

LAMPIRAN A

SOURCE CODE MIKROKONTROLER ARDUINO NANO

```
#include <SoftwareSerial.h>
#include <SPI.h>
#include <LoRa.h>
#include <ArduinoJson.h>
SoftwareSerial s(5,4);
SoftwareSerial mySerial(6, 7);
String incoming;
//char incoming[100] = {0};
String myString;
char c;
int Index1,Index2,Index3,Index4,Index5,Index6;
String secondValue, thirdValue, fourthValue, fifthValue, firstValue;

boolean aman=false;
boolean siaga=false;
boolean bahaya=false;

void setup() {
  Serial.begin(9600);
  mySerial.begin(9600);
  s.begin (9600);
  while (!Serial);

  Serial.println("LoRa Receiver");

  if (!LoRa.begin(915E6)) {
    Serial.println("Starting LoRa failed!");
    while (1);
  }
}

void loop() {
  unsigned long currentMillis = millis(); // grab current time
  // try to parse packet

  int packetSize = LoRa.parsePacket();
  if (packetSize) {

    Serial.print("Received packet ': ");
    // read packet
    while (LoRa.available()) {
      // Serial.print((char)LoRa.read());
      incoming = LoRa.readString();
    }
  }
}
```

```

Serial.print(incoming);
myString += incoming;
Index1 = myString.indexOf('|');
Index2 = myString.indexOf('|', Index1+1);
Index3 = myString.indexOf('|', Index2+1);
Index4 = myString.indexOf('|', Index3+1);
Index5 = myString.indexOf('|', Index4+1);

secondValue = myString.substring(Index1+1, Index2);
thirdValue = myString.substring(Index2+1, Index3);
fourthValue = myString.substring(Index3+1, Index4);
fifthValue = myString.substring(Index4+1, Index5);

Serial.println();
Serial.print("Latitude : ");Serial.print(secondValue);
Serial.print("Longitude : ");Serial.print(thirdValue);
Serial.print("Tegangan : ");Serial.print(fourthValue);
Serial.println(fifthValue);
myString="";
// print RSSI of packet
Serial.print("' with RSSI ");
Serial.println(LoRa.packetRssi());
unsigned long timeout = millis();
while (s.available() == 0) {
  if (millis() - timeout > 4000) {
    s.listen();
    mySerial.end();
    DynamicJsonDocument doc(100);
    doc["Latitude"] = (secondValue);
    doc["Longitude"] = (thirdValue);
    doc["Tegangan"] = (fourthValue);
    doc["Id"] = (fifthValue);
    serializeJson(doc, s);
    serializeJson(doc, Serial);
    s.end();
    return;
  }
}
}
}
if ( fifthValue == "N1" ){
  if(!bahaya){
    mySerial.listen();
Serial.println ("Proses Kirim SMS");
mySerial.println("AT+CMGF=1");
Serial.println ("AT+CMGF=1");
delay(1000);
mySerial.println("AT+CMGS=\"085381425344\"\\r");
Serial.println ("AT+CMGS=\"085381425344\"\\r");
delay(1000);
mySerial.println("Bahaya!!! Gajah memasuki wilayah Tower 2");
Serial.println ("Bahaya!!! Gajah memasuki wilayah Tower 2");
delay(100);
mySerial.println((char)26);

```

```

delay(1000);
    bahaya=true;
    siaga=false;
    aman=false;
    mySerial.end();
    }
}
else if(fifthValue == "G" ){
    if(!siaga){
        mySerial.listen();
        Serial.println ("Proses Kirim SMS");

        mySerial.println("AT+CMGF=1");
        Serial.println ("AT+CMGF=1");
        delay(1000);
        mySerial.println("AT+CMGS=\"085381425344\"\\r");
        Serial.println ("AT+CMGS=\"085381425344\"\\r");
        delay(1000);
        mySerial.println("Peringatan!!! Gajah memasuki wilayah Tower 1");
        Serial.println ("Peringatan!!! Gajah memasuki wilayah Tower 1");
        delay(100);
        mySerial.println((char)26);
        delay(1000);

        siaga=true;
        aman=false;
        bahaya=false;
        mySerial.end();

    }

}
else {
    mySerial.listen();
    siaga=false;
    aman=true;
    bahaya=false;
    mySerial.end();
}
}
void updateSerial()
{
    delay(100);
    while (Serial.available())
    {
        mySerial.write(Serial.read());
    }
    while(mySerial.available())
    {
        Serial.write(mySerial.read());
    }
}
}

