LAMPIRAN

Lampiran – 1 Listing Program

A. Listing Program *Master Transmitter*

1. Pemrograman pada *Master Transmitter* kontrol otomatis AC/Kipas Angin

```
#include <DHT.h> //library DHT
#define DHTPIN 2 //pin DATA konek ke pin A0 Arduino
#define DHTTYPE DHT21   // DHT 21 (AM2301)
DHT dht(DHTPIN, DHTTYPE); //set sensor + koneksi pin

#include <RF24.h>
#include <RF24Network.h>
#include <SPI.h>

RF24 radio(9, 10); // nRF24L01 (CE,CSN)
RF24Network network(radio); // Include the radio in the
network

const uint16_t this_node = 01; // AddreDS of our node in
Octal format
const uint16_t nodeSlave[4] = {011, 021, 031, 041};

#include <PrayerTimes.h>
#include <EEPROM.h>
#include <LiquidCrystal_I2C.h>
LiquidCrystal_I2C lcd(0x27,16,2);  //0x27 atau 0x3F

#include "Wire.h"
#include <I2C_RTC.h>
static PCF8563 RTC;
byte zero = 0x00; //workaround for issue #527
void(* resetFunc) (void) = 0;

//================== Koordinat Posisi ====================
double lintang = -4.016062;
double bujur = 119.650634;

//==================== Pin SETUP  ========================
// pin A4 ke SDA (LCD dan RTC)
// pin A5 ke SCL (LCD dan RTC)
const byte btnSet = A1; //btn aktif LOW (untuk Setting)
const byte Buzzer = A2;
const byte btnMode= A3; //btnMode aktif LOW (untuk pilih
Mode)
const byte SW[]={7,6,5,4};

//====================  Deklarasi Variabel
============================
```

```
byte detRTC, mntRTC, jamRTC, hriRTC, tglRTC, blnRTC, thnRTC;
byte ht, Mode=0, Lama, detJedah, countB=0, SetA, SetB,
valSet, bacaWaktu;
byte ON_SH, ON_sh, ON_shR, ON_DZ, ON_dz, ON_dzJ ;
byte ON_as, ON_mg, ON_is;
byte OFF_SH, OFF_sh, OFF_DZ, OFF_dz, OFF_dzJ;
byte OFF_as, OFF_mg, OFF_IS, OFF_is, OFF_isR;
int nRTC, nSH, nDZ, nAS, nMG, nIS, count=1000, menitJedah;
byte KL[4], KValue, countS=0,countT=0;
byte suhu, limitSuhu;

//**********************************************************
***//

bool lcdState = true;
bool stKipas = false;
bool blnRamadhan = false;
bool error_RTC = false;
const byte lamaKegiatan=120; //dalam menit
//================ Akhir Deklarasi Variabel
==================

void setup() {
    Serial.begin(9600);
    dht.begin();
    SPI.begin();
    radio.begin();
    network.begin(90, this_node); //(channel, node addreDS)
    radio.setDataRate(RF24_2MBPS);

    Wire.begin();
    RTC.begin();
    if(EEPROM.read(10)==255) simpanKeEEPROM();
    lcd.init(); lcd.setBacklight(100);
    lcd.home ();        lcd.print(F("SISTEM OTOMATIS "));
    lcd.setCursor(0,1); lcd.print(F("=== KIPAS/AC ==="));
    delay(2000);

    pinMode(btnSet,INPUT_PULLUP);
    pinMode(btnMode,INPUT_PULLUP);
    pinMode(Buzzer,OUTPUT); //Buzzer aktif HIGH
    for (byte i=0; i<4; i++) { pinMode(SW[i], INPUT_PULLUP);
}

    bacaEEPROM(); bacaJadwal(); delay(2000);
    byte countSet=0;
    while (!digitalRead(btnSet) && lcdState && countSet<30)
{
      countSet++; delay(100); }
    if(countSet>=30 && lcdState) { beepSet(); Setting_A(); }
}
// ==================== Akhir void setup ()
=========================

void loop() {
   countS++;
```

```
   if(countS==20){
    countS=0;
    suhu = int(dht.readTemperature());//baca suhu
    Serial.println("Suhu sekarang:  "+ String(suhu)+ " °C");
   }

   bacaRTC();
   cek_RTC();
   nRTC = jamRTC*60 + mntRTC; //mengubah nilai pukul ke
nilai menit nRTC
   if(jamRTC==0 & detRTC==10) bacaJadwal();

   cekHariBln();
   modeOperasi();
   cekSaklarLCD();

   if(stKipas && suhu>limitSuhu) {
      countT=0;
      for (byte i=0; i<4; i++) { KL[i] =
!digitalRead(SW[i]); }
      KValue = KL[3]*8+ KL[2]*4 + KL[1]*2 + KL[0];
      kirimKValue();
   }
   else {if(countT<10) {countT++; KValue=0; kirimKValue();
}}
}

void kirimKValue() {
  network.update();

  for (byte i=0; i<4; i++) {
    RF24NetworkHeader alamat(nodeSlave[i]); //set alamat
    network.write(alamat, &KValue, sizeof(KValue)); //kirim
    delay(100);
  }
}


// ========================  Akhir void loop()
======================
```

