



# Seminar IoT

MAN 1 Kota Kediri

**2022**



# Rundown

- 08:00 - 08:30 : Materi & QnA
- 08:30 - 11:20 : Praktikum (Instalasi, Rakit, Uji Coba)
- 11:20 - 11:50 : Rancangan Ide IoT
- 11:50 - 12:00 : Penutupan



## Pemateri

Wahyu Firmansyah

0856-0856-9997

 wahjoe\_labs



## Asisten

Riswandha Adhitia

0858-1588-8782

 riswandha\_a

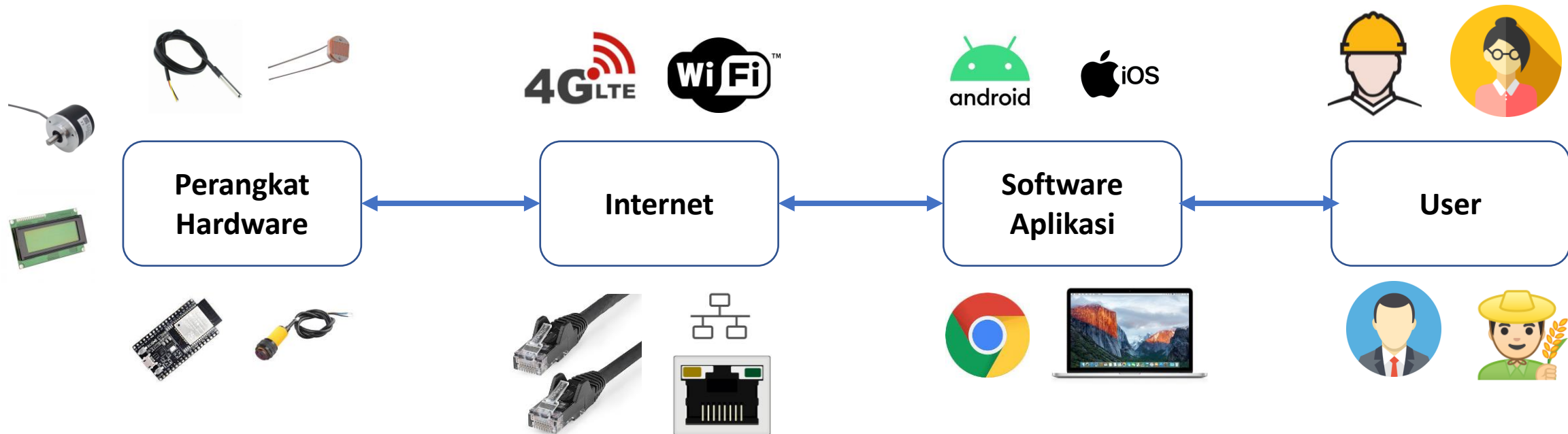


adalah suatu konsep teknologi yang dapat menghubungkan dan komunikasi antara perangkat hardware, software, internet, dan end user.





# Garis Besar Internet of Things (IoT)





# Protokol Internet of Things (IoT)

Pada umumnya perangkat iot dalam komunikasi data menggunakan 2 protokol

- **HTTP (Hypertext Transfer Protocol)**

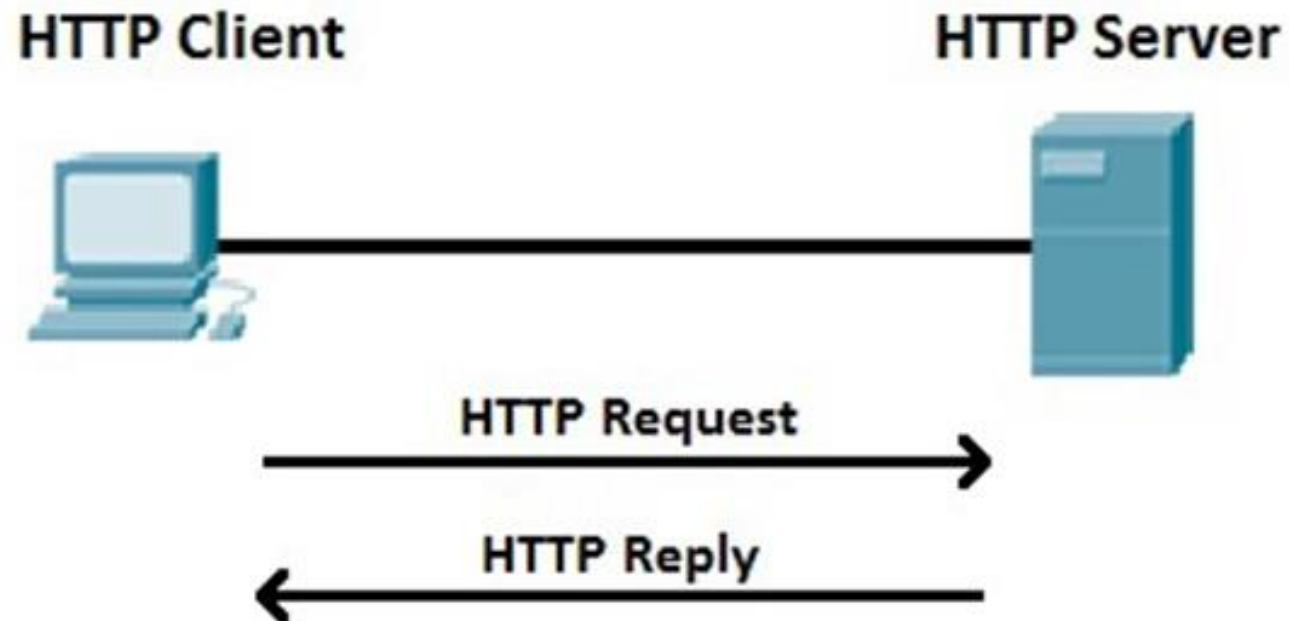
Protokol ini biasa digunakan untuk mengirim data melalui web API

- **MQTT (Message Queuing Telemetry Transport)**

Standar protokol komunikasi iot dengan karakteristik publish dan subscribe

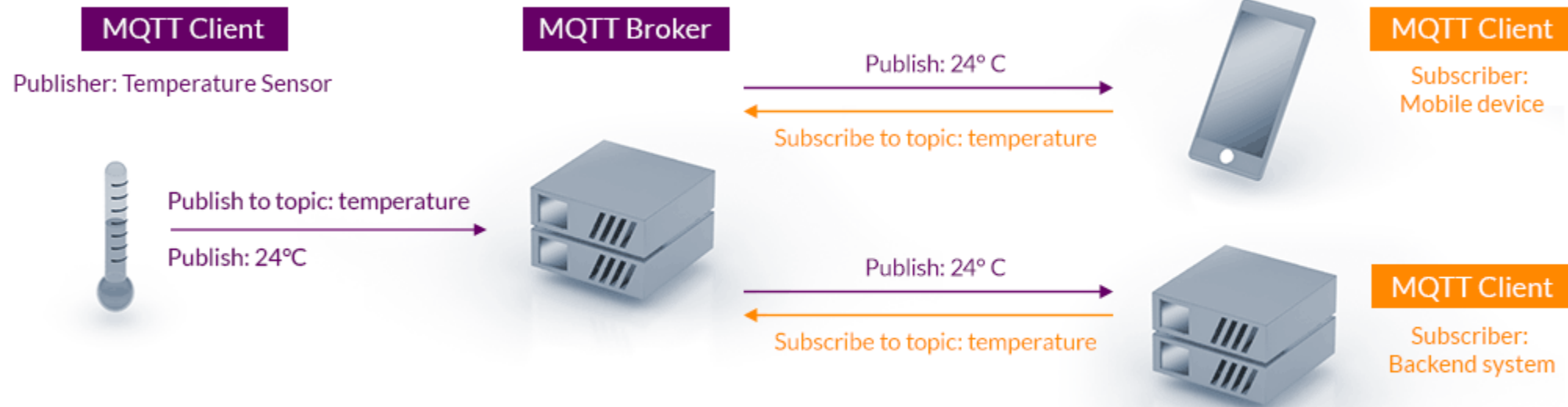


# HTTP Overview





# MQTT Overview





# Kesimpulan Internet of Things (IoT)

- Pada intinya konsep Internet of Things (IoT) adalah komunikasi data melalui koneksi jaringan komputer. Baik itu data sensor, ataupun status alat. **Semua tentang komunikasi data !**



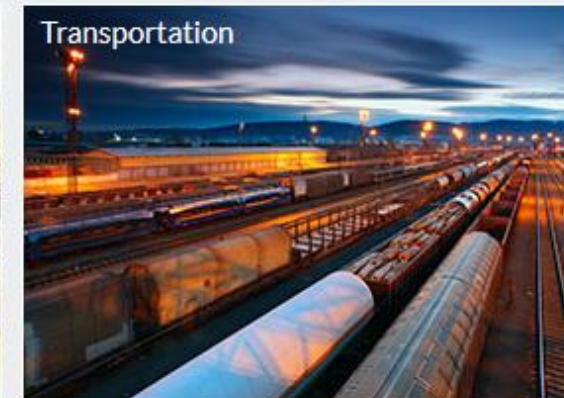
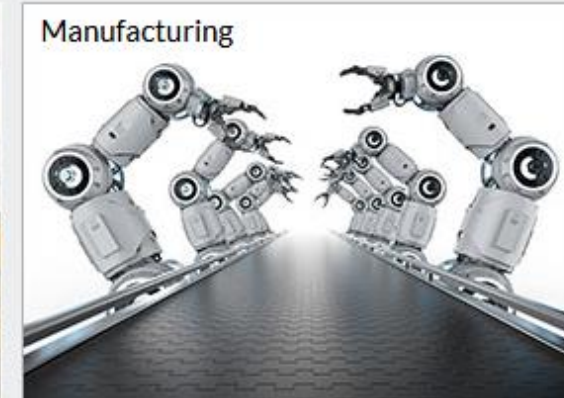
image: gmedia.net





## MQTT in Action

MQTT is used in a wide variety of industries





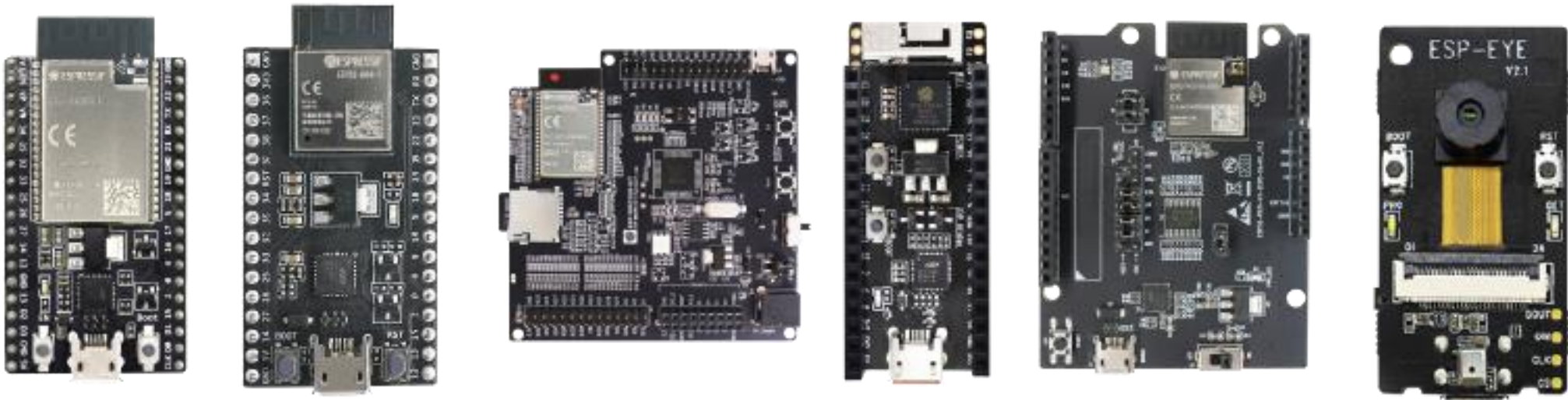
# Contoh Project IoT

- Ruangan (Lampu Otomatis, AC Otomatis, RFID Logger)
- Perkebunan (Nutrisi Tanah, Penyiram Otomatis, Panen Terjadwal)
- Peternakan (Suhu kandang, Pembersihan Kandang Terjadwal)
- Perikanan (PH Air, Suhu Air, Nutrisi Air, Kualitas Air, Pakan Otomatis)
- Industri (Inventory Barang, Sorting barang, Manajemen Barang)
- Energi Terbarukan (KWH Meter, Volt Monitor, Battery Pack Monitor)



# Microcontroller ESP32

- **ESP32** merupakan salah satu contoh produk dari espressif system dengan harga murah di pasaran mulai dari 100 ribuan sudah terdapat built in WiFi, Bluetooth, dengan dual core.

