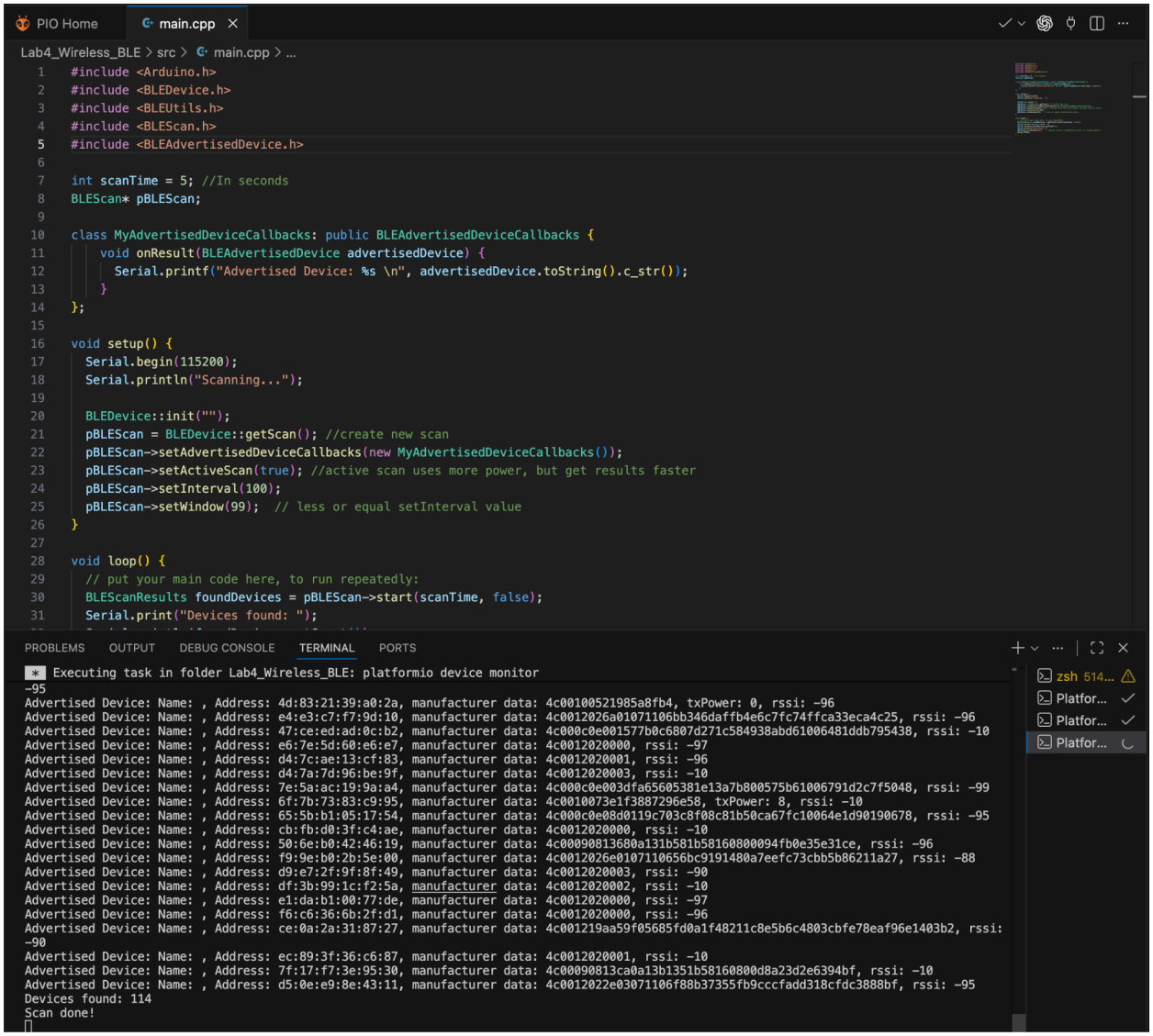
Lab 4: Wireless

Lewis Liu, Iris Yang

Github Link: https://github.com/IrisYzh/TECHIN-514-Hardware-Software-Lab

Section 1: MCU as BLEScanner