2. Pemrograman RTC dan LCD I2C pada *Master Transmitter*

```
void cek_RTC() {
     if(thnRTC<23 || thnRTC>33 ) {
        error_RTC=1;
        RTC.setDay(15);
        RTC.setMonth(6);
        RTC.setYear(2023);
        RTC.setWeek(4);  // Always Set weekday after setting
Date
        RTC.setHours(12);
        RTC.setMinutes(30);
        RTC.setSeconds(30);
        lcd.noDisplay(); lcd.noBacklight();
```

```
    }
     while(thnRTC<24 || thnRTC>33 ) {
        lcdState=0;
        buzzer_ON(); delay(100); buzzer_OFF();
delay(100);
        if(!digitalRead(btnSet)) {
            lcd.display(); lcd.backlight();
            Setting_A();
        }
     }
}

void bacaRTC() {
     detRTC = RTC.getSeconds();
     mntRTC = RTC.getMinutes();
     jamRTC = RTC.getHours();
     tglRTC = RTC.getDay();
     blnRTC = RTC.getMonth();
     thnRTC = RTC.getYear()-2000;
     hriRTC = RTC.getWeek();
}

void cekHariBln() {
     //Cek hari Jum'at
     if(hriRTC==6) {ON_DZ=ON_dzJ; OFF_DZ=OFF_dzJ;}
//jika hari Jum'at dan semua bulan
     else  { ON_DZ = ON_dz; OFF_DZ = OFF_dz; }

     blnRamadhan=cekRamadhan();
     if(blnRamadhan) { ON_SH=ON_shR; OFF_IS=OFF_isR;
                       OFF_SH=OFF_sh + 10; //jika
Ramadhan dan semua hari
                     }
     else { ON_SH=ON_sh; OFF_IS=OFF_is;
            if(hriRTC==6) OFF_SH=OFF_sh + 5;  //jika
Jum'at bukan Ramadhan
            if(hriRTC!=6) OFF_SH=OFF_sh; //jika bukan
Jum'at dan bukan Ramadhan
          }
}

boolean cekRamadhan() {
   boolean cek=0;
   byte tg=tglRTC, bl=blnRTC, jam=jamRTC;
   switch (thnRTC) {
     case 23: if((bl== 3 && ((tg==22 &&
nRTC>nMG)||tg>=23))||
                 (bl== 4 && (tg<20||(tg==20 &&
nRTC<nMG)))) cek=1; break;
     case 24: if((bl== 3 && ((tg==10 &&
nRTC>nMG)||tg>=11))||
                 (bl== 4 && (tg< 9||(tg== 9 &&
nRTC<nMG)))) cek=1; break;
     case 25: if((bl== 2 && (tg==28 && nRTC>nMG))||
                 (bl== 3 && (tg<29||(tg==29 &&
nRTC<nMG)))) cek=1; break;
```

```
     case 26: if((bl== 2 && ((tg==17 &&
nRTC>nMG)||tg>=18))||
                  (bl== 3 && (tg<19||(tg==19 && nRTC<nMG))))
cek=1; break;
     case 27: if((bl== 2 && ((tg== 7 && nRTC>nMG)||tg>=
8))||
                  (bl== 3 && (tg< 8||(tg== 8 && nRTC<nMG))))
cek=1; break;
     case 28: if((bl== 1 && ((tg==27 &&
nRTC>nMG)||tg>=28))||
                  (bl== 2 && (tg<25||(tg==25 && nRTC<nMG))))
cek=1; break;
     case 29: if((bl== 1 && ((tg==15 &&
nRTC>nMG)||tg>=16))||
                  (bl== 2 && (tg<13||(tg==13 && nRTC<nMG))))
cek=1; break;
     case 30: if((bl== 1 && ((tg== 4 && nRTC>nMG)||tg>=5))
||
                  (bl== 2 && (tg< 3||(tg== 3 && nRTC<nMG)))||
                  (bl==12 && ((tg==25 && nRTC>nMG)||tg>=26)))
cek=1; break;
     case 31: if((bl==12 && ((tg==14 &&
nRTC>nMG)||tg>=15))||
                  (bl== 1 && (tg<23||(tg==23 && nRTC<nMG))))
cek=1; break;
     case 32: if((bl==12 && ((tg== 3 && nRTC>nMG)||tg>=
4))||
                  (bl== 1 && (tg<13||(tg==13 && nRTC<nMG))))
cek=1; break;
     case 33: if((bl==11 && ((tg==22 &&
nRTC>nMG)||tg>=23))||
                  (bl==12 && (tg<22||(tg==22 && nRTC<nMG))))
cek=1; break;
     default:  cek=0; break;
   }
   return cek;
}
```

3. Pemrograman tampilan LCD I2C pada *Master Transmitte*

```
void cekSaklarLCD() {
   //======================== Masuk menu Setting Variabel
Control =====================
   byte countSet=0;
   while (!digitalRead(btnSet) && lcdState && countSet<30) {
countSet++; delay(100); }
   if(countSet>=30 && lcdState)  { beepSet(); Setting_A(); }

   //================================== Status LCD
==================================
   if(!digitalRead(btnSet) && !lcdState) { count=1000;
lcdState=1; }
   if(lcdState) tampilkan_ke_LCD();
   delay(100); count--;
```

```
}

void tampilkan_ke_LCD(){
     String baris1,baris2, hari, Kipas;
     if(hriRTC==1) hari="Ahad  " ;
     if(hriRTC==2) hari="Senin " ;
     if(hriRTC==3) hari="Selasa" ;
     if(hriRTC==4) hari="Rabu  " ;
     if(hriRTC==5) hari="Kamis " ;
     if(hriRTC==6) hari="Jum'at" ;
     if(hriRTC==7) hari="Sabtu " ;

     if(Mode==0) {if(stKipas==1) Kipas=" ON";  else
Kipas="OFF"; }
     if(Mode==1) Kipas=" ON";

     //=========String Jam-Menit-
Detik=======================
     baris1 = "Jam
"+String(jamRTC/10)+String(jamRTC%10)+":"+
              String(mntRTC/10) + String(mntRTC%10)+":" +
              String(detRTC/10)+String(detRTC%10)+ "  M" +
              String(Mode);;

     if(count%10==0) ht+=1; if(ht>7) ht=1;
     //============= format tampilan keLCD
====================
     if(ht==1) baris2 = hari + " "+ String (tglRTC/10) +
                        String (tglRTC%10)+ "-"+ String
(blnRTC/10)+
                        String (blnRTC%10) + "-"+ String
(thnRTC) +
                        "    ";
     if(ht==2) baris2 = "Subuh  " + String(nSH/600) +
                        String(nSH%600/60) +":" +
String(nSH%60/10) +
                        String(nSH%10)+" "+Kipas;
     if(ht==3) baris2 = "Duhur  " + String(nDZ/600) +
                        String(nDZ%600/60) +":" +
String(nDZ%60/10) +
                        String(nDZ%10)+" "+Kipas;
     if(ht==4) baris2 = "Ashar  " + String(nAS/600) +
                        String(nAS%600/60) +":" +
String(nAS%60/10) +
                        String(nAS%10)+" "+Kipas;
     if(ht==5) baris2 = "Magrib " + String(nMG/600) +
                        String(nMG%600/60) +":" +
String(nMG%60/10) +
                        String(nMG%10)+ " "+Kipas;
     if(ht==6) baris2 = "Isya   " + String(nIS/600) +
                        String(nIS%600/60) +":" +
String(nIS%60/10) +
                        String(nIS%10)+" "+Kipas;
     if(ht==7) {
               baris2 = "Suhu : " + String(suhu)+ "
"+(char)223+"C    ";
```

```
     }

     lcd.display();  lcd.backlight();
     lcd.setCursor(0,0); lcd.print(baris1);
     lcd.setCursor(0,1); lcd.print(baris2);
     if(count==0) {lcdState=0; lcd.noDisplay();
lcd.noBacklight(); }
}
```