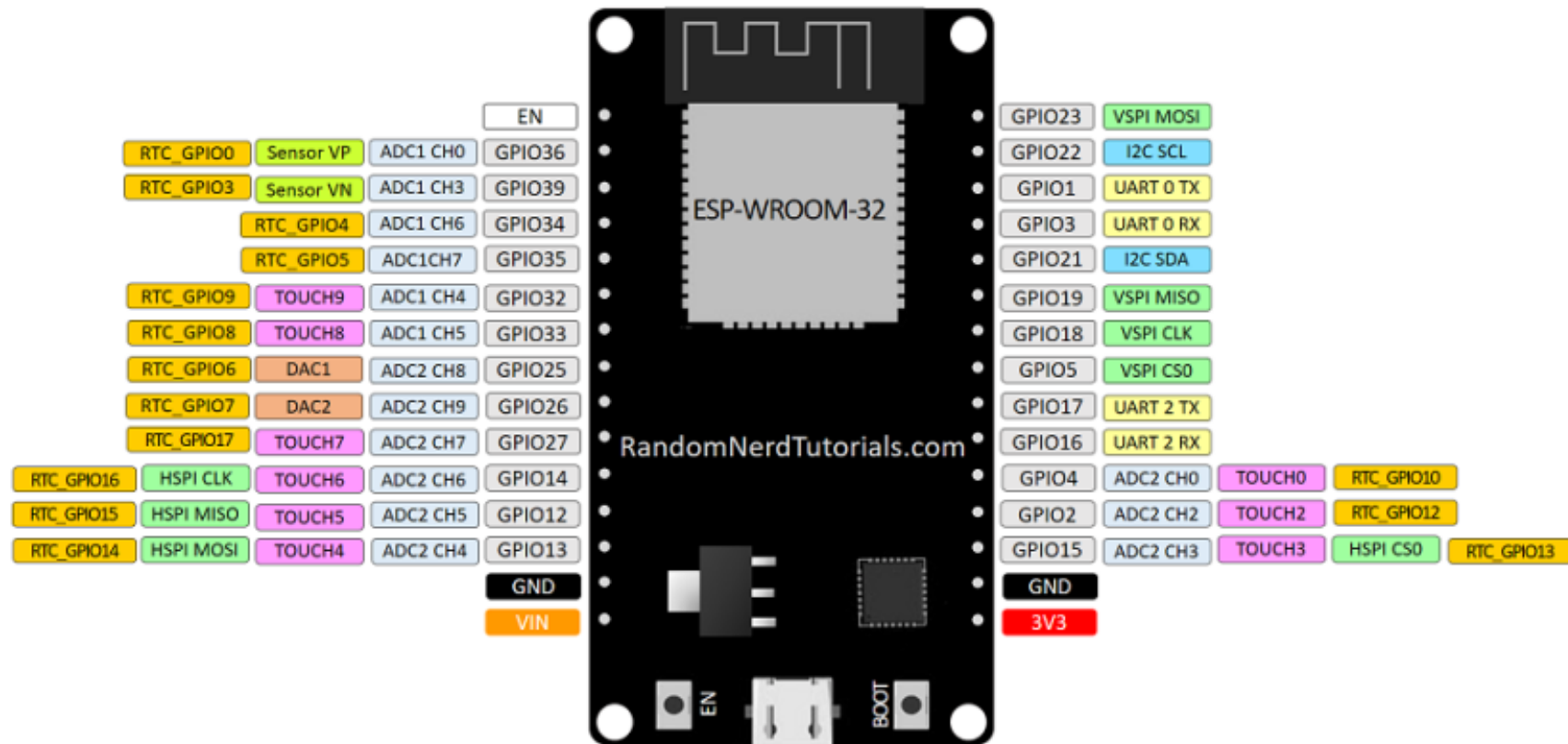






# ESP32 Devkit V1

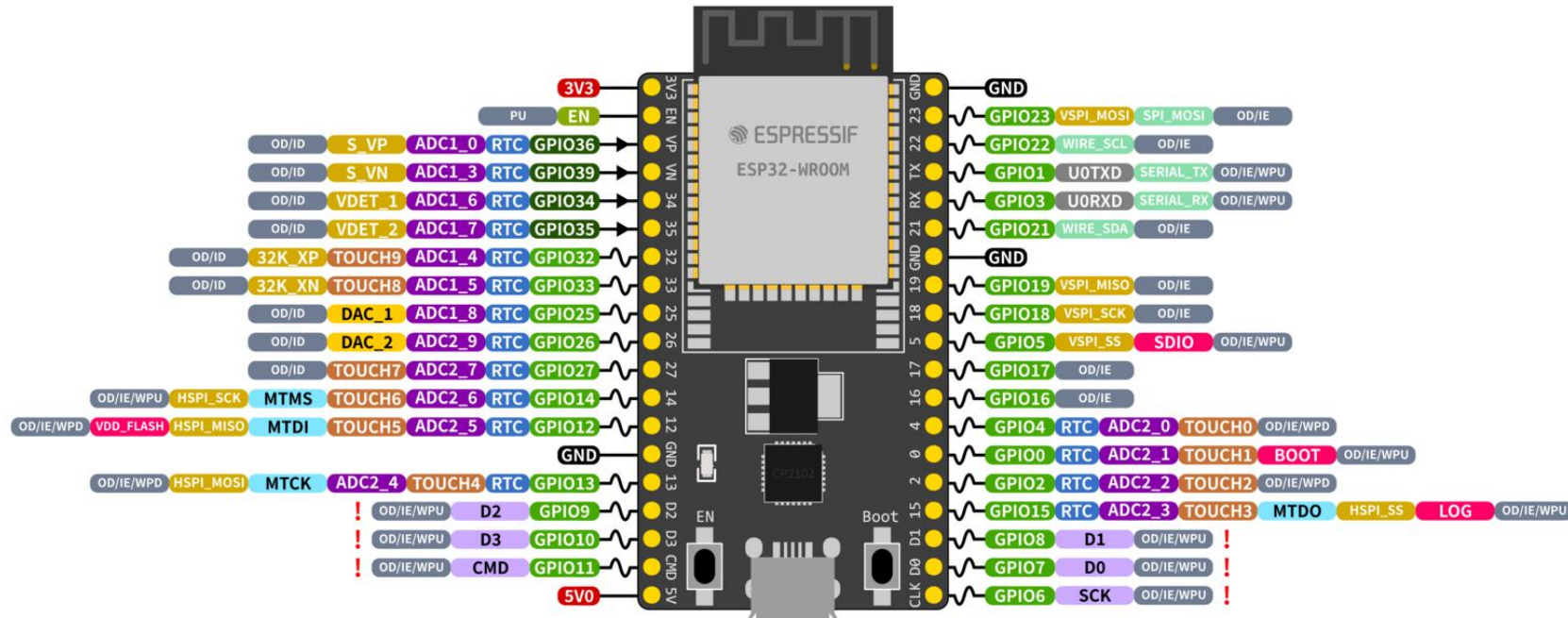
## ESP32 DEVKIT V1 – DOIT version with 30 GPIOs





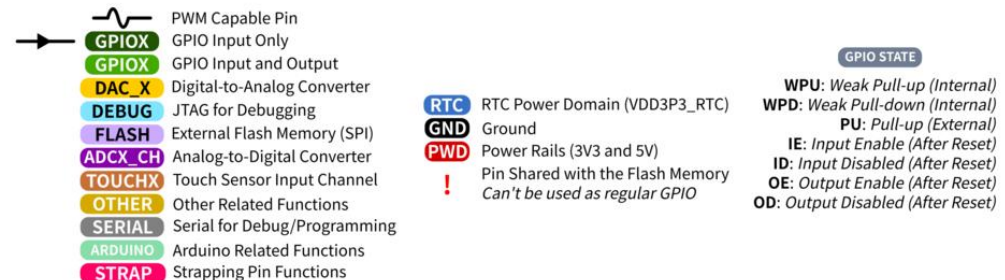
# ESP32 Devkit V4

ESP32-DevKitC



## ESP32 Specs

32-bit Xtensa® dual-core @240MHz  
Wi-Fi IEEE 802.11 b/g/n 2.4GHz  
Bluetooth 4.2 BR/EDR and BLE  
520 KB SRAM (16 KB for cache)  
448 KB ROM  
34 GPIOs, 4x SPI, 3x UART, 2x I2C,  
2x I2S, RMT, LED PWM, 1 host SD/eMMC/SDIO,  
1 slave SDIO/SPI, TWAI®, 12-bit ADC, Ethernet

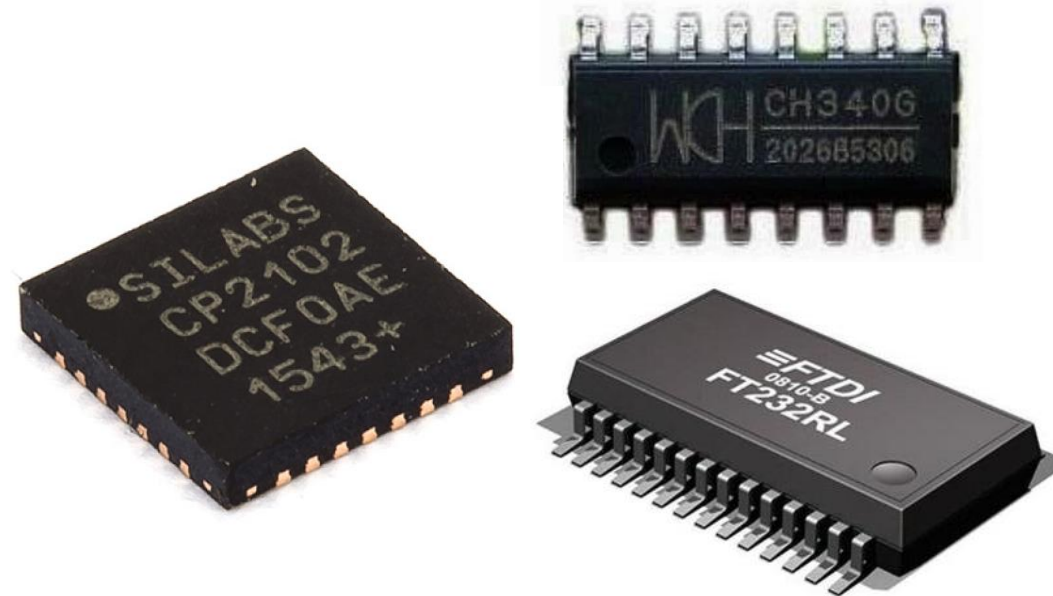




# USB Driver

- Program microcontroller melalui PC/Laptop memerlukan tambahan instalasi USB Driver. Beberapa distribusi USB Driver dalam microcontroller biasanya menggunakan:

CP210x	(ESP)
FTDI VCP	(ESP)
CH340, CH341	(Arduino)
FT232RL	





# SESI LANJUTAN: PRAKTIKUM INSTALASI



# Requirement

## 1. Arduino IDE [ <https://www.arduino.cc/en/software> ]

- Instalasi ESP32
- Blynk Library

## 2. USB Driver [ <https://s.id/iotblynk> ]

## 3. Blynk Android

<https://play.google.com/store/apps/details?id=cloud.blynk>

## 4. Blynk Browser

<https://blynk.cloud/dashboard/login>





# Requirement1 – Arduino IDE

- Instalasi Software Arduino IDE
- Link: <https://www.arduino.cc/en/software>



## Arduino IDE 1.8.19

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. This software can be used with any Arduino board.

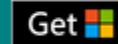
Refer to the [Getting Started](#) page for Installation instructions.

