RASPBERRY PI

Program MQTT Client

- **Inisialisasi**

```python
import time
import ttn

app_id = "lorawan_lg01s_gateway"
access_key = "ttn-account-v2.KRlh5dbuKtFtTJV-i07SrpmhCY_oCAjkzi7ekYggQUI"
dev_id = "ttgo_lora_esp32"
payload = { "led_state": "on" }


handler = ttn.HandlerClient(app_id, access_key)
mqtt_client = handler.data()
mqtt_client.set_uplink_callback(uplink_callback)
mqtt_client.connect()
```

- **Uplink data**

```python
def uplink_callback(msg, client):
    global ttnVoltage3, ttnCurrent3, ttnPower3, ttnEnergy3, ttnPf3

    print("Received uplink from ", msg.dev_id)
    print(msg.payload_fields)

    ttnVoltage1R = msg.payload_fields.Voltage3
    ttnCurrent1R = msg.payload_fields.Current3
    ttnPower1R = msg.payload_fields.Power3
    ttnEnergy1R = msg.payload_fields.Energy3
    ttnPf1R = msg.payload_fields.Pf3
```

- **Downlink data**

```python
def uplink_callback(msg, client):
    print("Received uplink from ", msg.dev_id)
    print(msg.payload_fields)

    mqtt_client.set_downlink_callback(downlinkCallback)
    mqtt_client.send(dev_id, payload, port=1, conf=False, sched="replace")

def downlinkCallback(mid, client):
    print("Received downlink with id ", mid)
```

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Program Realtime Firebase

- Inisialisasi

```
import pyrebase

config = {
  "apiKey": "",
  "authDomain": "monitoring-energy-2.firebaseapp.com",
  "databaseURL": "https://monitoring-energy-2-default-rtdb.firebaseio.com/",
  "storageBucket": "monitoring-energy-2.appspot.com"
}
firebase = pyrebase.initialize_app(config)
db = firebase.database()
```

- Read data

```
valRelay1 = db.child("Control_Relay1").get().val()
print("Read Value Relay 1: "+ str(valRelay1.get("valRelay1")))
```

- Write data

```
pzem1R = {"Voltage1R":ttnVoltage3,
          "Current1R":ttnCurrent3,
          "Power1R":ttnPower3,
          "Energy1R":ttnEnergy3,
          "Power_Factor1R":ttnPf3
          }

db.child("Sensor_PZEM1_R").set(pzem1R)
```

Program Firestore

- Inisialisasi

```
import firebase_admin
from firebase_admin import credentials
from firebase_admin import firestore

cred = credentials.Certificate("/home/pi/Projek Monitoring Energi/monitoring-energy-2-firebase-adminsdk-dddqf-bda3c4c53b.json")
firebase_admin.initialize_app(cred)

sPzem1R_ref = firestore.client().collection('Sensor_PZEM1_R')
```