4. Pemrograman Arduino EEPROM pada *Master Transmitter*

```
void bacaEEPROM() {
    ON_sh  = EEPROM.read(10);
    ON_shR = EEPROM.read(11);
    ON_dz  = EEPROM.read(12);
    ON_dzJ = EEPROM.read(13);
    ON_as  = EEPROM.read(14);
    ON_mg  = EEPROM.read(15);
    ON_is  = EEPROM.read(16);

    OFF_sh = EEPROM.read(17);
    OFF_dz =  EEPROM.read(18);
    OFF_dzJ = EEPROM.read(19);
    OFF_as =  EEPROM.read(20);
    OFF_mg =  EEPROM.read(21);
    OFF_is =  EEPROM.read(22);
    OFF_isR = EEPROM.read(23);
    limitSuhu = EEPROM.read(24);
}

void simpanKeEEPROM(){
     EEPROM.write(10,5);  //ON_sh   (min=0, valMax=20)
     EEPROM.write(11,5);  //ON_shR  (min=0, valMax=25)
     EEPROM.write(12,5);  //ON_dz   (min=0, valMax=20)
     EEPROM.write(13,5);  //ON_dzJ  (min=0, valMax=35)
     EEPROM.write(14,5);  //ON_as   (min=0, valMax=20)
     EEPROM.write(15,5);  //ON_mg   (min=0, valMax=20)
     EEPROM.write(16,5);  //ON_is   (min=0, valMax=20)

     EEPROM.write(17,40);  //OFF_sh  (min=35, valMax=50)
     EEPROM.write(18,25);  //OFF_dz  (min=20, valMax=30)
     EEPROM.write(19,60);  //OFF_dzJ (min=45, valMax=60)
     EEPROM.write(20,25);  //OFF_as  (min=20, valMax=30)
     EEPROM.write(21,30);  //OFF_mg  (min=25, valMax=35)
     EEPROM.write(22,30);  //OFF_is  (min=25, valMax=35)
     EEPROM.write(23,130); //OFF_isR (min=100, valMax=180)
     EEPROM.write(24,20);  //limitSuhu (min=15, valMax=25)
}
```

5. Pemrograman baca jadwal shalat pada *Master Transmitter*

```
void bacaJadwal() {
     double times[sizeof(TimeName) / sizeof(char*)];
     int jam_sh, mnt_sh, jam_dz, mnt_dz, jam_as, mnt_as,
         jam_mg, mnt_mg, jam_is, mnt_is;
     byte tgl = RTC.getDay();
     byte bln = RTC.getMonth();
     int thn = 2000 + thnRTC;
     int TZ = 8 ;  //Zona Waktu GMT WIT

     set_calc_method(ISNA);    //Methode perhitungan ISNA
     set_asr_method(Shafii);   //Pendapat Imam Syafi'i
     set_high_lats_adjust_method(AngleBased);
     set_fajr_angle(20);       //Sudut Waktu Subuh
     set_isha_angle(18);       //Sudut Waktu Isya

     get_prayer_times(thn, bln, tgl, lintang, bujur, TZ,
times);
     get_float_time_parts(times[0]+0.05, jam_sh, mnt_sh);
//Subuh
     get_float_time_parts(times[2]+0.02, jam_dz, mnt_dz);
//Dzuhur
     get_float_time_parts(times[3]+0.02, jam_as, mnt_as);
//Asar
     get_float_time_parts(times[4]+0.02, jam_mg, mnt_mg);
//Magrib
     get_float_time_parts(times[6]+0.02, jam_is, mnt_is);
//Isya

     //====== Mengubah Jam-Jadwal ke nilai Menit
=============
     nSH = jam_sh*60 + mnt_sh;
     nDZ = jam_dz*60 + mnt_dz;
     nAS = jam_as*60 + mnt_as;
     nMG = jam_mg*60 + mnt_mg;
     nIS = jam_is*60 + mnt_is;
}
//================ AKHIR void
bacaJadwal()====================
```

6. Pemrograman kontrol modul Buzzer

```
void High(int pin) { digitalWrite(pin,HIGH); }
void Low(int pin) { digitalWrite(pin,LOW); }

void Kendali_ON() {if(!stKipas){ stKipas = 1; beep(3,500);
}}
void Kendali_OFF() {
  if(stKipas) { stKipas = 0; beep(3,100); delay(1000); }
}

void perangkat_ON() {
     Kendali_ON();
     if(nRTC==menitJedah+Lama & detRTC>=detJedah) {
```

```
        beep(3,100);  Mode=0; menitJedah=0;
     }
}

//================ Buzzer aktif HIGH  ================
void buzzer_ON() { High(Buzzer); }
void buzzer_OFF() { Low(Buzzer); }

//==================== beep Buzzer ==================
void beep(byte kali, int tunda) {
  for(byte i=1; i<=kali; i++) {
     buzzer_ON(); delay(tunda);
     buzzer_OFF(); delay(tunda);
  }
}

void kedipBeep() {
      countB++;
      if(countB==40) buzzer_ON();
      if(countB==41) {buzzer_OFF(); countB=0;}
}

void beepSet() { buzzer_ON(); delay(500); buzzer_OFF(); }
void beepChange() { buzzer_ON(); delay(100); buzzer_OFF(); }
```

