

LAMPIRAN A

Listing Program ESP32 Slave(transmitter)

```
#define ENABLE_RSSI true

#include "Arduino.h"
#include "LoRa_E220.h"
#include <TinyGPS++.h>
#include <SoftwareSerial.h>

#define RX_PIN 4
#define TX_PIN 5
SoftwareSerial gpsSerial(RX_PIN, TX_PIN);
TinyGPSPlus gps;
String latitude, longitude;
const int buttonPin = 15;
const int interval = 2000; // Interval waktu (dalam milidetik) antara pengiriman data

bool buttonState = false;
//const int buzz = 2;

// ----- esp32 pins -----
LoRa_E220 e220ttl(&Serial2, 15, 21, 19); // RX AUX M0 M1

void setup() {
  Serial.begin(9600);
  gpsSerial.begin(9600);
  pinMode(buttonPin, INPUT_PULLUP);
  // pinMode(buzz, OUTPUT);
  delay(500);
  e220ttl.begin();

  // Send message
  ResponseStatus rs = e220ttl.sendMessage("Hello, world?");
  // Check If there is some problem of succesfully send
  Serial.println(rs.getResponseDescription());
}
```

```

void loop() {
  // This sketch displays information every time a new sentence is
  // correctly encoded.
  while (gpsSerial.available() > 0) {
    if (gps.encode(gpsSerial.read())) {
      if (gps.location.isValid()) {
        float la = gps.location.lat();
        float lo = gps.location.lng();

        latitude = String (la, 6);
        longitude = String (lo, 6);

        buttonState = digitalRead(buttonPin);
        delay(100);

        if (buttonState == 0) {
          Serial.println("pushbutton ditekan");
          String kirim1 = latitude + "," + longitude + "," + "Emergency";
          // Send message
          ResponseStatus rs = e220ttl.sendMessage(kirim1);
          // Check If there is some problem of successfully send
          Serial.println(rs.getResponseDescription());
        }
        if (buttonState == 1) {
          Serial.println("pushbutton tidak ditekan");
          String kirim = latitude + "," + longitude;
          // Send message
          ResponseStatus rs = e220ttl.sendMessage(kirim);
          // Check If there is some problem of successfully send
          Serial.println(rs.getResponseDescription());
        }
        delay(5000);
      }
    }
  }
}

```

Listing Program ESP32 Master(receiver)

```
#define ENABLE_RSSI true
#include "Arduino.h"
#include "LoRa_E220.h"
#include <WiFi.h>

#include <FirebaseESP32.h>
#define FIREBASE_HOST "https://trackingposition.com/"
#define FIREBASE_AUTH
"YIT5OV7l5WseG6VSy9QsrV5U9E4G7pDbR"
//
#include <WiFiClientSecure.h>
#include <UniversalTelegramBot.h>
//https://www.google.com/maps/search/?api=1&query=latitude,longitude
e (format penulisan link untuk gmaps)

// Initialize Wifi connection to the router
char ssid[] = "PT MENCARI CINTA SEJATI"; // diisi nama wifi
char password[] = "12345678"; // diisi password wifi
int panjangdata;
String pesan;
String latitude;
String longitude;
String sisa;
const int relay = 13;

// Initialize Telegram BOT
#define BOTtoken
"6202784286:AAHeAXKA3K1ZG9mtxD7LkADnTg"
WiFiClientSecure client;
UniversalTelegramBot bot(BOTtoken, client);
//Checks for new messages every 1 second.
int botRequestDelay = 1000;
unsigned long lastTimeBotRan;

//Define FirebaseESP32 data object
FirebaseData firebaseData;
FirebaseJson json;
```

```

// ----- esp32 pins -----
LoRa_E220 e220ttl(&Serial2, 15, 21, 19); // RX AUX M0 M1

void handleNewMessages(int numNewMessages) {
  Serial.println("handleNewMessages");
  Serial.println(String(numNewMessages));

  for (int i = 0; i < numNewMessages; i++) {
    String chat_id = String(bot.messages[i].chat_id);
    String text = bot.messages[i].text;

    String from_name = bot.messages[i].from_name;
    if (from_name == "") from_name = "";

    if (text == "/ceklokasi") {
      String kondisi = "Lokasi terakhir :
https://www.google.com/maps/search/?api=1&query=;
      kondisi += latitude;
      kondisi += ", " + longitude;
      bot.sendMessage(chat_id, kondisi, "");
    }
    if (text == "/start") {
      String welcome = "Selamat datang di pusat informasi lokasi pendaki
gunung, silahkan pilih menu dibawah. \n";
      welcome += "/ceklokasi : Untuk mengecek lokasi terakhir
pendaki\n";
      bot.sendMessage(chat_id, welcome, "Markdown");
    }
  }
}

void setup() {
  Serial.begin(9600);
  e220ttl.begin();
  pinMode(relay, OUTPUT);
  delay(500);
  client.setInsecure();
  WiFi.mode(WIFI_STA);
}