```

LAMPIRAN B

SOURCE CODE MIKROKONTROLER NODEMCU V3 LOLIN

```
#include <ArduinoJson.h>
#include <ESP8266WiFi.h>
#include <SoftwareSerial.h>
SoftwareSerial serial(D2,D1);
//Konfigurasi WiFi
const char *ssid = "Orang Turki";
const char *password = "seniseviyorum";

String naaa;
String nii;
String nuuu;
String neee;
float naa;
float nii;
float nuu;
float nee;

unsigned long interval=1000; // the time we need to wait
unsigned long previousMillis=0;
//IP Address Server yang terpasang XAMPP
const char *host = "192.168.43.119";
//const char *host = "185.27.134.219";
void setup() {
  Serial.begin(115200);
  serial.begin(9600);
  WiFi.mode(WIFI_STA);
  WiFi.begin(ssid, password);
  Serial.println("");

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

  //Jika koneksi berhasil, maka akan muncul address di serial monitor
  Serial.println("");
  Serial.print("Connected to ");
  Serial.println(ssid);
  Serial.print("IP address: ");
  Serial.println(WiFi.localIP());
}

int value = 0;
```

```

void loop() {
  // Proses Pengiriman -----
  -----

  ++value;

  serial.listen();
  DynamicJsonDocument doc(1000);
  DeserializationError error = deserializeJson(doc, serial);
  if (error)
    return;

  String na = doc["Latitude"];
  String ni = doc["Longitude"];
  String nu = doc["Tegangan"];
  String ne = doc["Id"];
  Serial.println ("Latitude :");
  Serial.println (na);
  Serial.println ("Longitude :");
  Serial.println (ni);
  Serial.println ("Tegangan :");
  Serial.println (nu);
  Serial.println ("Id :");
  Serial.println (ne);
  serial.end();

  naa = na.toFloat();
  Serial.println (naa,6);
  nii = ni.toFloat();
  Serial.println (nii,6);
  nuu = nu.toFloat();
  Serial.println (nuu);
  //nee = ne.toFloat();
  //Serial.println (nee);

  naaa = String (naa,6);
  Serial.println(naaa);
  niii = String (nii,6);
  Serial.println(niii);
  nuuu = String (nuu);
  Serial.println(nuuu);
  neee = String (ne);
  Serial.println(neee);

  Serial.print("connecting to ");
  Serial.println(host);
  // Mengirimkan ke alamat host dengan port 80 -----
  -----

  WiFiClient client;
  const int httpPort = 80;
  if (!client.connect(host, httpPort)) {
    Serial.println("connection failed");
    return;
  }
}

```

```

}

// Isi Konten yang dikirim adalah alamat ip si esp -----
-----
String url = "/koneksi/potensio.php?latitude=";
    url += naaa;
    url += "&longitude=";
    url += niii;
    url += "&tegangan=";
    url += nuuu;
    url += "&id=";
    url += neee;

Serial.print("Requesting URL: ");

// Mengirimkan Request ke Server -----
-----
client.print(String("GET http://") + url + " HTTP/1.1\r\n" +
    "Host: " + host + "\r\n" +
    "Connection: close\r\n\r\n");
unsigned long timeout = millis();
while (client.available() == 0) {
    if (millis() - timeout > 1000) {
        Serial.println(">>> Client Timeout !");
        client.stop();
        return;
    }
}

// Read all the lines of the reply from server and print them to
Serial
while (client.available()) {
    String line = client.readStringUntil('\r');
    Serial.print(line);
}

Serial.println();
Serial.println("closing connection");
}