### DOWNLOAD OPTIONS

**Windows** Win 7 and newer

**Windows** ZIP file

**Windows app** Win 8.1 or 10



**Linux** 32 bits

**Linux** 64 bits

**Linux** ARM 32 bits

**Linux** ARM 64 bits

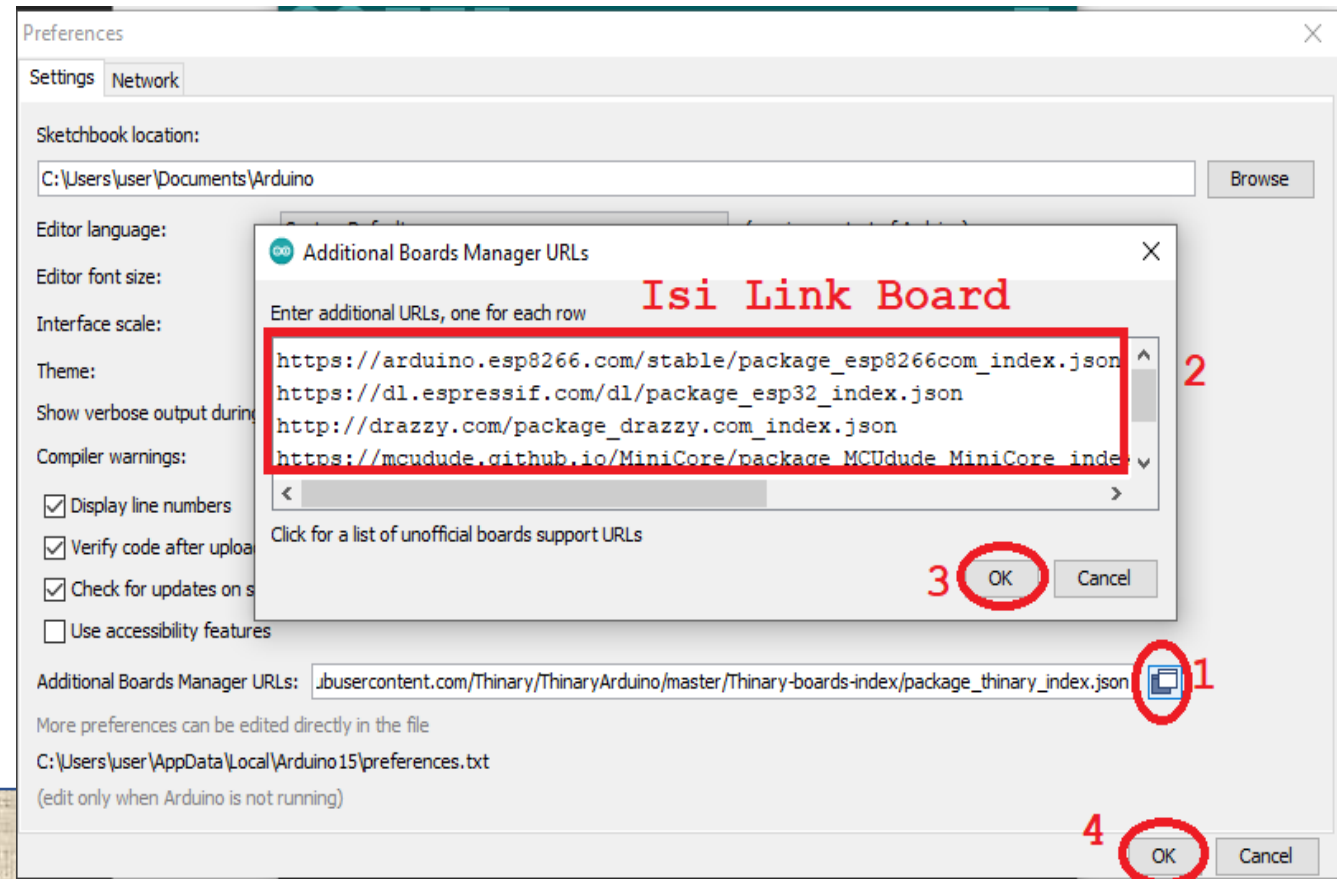
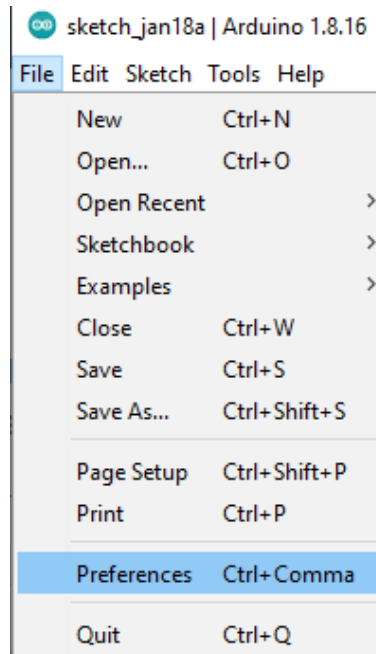


# Requirement1 – Arduino IDE – Board ESP

[https://arduino.esp8266.com/stable/package\\_esp8266com\\_index.json](https://arduino.esp8266.com/stable/package_esp8266com_index.json)  
[https://dl.espressif.com/dl/package\\_esp32\\_index.json](https://dl.espressif.com/dl/package_esp32_index.json)

Link  
Board

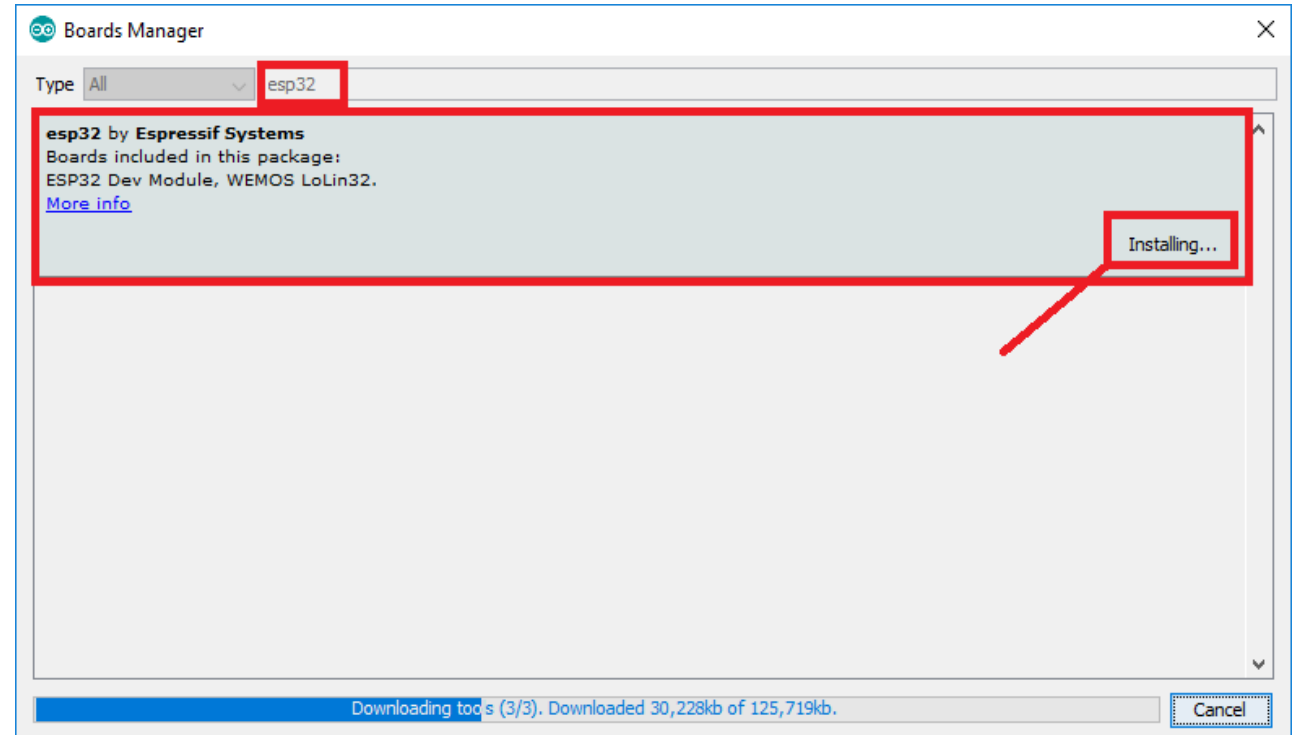
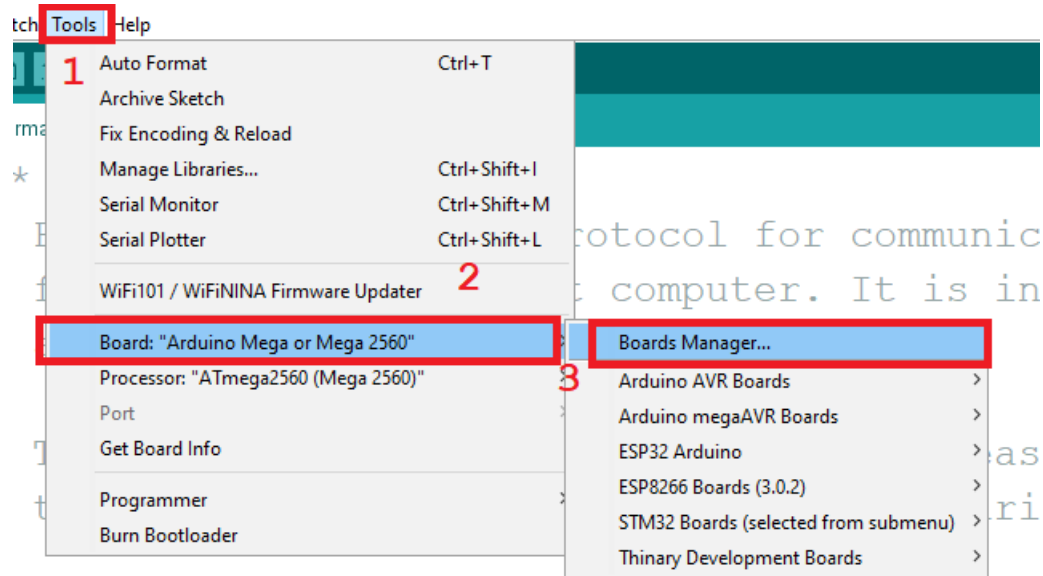
- File > Preferences