7. Pemrograman untuk mode operasi *Master Transmitter*

```
void modeOperasi() {
   // kembali ke Mode 0 setiap masuk Waktu kipasON atau
Sholat
      if((nRTC==nSH-ON_SH || nRTC==nDZ-ON_DZ ||
       nRTC==nAS-ON_as || nRTC==nMG-ON_mg || nRTC==nIS-ON_is
||
       nRTC==nSH || nRTC==nDZ || nRTC==nAS || nRTC==nIS
||nRTC==nMG ||
       nRTC==1430) & Mode!=0 & detRTC<2) { Mode=0; }

   if(!digitalRead(btnMode)) {
      if(!lcdState) {count=400; lcdState=1;}
      byte tunggu=0;
      while(!digitalRead(btnMode) & tunggu<15){
            delay(150); buzzer_ON(); tunggu++; }
      buzzer_OFF();

      //Untuk Meng ON-OFF Relay diluar valSet Sholat
      if((nRTC>60 & nRTC<nSH-ON_SH)||
         (nRTC>=nSH+OFF_SH & nRTC<nDZ-ON_DZ)||
         (nRTC>=nDZ+OFF_DZ & nRTC<nAS-ON_as)||
         (nRTC>=nAS+OFF_as & nRTC<nMG-ON_mg)||
         (nRTC>=nMG+OFF_mg & nRTC<nIS-ON_is)||
         (nRTC>=nIS+OFF_IS & nRTC<1430)) {
          if(tunggu>4 & Mode==0){
```

```
              tunggu=0; Mode=1; menitJedah=nRTC;
detJedah=detRTC;
              Lama=lamaKegiatan; }
           if(tunggu>4 & Mode==1){
              tunggu=0; Mode=0; beep(3,100); menitJedah=0;
              Kendali_OFF(); }
        }
   }

   if(Mode==0) { setKipas(); }
   if(Mode==1) { perangkat_ON(); }
}

void setKipas() {
   valSetSholat(nSH, ON_SH, OFF_SH); //valSet Sholat Subuh
   valSetSholat(nDZ, ON_DZ, OFF_DZ); //Sholat Dzuhur
   valSetSholat(nAS, ON_as, OFF_as); //valSet Sholat Asar
   valSetSholat(nMG, ON_mg, OFF_mg); //valSet Sholat Magrib
   valSetSholat(nIS, ON_is, OFF_IS); //valSet Sholat Isya

   //********** nRTC = 179 berarti pukul 02.59 atau
2*60+59=179  ***************
   if((nRTC >= nSH+OFF_SH & nRTC < nDZ-ON_DZ)||
      (nRTC >= nDZ+OFF_DZ & nRTC < nAS-ON_as)||
      (nRTC >= nAS+OFF_as & nRTC < nMG-ON_mg)||
      (nRTC >= nMG+OFF_mg & nRTC < nIS-ON_is)||
      (nRTC >= nIS+OFF_IS & nRTC<=1439) || nRTC<179 )
     { Kendali_OFF(); }
}

void valSetSholat(int nWS, byte kipasON, byte kipasOFF) {
  if(nRTC>=nWS-kipasON & nRTC<nWS+kipasOFF){ Kendali_ON();}
}
```

