Connection Details for Flood Monitoring Project

Sensing Station (ESP32 + LoRa SX1278 + Sensors)

Components:

- ESP32
- LoRa SX1278 (433 MHz)
- Rainfall Sensor (Analog)
- Flow Rate Sensor (Analog)
- Ultrasonic Sensor (for Water Level)
- Power Source

Connection Diagram:

1. ESP32 to LoRa SX1278

LoRa SX1278 Pin	ESP32 Pin
MISO	GPIO 19
MOSI	GPIO 23
SCK	GPIO 18
NSS (CS)	GPIO 5
RESET	GPIO 14
DIO0	GPIO 26
VCC	3.3V
GND	GND

2. Rainfall Sensor to ESP32

Rainfall Sensor Pin	ESP32 Pin
Signal	GPIO 34
VCC	3.3V
GND	GND

Anemometer to 32

3. Flow Rate Sensor to ESP32

Flow Rate Sensor Pin	ESP32 Pin
Signal	GPIO 35
VCC	3.3V
GND	GND

4. Ultrasonic Sensor (HC-SR04) to ESP32

Ultrasonic Sensor Pin	ESP32 Pin
VCC	5V
GND	GND
Trigger	GPIO 27
Echo	GPIO 25

Power Supply for ESP32:
- Use a 5V power supply with at least 1A current.
- You can also use a LiPo battery or solar panel for remote deployments.

Base Station (Raspberry Pi + LoRa SX1278 + OLED Display)

Components:

- Raspberry Pi 3B+/4
- LoRa SX1278 (433 MHz)

Connection Diagram:

1. LoRa SX1278 to Raspberry Pi

LoRa SX1278 Pin	Raspberry Pi Pin
MISO	Pin 21 (SPI_MISO)
MOSI	Pin 19 (SPI_MOSI)
SCK	Pin 23 (SPI_SCLK)
NSS (CS)	Pin 24 (SPI_CE0)
RESET	Pin 22 (GPIO 25)
DIO0	Pin 18 (GPIO 24)
VCC	3.3V
GND	GND

Power Supply for Raspberry Pi:
- Use a 5V/2.5A power adapter for the Raspberry Pi.

Summary of Connections

Sensing Station (ESP32)
- LoRa SX1278 connects via SPI.
- Rainfall Sensor, Flow Rate Sensor, and Ultrasonic Sensor connect to analog/digital GPIO pins.

Base Station (Raspberry Pi)
- LoRa SX1278 connects via SPI.