**Lampiran**

- **Sourcecode RTC Module**

```
// Date and time functions using a RTC connected via I2C and Wire lib
#include <Wire.h>
#include "RTClib.h"

RTC_DS3231 rtc;

char daysOfTheWeek[7][12] = {"Minngu", "Senin", "Selasa", "Rabu", "Kamis", "Jum'at", "Sabtu"};

void setup () {

#ifndef ESP8266
  while (!Serial);
#endif

  Serial.begin(9600);

  delay(3000); // wait for console opening

  if (! rtc.begin()) {
    Serial.println("Couldn't find RTC");
    while (1);
  }

  if (rtc.lostPower()) {
    Serial.println("RTC lost power, lets set the time!");
    // following line sets the RTC to the date & time this sketch was compiled
    rtc.adjust(DateTime(F(__DATE__), F(__TIME__)));
    // This line sets the RTC with an explicit date & time, for example to set
    // Mei 1, 2019 at 10am you would call:
    // rtc.adjust(DateTime(2019, 5, 1, 10, 0, 0));
}
   void loop () {
    DateTime now = rtc.now();

    Serial.print(now.year(), DEC);
    Serial.print('/');
    Serial.print(now.month(), DEC);
    Serial.print('/');
    Serial.print(now.day(), DEC);
```

```
    Serial.print(" (");
    Serial.print(daysOfTheWeek[now.dayOfTheWeek()]);
    Serial.print(") ");
    Serial.print(now.hour(), DEC);
    Serial.print(':');
    Serial.print(now.minute(), DEC);
    Serial.print(':');
    Serial.print(now.second(), DEC);
    Serial.println();
    Serial.println();
    delay(3000);
  }
```

- **Sourcecode Relay/Gabungan**

```
#include "Wire.h"
#define DS3231_I2C_ADDRESS 0x68
#include <LiquidCrystal_I2C.h>
#include <Servo.h>

LiquidCrystal_I2C lcd(0x27, 16, 2);

Servo myservo;
int ix;
int mark;
int cacah;
byte second, minute, hour, dayOfWeek, dayOfMonth, month, year;

int buzzer = 2;


// Convert normal decimal numbers to binary coded decimal
byte decToBcd(byte val)
{
  return( (val/10*16) + (val%10) );
}
// Convert binary coded decimal to normal decimal numbers
byte bcdToDec(byte val)
{
  return( (val/16*10) + (val%16) );
}

void setup()
```

```
{
  lcd.clear();
  lcd.begin();
  lcd.noCursor();
  myservo.attach(9);

  myservo.write(100);

  pinMode(buzzer,OUTPUT);

  Wire.begin();
  Serial.begin(9600);
  // set the initial time here:
  // DS3231 seconds, minutes, hours, day, date, month, year
  // setDS3231time(0,14,10,2,8,7,19);

}


void setDS3231time(byte second, byte minute, byte hour, byte dayOfWeek, byte
dayOfMonth, byte month, byte year)
{
  // sets time and date data to DS3231
  Wire.beginTransmission(DS3231_I2C_ADDRESS);
  Wire.write(0); // set next input to start at the seconds register
  Wire.write(decToBcd(second)); // set seconds
  Wire.write(decToBcd(minute)); // set minutes
  Wire.write(decToBcd(hour)); // set hours
  Wire.write(decToBcd(dayOfWeek)); // set day of week (1=Sunday, 7=Saturday)
  Wire.write(decToBcd(dayOfMonth)); // set date (1 to 31)
  Wire.write(decToBcd(month)); // set month
  Wire.write(decToBcd(year)); // set year (0 to 99)
  Wire.endTransmission();
}
void readDS3231time(byte *second,
byte *minute,
byte *hour,
byte *dayOfWeek,
byte *dayOfMonth,
byte *month,
byte *year)
{
  Wire.beginTransmission(DS3231_I2C_ADDRESS);
  Wire.write(0); // set DS3231 register pointer to 00h
```

```
  Wire.endTransmission();
  Wire.requestFrom(DS3231_I2C_ADDRESS, 7);
  // request seven bytes of data from DS3231 starting from register 00h
  *second = bcdToDec(Wire.read() & 0x7f);
  *minute = bcdToDec(Wire.read());
  *hour = bcdToDec(Wire.read() & 0x3f);
  *dayOfWeek = bcdToDec(Wire.read());
  *dayOfMonth = bcdToDec(Wire.read());
  *month = bcdToDec(Wire.read());
  *year = bcdToDec(Wire.read());
}
void displayTime()
{
  // retrieve data from DS3231
  readDS3231time(&second, &minute, &hour, &dayOfWeek, &dayOfMonth, &month,
  &year);
 lcd.setCursor(0,0);
  // send it to the serial monitor
  lcd.print(hour, DEC);
  // convert the byte variable to a decimal number when displayed
  lcd.print(":");
  if (minute<10)
  {
    lcd.print("0");
  }
  lcd.print(minute, DEC);
  lcd.print(":");
  if (second<10)
  {
    lcd.print("0");
  }
  lcd.print(second, DEC);
  lcd.print(" ");
  lcd.print(dayOfMonth, DEC);
  lcd.print("/");
  lcd.print(month, DEC);
  lcd.print("/");
  lcd.print(year, DEC);
  lcd.print(" Day of week: ");
  switch(dayOfWeek){
  case 1:
    Serial.println("Sunday");
    break;
  case 2:
```

```
    Serial.println("Monday");
    break;
  case 3:
    Serial.println("Tuesday");
    break;
  case 4:
    Serial.println("Wednesday");
    break;
  case 5:
    Serial.println("Thursday");
    break;
  case 6:
    Serial.println("Friday");
    break;
  case 7:
    Serial.println("Saturday");
    break;
  }
}



void loop()
{
  displayTime(); // display the real-time clock data on the Serial Monitor,

if((mark == 0)&&(hour == 13)){
digitalWrite(buzzer,HIGH);
delay(10000);
digitalWrite(buzzer,LOW);
gerak();
  }

lcd.setCursor(0,0);
lcd.print(" Nayu 1461505106");
lcd.setCursor(0,1);
lcd.print(" Terapi Selesai");

delay(1000);
}


void gerak(){
```

```
 digitalWrite(buzzer,LOW);

 for(ix=100;ix<=200;ix++){
 myservo.write(ix);
 delay(50);

 }
 delay(1000);

 for(ix=200;ix>=100;ix--){
 myservo.write(ix);
 delay(50);

 }
 delay(1000);
 cacah++;

lcd.setCursor(0,1);
lcd.print("X= ");
lcd.print(cacah);

if(cacah >= 10){
  mark = 1;
 return;

  }
gerak();

  }
```

