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LAMPIRAN

Lampiran 1 Dokumentasi Alat





Lampiran 2 Pengerjaan alat dan Kalibrasi sensor





Lampiran 3 Dokumentasi Perkembangan Jamur

Hari	Dokumentasi
0	
1	
3	
5	



	
7	
10	
14	
15	



	
16	
17	
18	



19	
20	

Lampiran 4 Program Alat

```
// Kode utama
#define BLYNK_TEMPLATE_ID    "TMPL66994V4oi"
#define BLYNK_TEMPLATE_NAME  "ocang"
#define BLYNK_AUTH_TOKEN     "TU6wAQ_wTvjJF6uDu1sfioy79ibBjXN-"

#include <WiFi.h>
#include <WiFiClient.h>
#include <Wire.h>
#include <LiquidCrystal_I2C.h>
#include <DHT.h>
#include <BH1750.h>
#include <BlynkSimpleEsp32.h>

const int relayPins[] = {12, 14, 4, 15};
#define DHT_SENSOR_PIN 13
#define DHT_SENSOR_TYPE DHT22
```



```
.sensor(DHT_SENSOR_PIN, DHT_SENSOR_TYPE);
.ightMeter;
ix;

ystal_I2C lcd(0x27, 20, 4);
```

```

// Kalibrasi Nilai
float suhu_offset = 0.0;
float kelembapan_offset = -5.0;
float lux_offset = 0.0;

char auth[] = BLYNK_AUTH_TOKEN;
char ssid[] = "Xiaomi 12";
char pass[] = "12345678";

void setup() {
  Serial.begin(115200);
  Wire.begin();
  lcd.init();
  lcd.backlight();
  dht_sensor.begin();
  lightMeter.begin();

  for (int i = 0; i < 4; i++) {
    pinMode(relayPins[i], OUTPUT);
    digitalWrite(relayPins[i], LOW);
  }

  Blynk.begin(auth, ssid, pass);

  while (Blynk.connect() == false) {
    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("Connecting to Blynk");
    delay(1000);
  }
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("WiFi/Blynk Connected");
  delay(1500);
}

void loop() {
  Blynk.run();
  float humi = dht_sensor.readHumidity() + kelembapan_offset;
  float tempC = dht_sensor.readTemperature() + suhu_offset;
  float tempF = dht_sensor.readTemperature(true) + suhu_offset;
  lightMeter.readLightLevel() + lux_offset;

  .ear(); // Hapus tampilan LCD setiap kali loop dimulai

  .snan(humi)) {

```



```

Serial.print("Kelembapan: ");
Serial.print(humi);
Serial.print("%");
lcd.setCursor(0, 0);
lcd.print("Kelembapan: ");
lcd.setCursor(11, 0);
lcd.print(humi);
lcd.print("%");
} else {
  Serial.println("Failed to read humidity sensor!");
  lcd.setCursor(0, 0);
  lcd.print("Humidity Error");
}

if (!isnan(tempC)) {
  Serial.print("Temperature: ");
  Serial.print(tempC);
  Serial.print("°C ~ ");
  Serial.print(tempF);
  Serial.println("°F");
  lcd.setCursor(0, 1);
  lcd.print("Suhu      : ");
  lcd.setCursor(11, 1);
  lcd.print(tempC);
  lcd.print(" C ");
} else {
  Serial.println("Failed to read temperature sensor!");
  lcd.setCursor(0, 1);
  lcd.print("Temperature Error");
}

if (!isnan(lux)) {
  Serial.print("Light: ");
  Serial.print(lux);
  Serial.println(" lx");
  lcd.setCursor(0, 2);
  lcd.print("Light      : ");
  lcd.setCursor(11, 2);
  lcd.print(lux);
  lcd.print(" lx ");
} else {
  Serial.println("Failed to read light sensor!");
  lcd.setCursor(0, 2);
  lcd.print("Light Error");
}

virtualWrite(V0, tempC);