8. Pemrograman untuk setting *Master Transmitter*

```
void Setting_A() {
  if(SetA==0) {
     lcd.clear();
     lcd.setCursor(0,0); lcd.print(F("  Masuk Menu    "));
     lcd.setCursor(0,1); lcd.print(F("  Setting ... ! "));
     delay(2000); lcd.clear();
     SetA=250;
  }
  while(SetA==250) {
    beepSet(); SetA=1; bacaRTC();  valSet=detRTC;
    lcd.setCursor(0,0); lcd.print(F(" DETIK ... ?"));
    lcd.setCursor(0,1); lcd.print(F(" Detik =   "));
    lcd.setCursor(10,1); if(valSet<10) { lcd.print(F("0"));}
    lcd.print(valSet);
  }

  //=================== Untuk men-RTC, Regiter 0 s/d 6
===============
```

```
  //variabel setX (alamat, kursor, teksA, teksB, teksC,
teksD )
  while(SetA== 1) { setX(0, 10,   1,   2,   3,  4); }
//MENIT ... ?
  while(SetA== 2) { setX(1, 10,   5,   6,   7,  8); } //JAM
... ?
  while(SetA== 3) { setX(2, 11,   9,  10,  11,  6); } //TGL
... ?
  while(SetA== 4) { setX(3,  9,  13,  14,  15, 16); } //BLN
... ?
  while(SetA== 5) { setX(4, 11,  17,  18,  19, 20); } //THN
... ?
  while(SetA== 6) { setX(5,  9,  21,  22,  23, 24); } //HARI
... ?
  while(SetA== 7) { setX(6, 10,  25,  26,  27, 28); }
//ON_SH ?

  //================  Untuk men-EEPROM  mulai alamat:10
==============
  while(SetA== 8) { setX(10, 0,  29,  30,  31, 32); }
//ON_SHR ?
  while(SetA== 9) { setX(11, 0,  33,  34,  35, 36); }
//ON_DZ ?
  while(SetA==10) { setX(12, 0,  37,  38,  39, 40); }
//ON_DZJ ?
  while(SetA==11) { setX(13, 0,  41,  42,  43, 44); }
//ON_AS ?
  while(SetA==12) { setX(14, 0,  45,  46,  47, 48); }
//ON_MG ?
  while(SetA==13) { setX(15, 0,  49,  50,  51, 52); }
//ON_IS ?
  while(SetA==14) { setX(16, 0,  53,  54,  55, 56); }
//OFF_SH ?
  while(SetA==15) { setX(17, 0,  57,  58,  59, 60); }
//OFF_DZ ?
  while(SetA==16) { setX(18, 0,  61,  62,  63, 64); }
//OFF_DZJ ?
  while(SetA==17) { setX(19, 0,  65,  66,  67, 68); }
//OFF_AS ?
  while(SetA==18) { setX(20, 0,  69,  70,  71, 72); }
//OFF_MG ?
  while(SetA==19) { setX(21, 0,  73,  74,  75, 76); }
//OFF_IS ?
  while(SetA==20) { setX(22, 0,  77,  78,  79, 80); }
//OFF_ISR ?
  while(SetA==21) { setX(23, 0,  81,  82,  83, 84); }
//limitSuhu ?
  while(SetA==22) { setX(24, 0,  85,  86,  87, 88); } //==
SETTING ==
}

void Setting_B() {
 //variabel setY  (alamat, kursor, valMin, valMax)
 //================== Setting RTC, Regiter 0 s/d 6
==================
  while(SetB== 1) { setY( 0, 10,  0, 59 ); } //Detik
```

```
  while(SetB== 2) { setY( 1, 10,  0, 59 ); } //Menit
  while(SetB== 3) { setY( 2, 10,  0, 23 ); } //Jam
  while(SetB== 4) { setY( 3, 11,  1, 31 ); } //Tanggal
  while(SetB== 5) { setY( 4,  9,  1, 12 ); } //Bulan
  while(SetB== 6) { setY( 5, 11, 22, 40 ); } //Tahun
  while(SetB== 7) { setY( 6,  9,  1,  7 ); } //Hari

  //================  Setting EEPROM  mulai alamat:10
================
  while(SetB== 8) { setY(10,  0, 0, 20 ); } //ON Subuh
  while(SetB== 9) { setY(11,  0, 0, 25 ); } //ON Subuh
Ramadhan
  while(SetB==10) { setY(12,  0, 0, 20 ); } //ON Dzuhur
  while(SetB==11) { setY(13,  0, 0, 35 ); } //ON Dzuhur
Jum'at
  while(SetB==12) { setY(14,  0, 0, 20 ); } //ON Asar
  while(SetB==13) { setY(15,  0, 0, 20 ); } //ON Magrib
  while(SetB==14) { setY(16,  0, 0, 20 ); } //ON Isya
  while(SetB==15) { setY(17,  0, 0, 50 ); } //OFF_sh
  while(SetB==16) { setY(18,  0, 20, 30 ); } //OFF_dz
  while(SetB==17) { setY(19,  0, 50, 70 ); } //OFF_dzJ
  while(SetB==18) { setY(20,  0, 20, 40 ); } //OFF_as
  while(SetB==19) { setY(21,  0, 20, 50 ); } //OFF_mg
  while(SetB==20) { setY(22,  0, 20, 35 ); } //OFF_is
  while(SetB==21) { setY(23,  0, 80,180 ); } //OFF_isR
  while(SetB==22) { setY(24,  0, 15, 30 ); } //limitShuhu
}

void setX (byte alamat, byte kursor, byte teksA, byte teksB,
           byte teksC, byte teksD ) {
   if(SetA>0 && !digitalRead(btnMode)) {
     if(!error_RTC) selesaiSetting();
     else {beep(3,100); resetFunc();}
   }

   byte countSet=0; while(!digitalRead(btnSet) &
countSet<12){
        countSet++; delay(100); }
   if(countSet>0 & countSet<12) {
      beepSet();
      lcd.clear();
      lcd.setCursor(0,0); cetak(teksA);
      //Baca RTC :
      if(SetA==1) valSet= mntRTC;
      if(SetA==2) valSet= jamRTC;
      if(SetA==3) valSet= tglRTC;
      if(SetA==4) valSet= blnRTC;
      if(SetA==5) valSet= thnRTC;
      if(SetA==6) valSet= hriRTC;

      if(SetA==7) valSet=EEPROM.read(10);
      if(SetA>7) valSet=EEPROM.read(alamat+1);
      lcd.setCursor(0,1); cetak(teksB);

      SetA++;
      if(SetA<8) lcd.setCursor(kursor,1); //untuk RTC
```

```
      if(SetA>7) lcd.setCursor(0,1);
      if(SetA==21) {if(valSet<100) lcd.print(F("0"));}
      if(SetA<21) {if(valSet<10) lcd.print(F("0")); }
      if(SetA<23) lcd.print(valSet);
      if(SetA==22){ lcd.print(F(" "));
                    lcd.print((char)223);
                    lcd.print(F("C "));
                  }

      if(!digitalRead(btnMode)) {
         if(SetB>0 & SetB<7) {SetA=0; SetB=0;} //untuk RTC
         if(SetB>6 & SetB<23) {
            beep(3,100); delay(2000); resetFunc();
         }
      }
      if(SetA>22) selesaiSetting();
   }
   if(countSet>=12) {
      //Baca RTC :
      if(SetA==1) valSet= detRTC;
      if(SetA==2) valSet= mntRTC;
      if(SetA==3) valSet= jamRTC;
      if(SetA==4) valSet= tglRTC;
      if(SetA==5) valSet= blnRTC;
      if(SetA==6) valSet= thnRTC;
      if(SetA==7) valSet= hriRTC;

      if(SetA>7) valSet=EEPROM.read(alamat);  beep(3,100);
      lcd.setCursor(0,0); cetak(teksC);
      lcd.setCursor(0,1); cetak(teksD);
      SetB=SetA;
      Setting_B();
   }
}


void setY(byte alamat, byte kursor, byte valMin, byte
valMax){
   byte countSet=0;
   while(!digitalRead(btnSet) & countSet<12) {countSet++;
delay(100);}
   if(countSet>=12) {
       countSet=0;
       //Setting RTC :
       if(SetB==1) RTC.setSeconds(valSet);
       if(SetB==2) RTC.setMinutes(valSet);
       if(SetB==3) RTC.setHours(valSet);
       if(SetB==4) RTC.setDay(valSet);
       if(SetB==5) RTC.setMonth(valSet);
       if(SetB==6) RTC.setYear(valSet);
       if(SetB==7) RTC.setWeek(valSet);
```

```
        if(SetB>7) EEPROM.write(alamat,valSet);
        lcd.setCursor(0,0); lcd.print(F("SUDAH DI UBAH ! "));
        lcd.setCursor(0,1); lcd.print(F("Terimakasih ... "));
        beepSet(); delay(1000); beep(3,100);
        Setting_A(); //SetB=0;
   }

   if(countSet>0 & countSet<12) { countSet=0; beepChange();
      if(digitalRead(btnMode)) {
         if(SetB==21) valSet+=10; else valSet++;
         if(valSet>valMax) valSet=valMin;
      } else {
         if(SetB==21) valSet-=10; else valSet--;
         if(valSet<valMin || valSet>valMax) valSet=valMax;
      }
   }

   lcd.setCursor(kursor,1);
   if(SetB<21) {if(valSet<10) lcd.print(F("0")); }
   if(SetB==21) {if(valSet<100) lcd.print(F("0"));}
   if(SetB<23) lcd.print(valSet);
   if(SetB==22){ lcd.print(F(" "));
                 lcd.print((char)223);
                 lcd.print(F("C "));
               }
}

void selesaiSetting() {
   lcd.setCursor(0,0); cetak(85);
   lcd.setCursor(0,1); cetak(86);
   beep(3,100);
   if(SetB>7) resetFunc();
   else { SetA=0; SetB=0; }
}

void cetak(byte tx) {
   if(tx== 1) lcd.print(F(" MENIT ... ?"));
   if(tx== 2 || tx== 8) lcd.print(F(" Menit = "));
   if(tx== 3) lcd.print(F("Setting DETIK..."));
   if(tx== 4) lcd.print(F(" Detik =  "));
   if(tx== 5) lcd.print(F(" JAM ... ?  "));
   if(tx== 6 || tx==12) lcd.print(F("   Jam = "));
   if(tx== 7) lcd.print(F("Setting MENIT..."));
   if(tx== 9) lcd.print(F(" TGL ... ?  "));
   if(tx==10 || tx==16) lcd.print(F(" Tanggal = "));
   if(tx==11) lcd.print(F("Setting JAM ... "));

   if(tx==13) lcd.print(F(" BLN ... ?  "));
   if(tx==14 || tx==20) lcd.print(F(" Bulan = "));
   if(tx==15) lcd.print(F("Setting TGL ..."));
   if(tx==17) lcd.print(F(" TAHUN ... ?"));
   if(tx==18 || tx==24) lcd.print(F(" Tahun = 20"));
   if(tx==19) lcd.print(F("Setting THN ... "));
   if(tx==21) lcd.print(F(" HARI ... ? "));
   if(tx==22 || tx==28) lcd.print(F("  Hari = "));
   if(tx==23) lcd.print(F("Setting TGL ... "));
```

```
   if(tx==25) lcd.print(F("SET_ON Subuh  ? "));
   if(tx==26||tx==30||tx==32||tx==34||tx==36 ||tx==38||
      tx==40||tx==42||tx==44||tx==46||tx==48||tx==50||
      tx==52||tx==56)
      lcd.print(F("    Mnt Sebelum "));
   if(tx==27) lcd.print(F("Setting Hari ..."));
   if(tx==29) lcd.print(F("ON SubuhRMD ?"));
   if(tx==31) lcd.print(F("ON Subuh :      "));
   if(tx==33) lcd.print(F("ON_Dzuhur ? "));
   if(tx==35) lcd.print(F("ON SubuhRMD :   "));
   if(tx==37) lcd.print(F("ON Jum'at ? "));
   if(tx==39) lcd.print(F("ON Dzuhur :     "));
   if(tx==41) lcd.print(F("ON Asar ?   "));
   if(tx==43) lcd.print(F("ON Jum'at :     "));
   if(tx==45) lcd.print(F("ON Magrib ? "));
   if(tx==47) lcd.print(F("ON Asar :       "));
   if(tx==49) lcd.print(F("ON Isya ?   "));
   if(tx==51) lcd.print(F("ON Magrib :     "));
   if(tx==53) lcd.print(F("OFF Subuh ? "));
   if(tx==54||tx==58||tx==60||tx==62||tx==64||tx==66||
      tx==68|| tx==70||tx==72||tx==74||tx==76||
      tx==78||tx==80)
      lcd.print(F("    Mnt Setelah "));
   if(tx==55) lcd.print(F("ON Isya :       "));
   if(tx==57) lcd.print(F("OFF Dzuhur ?"));
   if(tx==59) lcd.print(F("OFF Subuh :     "));
   if(tx==61) lcd.print(F("OFF Jum'at ?"));
   if(tx==63) lcd.print(F("OFF Dzuhur :    "));
   if(tx==65) lcd.print(F("OFF Asar ?  "));
   if(tx==67) lcd.print(F("OFF Jum'at :    "));
   if(tx==69) lcd.print(F("OFF Magrib ?"));
   if(tx==71) lcd.print(F("OFF ASar :      "));
   if(tx==73) lcd.print(F("OFF Isya ?  "));
   if(tx==75) lcd.print(F("OFF Magrib :    "));
   if(tx==77) lcd.print(F("OFF IsyaRMD ?"));
   if(tx==79) lcd.print(F("OFF Isya :      "));

   if(tx==81) lcd.print(F("limitSuhu ?  "));
   if(tx==83) lcd.print(F("OFF IsyaRM :    "));

   if(tx==85) lcd.print(F(" == SETTING ==  "));
   if(tx==86) lcd.print(F(" == SELESAI ==  "));
   if(tx==87) lcd.print(F("limiSuhu :      "));
}
```