# Requirement1 – Arduino IDE – Board ESP

**Tools > Board > Boards Manager > ketik esp32 > Install**

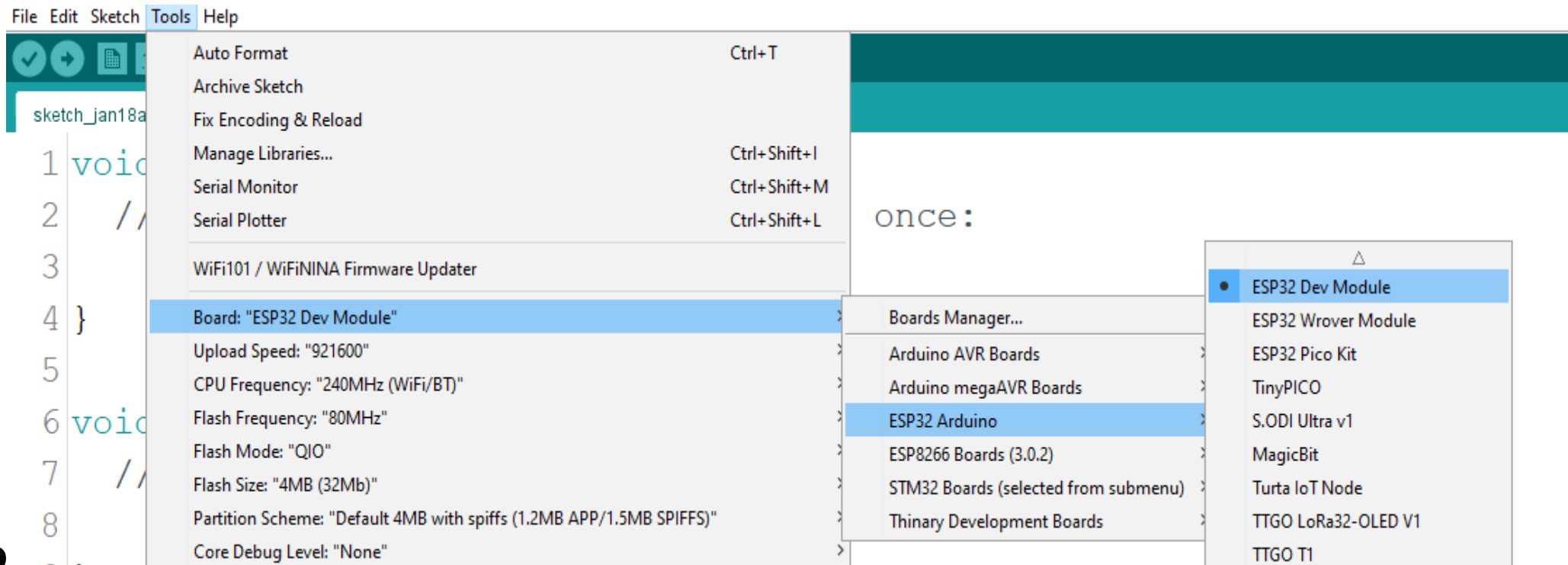




# Requirement1 – Arduino IDE – Board ESP

Untuk Pengecekan Instalasi ESP Sukses

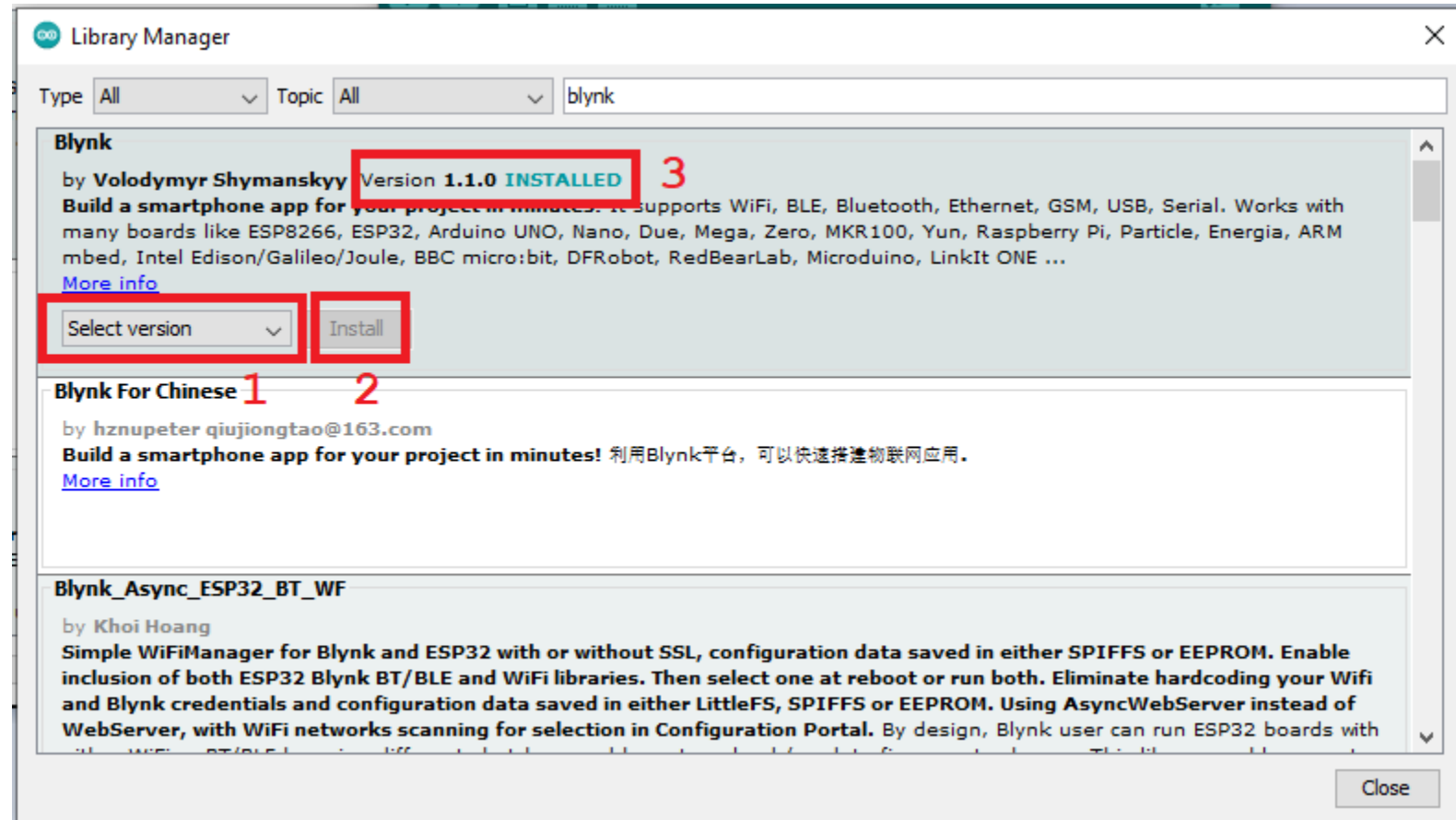
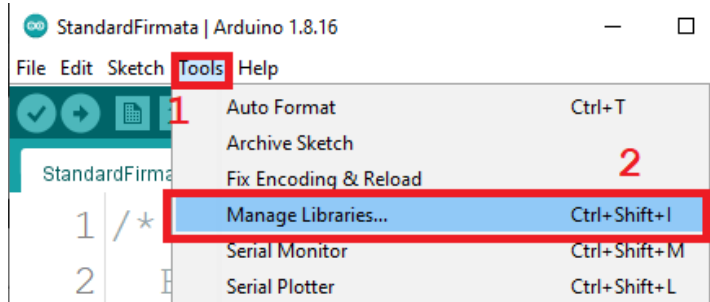
- Tools > Board > ESP32 Arduino > ESP Dev Module





# Requirement1 – Arduino IDE – Blynk Library

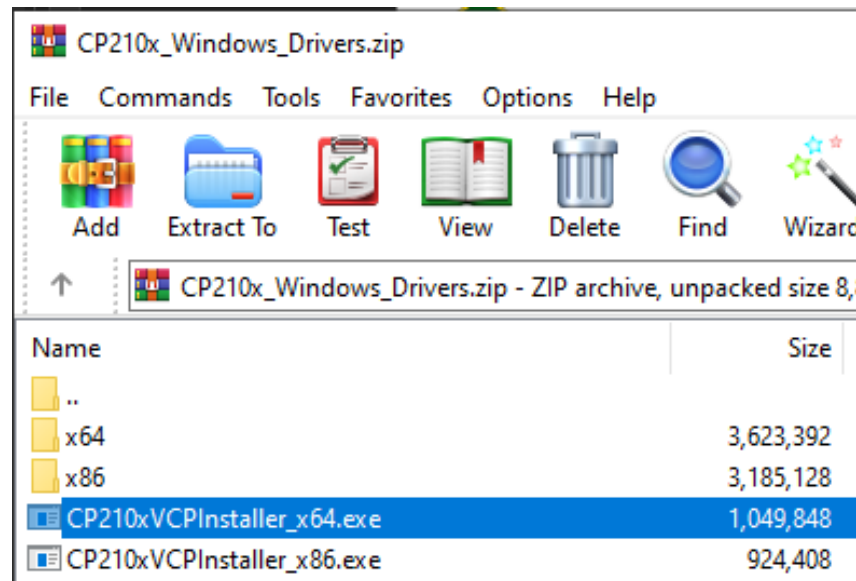
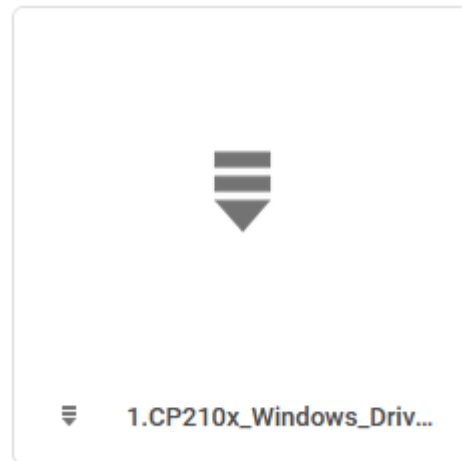
- Tools > Manage Libraries





# Requirement2 – USB Driver

- Download & Install USB Driver x64
- Link: [s.id/iotblynk](https://s.id/iotblynk)





# Requirement 3&4 – Blynk App

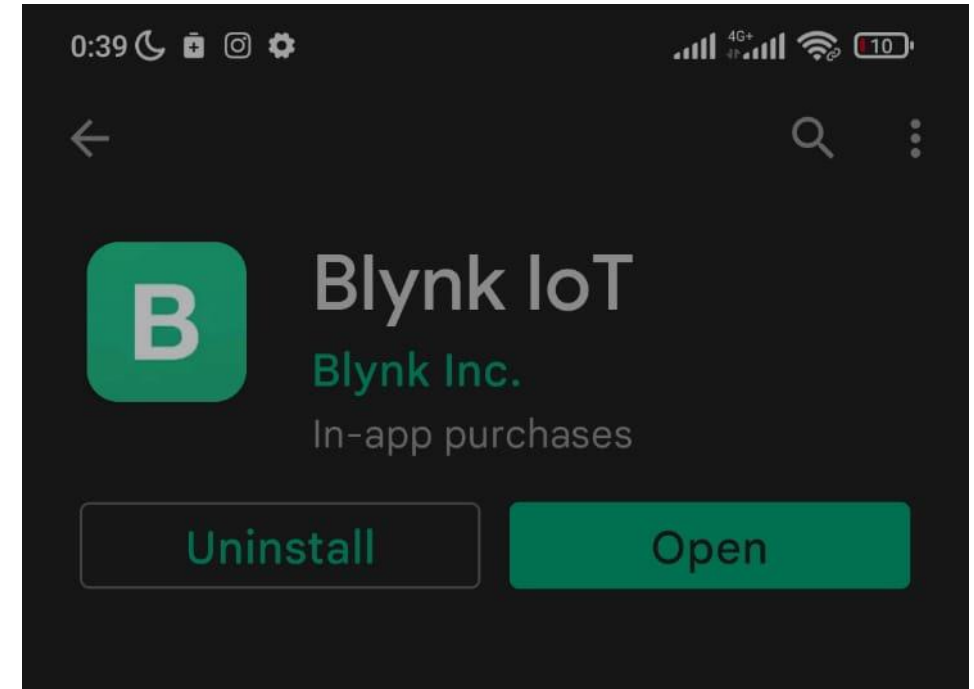
**Lakukan Instalasi, Daftar, Login Blynk App**

## **3. Blynk Android**

<https://play.google.com/store/apps/details?id=cloud.blynk>

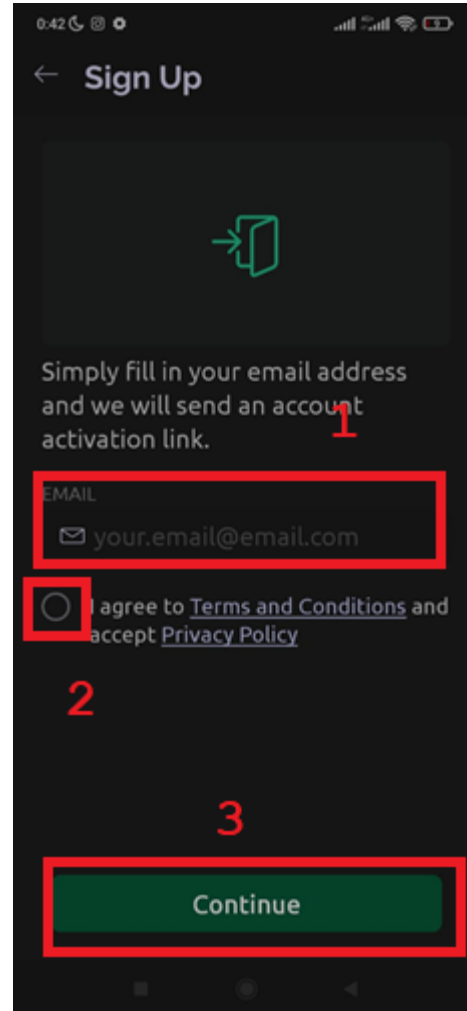
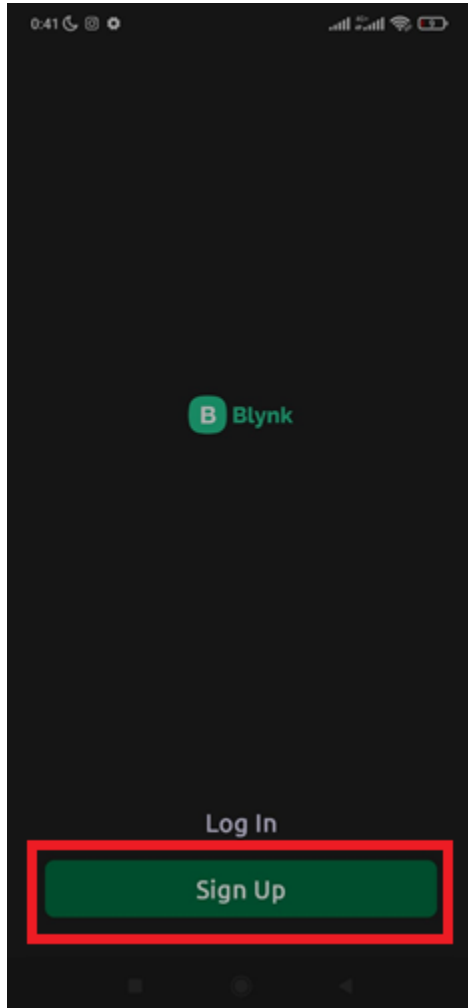
## **4. Blynk Browser**