```



```

Blynk.virtualWrite(V1, humi);
Blynk.virtualWrite(V2, lux);

// Kontrol relay dan lainnya
controlRelay(tempC, humi, lux);
delay(5000); // Menambahkan waktu delay yang lebih panjang
}

void controlRelay(float temperature, float humidity, float
lightIntensity) {
    // Kontrol relay berdasarkan nilai suhu, kelembapan, dan
    intensitas cahaya yang terbaca
    // Ganti logika relay sesuai kebutuhan Anda
    if (temperature > 29) {
        digitalWrite(relayPins[0], LOW);
        Blynk.virtualWrite(V16, HIGH);
    } else {
        digitalWrite(relayPins[0], HIGH);
        Blynk.virtualWrite(V16, LOW);
    }
    if (humidity < 65.5) {
        digitalWrite(relayPins[1], LOW);
        Blynk.virtualWrite(V17, HIGH);
    } else {
        digitalWrite(relayPins[1], HIGH);
        Blynk.virtualWrite(V17, LOW);
    }
    if (lightIntensity < 150) {
        digitalWrite(relayPins[2], LOW);
        Blynk.virtualWrite(V18, HIGH);
    } else if (lightIntensity > 450){
        digitalWrite(relayPins[2], HIGH);
        Blynk.virtualWrite(V18, LOW);
    }
    if (temperature < 26.5 || humidity > 90) {
        digitalWrite(relayPins[3], LOW);
        Blynk.virtualWrite(V19, HIGH);
    } else {
        digitalWrite(relayPins[3], HIGH);
        Blynk.virtualWrite(V19, LOW);
    }
}
}

```



5 Data

	Suhu	Kelembapan	Intensitas Cahaya
2024 00:00	26,05	96,10	169,17

01/02/2024 01:00	26,45	95,02	167,50
01/02/2024 02:00	26,65	95,05	167,66
01/02/2024 03:00	26,52	94,90	166,87
01/02/2024 04:00	26,63	94,65	167,31
01/02/2024 05:00	26,75	94,68	165,33
01/02/2024 06:00	26,75	92,36	162,01
01/02/2024 07:00	26,80	90,22	159,53
01/02/2024 08:00	26,95	90,14	190,43
01/02/2024 09:00	27,05	89,81	185,18
01/02/2024 10:00	27,98	89,74	172,03
01/02/2024 11:00	27,85	89,53	171,91
01/02/2024 12:00	27,77	89,62	171,60
01/02/2024 13:00	27,85	89,25	172,37
01/02/2024 14:00	27,55	89,38	172,40
01/02/2024 15:00	27,26	89,53	171,42
01/02/2024 16:00	26,94	89,71	171,68
01/02/2024 17:00	26,85	89,72	171,47
01/02/2024 18:00	26,78	89,88	171,26
01/02/2024 19:00	26,63	90,05	171,70
01/02/2024 20:00	26,45	90,01	172,51
01/02/2024 21:00	26,54	90,22	171,09
01/02/2024 22:00	26,40	90,36	169,93
01/02/2024 23:00	26,67	89,98	225,98
02/02/2024 00:00	26,35	91,09	167,85
02/02/2024 01:00	25,95	94,01	167,40
02/02/2024 02:00	26,22	93,87	166,78
02/02/2024 03:00	26,46	92,50	166,79
02/02/2024 04:00	26,65	91,09	165,92
02/02/2024 05:00	26,52	90,87	165,60
02/02/2024 06:00	26,66	90,42	163,34
02/02/2024 07:00	26,64	90,14	162,16
02/02/2024 08:00	26,55	90,08	165,80
02/02/2024 09:00	26,68	90,02	184,71
02/02/2024 10:00	26,84	89,97	184,07
02/02/2024 11:00	26,75	90,03	183,72
02/02/2024 12:00	26,78	89,96	168,55
02/02/2024 13:00	27,14	88,67	166,75
02/02/2024 14:00	26,82	89,20	169,67
02/02/2024 15:00	26,77	89,27	170,58
02/02/2024 16:00	26,69	89,29	170,38
02/02/2024 17:00	26,65	89,29	169,25
02/02/2024 18:00	26,60	89,32	169,03
02/02/2024 19:00	26,75	89,33	169,18
02/02/2024 20:00	26,65	89,36	168,72