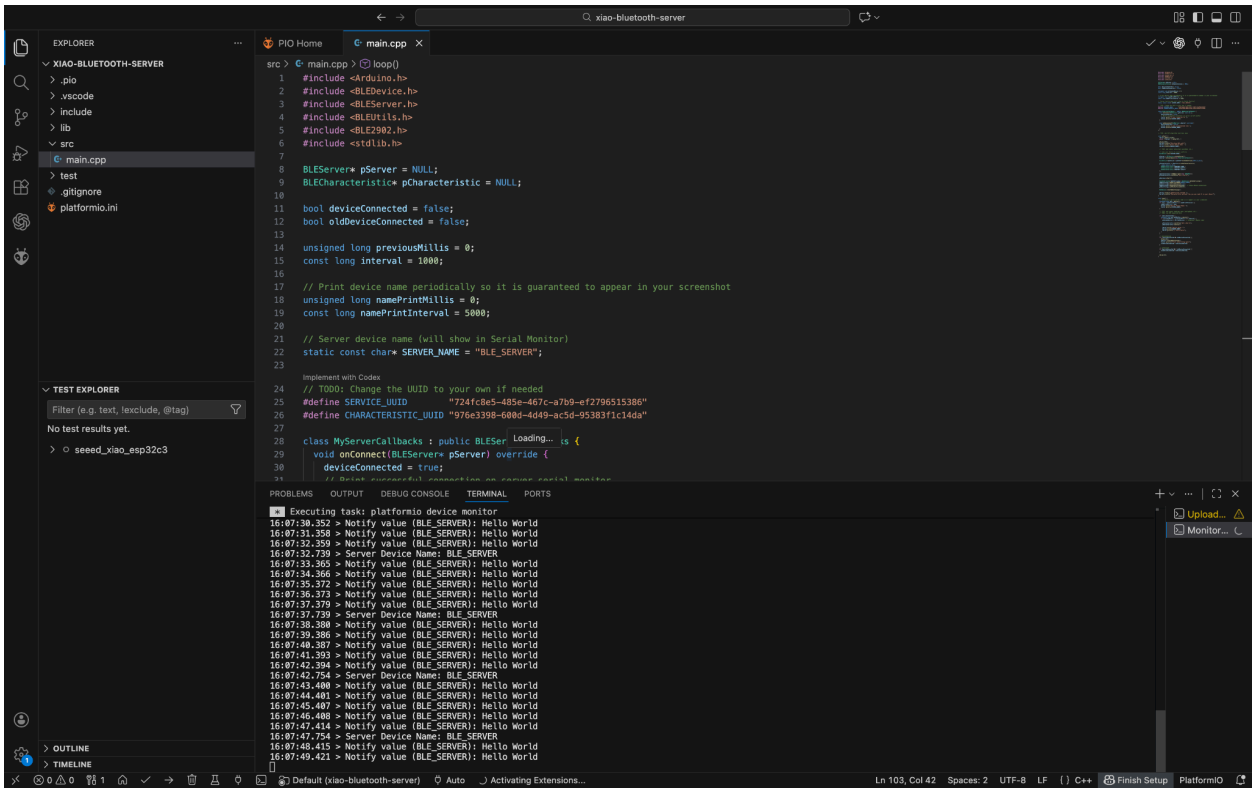
Screenshot of your serial monitor displaying the number of Bluetooth devices detected using your MCU as BLEScanner