B. Listing Program *Receiver Slave*

1. *Receiver Slave* 1

```
#include <RF24.h>
#include <RF24Network.h>
#include <SPI.h>
RF24 radio(9, 10); // nRF24L01 (CE,CSN)
RF24Network network(radio); // Include the radio in the
network
```

```
#define KIPAS A3
#define NYALA LOW
#define PADAM HIGH

const uint16_t this_node = 011; // Address of this node in
Octal format
const uint16_t node01 = 01;
byte dataMasuk, dataIn;

unsigned long LRT = 0; //lastReceiveTime
unsigned long CT = 0;  //currentTime
unsigned long LT = 10000; //limitTime

void setup() {
  Serial.begin(9600);
  SPI.begin();
  radio.begin();
  network.begin(90, this_node); //(channel, node address)
  radio.setDataRate(RF24_2MBPS);
  pinMode(KIPAS, OUTPUT); //relay KIPAS
  digitalWrite(KIPAS, PADAM); //KIPAS PADAM
}

void loop() {
   network.update();
   terima();
   delay(1000);
}

void terima() {
  while ( network.available() ) { // Is there any incoming
data?
    RF24NetworkHeader header;
    //Read the incoming data:
    network.read(header, &dataMasuk, sizeof(dataMasuk));
    if(header.from_node==01) { dataIn=dataMasuk; LRT =
millis(); }
  }

  CT = millis(); if(CT-LRT>LT) dataIn=0;
  delay(500);
  if ((dataIn & 1)==1) digitalWrite(KIPAS, NYALA);
  else if ((dataIn & 1)==0)digitalWrite(KIPAS, PADAM);
}
```