02/02/2024 21:00	26,64	89,35	168,91
02/02/2024 22:00	26,56	89,50	169,17
02/02/2024 23:00	26,52	89,51	169,60
03/02/2024 00:00	26,48	89,87	204,85
03/02/2024 01:00	26,47	89,87	206,74
03/02/2024 02:00	26,45	90,01	209,47
03/02/2024 03:00	26,40	89,98	208,64
03/02/2024 04:00	26,66	89,60	209,70
03/02/2024 05:00	26,71	89,56	213,03
03/02/2024 06:00	26,74	89,50	214,02
03/02/2024 07:00	27,05	89,33	215,83
03/02/2024 08:00	27,57	88,80	218,11
03/02/2024 09:00	28,01	85,11	219,24
03/02/2024 10:00	28,91	82,94	221,97
03/02/2024 11:00	29,55	80,45	223,41
03/02/2024 12:00	29,40	79,87	223,33
03/02/2024 13:00	30,10	75,23	223,41
03/02/2024 14:00	30,05	75,90	222,80
03/02/2024 15:00	30,09	73,89	222,73
03/02/2024 16:00	29,96	75,22	222,80
03/02/2024 17:00	29,75	75,53	222,35
03/02/2024 18:00	29,70	76,69	222,12
03/02/2024 19:00	29,49	79,81	221,89
03/02/2024 20:00	29,29	81,34	221,67
03/02/2024 21:00	29,03	82,88	221,67
03/02/2024 22:00	28,96	83,35	221,21
03/02/2024 23:00	28,62	86,35	221,67
04/02/2024 00:00	28,57	86,89	189,17
04/02/2024 01:00	28,40	87,42	187,50
04/02/2024 02:00	28,14	88,55	187,66
04/02/2024 03:00	27,76	90,09	186,87
04/02/2024 04:00	27,36	90,02	187,31
04/02/2024 05:00	27,20	89,93	185,33
04/02/2024 06:00	26,96	90,34	182,01
04/02/2024 07:00	26,71	90,82	179,53
04/02/2024 08:00	26,78	89,69	210,43
04/02/2024 09:00	27,77	84,25	205,18
04/02/2024 10:00	27,23	86,08	192,03
04/02/2024 11:00	26,95	87,12	191,91
04/02/2024 12:00	26,90	87,68	191,60
04/02/2024 13:00	27,25	87,88	192,37
04/02/2024 14:00	26,86	87,97	192,40
04/02/2024 15:00	26,77	87,60	191,42
04/02/2024 16:00	26,56	87,92	191,68



04/02/2024 17:00	26,54	88,11	191,47
04/02/2024 18:00	26,47	90,10	191,26
04/02/2024 19:00	26,45	90,80	191,70
04/02/2024 20:00	26,41	90,60	192,51
04/02/2024 21:00	26,30	90,70	191,09
04/02/2024 22:00	26,04	91,01	189,93
04/02/2024 23:00	26,43	90,04	221,97
05/02/2024 00:00	26,36	90,09	224,17
05/02/2024 01:00	26,40	90,02	222,50
05/02/2024 02:00	26,24	91,00	222,66
05/02/2024 03:00	26,48	90,60	221,87
05/02/2024 04:00	26,50	90,50	222,31
05/02/2024 05:00	26,52	90,40	220,33
05/02/2024 06:00	26,53	90,10	217,01
05/02/2024 07:00	26,60	89,95	214,53
05/02/2024 08:00	26,72	89,75	245,43
05/02/2024 09:00	26,83	89,54	240,18
05/02/2024 10:00	26,63	89,64	227,03
05/02/2024 11:00	26,69	89,58	226,91
05/02/2024 12:00	26,90	89,35	226,60
05/02/2024 13:00	27,60	85,40	227,37
05/02/2024 14:00	28,61	82,55	227,40
05/02/2024 15:00	28,55	82,67	226,42
05/02/2024 16:00	28,81	77,28	226,68
05/02/2024 17:00	28,65	78,48	226,47
05/02/2024 18:00	28,27	79,58	226,26
05/02/2024 19:00	28,01	81,31	226,70
05/02/2024 20:00	27,70	85,21	227,51
05/02/2024 21:00	27,41	85,66	226,09
05/02/2024 22:00	26,99	88,60	224,93
05/02/2024 23:00	26,81	88,71	225,19
06/02/2024 00:00	26,63	88,80	200,83
06/02/2024 01:00	26,61	88,91	200,08
06/02/2024 02:00	26,32	90,10	201,06
06/02/2024 03:00	26,39	89,86	201,52
06/02/2024 04:00	26,44	89,82	200,61
06/02/2024 05:00	26,51	89,56	201,21
06/02/2024 06:00	26,64	89,11	200,76
06/02/2024 07:00	26,81	89,24	200,98
06/02/2024 08:00	26,89	89,45	200,45
06/02/2024 09:00	26,93	89,02	200,76
06/02/2024 10:00	27,04	88,78	200,00
06/02/2024 11:00	27,11	88,75	200,30
06/02/2024 12:00	27,39	87,56	201,14