<https://blynk.cloud/dashboard/login>





# Requirement 3&4 – Blynk App







# SESI LANJUTAN: FIRST TEST

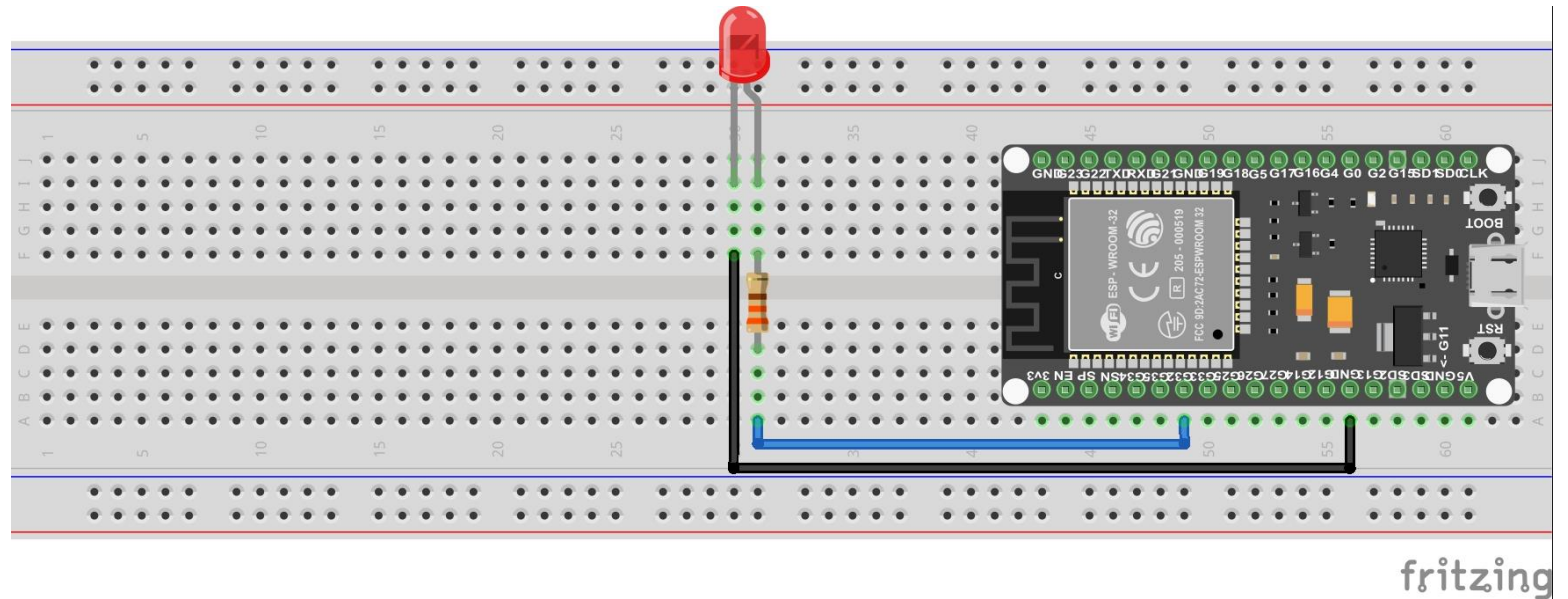


# First Test - Rangkaian

Rangkailah Seperti Gambar Berikut

## LED

Led + (Kaki Panjang)	Resistor + Pin 32
Led - (Kaki Pendek)	GND





# First Test - Program

```
#define led_pin 23

void setup() {
    pinMode(led_pin, OUTPUT); //Led Output
}

void loop() {
    digitalWrite(led_pin, HIGH); //Led ON
    delay(2000);
    digitalWrite(led_pin, LOW); //Led OFF
    delay(2000);
}
```

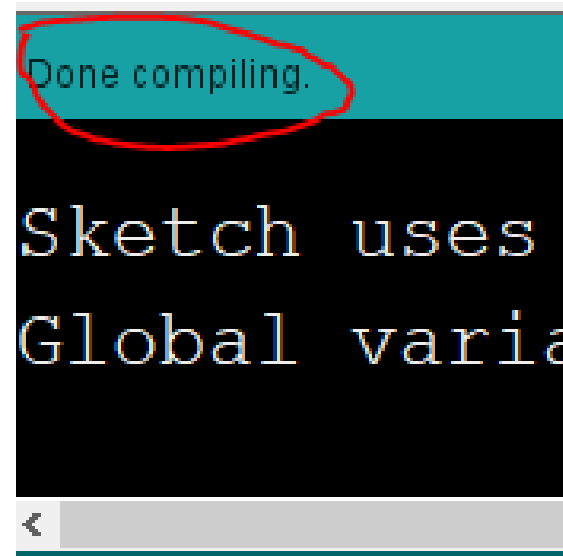
- Jika Sudah Selesai, **Verify**

sketch\_jun16a | Arduino 1.8.16

File Edit Sketch Tools Help



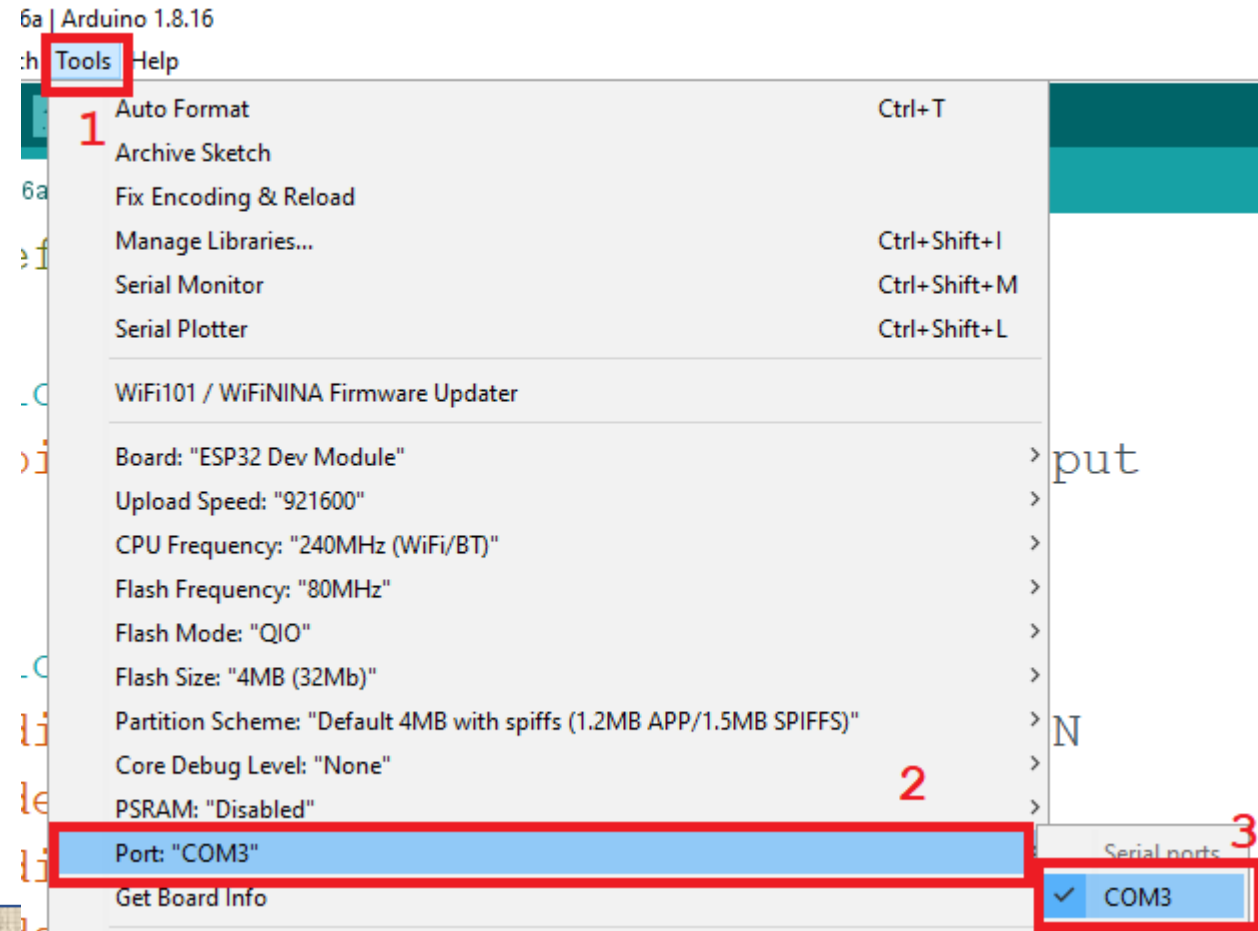
- Tidak Ada Error = **Done Compiling**



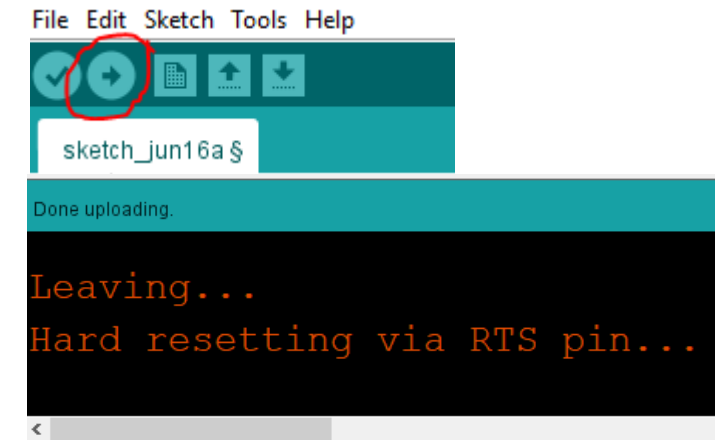


# First Test - Upload

- 1. Pilih Port & Com



- 2. Upload



## Kesimpulan:

Jika rangkaian benar, maka led akan nyala dan mati



# SESI LANJUTAN: RANGKAIAN & BLYNK APP



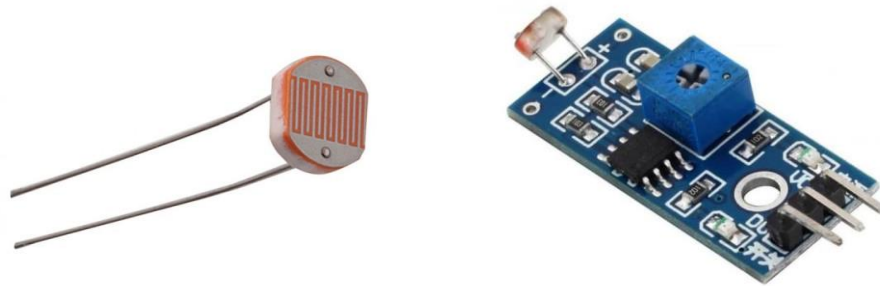
# Blynk App

**Sample Project Hari Ini:**

**PROJECT1:** Kontrol Lampu IoT



**PROJECT2:** Mengirim Data Sensor Cahaya LDR (Light Dependent Resistor)





# Get Token Blynk App

Token berfungsi untuk menghubungkan koneksi data dari alat ke software blynk

**1** Search icon

**2** My devices


**3** Quickstart Device

Device name	Device owner	Status	Device model
Device	Wahjoe	Offline	
Quickstart Device	Wahjoe	Offline	