- **Sourcecode**

```
int sensorPin = A0;
int powerPin = 6 ;
#include <Wire.h>
#include "RTClib.h"
#include <LiquidCrystal.h>
LiquidCrystal lcd(2, 3, 4, 5, 6 , 7);
RTC_DS1307 rtc;
char namaHari[7][12] = {"Minggu", "Senin", "Selasa", "Rabu", "Kamis", "Jumat", "Sabtu"};

void setup() {
  lcd.begin(16, 2);
  pinMode (powerPin, OUTPUT);
```

```
  digitalWrite ( powerPin,LOW);
  Serial.begin (9600);
  Serial.begin(9600);
   if (! rtc.begin()) {
    Serial.println("RTC TIDAK TERBACA");
    while (1);
   }

  if (! rtc.isrunning()) {
    Serial.println("RTC is NOT running!");
    rtc.adjust(DateTime(F(__DATE__), F(__TIME__)));//update rtc dari waktu komputer
   }

}
void loop() {
  { DateTime now = rtc.now();
    Serial.print(namaHari[now.dayOfTheWeek()]);
    Serial.print(',');
    Serial.print(now.day(), DEC);
    Serial.print('/');
    Serial.print(now.month(), DEC);
    Serial.print('/');
    Serial.print(now.year(), DEC);
    Serial.print(" ");
    Serial.print(now.hour(), DEC);
    Serial.print(':');
    Serial.print(now.minute(), DEC);
    Serial.print(':');
    Serial.print(now.second(), DEC);
    Serial.println();

    lcd.setCursor(0,0);
    lcd.print("JAM");
     lcd.setCursor(4,0);
    lcd.print("=");
    lcd.setCursor(5,0);
    lcd.print(" ");
    lcd.print(now.hour(), DEC);
    lcd.print(':');
    lcd.print(now.minute(), DEC);
    lcd.print(':');
    lcd.print(now.second(), DEC);
    lcd.println();
    delay (100);}
```

```
    {Serial.print("HUM");
 Serial.println(bacaSensor());
 lcd.setCursor (0,1);
 lcd.print("HUM");
  lcd.setCursor(4,1);
    lcd.print("=");
 lcd.setCursor (8,1);
 lcd.print("%");
 lcd.setCursor (5,1);
 lcd.print (bacaSensor());


}}


int bacaSensor ()
{
  digitalWrite (powerPin, HIGH);
  delay (500);
  int nilaiSensor = analogRead (sensorPin);
  digitalWrite(powerPin, LOW);
  return 1023 - nilaiSensor;
}
// put your main code here, to run repeatedly:
```

- **Sourcecode LCD**

```
#include <Wire.h>
#include <LiquidCrystal_I2C.h>

LiquidCrystal_I2C lcd(0x27, 16, 2);

void setup()
{
  lcd.begin ();
}

void loop()
{
lcd.setCursor(0,0);
  // send it to the serial monitor
  lcd.print(hour, DEC);
  // convert the byte variable to a decimal number when displayed
  lcd.print(":");
```

```
  if (minute<10)
  {
    lcd.print("0");
  }
  lcd.print(minute, DEC);
  lcd.print(":");
  if (second<10)
  {
    lcd.print("0");
  }
  lcd.print(second, DEC);
  lcd.print(" ");
  lcd.print(dayOfMonth, DEC);
  lcd.print("/");
  lcd.print(month, DEC);
  lcd.print("/");
  lcd.print(year, DEC);
  lcd.print(" Day of week: ");

  lcd.setCursor(0,1);
  lcd.print("X= ");
  lcd.print(cacah);
  delay(1000);
}
```