06/02/2024 13:00	27,61	85,83	202,50
06/02/2024 14:00	28,58	82,46	202,50
06/02/2024 15:00	28,27	83,90	203,41
06/02/2024 16:00	27,47	86,31	203,41
06/02/2024 17:00	27,36	86,60	204,17
06/02/2024 18:00	27,02	87,66	205,08
06/02/2024 19:00	26,88	88,10	206,36
06/02/2024 20:00	26,80	88,31	208,79
06/02/2024 21:00	26,70	88,61	211,06
06/02/2024 22:00	26,51	89,32	213,79
06/02/2024 23:00	26,36	90,43	205,00
07/02/2024 00:00	26,40	90,20	214,17
07/02/2024 01:00	26,47	89,97	212,50
07/02/2024 02:00	26,46	89,76	212,66
07/02/2024 03:00	26,53	89,70	211,87
07/02/2024 04:00	26,56	89,69	212,31
07/02/2024 05:00	26,60	89,45	210,33
07/02/2024 06:00	26,65	89,68	207,01
07/02/2024 07:00	26,43	90,03	204,53
07/02/2024 08:00	26,52	90,00	235,43
07/02/2024 09:00	26,58	89,92	230,18
07/02/2024 10:00	26,62	89,76	217,03
07/02/2024 11:00	26,70	89,78	216,91
07/02/2024 12:00	26,74	89,81	216,60
07/02/2024 13:00	26,83	89,68	217,37
07/02/2024 14:00	27,01	89,10	217,40
07/02/2024 15:00	27,26	88,85	216,42
07/02/2024 16:00	27,58	83,17	216,68
07/02/2024 17:00	27,43	86,31	216,47
07/02/2024 18:00	27,23	86,87	216,26
07/02/2024 19:00	27,08	87,48	216,70
07/02/2024 20:00	26,98	87,77	217,51
07/02/2024 21:00	26,84	88,21	216,09
07/02/2024 22:00	26,72	88,55	214,93
07/02/2024 23:00	26,58	89,11	215,19
08/02/2024 00:00	26,53	89,25	216,08
08/02/2024 01:00	26,65	89,41	215,85
08/02/2024 02:00	26,59	89,67	216,50
08/02/2024 03:00	26,51	89,67	215,50
08/02/2024 04:00	26,58	89,75	214,75
08/02/2024 05:00	26,62	89,77	215,39
08/02/2024 06:00	26,65	89,74	215,80
08/02/2024 07:00	26,72	89,53	213,33
08/02/2024 08:00	26,87	89,00	212,52



