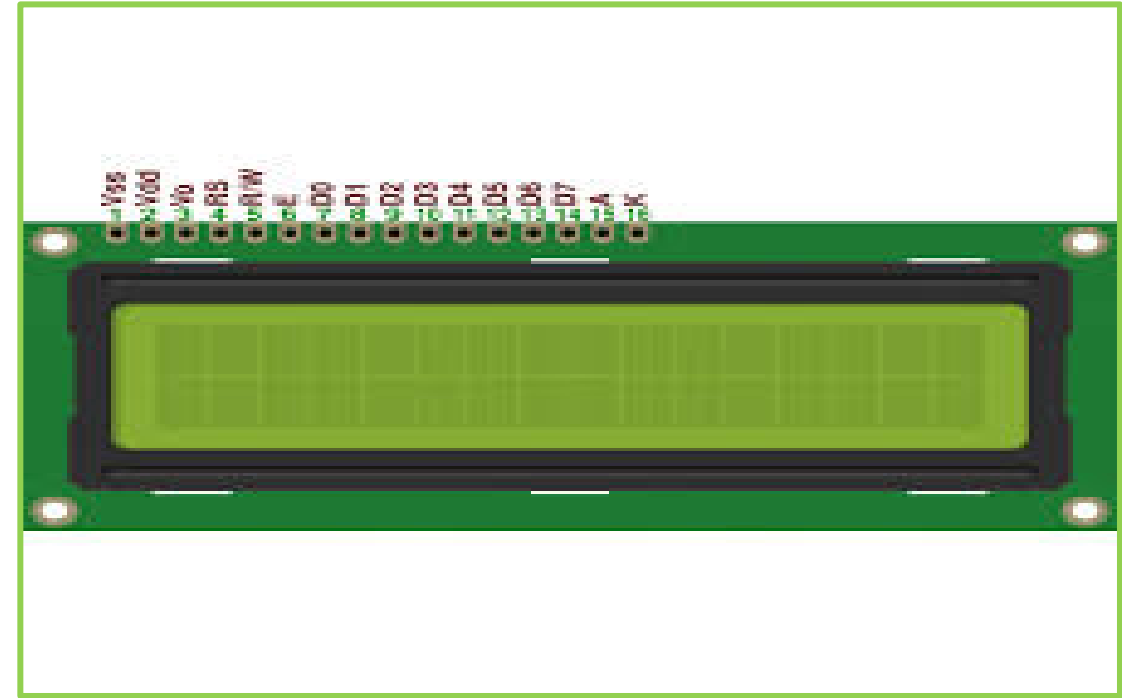


# 16x2 LCD Display

The 16x2 LCD Display Module is a widely used alphanumeric display for embedded systems and IoT projects, providing a simple way to output text-based information. Here's a brief overview of its key components and functions:

## Key Components:

- ❑ **LCD Panel:** A 16-column by 2-row display capable of showing 32 characters.
- ❑ **HD44780 Controller:** A built-in driver IC that processes data from microcontrollers for display.
- ❑ **Interface Pins:**
  - Power Pins (VSS, VDD, V0):** Provide power and contrast adjustment.
  - Control Pins (RS, RW, E):** Manage data and command inputs.
  - Data Pins (D0-D7):** Send character data in 4-bit or 8-bit mode.
  - Backlight Pins (A, K):** Control the LED backlight.




# Procedure:-


Connect Arduino Uno development board to the IR Sensor Processing Board



Connect GND on IR Module to GND on Arduino, Out on IR Module to A0 on Arduino, and Vcc on IR Module to 5V on Arduino, then connect water turbidity probe to the IR Module.



On the LCD Display, connect GND to GND on Arduino, connect Vcc to 5V on Arduino, connect SDA to A4 on Arduino, and connect SCL to A5 on Arduino.

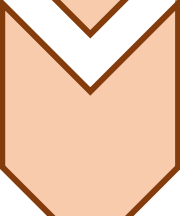


Upload the code to the Arduino Uno device using the available USB connection port and use a 9V battery as a portable power source. The Probe may now be used for sensing water turbidity.