2. *Receiver Slave* 2

```
#include <RF24.h>
#include <RF24Network.h>
#include <SPI.h>
RF24 radio(9, 10); // nRF24L01 (CE,CSN)
RF24Network network(radio); // Include the radio in the
network
```

```
#define KIPAS A3
#define NYALA LOW
#define PADAM HIGH

const uint16_t this_node = 021; // Address of this node in
Octal format
const uint16_t node01 = 01;
byte dataMasuk, dataIn;

unsigned long LRT = 0; //lastReceiveTime
unsigned long CT = 0;  //currentTime
unsigned long LT = 10000; //limitTime

void setup() {
  Serial.begin(9600);
  SPI.begin();
  radio.begin();
  network.begin(90, this_node); //(channel, node address)
  radio.setDataRate(RF24_2MBPS);
  pinMode(KIPAS, OUTPUT); //relay KIPAS
  digitalWrite(KIPAS, PADAM); //KIPAS PADAM
}

void loop() {
   network.update();
   terima();
   delay(1000);
}

void terima() {
  while ( network.available() ) { // Is there any incoming
data?
    RF24NetworkHeader header;
    //Read the incoming data:
    network.read(header, &dataMasuk, sizeof(dataMasuk));
    if(header.from_node==01) { dataIn=dataMasuk; LRT =
millis(); }
  }

  CT = millis(); if(CT-LRT>LT) dataIn=0;
  delay(500);
  if ((dataIn & 2)==2) digitalWrite(KIPAS, NYALA);
  else if ((dataIn & 2)==0)digitalWrite(KIPAS, PADAM);
}
```

3. *Receiver Slave* 3

```
#include <RF24.h>
#include <RF24Network.h>
#include <SPI.h>
RF24 radio(9, 10); // nRF24L01 (CE,CSN)
RF24Network network(radio); // Include the radio in the
network
```

```
#define KIPAS A3
#define NYALA LOW
#define PADAM HIGH

const uint16_t this_node = 031; // Address of this node in
Octal format
const uint16_t node01 = 01;
byte dataMasuk, dataIn;

unsigned long LRT = 0; //lastReceiveTime
unsigned long CT = 0;  //currentTime
unsigned long LT = 10000; //limitTime

void setup() {
  Serial.begin(9600);
  SPI.begin();
  radio.begin();
  network.begin(90, this_node); //(channel, node address)
  radio.setDataRate(RF24_2MBPS);
  pinMode(KIPAS, OUTPUT); //relay KIPAS
  digitalWrite(KIPAS, PADAM); //KIPAS PADAM
}

void loop() {
   network.update();
   terima();
   delay(1000);
}

void terima() {
  while ( network.available() ) { // Is there any incoming
data?
    RF24NetworkHeader header;
    //Read the incoming data:
    network.read(header, &dataMasuk, sizeof(dataMasuk));
    if(header.from_node==01) { dataIn=dataMasuk; LRT =
millis(); }
  }

  CT = millis(); if(CT-LRT>LT) dataIn=0;
  delay(500);
  if ((dataIn & 4)==4) digitalWrite(KIPAS, NYALA);
  else if ((dataIn & 4)==0)digitalWrite(KIPAS, PADAM);
}
```

4. *Receiver Slave* 4

```
#include <RF24.h>
#include <RF24Network.h>
#include <SPI.h>
RF24 radio(9, 10); // nRF24L01 (CE,CSN)
RF24Network network(radio); // Include the radio in the
network
```

```
#define KIPAS A3
#define NYALA LOW
#define PADAM HIGH

const uint16_t this_node = 041; // Address of this node in
Octal format
const uint16_t node01 = 01;
byte dataMasuk, dataIn;

unsigned long LRT = 0; //lastReceiveTime
unsigned long CT = 0;  //currentTime
unsigned long LT = 10000; //limitTime

void setup() {
  Serial.begin(9600);
  SPI.begin();
  radio.begin();
  network.begin(90, this_node); //(channel, node address)
  radio.setDataRate(RF24_2MBPS);
  pinMode(KIPAS, OUTPUT); //relay KIPAS
  digitalWrite(KIPAS, PADAM); //KIPAS PADAM
}

void loop() {
   network.update();
   terima();
   delay(1000);
}

void terima() {
  while ( network.available() ) { // Is there any incoming
data?
    RF24NetworkHeader header;
    //Read the incoming data:
    network.read(header, &dataMasuk, sizeof(dataMasuk));
    if(header.from_node==01) { dataIn=dataMasuk; LRT =
millis(); }
  }

  CT = millis(); if(CT-LRT>LT) dataIn=0;
  delay(500);
  if ((dataIn & 8)==8) digitalWrite(KIPAS, NYALA);
  else if ((dataIn & 8)==0)digitalWrite(KIPAS, PADAM);
}
```