- Write data

```
sPzem1R_ref.add({
        "Voltage1R":ttnVoltage1R,
        "Current1R":ttnCurrent1R,
        "Power1R":ttnPower1R,
        "Energy1R":ttnEnergy1R,
        "Power_Factor1R":ttnPf1R,
        "timestamp": firestore.SERVER_TIMESTAMP
    })
```
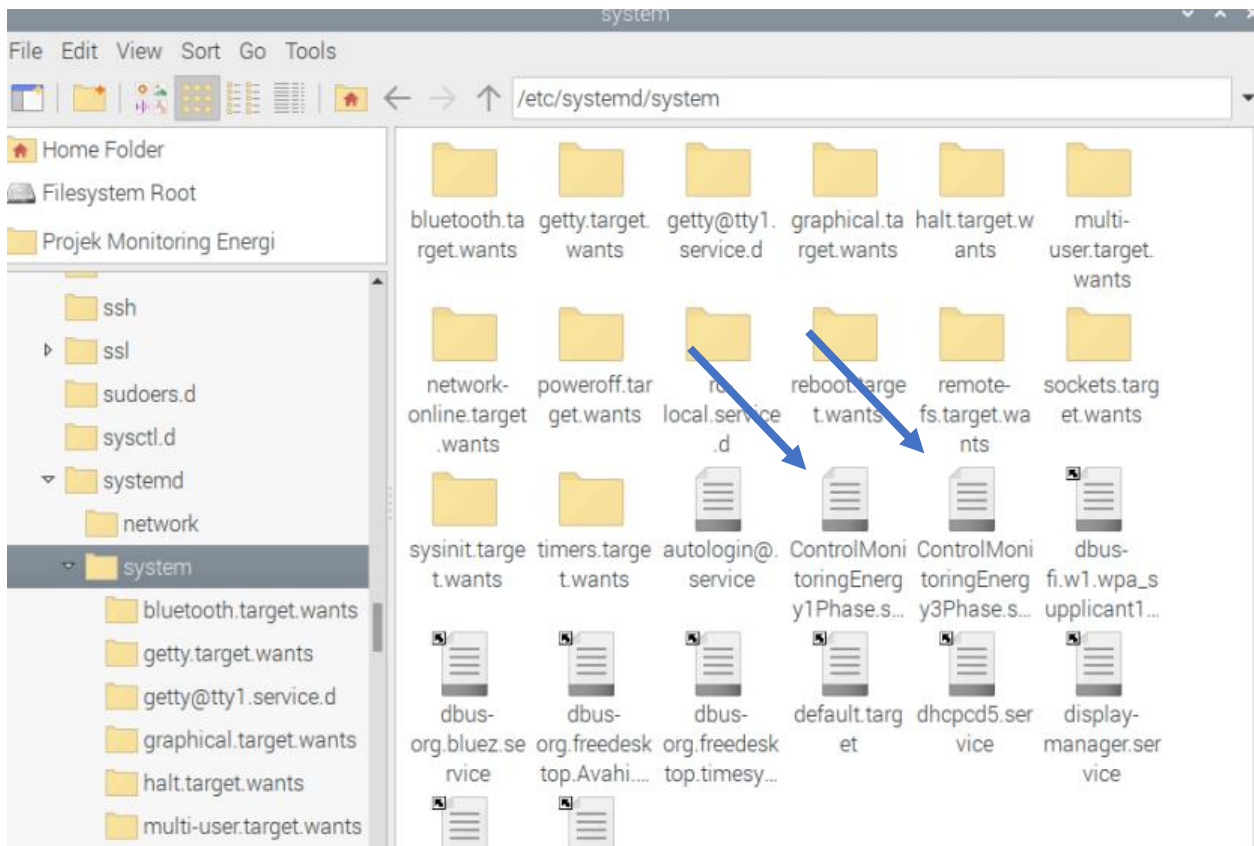
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Program SystemCTL

- Configurasi


```
[Unit]
Description=My service
After=network.target

[Service]
ExecStart=/usr/bin/python3 -u Firebase_MQTT_Client-Raspi_1Fasa.py
WorkingDirectory=/home/pi/myscript
StandardOutput=inherit
StandardError=inherit
Restart=always
User=pi

[Install]
WantedBy=multi-user.target
```

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- <mark>Start</mark>

  sudo systemctl start ControlMonitoringEnergy1Phase.service

  sudo systemctl start ControlMonitoringEnergy3Phase.service

- <mark>Stop</mark>

  sudo systemctl stop ControlMonitoringEnergy1Phase.service

  sudo systemctl stop ControlMonitoringEnergy3Phase.service

- <mark>Enable</mark>

  sudo systemctl enable ControlMonitoringEnergy1Phase.service

  sudo systemctl enable ControlMonitoringEnergy3Phase.service

- <mark>Disable</mark>

  sudo systemctl disable ControlMonitoringEnergy1Phase.service

  sudo systemctl disable ControlMonitoringEnergy3Phase.service

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