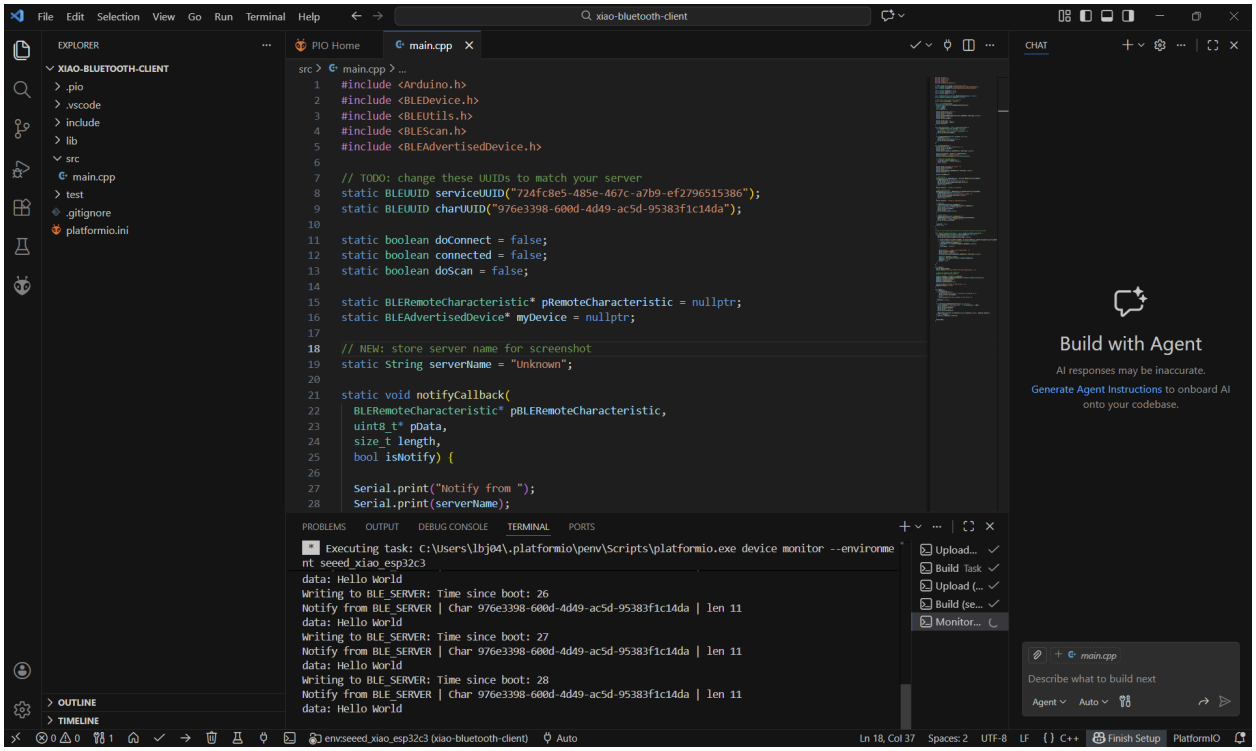
Section 2: Establishing Bluetooth Connection

Screenshot of the serial monitor of your clicent device to show successfull connection with your server device (make sure the server device's name is included).

