Automatic Water Tank Controller

This document contains the complete wiring guide, code explanation, and use-case breakdown for your Arduino-based automatic water tank controller using an ultrasonic sensor and OLED display.

COMPONENTS USED:

- Arduino Uno / Nano
- HC-SR04 Ultrasonic Sensor
- 0.96" OLED Display (I2C)
- Relay Module (5V)
- R16 Latching Push Button (for manual override)
- Purple LED (for override indicator)
- Power supply (5V or USB for Arduino)
- Wires & Housing

WIRING DIAGRAM:

- HC-SR04: VCC -> 5V, GND -> GND, Trig -> D8, Echo -> D9
- OLED: VCC -> 5V, GND -> GND, SCL -> A5, SDA -> A4
- Relay: VCC -> 5V, GND -> GND, IN -> D7
- Latching Button: One side -> D6, other side -> GND (for signal)
- Purple LED: Anode -> 220 Ohm -> D5, Cathode -> GND

LOGIC OVERVIEW:

- When water level drops below threshold, relay triggers motor ON.
- When tank fills, relay turns motor OFF.
- Manual override can force ON the motor at any time (unless full).
- OLED displays tank fill percentage.

- Purple LED lights up when override is active.

CODE EXPLANATION:

- #include <NewPing.h>: Controls HC-SR04

- #include <Adafruit_GFX.h> + Adafruit_SSD1306.h: For OLED display

- #define TRIG_PIN, ECHO_PIN, MAX_DISTANCE: Ultrasonic setup

- loop(): Continuously checks level, updates display, manages override

See Arduino sketch file (WaterTankController.ino) for full implementation.