08/02/2024 09:00	26,94	88,59	221,03
08/02/2024 10:00	27,07	87,64	222,84
08/02/2024 11:00	27,26	85,16	217,21
08/02/2024 12:00	27,36	84,95	217,30
08/02/2024 13:00	27,47	82,42	218,84
08/02/2024 14:00	27,60	80,94	204,77
08/02/2024 15:00	27,71	79,84	204,92
08/02/2024 16:00	27,94	81,97	204,92
08/02/2024 17:00	27,88	81,87	205,08
08/02/2024 18:00	27,68	85,65	205,00
08/02/2024 19:00	27,44	86,31	205,00
08/02/2024 20:00	27,25	86,94	204,24
08/02/2024 21:00	26,99	87,17	204,92
08/02/2024 22:00	26,79	88,27	204,32
08/02/2024 23:00	26,63	90,52	204,24
09/02/2024 00:00	26,57	89,54	165,17
09/02/2024 01:00	26,65	89,25	163,50
09/02/2024 02:00	26,32	89,32	163,66
09/02/2024 03:00	26,85	90,24	162,87
09/02/2024 04:00	26,76	89,78	163,31
09/02/2024 05:00	25,97	89,41	161,33
09/02/2024 06:00	25,85	90,16	158,01
09/02/2024 07:00	26,72	90,92	155,53
09/02/2024 08:00	26,53	90,63	186,43
09/02/2024 09:00	26,49	88,87	181,18
09/02/2024 10:00	26,68	88,24	168,03
09/02/2024 11:00	26,52	89,52	167,91
09/02/2024 12:00	27,98	88,63	167,60
09/02/2024 13:00	27,43	88,23	168,37
09/02/2024 14:00	27,76	87,34	168,40
09/02/2024 15:00	27,63	87,82	167,42
09/02/2024 16:00	27,53	87,46	167,68
09/02/2024 17:00	27,33	87,58	167,47
09/02/2024 18:00	27,35	88,42	167,26
09/02/2024 19:00	27,49	89,47	167,70
09/02/2024 20:00	27,21	90,48	168,51
09/02/2024 21:00	26,53	90,56	167,09
09/02/2024 22:00	26,39	90,47	165,93
09/02/2024 23:00	26,42	90,74	166,19
10/02/2024 00:00	26,44	91,04	243,04
2024 01:00	26,58	91,45	242,59
2024 02:00	26,37	91,63	241,86
2024 03:00	26,63	92,83	241,66
2024 04:00	26,54	91,73	242,00



10/02/2024 05:00	25,87	91,43	240,76
10/02/2024 06:00	25,92	92,34	240,35
10/02/2024 07:00	26,34	92,16	276,78
10/02/2024 08:00	26,54	92,31	240,40
10/02/2024 09:00	26,47	92,42	238,80
10/02/2024 10:00	27,26	91,87	274,03
10/02/2024 11:00	27,16	89,65	237,29
10/02/2024 12:00	27,65	89,67	235,79
10/02/2024 13:00	27,75	89,31	260,37
10/02/2024 14:00	27,92	89,02	252,26
10/02/2024 15:00	27,81	89,11	268,94
10/02/2024 16:00	27,65	88,72	327,21
10/02/2024 17:00	27,32	89,23	234,83
10/02/2024 18:00	26,98	90,51	247,13
10/02/2024 19:00	26,75	92,15	211,76
10/02/2024 20:00	26,17	93,09	211,45
10/02/2024 21:00	26,75	92,19	241,95
10/02/2024 22:00	26,34	89,83	210,02
10/02/2024 23:00	26,51	89,88	241,74
11/02/2024 00:00	26,57	90,10	249,17
11/02/2024 01:00	26,61	90,07	247,50
11/02/2024 02:00	26,75	90,22	247,66
11/02/2024 03:00	26,84	92,71	246,87
11/02/2024 04:00	26,09	89,52	247,31
11/02/2024 05:00	26,16	89,34	245,33
11/02/2024 06:00	26,93	89,62	242,01
11/02/2024 07:00	26,86	88,62	239,53
11/02/2024 08:00	26,42	88,67	270,43
11/02/2024 09:00	26,34	88,92	265,18
11/02/2024 10:00	26,71	88,23	252,03
11/02/2024 11:00	26,97	88,43	251,91
11/02/2024 12:00	27,34	88,38	251,60
11/02/2024 13:00	27,87	89,53	252,37
11/02/2024 14:00	27,82	89,74	252,40
11/02/2024 15:00	27,98	89,02	251,42
11/02/2024 16:00	27,55	89,16	251,68
11/02/2024 17:00	27,84	89,24	251,47
11/02/2024 18:00	26,81	89,32	251,26
11/02/2024 19:00	26,63	90,41	251,70
11/02/2024 20:00	26,65	90,23	252,51
2024 21:00	26,55	91,35	251,09
2024 22:00	26,43	91,94	249,93
2024 23:00	26,65	92,71	250,19
2024 00:00	26,44	93,61	251,08