# Get Token Blynk App

Token berfungsi untuk menghubungkan koneksi data dari alat ke software blynk

**Quickstart Device** Offline ⋮  
Wahjoe My organization - 9959DK  
Add Tag

Dashboard

Timeline

Device Info

Metadata

Actions Log

STATUS

● Offline

DEVICE ACTIVATED

12:24 PM Mar 22, 2022

LAST UPDATED

12:24 PM Mar 22, 2022

LATEST METADATA UPDATE

12:49 PM Mar 22, 2022

FIRMWARE CONFIGURATION

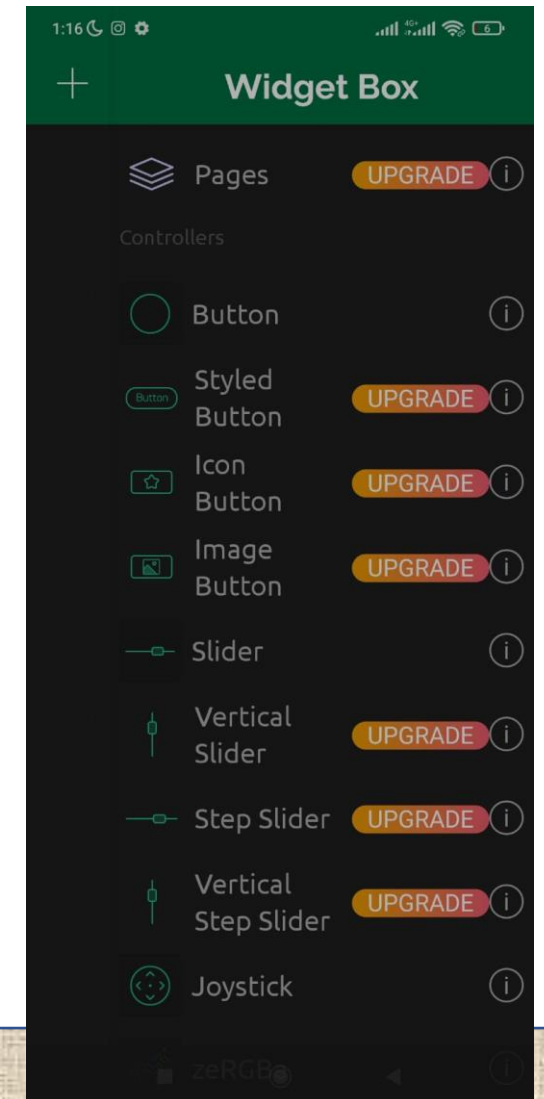
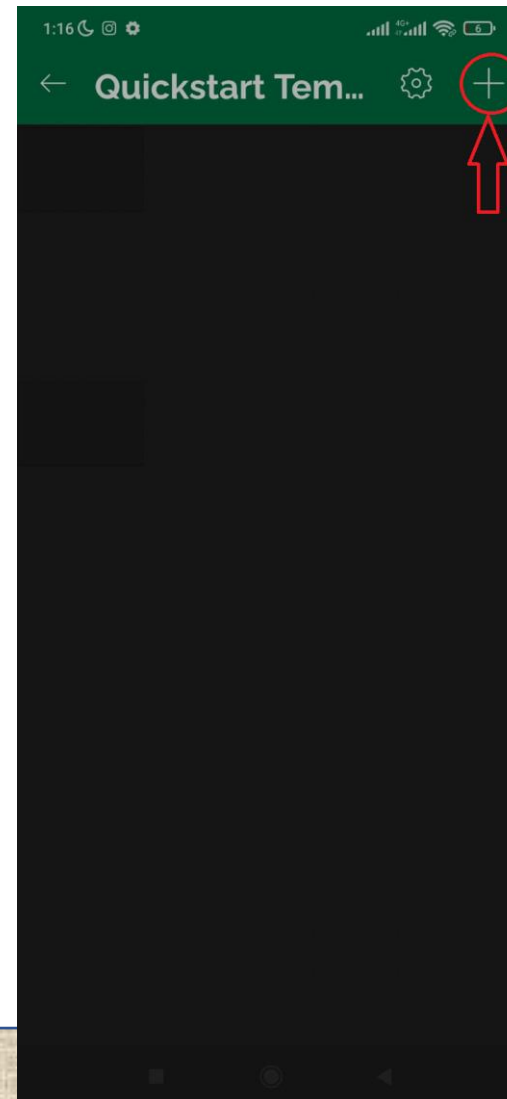
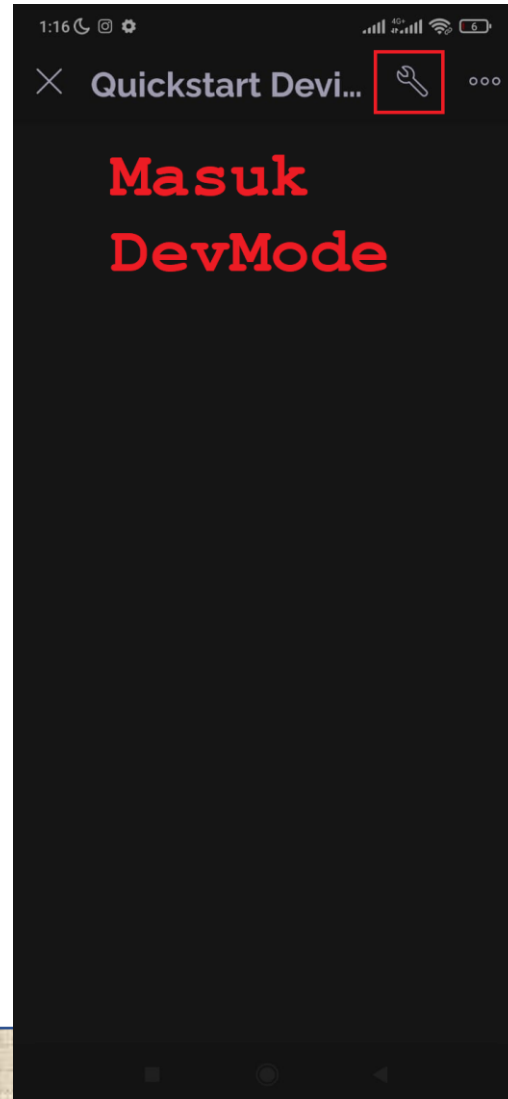
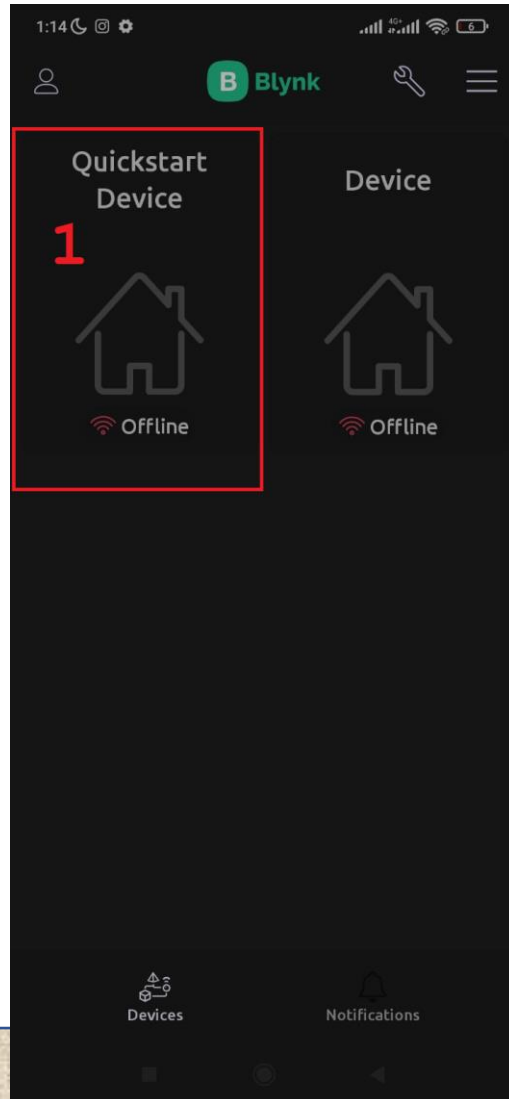
```
#define BLYNK_TEMPLATE_ID "TMPL_F9xpXCF"
#define BLYNK_DEVICE_NAME "Quickstart Template"
#define BLYNK_AUTH_TOKEN
"dJLgdN0EJt1shUnKJnEJTbpD...hB79"
```

Template ID, Device Name, and AuthToken should be declared at the very top of the firmware code.





# Blynk App – First Setup

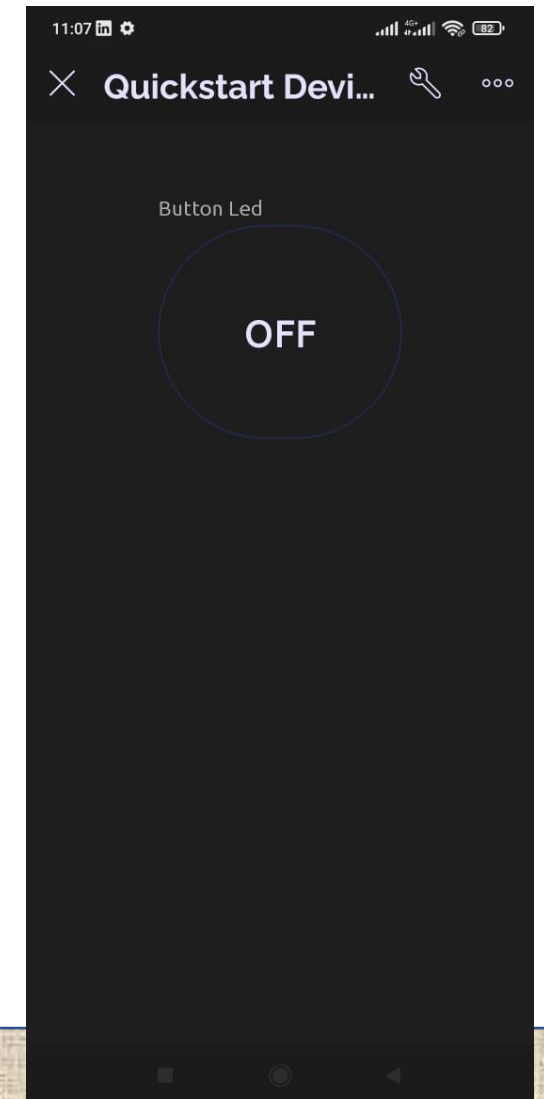
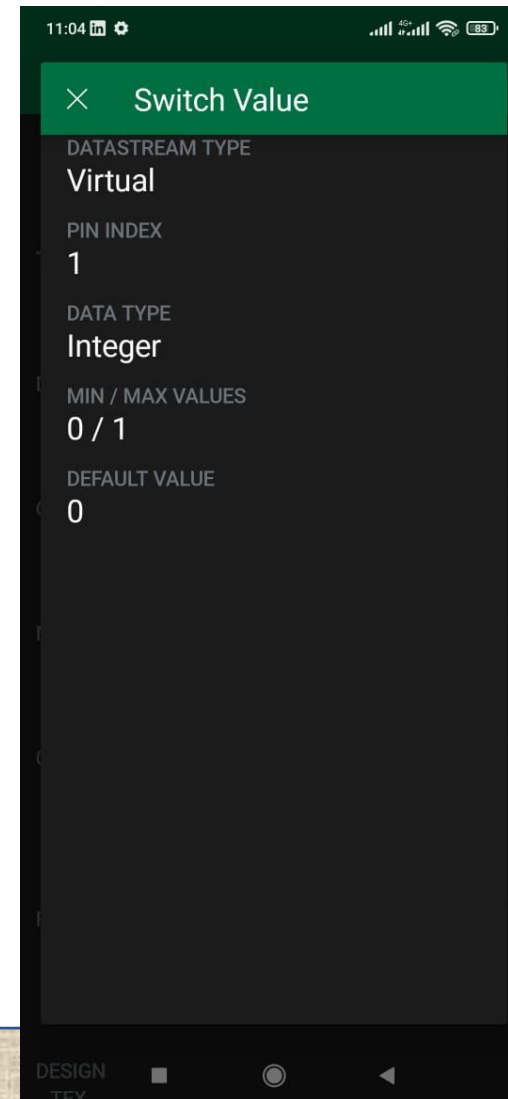
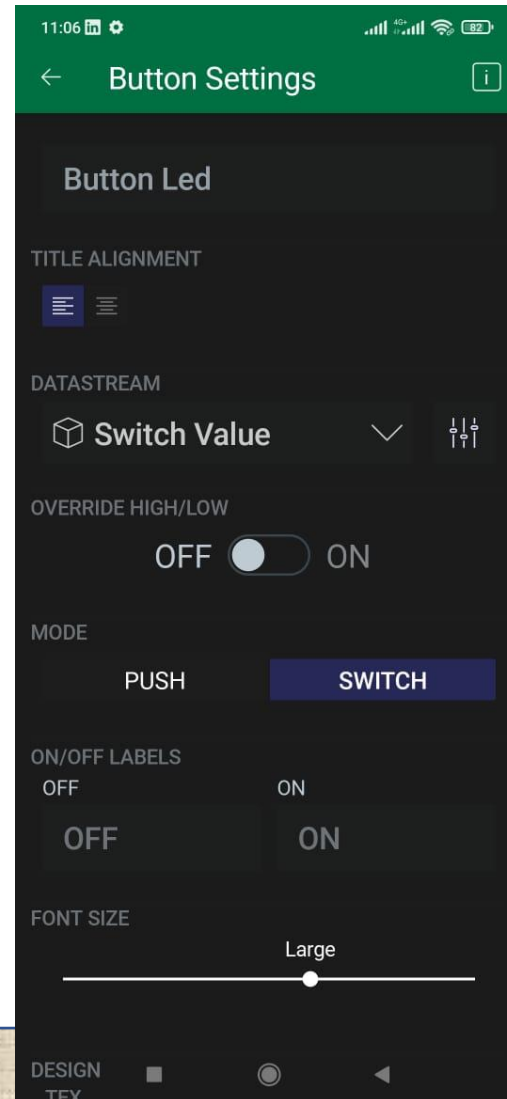
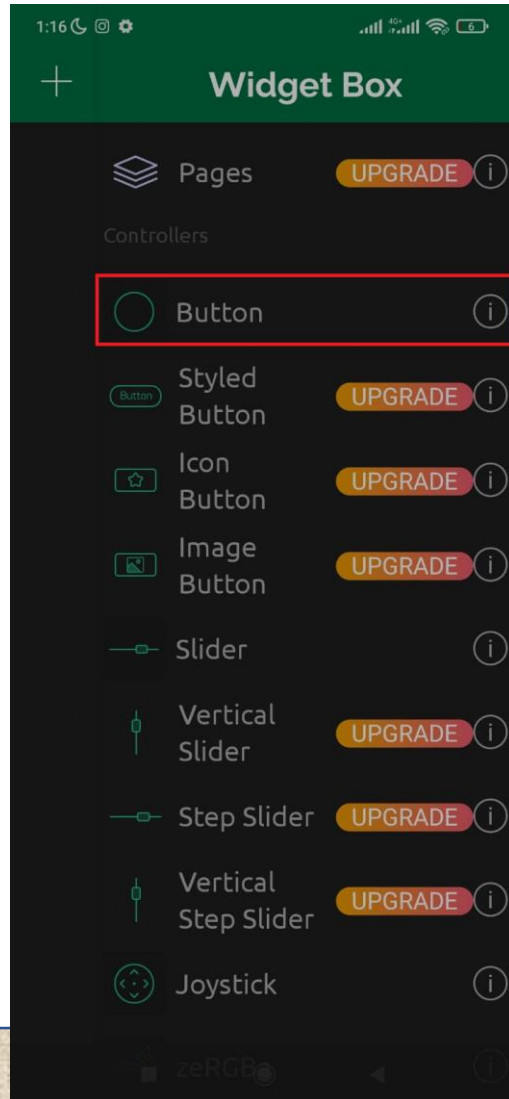