Server

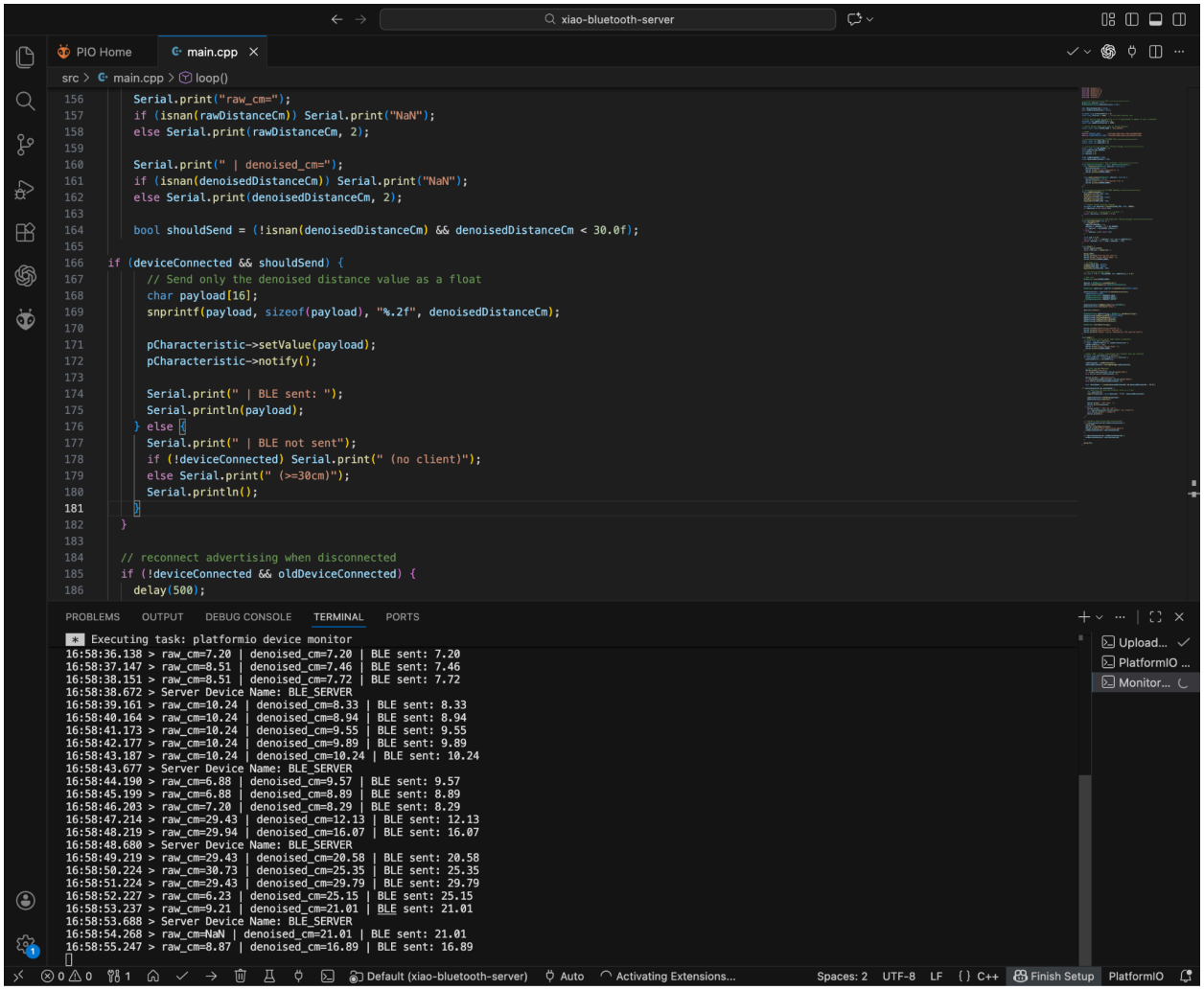


Client


File Edit Selection View Go Run Terminal Help
xiao-bluetooth-client
EXPLORER
XIAO-BLUETOOTH-CLIENT
.pio
.vscode
include
lib
src
main.cpp
test
.gitignore
platformio.ini
PIO Home
main.cpp
src > main.cpp > ...
#include <Arduino.h>
#include <BLEDevice.h>
#include <BLEUtils.h>
#include <BLEScan.h>
#include <BLEAdvertisedDevice.h>
// TODO: change these UUIDs to match your server
static BLEUUID serviceUUID("724fc8e5-485e-467c-a7b9-ef2796515386");
static BLEUUID charUUID("976e3398-600d-4d49-ac5d-95383f1c14da");
static boolean doConnect = false;
static boolean connected = false;
static boolean doScan = false;
static BLERemoteCharacteristic* pRemoteCharacteristic = nullptr;
static BLEAdvertisedDevice* myDevice = nullptr;
// NEW: store server name for screenshot
static String serverName = "Unknown";
static void notifyCallback(
BLERemoteCharacteristic* pBLERemoteCharacteristic,
uint8_t* pData,
size_t length,
bool isNotify) {
Serial.print("Notify from ");
Serial.print(serverName);
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Executing task: C:\Users\lbj04\.platformio\penv\Scripts\platformio.exe device monitor --environment seeed_xiao_esp32c3
data: Hello World
Writing to BLE_SERVER: Time since boot: 26
Notify from BLE_SERVER | Char 976e3398-600d-4d49-ac5d-95383f1c14da | len 11
data: Hello World
Writing to BLE_SERVER: Time since boot: 27
Notify from BLE_SERVER | Char 976e3398-600d-4d49-ac5d-95383f1c14da | len 11
data: Hello World
Writing to BLE_SERVER: Time since boot: 28
Notify from BLE_SERVER | Char 976e3398-600d-4d49-ac5d-95383f1c14da | len 11
data: Hello World
Upload...
Build Task
Upload (...
Build (se...
Monitor...
OUTLINE
TIMELINE
CHAT
Build with Agent
AI responses may be inaccurate.
Generate Agent Instructions to onboard AI onto your codebase.
main.cpp
Describe what to build next
Agent
Auto
env:seeed_xiao_esp32c3 (xiao-bluetooth-client)
Auto
Ln 18, Col 37
Spaces: 2
UTF-8
LF
C++
Finish Setup
PlatformIO

