🔌 Medibox Hardware Schematic

📍 Pin Connections

ESP32 Pin Mapping

Component	ESP32 Pin	Purpose
OLED SDA	GPIO 21	I2C Data
OLED SCL	GPIO 22	I2C Clock
DHT22 Data	GPIO 12	Temperature/Humidity Sensor
Button UP	GPIO 33	Navigation Button
Button OK	GPIO 32	Selection Button
Button DOWN	GPIO 35	Navigation Button
Button CANCEL	GPIO 34	Cancel/Back Button
LED	GPIO 15	Status/Alert Indicator
Buzzer	GPIO 5	Audio Alert

🔧 Component Details

1. ESP32 Development Board

- Microcontroller: ESP32-WROOM-32
- Clock Speed: 240 MHz
- Memory: 4MB Flash, 520KB SRAM

2. OLED Display

- Model: SSD1306
- Resolution: 128x64 pixels
- Communication: I2C
- Address: 0x3C

3. DHT22 Sensor

- Temperature Range: -40 to 80°C
- Humidity Range: 0-100%
- Accuracy: ±0.5°C, ±2-5% RH

4. Buttons

- Type: Momentary Push Buttons
- Configuration: Active LOW with Internal Pull-up

5. Additional Components

- LED: Standard 3mm/5mm LED
- Buzzer: Active Buzzer Module
- Voltage Regulator: 3.3V Supply

🔌 Wiring Diagram Explanation

```
ESP32 Board
│
├── OLED Display
│   ├── VCC  → 3.3V
│   ├── GND  → GND
│   ├── SDA  → GPIO 21
│   └── SCL  → GPIO 22
│
├── DHT22 Sensor
│   ├── VCC  → 3.3V
│   ├── GND  → GND
│   └── DATA → GPIO 12
│
├── Buttons
│   ├── UP     → GPIO 33
│   ├── OK     → GPIO 32
│   ├── DOWN   → GPIO 35
│   └── CANCEL → GPIO 34
│
├── LED
│   └── Signal → GPIO 15
│
└── Buzzer
    └── Signal → GPIO 5
```

⚡ Power Considerations

- Operating Voltage: 3.3V
- Recommended Power Supply:

- USB Power Bank
- 3.7V LiPo Battery with Boost Converter

🛠 Assembly Tips

1. Use breadboard for prototyping
2. Implement pull-up resistors if needed
3. Ensure clean power supply
4. Use short, direct connections
5. Consider PCB design for final version

🔬 Calibration Notes

- Calibrate DHT22 sensor periodically
- Verify button responsiveness
- Check I2C communication stability
- Monitor power consumption

🚧 Potential Improvements

1. Add voltage regulation stage
2. Implement battery monitoring
3. Design custom PCB
4. Add external EEPROM for settings