```

```

WiFi.disconnect();
delay(100);

// attempt to connect to Wifi network:
Serial.print("Connecting Wifi: ");
Serial.println(ssid);
WiFi.begin(ssid, password);

while (WiFi.status() != WL_CONNECTED) {
  Serial.print("...");
  delay(500);
}
Serial.println("");
Serial.println("WiFi connected");
Serial.print("IP address: ");
Serial.println(WiFi.localIP());

Firebase.begin(FIREBASE_HOST, FIREBASE_AUTH);
Firebase.reconnectWiFi(true);

//Set database read timeout to 1 minute (max 15 minutes)
Firebase.setReadTimeout(firebaseData, 1000 * 60);
//tiny, small, medium, large and unlimited.
//Size and its write timeout e.g. tiny (1s), small (10s), medium (30s)
and large (60s).
Firebase.setwriteSizeLimit(firebaseData, "tiny");
//

Serial.println("Start receiving");
digitalWrite(15, LOW);
}

void loop() {
  // If something available
  if (e220ttl.available() > 1) {
    // read the String message
#ifdef ENABLE_RSSI
    ResponseContainer rc = e220ttl.receiveMessageRSSI();

```

```

#else
    ResponseContainer rc = e220ttl.receiveMessage();
#endif
    // Is something goes wrong print error
    if (rc.status.code != 1) {
//    Serial.println(rc.status.getResponseDescription());
    } else {
        // Print the data received
//    Serial.println(rc.status.getResponseDescription());
//    Serial.println(rc.data);
//    delay(500);
#ifdef ENABLE_RSSI
        Serial.print("RSSI: "); Serial.println(rc.rssi * -1, DEC);
#endif
    }
    pesan = rc.data;
    panjangdata = pesan.length();
    Serial.print("data length received = ");
    Serial.println(panjangdata);
    String Emergency;
    int separatorIndex = pesan.indexOf(",");
    int separatorIndex1 = pesan.indexOf(", ", separatorIndex + 1);

    latitude = pesan.substring(0, separatorIndex);
    longitude = pesan.substring(separatorIndex + 1, separatorIndex1 );
    sisa = pesan.substring(separatorIndex1 + 1);

    if (panjangdata <= 20) {
        Emergency = "No";
        digitalWrite(relay, LOW);
        //send data to firebase
        json.set("/Latitude ", latitude);
        json.set("/Longitude ", longitude);
        json.set("/Status ", rc.status.getResponseDescription());
        json.set("/Emergency ", Emergency);
        Firebase.updateNode(firebaseData, "/Lora", json);
    }
    if (panjangdata >= 25) {

```

```

Emergency = "EMERGENCY";
digitalWrite(relay, HIGH);
String chat_id = String(bot.messages[0].chat_id);
String PesanDarurat = "EMERGENCY!!!!!!!! \nSegera cek lokasi
terakhir pendaki https://www.google.com/maps/search/?api=1&query=";
PesanDarurat += latitude;
PesanDarurat += "," + longitude;
bot.sendMessage(chat_id, PesanDarurat, "");

//send data to firebase
json.set("/Latitude ", latitude);
json.set("/Longitude ", longitude);
json.set("/Status ", rc.status.getResponseDescription());
json.set("/Emergency ", Emergency);
Firebase.updateNode(firebaseData, "/Lora", json);
}
Emergency = "No";
}
if (Serial.available()) {
String input = Serial.readString();
e220ttl.sendMessage(input);
}

if (millis() > lastTimeBotRan + botRequestDelay) {
int numNewMessages = bot.getUpdates(bot.last_message_received +
1);

while (numNewMessages) {
Serial.println("got response");
handleNewMessages(numNewMessages);
numNewMessages = bot.getUpdates(bot.last_message_received +
1);
}
lastTimeBotRan = millis();
}
}
}

```

LAMPIRAN B

Dokumentasi Hasil Alat



Gambar (A) Perangkat Receiver Dan Transmitter



Gambar (B) Perangkat Receiver Saat Ada Emergency

BIODATA PENULIS



Nama : Syahrul Ramadan
Tempat/Tanggal Lahir : Cilacap, 13 November 2002
Alamat : Jl. Keong Mas RT04/12, Kelurahan Mertasinga, Kecamatan Cilacap Utara, Kab. Cilacap, Jawa Tengah.
Email : arulramadan1311@gmail.com
Telephone/Hp. : 08159775563
Hobi : Bersepeda Fixie.
Motto : Pantang menyerah sebelum punya mobil Supra sama sepeda Dosnoventa.
Riwayat Pendidikan :

1. SMP Negeri 5 Cilacap Tahun 2014 – 2017
2. SMK Negeri 2 Cilacap Tahun 2017 – 2020
3. Politeknik Negeri Cilacap Tahun 2020 – 2023
Prodi D3 – Teknik Elektronika

Penulis telah melaksanakan seminar Tugas Akhir pada tanggal 3 Agustus 2023 sebagai salah satu persyaratan untuk memperoleh gelar Ahli Madya (A.Md).