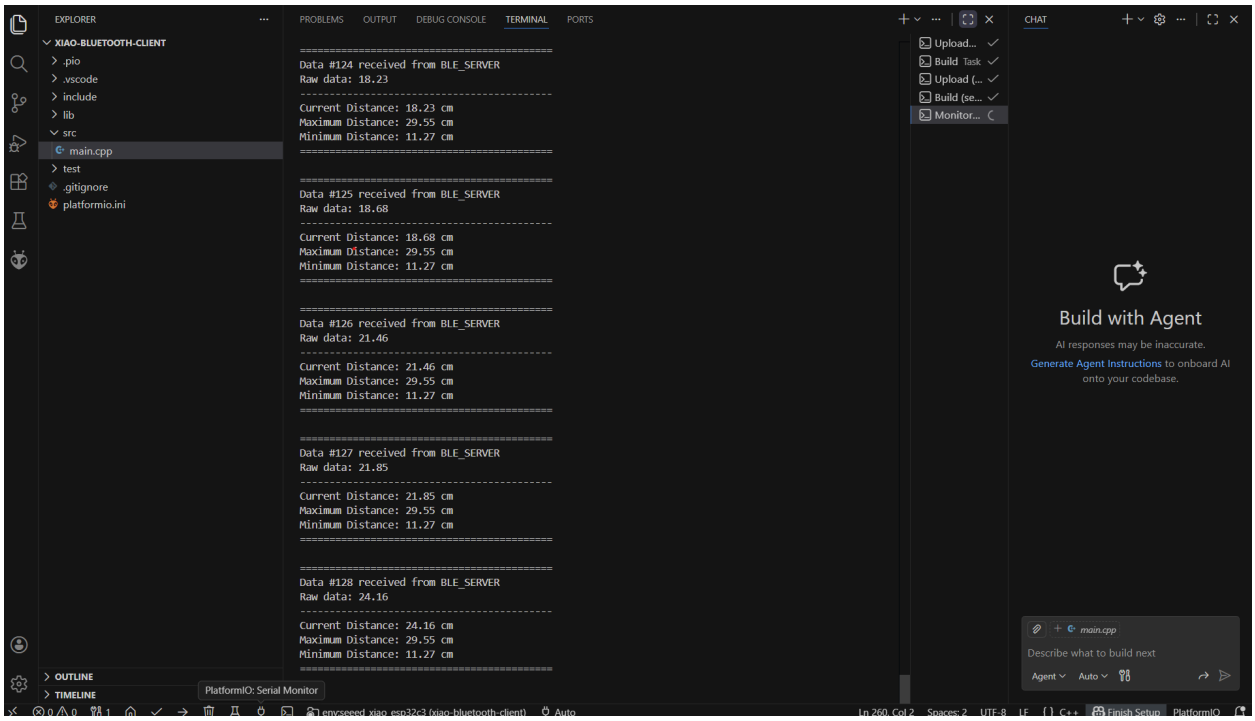
4.3 Sensor Device Signal Processing and Data Transmission