# PROJECT1: Kontrol Lampu IoT



# Blynk App – Project 1 Blynk - Widget



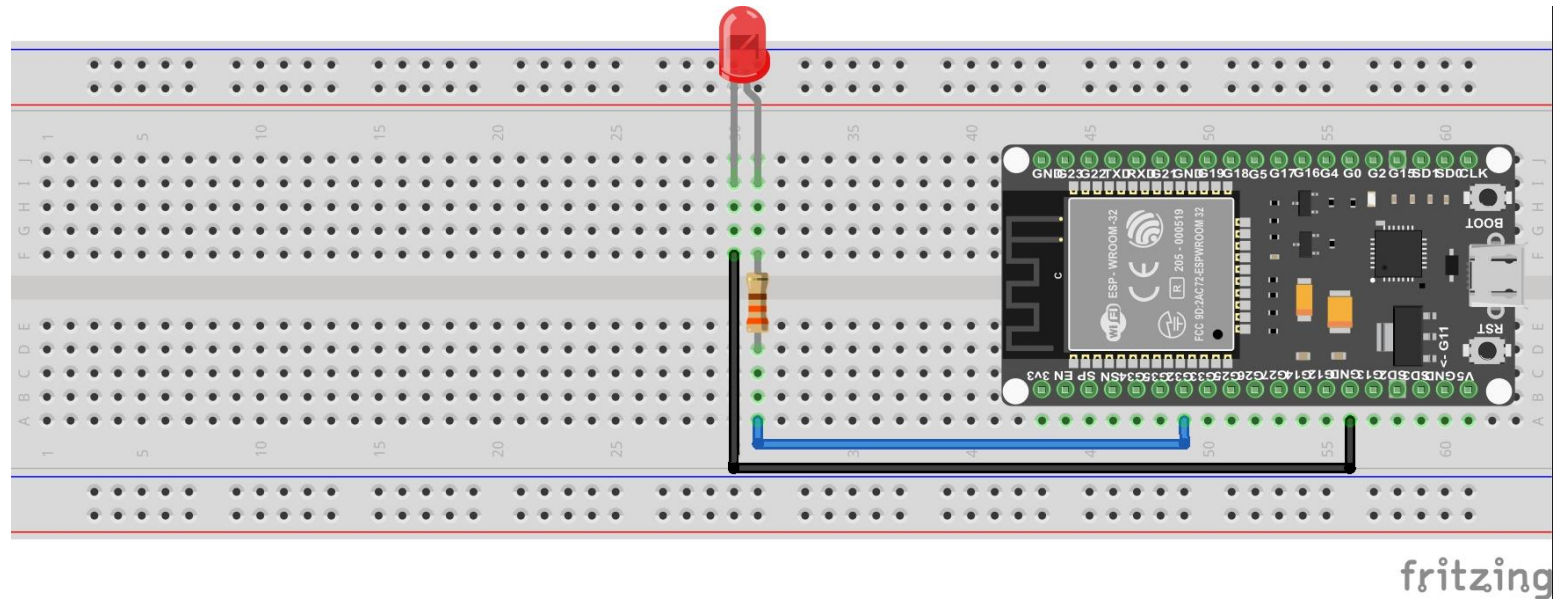


# Blynk App – Project 1 Blynk - Rangkaian

Rangkailah Seperti Gambar Berikut

## LED

Led + (Kaki Panjang)	Resistor + Pin 32
Led – (Kaki Pendek)	GND





# Blynk App – Project 1 Blynk - Program

```
#include <WiFi.h>
#include <BlynkSimpleEsp32.h>
#define BLYNK_NO_BUILTIN
#define BLYNK_NO_FLOAT
#define BLYNK_PRINT Serial
#define BLYNK_TEMPLATE_ID "TMPL_F9xpXCF"
#define BLYNK_DEVICE_NAME "Quickstart Template"
#define BLYNK_AUTH_TOKEN "dJLgdN0EJt1shUnKJnEJTbpD1irqhB79"

//Led pin 32
#define led 32

//Blynk Wifi Config
char ssid[] = "robotku";
char pass[] = "robot1234";
char auth[] = BLYNK_AUTH_TOKEN;

BLYNK_WRITE(V1) {
  int btn = param.asInt(); //Cek Data Button
  Serial.print("BUTTON:"); Serial.println(btn);

  if (btn == 1) digitalWrite(led, HIGH); //1-ON , 0-OFF
  if (btn == 0) digitalWrite(led, LOW);
}

void setup() {
  Serial.begin(115200);
  pinMode(led, OUTPUT); //Led Output

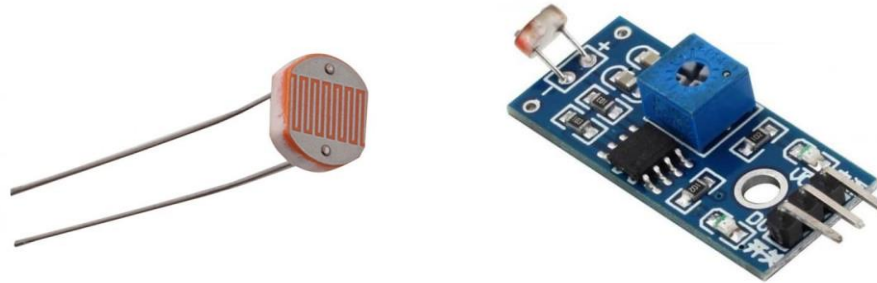
  Blynk.begin(auth, ssid, pass, "blynk.cloud", 80); //Blynk Config
  Serial.println(Blynk.connected());
  Serial.println("OK");
}

void loop() {
  Blynk.run();
}
```

**RAW:** [github.com/bywahjoe/MAN1KDR-IOT22](https://github.com/bywahjoe/MAN1KDR-IOT22)



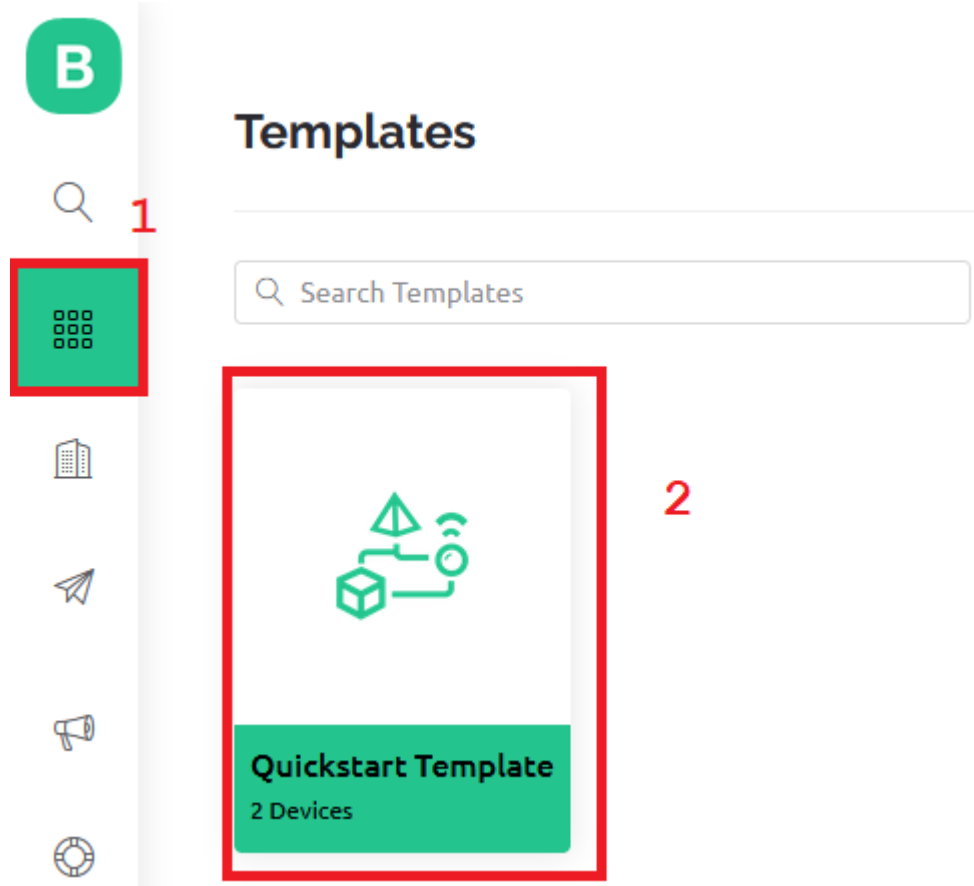
## PROJECT2: Mengirim Data Sensor Cahaya LDR (Light Dependent Resistor)