12/02/2024 01:00	26,48	93,82	250,85
12/02/2024 02:00	26,61	93,81	251,50
12/02/2024 03:00	26,53	93,17	250,50
12/02/2024 04:00	26,65	93,28	249,75
12/02/2024 05:00	26,60	93,71	250,39
12/02/2024 06:00	26,75	93,64	250,80
12/02/2024 07:00	26,82	93,81	248,33
12/02/2024 08:00	27,24	92,21	247,52
12/02/2024 09:00	27,56	91,84	256,03
12/02/2024 10:00	27,36	90,63	257,84
12/02/2024 11:00	27,84	90,47	252,21
12/02/2024 12:00	27,28	90,55	252,30
12/02/2024 13:00	27,11	89,54	253,84
12/02/2024 14:00	27,28	89,46	253,70
12/02/2024 15:00	26,92	89,22	252,03
12/02/2024 16:00	26,96	89,34	252,19
12/02/2024 17:00	26,78	89,81	251,40
12/02/2024 18:00	26,65	90,45	251,84
12/02/2024 19:00	26,73	90,56	249,86
12/02/2024 20:00	26,53	91,54	246,54
12/02/2024 21:00	26,38	91,72	244,06
12/02/2024 22:00	26,43	92,96	274,96
12/02/2024 23:00	26,49	92,78	269,71
13/02/2024 00:00	26,53	92,91	256,56
13/02/2024 01:00	26,46	92,51	256,44
13/02/2024 02:00	26,38	92,27	256,13
13/02/2024 03:00	26,73	92,17	256,90
13/02/2024 04:00	26,63	92,34	256,93
13/02/2024 05:00	26,53	92,17	255,95
13/02/2024 06:00	26,57	92,71	256,21
13/02/2024 07:00	26,64	92,12	256,01
13/02/2024 08:00	26,71	92,81	255,80
13/02/2024 09:00	26,79	91,92	256,23
13/02/2024 10:00	26,44	91,02	257,05
13/02/2024 11:00	26,41	91,26	255,62
13/02/2024 12:00	26,53	90,92	254,46
13/02/2024 13:00	26,63	90,23	254,72
13/02/2024 14:00	26,64	90,22	203,79
13/02/2024 15:00	26,71	89,23	204,02
13/02/2024 16:00	26,75	89,23	204,17
2024 17:00	26,57	90,56	204,17
2024 18:00	26,48	90,72	202,95
2024 19:00	25,36	90,34	203,26
2024 20:00	26,32	91,37	203,33



13/02/2024 21:00	26,29	91,02	203,33
13/02/2024 22:00	26,26	91,72	203,33
13/02/2024 23:00	26,18	92,04	202,95
14/02/2024 00:00	26,39	92,93	254,17
14/02/2024 01:00	26,41	92,83	252,50
14/02/2024 02:00	26,43	92,62	252,66
14/02/2024 03:00	26,41	92,10	251,87
14/02/2024 04:00	26,30	92,82	252,31
14/02/2024 05:00	26,58	90,92	250,33
14/02/2024 06:00	26,72	89,23	247,01
14/02/2024 07:00	27,19	89,53	244,53
14/02/2024 08:00	27,91	85,15	275,43
14/02/2024 09:00	28,34	82,15	270,18
14/02/2024 10:00	29,01	78,19	257,03
14/02/2024 11:00	30,02	76,69	256,91
14/02/2024 12:00	30,33	88,34	256,60
14/02/2024 13:00	30,17	72,07	257,37
14/02/2024 14:00	31,18	67,79	257,40
14/02/2024 15:00	30,48	73,42	256,42
14/02/2024 16:00	29,52	75,78	256,68
14/02/2024 17:00	29,08	79,12	256,47
14/02/2024 18:00	28,76	82,65	256,26
14/02/2024 19:00	28,16	83,48	256,70
14/02/2024 20:00	27,90	87,90	257,51
14/02/2024 21:00	27,76	88,13	256,09
14/02/2024 22:00	27,59	89,31	254,93
14/02/2024 23:00	27,38	88,40	254,82
15/02/2024 00:00	27,23	88,68	253,16
15/02/2024 01:00	27,06	89,09	253,31
15/02/2024 02:00	26,97	88,93	252,53
15/02/2024 03:00	27,06	88,55	252,97
15/02/2024 04:00	26,99	88,77	250,98
15/02/2024 05:00	26,85	89,04	247,67
15/02/2024 06:00	27,02	88,55	245,18
15/02/2024 07:00	27,54	85,56	276,08
15/02/2024 08:00	28,16	81,12	270,83
15/02/2024 09:00	29,32	77,84	257,69
15/02/2024 10:00	30,02	70,41	257,57
15/02/2024 11:00	30,00	71,39	257,25
15/02/2024 12:00	30,22	71,11	258,02
2024 13:00	31,08	75,36	258,05
2024 14:00	32,30	75,33	257,07
2024 15:00	31,55	76,35	257,34
2024 16:00	31,46	82,38	257,13