```

LAMPIRAN C

SOURCE CODE TAMPILAN UTAMA WEB SIPERIPEGAL

```
<!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="utf-8">
  <meta content="width=device-width,          initial-scale=1.0"
name="viewport">

  <title>SIPERIGAL</title>
  <meta content="" name="descriptison">
  <meta content="" name="keywords">

  <!-- Favicons -->
  <link href="assets/img/favicon.png" rel="icon">
  <link href="assets/img/apple-touch-icon.png" rel="apple-touch-icon">

  <!-- Google Fonts -->
  <link
href="https://fonts.googleapis.com/css?family=Open+Sans:300,300i,400,4
00i,600,600i,700,700i|Raleway:300,300i,400,400i,500,500i,600,600i,700,
700i|Poppins:300,300i,400,400i,500,500i,600,600i,700,700i"
rel="stylesheet">

  <!-- Vendor CSS Files -->
  <link href="assets/vendor/bootstrap/css/bootstrap.min.css"
rel="stylesheet">
  <link href="assets/vendor/icofont/icofont.min.css" rel="stylesheet">
  <link href="assets/vendor/boxicons/css/boxicons.min.css"
rel="stylesheet">
  <link href="assets/vendor/animate.css/animate.min.css"
rel="stylesheet">
  <link href="assets/vendor/owl.carousel/assets/owl.carousel.min.css"
rel="stylesheet">
  <link href="assets/vendor/venobox/venobox.css" rel="stylesheet">

  <!-- Template Main CSS File -->
  <link href="assets/css/style.css" rel="stylesheet">

  <!-- =====
  * Template Name: Eterna - v2.1.0
  * Template URL: https://bootstrapmade.com/eterna-free-multipurpose-
bootstrap-template/
  * Author: BootstrapMade.com
  * License: https://bootstrapmade.com/license/
  ===== -->
</head>
```

```

<body>

  <!-- ===== Top Bar ===== -->
  <section id="topbar" class="d-none d-lg-block">
    <div class="container d-flex">
      <div class="contact-info mr-auto">
        <i class="icofont-envelope"></i><a href="mailto:contact@example.com">waykambas@gmail.com</a>
        <i class="icofont-phone"></i> 0821 773 845 1
      </div>
    </div>
  </section>

  <!-- ===== Header ===== -->
  <header id="header">
    <div class="container d-flex">

      <div class="logo mr-auto">
        <h1 class="text-light"><a href="index.html"><span>SIPERIPEGAL</span></a></h1>
        <!-- Uncomment below if you prefer to use an image logo -->
        <!-- <a href="index.html"></a>-->
      </div>

      <nav class="nav-menu d-none d-lg-block">
        <ul>
          <li class="active"><a href="index.html">Beranda</a></li>

          <li class="drop-down"><a href="#">Tracking</a>
          <ul>
            <li><a href="lagi.php">Lacak Lokasi Gajah</a></li>
            <li><a href="lagi.php">Pola Pergerakan Gajah</a></li>
            <li><a href="lagi.php">Sistem Peringatan</a></li>

          </ul>
        </li>

        <li><a href="blog.html">News</a></li>
        <li><a href="contact.html">Kontak Kami</a></li>

      </ul>
    </nav><!-- .nav-menu -->

  </div>
</header><!-- End Header -->

  <!-- ===== Hero Section ===== -->
  <section id="hero">
    <div class="hero-container">

```



```

<div id="heroCarousel" class="carousel slide carousel-fade" data-
ride="carousel">

    <ol class="carousel-indicators" id="hero-carousel-
indicators"></ol>

    <div class="carousel-inner" role="listbox">

        <!-- Slide 1 -->
        <div class="carousel-item active" style="background:
url(assets/img/slide/slide-6.jpg)">
            <div class="carousel-container">
                <div class="carousel-content">
                    <h2 class="animate__animated
animate__fadeInDown">Welcome to <span>SIPERIEGAL</span></h2>
                    <p class="animate__animated animate__fadeInUp">Ayo
melihat gajah!</p>
                    <a href="about.html" class="btn-get-started
animate__animated animate__fadeInUp">Track Lokasi Gajah!</a>
                </div>
            </div>
        </div>

        <!-- Slide 2 -->
        <div class="carousel-item" style="background:
url(assets/img/slide/slide-6.jpg)">
            <div class="carousel-container">
                <div class="carousel-content">
                    <h2 class="animate__animated fanimate__adeInDown">Way
Kambas <span>News</span></h2>
                    <p class="animate__animated animate__fadeInUp">Ayo
lihat berita gajah!</p>
                    <a href="about.html" class="btn-get-started
animate__animated animate__fadeInUp">Lihat Gajah!</a>
                </div>
            </div>
        </div>

        <!-- Slide 3 -->
        <div class="carousel-item" style="background:
url(assets/img/slide/slide-6.jpg)">
            <div class="carousel-container">
                <div class="carousel-content">
                    <h2 class="animate__animated animate__fadeInDown">Way
Kambas <span>Warning</span></h2>
                    <p class="animate__animated animate__fadeInUp">Pantau
Lokasi Gajah Sekarang !</p>
                    <a href="about.html" class="btn-get-started
animate__animated animate__fadeInUp">Warning System!</a>
                </div>
            </div>
        </div>
    </div>