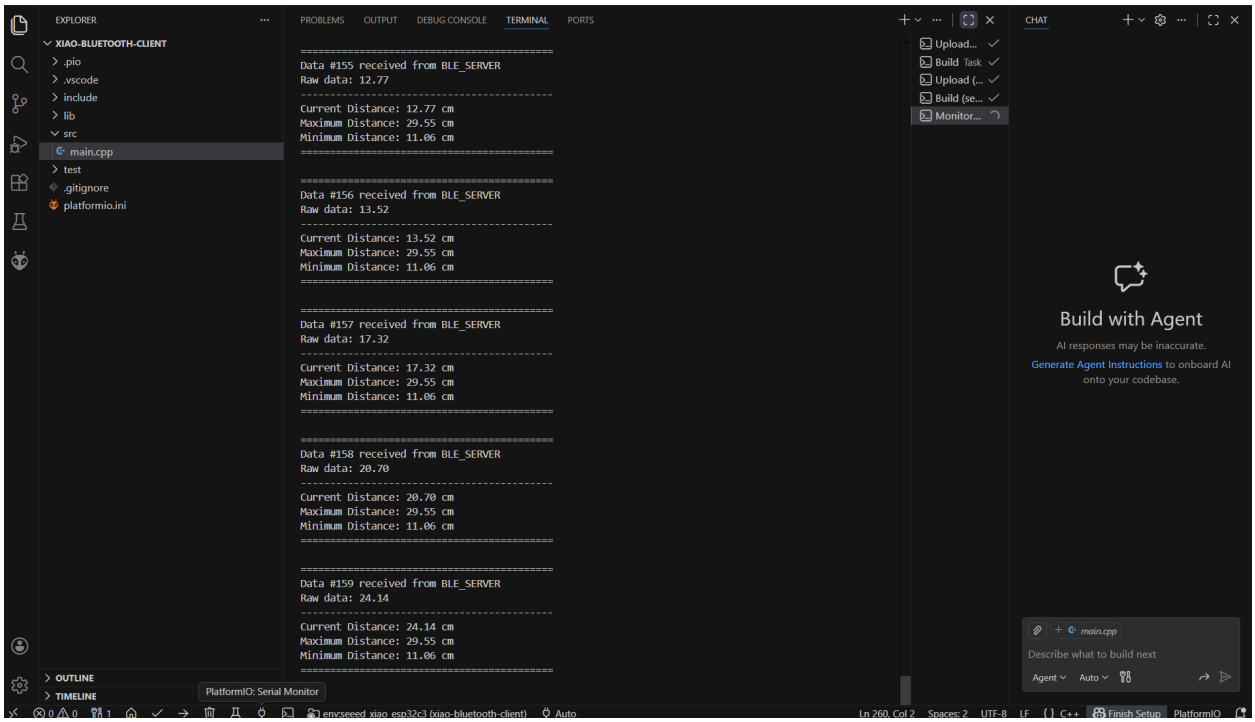
Screenshot of the serial monitor of your server device to show the raw and denoised sensor data.