15/02/2024 17:00	30,02	83,79	256,92
15/02/2024 18:00	29,76	85,38	257,35
15/02/2024 19:00	29,28	85,91	258,17
15/02/2024 20:00	28,85	86,75	256,74
15/02/2024 21:00	28,44	87,24	255,58
15/02/2024 22:00	27,95	87,89	255,84
15/02/2024 23:00	27,70	88,63	256,73
16/02/2024 00:00	27,06	89,07	256,50
16/02/2024 01:00	27,13	89,24	257,16
16/02/2024 02:00	27,02	89,07	256,15
16/02/2024 03:00	26,82	88,79	255,40
16/02/2024 04:00	26,79	88,95	256,05
16/02/2024 05:00	26,74	88,89	256,46
16/02/2024 06:00	26,93	88,59	253,98
16/02/2024 07:00	27,07	87,92	253,17
16/02/2024 08:00	27,52	87,79	261,69
16/02/2024 09:00	29,90	87,05	263,49
16/02/2024 10:00	30,01	85,54	257,86
16/02/2024 11:00	30,54	83,11	257,96
16/02/2024 12:00	31,60	80,68	259,49
16/02/2024 13:00	30,57	74,17	202,73
16/02/2024 14:00	30,45	71,18	202,88
16/02/2024 15:00	30,91	71,18	202,88
16/02/2024 16:00	30,03	74,62	203,18
16/02/2024 17:00	29,13	75,33	239,58
16/02/2024 18:00	29,04	80,50	239,65
16/02/2024 19:00	28,94	83,03	240,26
16/02/2024 20:00	28,43	82,20	240,41
16/02/2024 21:00	27,94	85,46	240,41
16/02/2024 22:00	27,83	87,04	240,41
16/02/2024 23:00	27,68	87,28	240,64
17/02/2024 00:00	27,59	87,62	240,11
17/02/2024 01:00	27,63	88,26	239,58
17/02/2024 02:00	27,36	88,60	240,18
17/02/2024 03:00	27,19	88,95	240,11
17/02/2024 04:00	27,35	89,06	240,18
17/02/2024 05:00	27,47	88,99	240,03
17/02/2024 06:00	27,52	88,42	239,80
17/02/2024 07:00	27,77	87,38	239,64
17/02/2024 08:00	28,10	86,72	239,78
2024 09:00	28,91	84,75	240,11
2024 10:00	29,55	80,45	240,33
2024 11:00	30,25	75,20	241,17
2024 12:00	30,34	74,63	239,50