```

```

        </div>

        <a      class="carousel-control-prev"      href="#heroCarousel"
role="button" data-slide="prev">
            <span      class="carousel-control-prev-icon      icofont-rounded-
left" aria-hidden="true"></span>
            <span class="sr-only">Previous</span>
        </a>

        <a      class="carousel-control-next"      href="#heroCarousel"
role="button" data-slide="next">
            <span      class="carousel-control-next-icon      icofont-rounded-
right" aria-hidden="true"></span>
            <span class="sr-only">Next</span>
        </a>

    </div>
</div>
</section><!-- End Hero -->

<main id="main">

    <!-- ===== Featured Section ===== -->
    <section id="featured" class="featured">
        <div class="container">

            <div class="row">
                <div class="col-lg-4">
                    <div class="icon-box">
                        <i class="icofont-computer"></i>
                        <h3><a href="">Way Kambas Hari Ini</a></h3>
                        <p>Pelatihan Gajah ini telah berhasil mendidik dan
menjinakkan sekitar 290 ekor gajah liar</p>
                    </div>
                </div>
                <div class="col-lg-4 mt-4 mt-lg-0">
                    <div class="icon-box">
                        <i class="icofont-image"></i>
                        <h3><a href="">How SIPERIPEGAL works?</a></h3>
                        <p>SIPERIPEGAL yang dipasang di gajah liar menggunakan
radio frekuensi untuk mentransfer data koordinat ke server melalui
node/transmisi yang telah ditentukan sehingga dapat memantau posisi
gajah liar berada.</p>
                    </div>
                </div>
                <div class="col-lg-4 mt-4 mt-lg-0">
                    <div class="icon-box">
                        <i class="icofont-tasks-alt"></i>
                        <h3><a href="team.html">Tentang SIPERIPEGAL</a></h3>
                        <p>SIPERIPEGAL dibuat oleh tim dengan beranggotakan ihsan
dan diah jurusan teknik elektro ITERA</p>
                    </div>
                </div>
            </div>
        </div>
    </main>

```

```

        </div>

    </div>
</section><!-- End Featured Section -->

    <!-- ===== About Section ===== -->
</main><!-- End #main -->
<!-- ===== Footer ===== -->
<footer id="footer">
    <div class="container">
        <div class="copyright">
            &copy; Copyright <strong><span>SIPERIPEGAL</span></strong>.
All Rights Reserved
        </div>
        <div class="credits">
            <!-- All the links in the footer should remain intact. -->
            <!-- You can delete the links only if you purchased the pro
version. -->
            <!-- Licensing information: https://bootstrapmade.com/license/
-->
            <!-- Purchase the pro version with working PHP/AJAX contact
form: https://bootstrapmade.com/eterna-free-multipurpose-bootstrap-
template/ -->
            Designed                                by                                <a
href="https://bootstrapmade.com/">BootstrapMade</a>
        </div>
    </div>
</footer><!-- End Footer -->

    <a href="#" class="back-to-top"><i class="icofont-simple-
up"></i></a>

    <!-- Vendor JS Files -->
    <script src="assets/vendor/jquery/jquery.min.js"></script>
    <script
src="assets/vendor/bootstrap/js/bootstrap.bundle.min.js"></script>
    <script
src="assets/vendor/jquery.easing/jquery.easing.min.js"></script>
    <script src="assets/vendor/php-email-form/validate.js"></script>
    <script src="assets/vendor/jquery-sticky/jquery.sticky.js"></script>
    <script
src="assets/vendor/owl.carousel/owl.carousel.min.js"></script>
    <script
src="assets/vendor/waypoints/jquery.waypoints.min.js"></script>
    <script src="assets/vendor/counterup/counterup.min.js"></script>
    <script src="assets/vendor/isotope-
layout/isotope.pkgd.min.js"></script>
    <script src="assets/vendor/venobox/venobox.min.js"></script>

    <!-- Template Main JS File -->
    <script src="assets/js/main.js"></script>
</body>
</html>