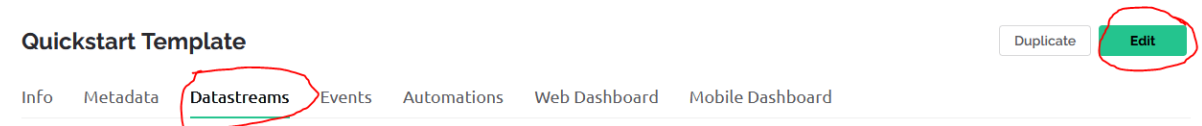


# Blynk App – Project 2 Blynk – Add Datastream

Website: <https://blynk.cloud>



- Datastreams > Edit



- Klik New Datastream

+ New Datastream



# Blynk App – Project 2 Blynk – Add Datastream

- Mengisi Virtual Pin Datastream

Virtual Pin Datastream

NAME  ALIAS  ☐

PIN  DATA TYPE

UNITS

MIN  MAX  DEFAULT VALUE

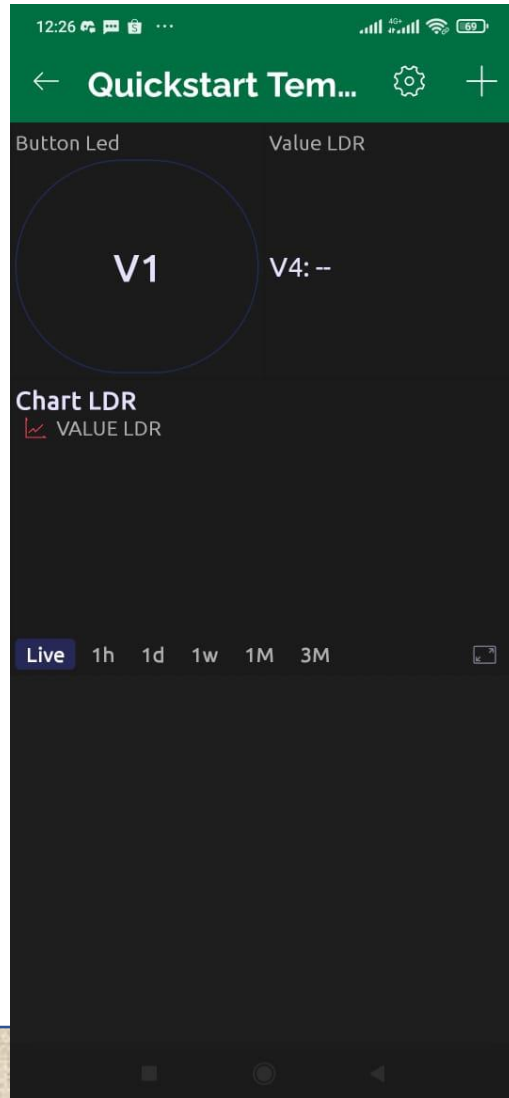
☐ ADVANCED SETTINGS

- Jika sudah selesai, Save and Apply



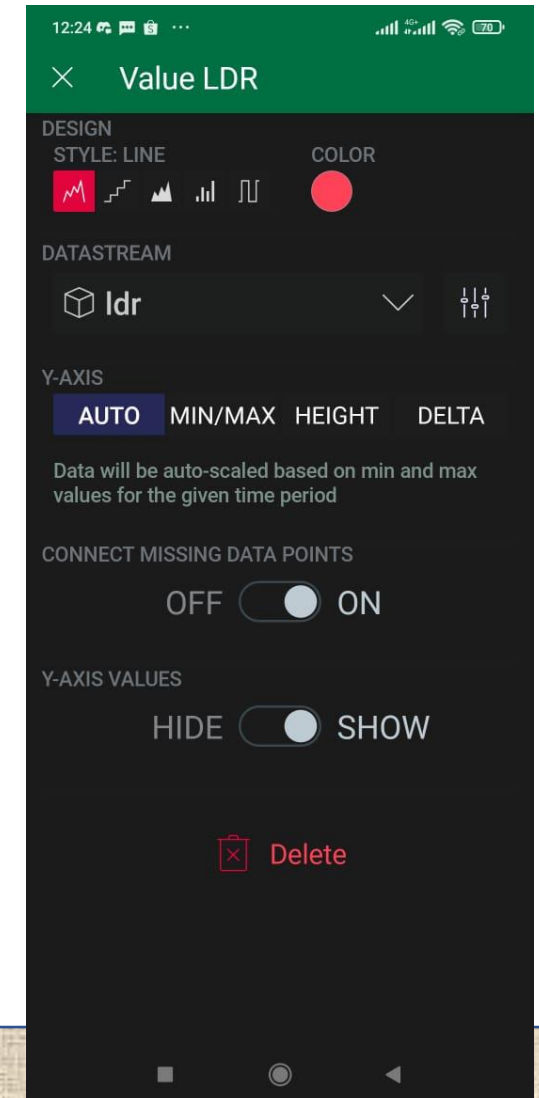
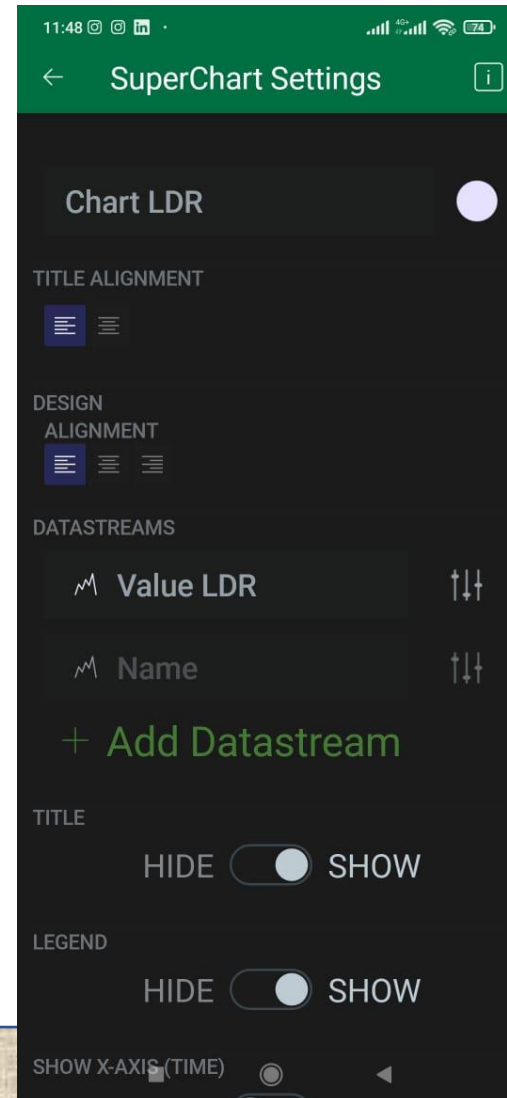
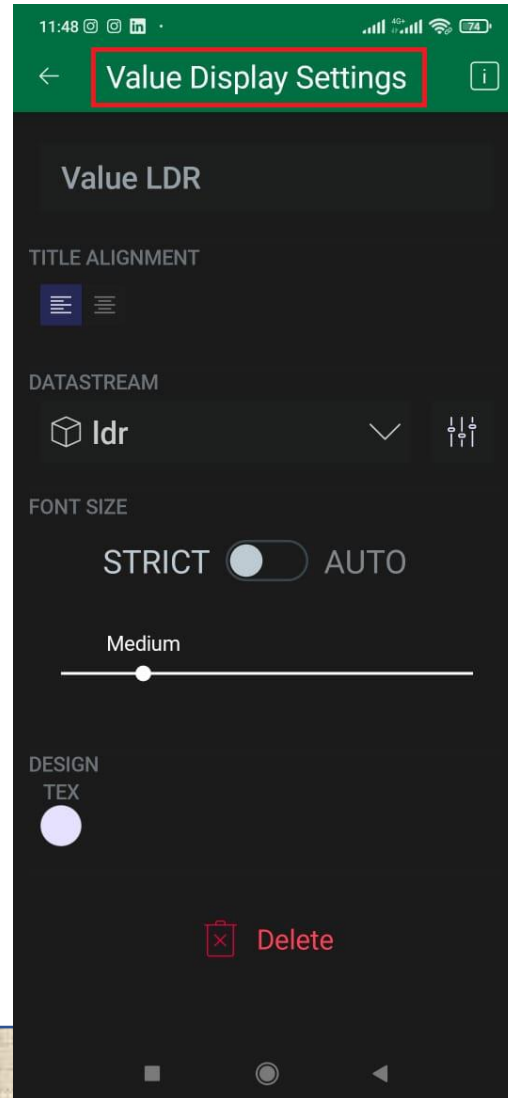
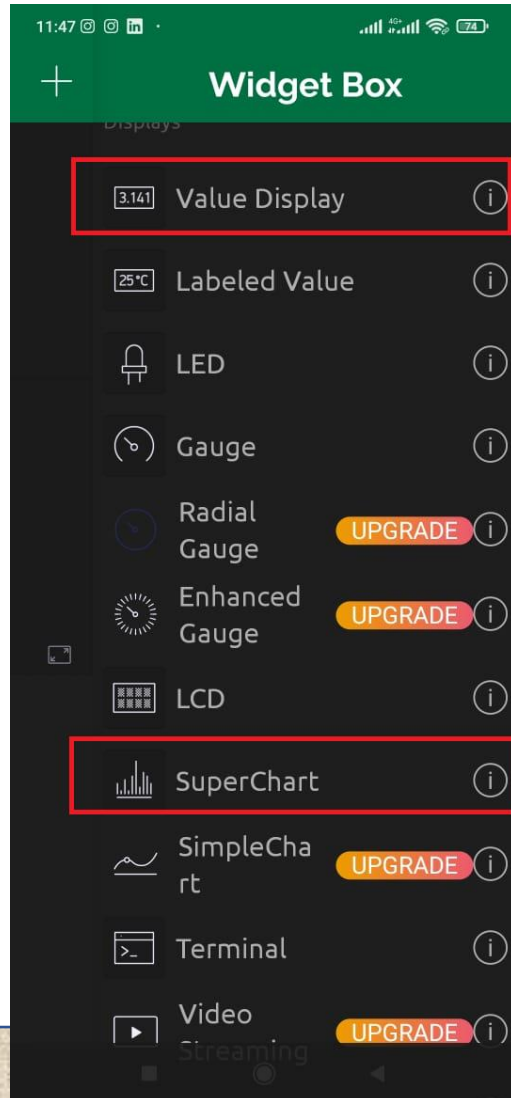


# Blynk App – Project 2 Blynk - Widget





# Blynk App – Project 2 Blynk - Widget





# Blynk App – Project 2 Blynk - Rangkaian

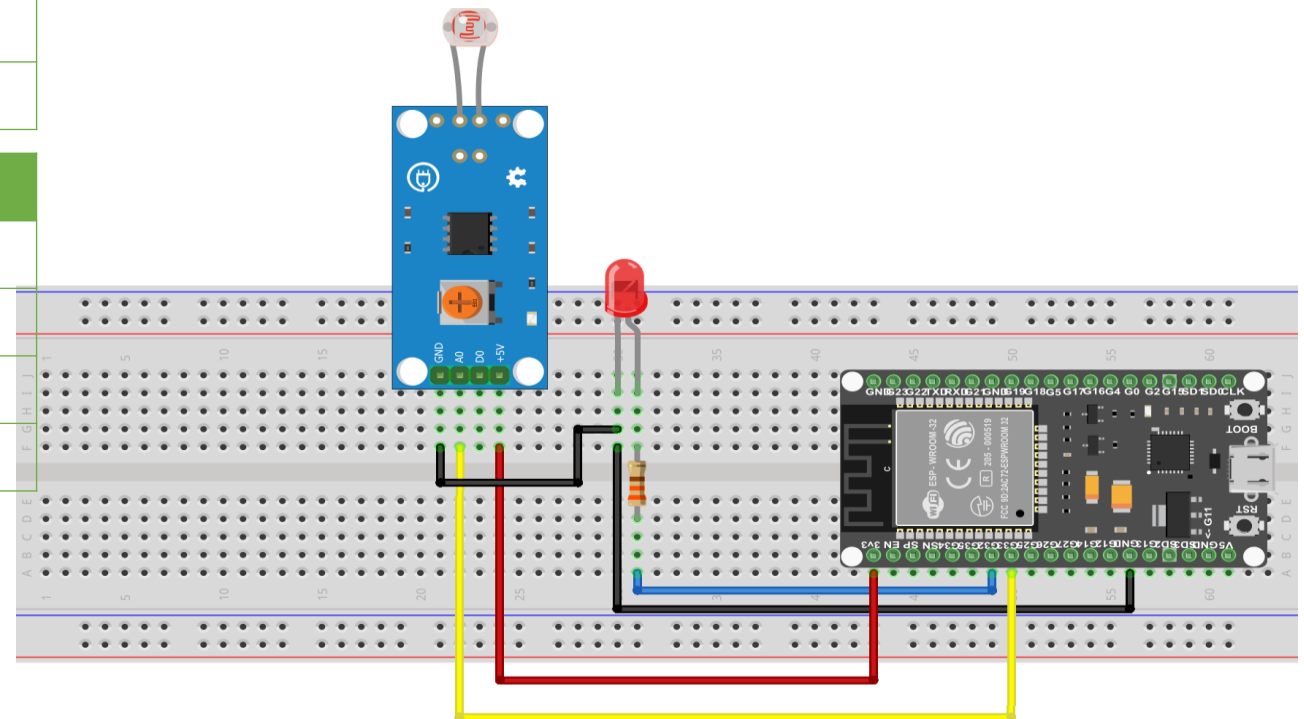
Rangkailah Seperti Gambar Berikut

## LED

Led + (Kaki Panjang)	Resistor + Pin 32
Led – (Kaki Pendek)	GND

## LDR

AO	Pin 33
DO	-
GND	GND
VCC	3.3



fritzing



# Blynk App – Project 2 Blynk - Program

```
#include <WiFi.h>
#include <BlynkSimpleEsp32.h>
#define BLYNK_NO_BUILTIN
#define BLYNK_NO_FLOAT
#define BLYNK_PRINT Serial
#define BLYNK_TEMPLATE_ID "TMPL_F9xpXCF"
#define BLYNK_DEVICE_NAME "Quickstart Template"
#define BLYNK_AUTH_TOKEN "dJLgdN0EJt1shUnKJnEJTbpD1irqhB79"
//PIN
#define led 32
#define ldr 33
//Blynk Wifi Config
char ssid[] = "robotku";
char pass[] = "robot1234";
char auth[] = BLYNK_AUTH_TOKEN;
BlynkTimer timer;

void sendSensorLDR() {
  int val=analogRead(ldr);
  Serial.print("Val LDR:"); Serial.println(val);
  Blynk.virtualWrite(V4, val);}
BLYNK_WRITE(V1) {
  int btn = param.asInt(); //Cek Data Button
  Serial.print("BUTTON:"); Serial.println(btn);

  if (btn == 1)digitalWrite(led, HIGH); //1-ON , 0-OFF
  if (btn == 0)digitalWrite(led, LOW);}
void setup() {
  Serial.begin(115200);
  pinMode(led, OUTPUT); //Led Output
  Blynk.begin(auth, ssid, pass, "blynk.cloud", 80); //Blynk Config
  Serial.println(Blynk.connected());
  Serial.println("OK");
  timer.setInterval(1000L, sendSensorLDR); //Timer Sensor
}
void loop() {
  Blynk.run();timer.run();
}
```

**RAW:** [github.com/bywahjoe/MAN1KDR-IOT22](https://github.com/bywahjoe/MAN1KDR-IOT22)



TERIMA KASIH...

Kesan & Pesan: <https://s.id/iotform>