7.2 Local Network Connectivity with Wi-Fi

Wi-Fi is a technology based on the **IEEE 802.11 standards** that enables wireless data exchange. The ESP32 supports common standards like 802.11b, 802.11g, and 802.11n, operating in the 2.4 GHz frequency band.

ESP32 Wi-Fi Modes

1. **Station Mode (STA)**: The ESP32 acts as a client, connecting to an existing access point (AP) like your home or university router. This is the most common mode for devices that need internet access.
2. **Access Point Mode (AP)**: The ESP32 creates its own Wi-Fi network, allowing other devices (like your phone or laptop) to connect directly to it. This is useful for initial device configuration or creating isolated local networks.
3. **STA + AP Mode**: The ESP32 can do both simultaneously, connecting to one network while also providing its own. This allows it to act as a range extender or a bridge between networks.

Example

```
#include <WiFi.h>

// --- Replace with your network credentials ---
const char* ssid = "YOUR_WIFI_SSID";
const char* password = "YOUR_WIFI_PASSWORD";
// ---------------------------------------

void setup() {
  Serial.begin(115200); // Allow serial to initialize

  Serial.println();
  Serial.print("Connecting to ");
  Serial.println(ssid);

  // Start the Wi-Fi connection
  WiFi.begin(ssid, password);

  // Wait for the connection to complete
```

```
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }

  Serial.println("");
  Serial.println("WiFi connected successfully!");
  Serial.print("IP Address: ");
  Serial.println(WiFi.localIP());
}

void loop() {
  // The main work is done in setup for this example.
  // In a real application, you would do your networking tasks here.
  delay(10000);
}
```

Revision #1
Created 2025-08-28 16:33:12 UTC by NS
Updated 2025-08-28 16:37:15 UTC by NS