```

LAMPIRAN D

SOURCE CODE PETA DIGITAL PADA WEB SIPERIPEGAL

```
<?php
//Variabel database
$servername = "localhost";
$username = "gajahliar";
$password = "gajahliar1@";
$dbname = "gps tracker";

$koneksi = mysqli_connect($servername, $username, $password,
$dbname); // menggunakan mysqli_connect

if(mysqli_connect_errno()){ // mengecek apakah koneksi database
error
    echo 'Gagal melakukan koneksi ke Database :
'.mysqli_connect_error(); // pesan ketika koneksi database error
}

$result = mysqli_query($koneksi, "SELECT*FROM nyoba order by id
desc limit 1")
?>
<!DOCTYPE html>
<html>
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-
scale=1.0">
    <title>Tracking posisi gajah</title>
    <link rel="stylesheet"
href="https://unpkg.com/leaflet@1.5.1/dist/leaflet.css" />
    <script
src="https://unpkg.com/leaflet@1.5.1/dist/leaflet.js"></script>
    <!-- Favicons -->
    <link href="assets/img/favicon.png" rel="icon">
    <link href="assets/img/apple-touch-icon.png" rel="apple-touch-icon">
    <style type="text/css">
        #peta{
            height:1080px;
        }
        @media screen and (max-width: 1080px) {
            #peta {
                width: 100%;
            }
        }
        @media screen and (max-width: 780px) {
            #peta {
                width: 10%;
            }
        }
    </style>
</head>
<body>
    <div id="peta">
        <img alt="Map showing the position of the elephant" />
    </div>
</body>
</html>
```

```

    }
    </style>
</head>
<body>
    <div id="peta"></div>
    <script type="text/javascript">
        function main (){
            var mapOptions = {
                center: [-5.370960, 105.314687],
                zoom: 15
            }
            var peta = L.map('peta', mapOptions);
            L.tilelayer('https://{s}.tile.openstreetmap.org/{z}/{x}/{y}.png',
            {attribution: '&copy;<a
href="https://www.openstreetmap.org/copyright">OpenStreetMap</a>
contributors'}).addTo(peta);
            // membuat marker lokasi terakhir
            <?php while ($row = mysqli_fetch_assoc($result)): ?>
            var myIcon = L.icon({
                iconUrl: 'Marker.png',
                iconSize: [40, 45], // size of the icon
            });
            var lok = new L.Marker([<?php echo $row["data"]?>,<?php
echo $row["longitude"]?>], {icon: myIcon}).addTo(peta);
            lok.bindPopup('Posisi gajah').openPopup();
            <?php endwhile; ?>
            //poligon lokasi gajah
            var titik = [
                [-5.359988, 105.308549],
                [-5.366701, 105.308199],
                [-5.373424, 105.308592],
                [-5.373365, 105.314770],
                [-5.372936, 105.320379],
                [-5.368086, 105.320488],
                [-5.363209, 105.320534],
                [-5.363063, 105.321589],
                [-5.357884, 105.321443],
                [-5.357537, 105.315447],
                [-5.3584416,105.3097859] ];
            L.polygon(titik, {color: "green"}).addTo(peta);
            //marker tower
            var tower3 = new L.Marker([-
5.3584416,105.3097859]).addTo(peta);
            tower3.bindPopup("Tower 1 (Gedung Labtek 1)");
            var tower2 = new L.Marker ([-
5.358879,105.31337]).addTo(peta);
            tower2.bindPopup("Tower 2 (Gedung C)");
        }
        window.onload = main;
    </script>
</body>
</html>

```

LAMPIRAN E

SOURCE CODE PHP PENYIMPANAN DATA PADA DATABASE

```
<?php

//Variabel database
$servername = "localhost";
$username = "gajahliar";
$password = "gajahliar1@";
$dbname = "gps tracker";

$conn      =      mysqli_connect("$servername",      "$username",
"$password", "$dbname");
    $var1 = $_GET['latitude'];
    $var2 = $_GET['longitude'];
    $var3 = $_GET['tegangan'];
    $var4 = $_GET['id'];

// Prepare the SQL statement

$result      =      mysqli_query      ($conn,"INSERT      INTO      nyoba
(data,longitude,tegangan,identitas)      VALUES
('$var1','$var2','$var3','$var4')");

if (!$result)
{
    die ('Invalid query: '.mysqli_error($conn));
}

?>
```