## Functioning Of The Device:-



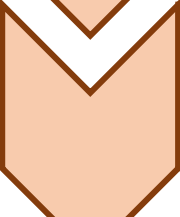
- The code will be implanted to activate the Arduino UNO R3 development board.



- As the UNO R3 will be activated the power will be supplied to the connected IR sensor and the LCD display.



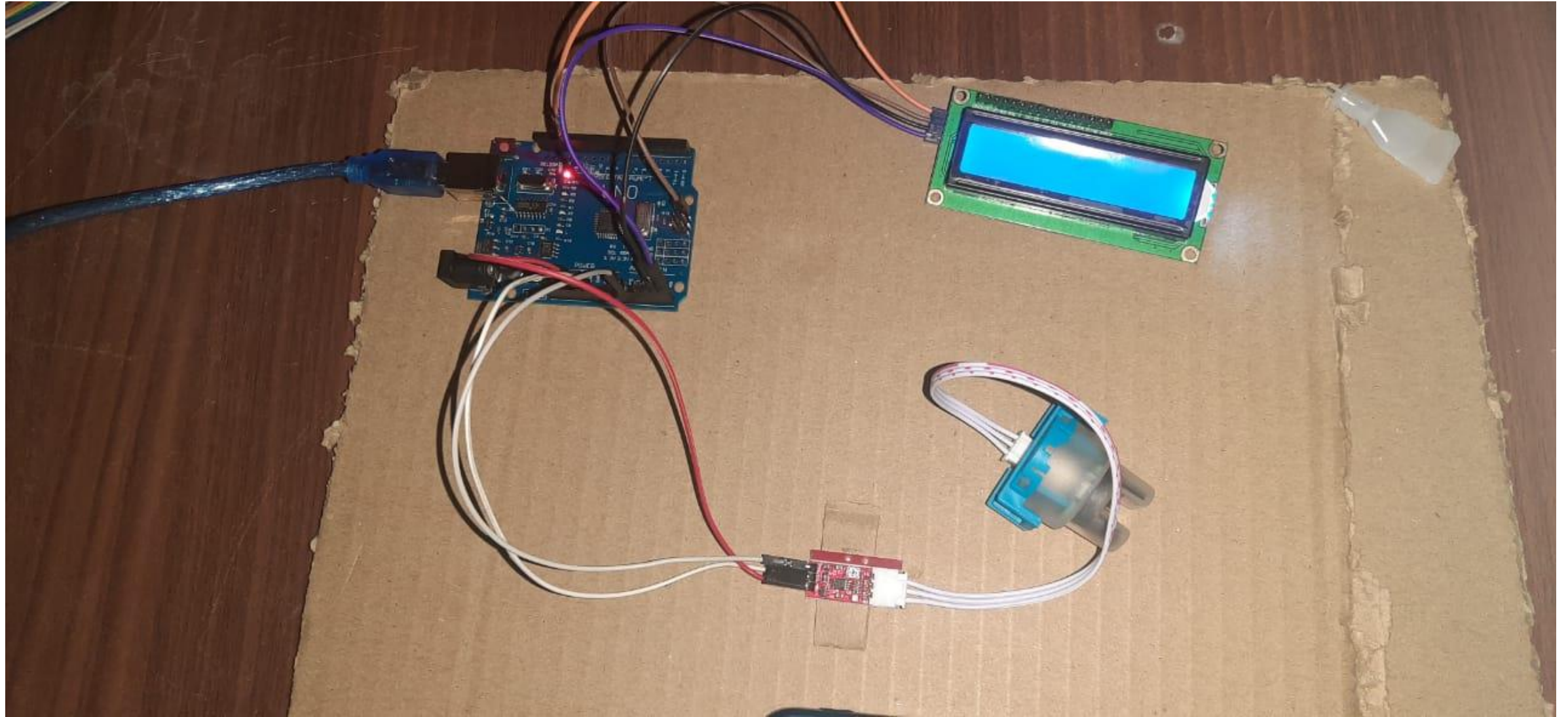
- As these will be activated the probe will send the detected turbidity of water sample and display the information about the sample with the LCD display.



- After this the LCD display will update the information about the water's turbidity in real time, providing information about whether the water is clear, cloudy or muddy.



# The Prototype



Thank You