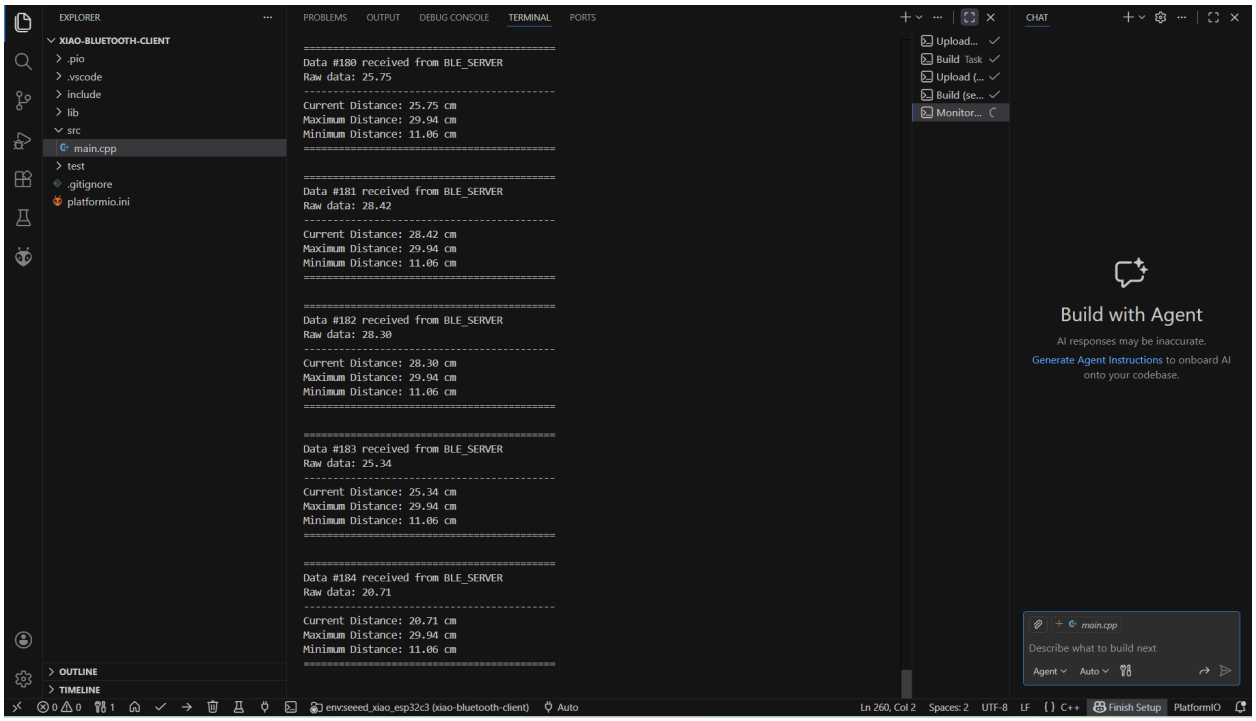


4.4 Display Device Signal Processing and Data Receiving

Screenshot of the serial monitor of your client device to show the currently-reading, maximum, and minimum data transmitted from your server device.






EXPLORER
XIAO-BLUETOOTH-CLIENT
.pio
.vscode
include
lib
src
main.cpp
test
.gitignore
platformio.ini
OUTLINE
TIMELINE
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
Upload...
Build Task
Upload (...
Build (se...
Monitor...
==========
Data #180 received from BLE_SERVER
Raw data: 25.75

Current Distance: 25.75 cm
Maximum Distance: 29.94 cm
Minimum Distance: 11.06 cm
==========
==========
Data #181 received from BLE_SERVER
Raw data: 28.42

Current Distance: 28.42 cm
Maximum Distance: 29.94 cm
Minimum Distance: 11.06 cm
==========
==========
Data #182 received from BLE_SERVER
Raw data: 28.30

Current Distance: 28.30 cm
Maximum Distance: 29.94 cm
Minimum Distance: 11.06 cm
==========
==========
Data #183 received from BLE_SERVER
Raw data: 25.34

Current Distance: 25.34 cm
Maximum Distance: 29.94 cm
Minimum Distance: 11.06 cm
==========
==========
Data #184 received from BLE_SERVER
Raw data: 20.71

Current Distance: 20.71 cm
Maximum Distance: 29.94 cm
Minimum Distance: 11.06 cm
==========
CHAT
Build with Agent
AI responses may be inaccurate.
Generate Agent Instructions to onboard AI onto your codebase.
main.cpp
Describe what to build next
Agent
Auto
envseeed_xiao_esp32c3 (xiao-bluetooth-client)
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Ln 260, Col 2
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LF
C++
Finish Setup
PlatformIO