17/02/2024 13:00	30,57	74,42	239,12
17/02/2024 14:00	30,73	71,66	238,89
17/02/2024 15:00	30,34	74,16	238,82
17/02/2024 16:00	30,53	73,76	238,74
17/02/2024 17:00	29,49	79,81	239,88
17/02/2024 18:00	29,28	81,34	239,20
17/02/2024 19:00	29,11	81,78	238,82
17/02/2024 20:00	29,03	82,88	238,82
17/02/2024 21:00	28,96	83,35	238,74
17/02/2024 22:00	28,63	85,78	238,67
17/02/2024 23:00	28,15	85,96	238,29
18/02/2024 00:00	27,76	86,62	224,74
18/02/2024 01:00	27,37	90,97	224,21
18/02/2024 02:00	26,96	88,71	224,36
18/02/2024 03:00	26,79	88,90	224,14
18/02/2024 04:00	26,66	88,24	224,52
18/02/2024 05:00	26,83	88,19	225,80
18/02/2024 06:00	26,88	87,21	226,86
18/02/2024 07:00	27,74	86,91	226,94
18/02/2024 08:00	27,63	85,65	226,33
18/02/2024 09:00	27,74	85,09	226,49
18/02/2024 10:00	28,30	82,51	226,64
18/02/2024 11:00	29,78	77,37	226,18
18/02/2024 12:00	30,51	71,95	225,95
18/02/2024 13:00	30,75	71,20	226,03
18/02/2024 14:00	30,81	71,58	225,88
18/02/2024 15:00	30,44	71,06	226,11
18/02/2024 16:00	29,94	70,27	225,58
18/02/2024 17:00	29,08	74,74	225,58
18/02/2024 18:00	28,69	79,10	225,88
18/02/2024 19:00	27,77	82,29	226,26
18/02/2024 20:00	27,13	84,04	224,97
18/02/2024 21:00	27,09	85,81	225,42
18/02/2024 22:00	26,98	87,97	225,42
18/02/2024 23:00	26,85	88,10	225,88
19/02/2024 00:00	26,75	88,49	239,58
19/02/2024 01:00	26,70	88,71	239,27
19/02/2024 02:00	26,62	88,93	240,94
19/02/2024 03:00	26,64	89,03	240,48
19/02/2024 04:00	26,71	89,22	240,26
2024 05:00	26,74	88,95	240,18
2024 06:00	26,90	88,31	240,11
2024 07:00	27,24	87,36	239,20
2024 08:00	28,13	85,92	238,97



19/02/2024 09:00	28,37	82,84	238,74
19/02/2024 10:00	28,53	83,25	239,05
19/02/2024 11:00	29,28	78,11	239,35
19/02/2024 12:00	29,59	76,11	239,20
19/02/2024 13:00	29,78	77,37	239,42
19/02/2024 14:00	30,32	72,46	239,42
19/02/2024 15:00	30,61	69,78	238,82
19/02/2024 16:00	29,94	70,27	238,74
19/02/2024 17:00	29,64	72,21	238,44
19/02/2024 18:00	28,78	82,09	237,91
19/02/2024 19:00	28,67	81,95	237,00
19/02/2024 20:00	28,39	82,69	237,00
19/02/2024 21:00	27,80	84,74	237,30
19/02/2024 22:00	27,48	86,75	237,30
19/02/2024 23:00	27,02	87,16	237,98
20/02/2024 00:00	26,90	87,54	201,36
20/02/2024 01:00	26,80	87,74	202,27
20/02/2024 02:00	26,74	87,86	203,18
20/02/2024 03:00	26,69	88,13	204,02
20/02/2024 04:00	26,61	87,59	205,98
20/02/2024 05:00	26,71	87,29	208,33
20/02/2024 06:00	26,97	86,86	207,80
20/02/2024 07:00	27,00	85,26	206,82
20/02/2024 08:00	27,65	82,86	209,17
20/02/2024 09:00	28,45	80,08	210,53
20/02/2024 10:00	29,05	78,73	207,50
20/02/2024 11:00	29,65	77,91	210,23
20/02/2024 12:00	30,04	76,28	212,20
20/02/2024 13:00	31,14	68,98	208,71
20/02/2024 14:00	31,08	68,27	212,73
20/02/2024 15:00	31,01	67,75	212,26
20/02/2024 16:00	30,44	71,06	214,02
20/02/2024 17:00	29,30	78,12	212,20
20/02/2024 18:00	29,04	79,95	214,70
20/02/2024 19:00	28,78	82,09	212,80
20/02/2024 20:00	27,94	84,59	215,61
20/02/2024 21:00	27,84	85,52	211,21
20/02/2024 22:00	27,40	86,17	213,33
20/02/2024 23:00	27,23	84,05	212,65