Lampiran – 2 Dokumentasi Alat

A. Dokumentasi Alat *Master Transmitter*



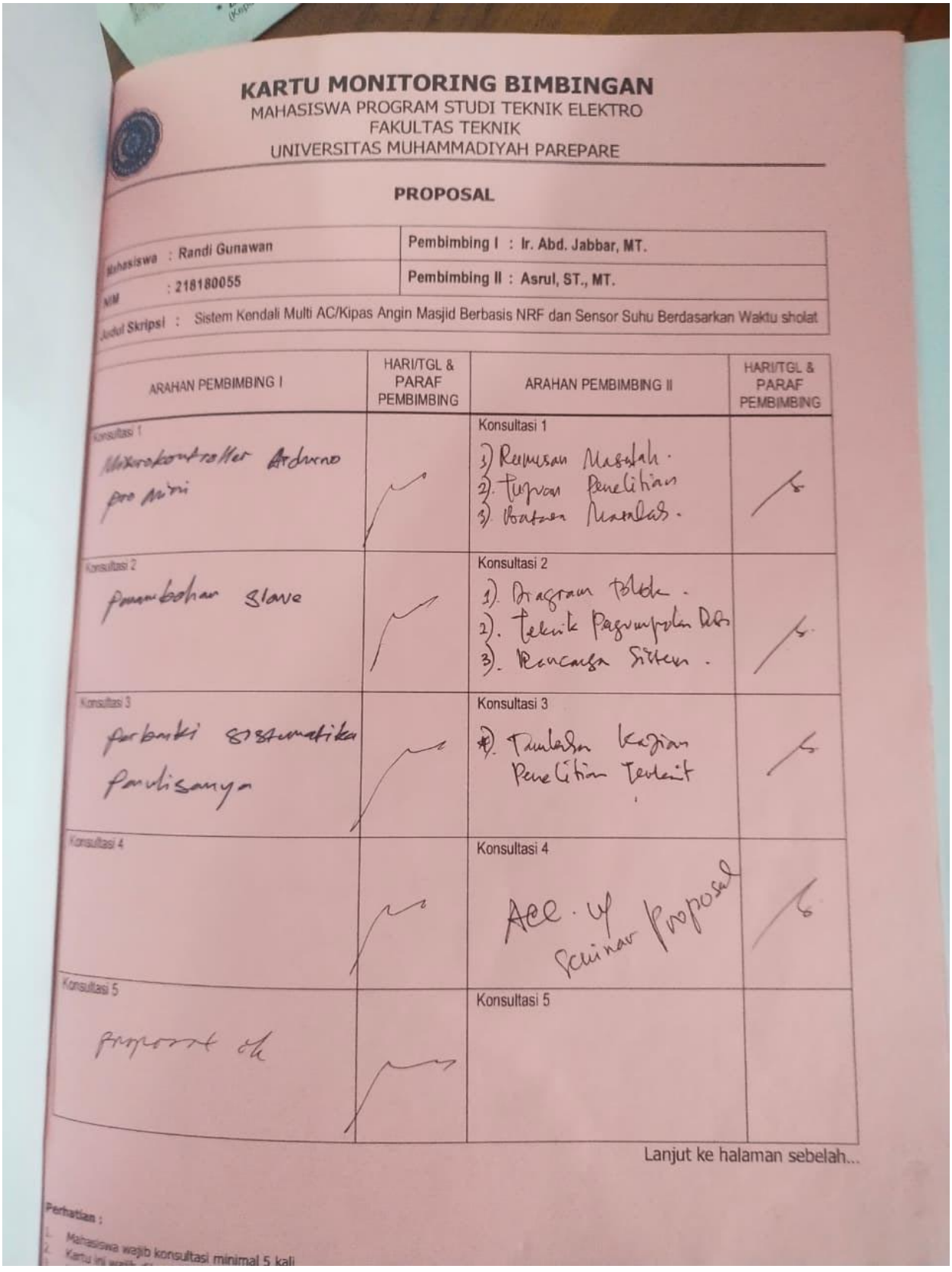


B. Dokumentasi Alat *Receiver Slave*





KARTU MONITORING



KARTU MONITORING BIMBINGAN
MAHASISWA PROGRAM STUDI TEKNIK ELEKTRO
FAKULTAS TEKNIK
UNIVERSITAS MUHAMMADIYAH PAREPARE

PROPOSAL

Mahasiswa : Randi Gunawan	Pembimbing I : Ir. Abd. Jabbar, MT.
NIM : 218180055	Pembimbing II : Asrul, ST., MT.
Judul Skripsi : Sistem Kendali Multi AC/Kipas Angin Masjid Berbasis NRF dan Sensor Suhu Berdasarkan Waktu sholat	

ARAHAN PEMBIMBING I	HARI/TGL & PARAF PEMBIMBING	ARAHAN PEMBIMBING II	HARI/TGL & PARAF PEMBIMBING
Konsultasi 1 Mikrokontroller Arduino pro Mini		Konsultasi 1 1) Rumusan Masalah. 2) Tujuan Penelitian 3) Batasan Masalah.	
Konsultasi 2 penambahan slave		Konsultasi 2 1) Diagram Blok. 2) Teknik Pengumpulan Data 3) Rancang Sistem.	
Konsultasi 3 perbaiki sistematika penulisanya		Konsultasi 3 *) Tambahan kajian Penelitian Terkait	
Konsultasi 4		Konsultasi 4 Acc. u/ Seminar Proposal	
Konsultasi 5 proposal ok		Konsultasi 5	

Lanjut ke halaman sebelah...

Perhatian :
1. Mahasiswa wajib konsultasi minimal 5 kali

KARTU MONITORING BIMBINGAN

MAHASISWA PROGRAM STUDI TEKNIK ELEKTRO
FAKULTAS TEKNIK
UNIVERSITAS MUHAMMADIYAH PAREPARE

HASIL

Mahasiswa : RANDI GUNAWAN	Pembimbing I : Ir. A. Abd. Jabbar, MT.
: 218180055	Pembimbing II : Asrul, ST., MT.
Judul Skripsi : SISTEM KENDALI MULTI AC / KIPAS ANGIN MASJID BERBASIS NRF DAN SENSOR SUHU BERDASARKAN WAKTU SHALAT	

ARAHAN PEMBIMBING I	HARI/TGL & PARAF PEMBIMBING	ARAHAN PEMBIMBING II	HARI/TGL & PARAF PEMBIMBING
Konsultasi 1 Desain Sistem.	✓	Konsultasi 1 Sistematika penulisan	✓
Konsultasi 2 Pengolahan Data penulisan	✓	Konsultasi 2 Pohadi alur degran (Flowchart).	✓
Konsultasi 3 Perubahan Data Flowchart	✓	Konsultasi 3 - Penyelesaian dygambleh - Penjambler Data.	✓
Konsultasi 4 —	✓	Konsultasi 4 Acc Seminar Hasil	✓
Konsultasi 5 Bh. Seminar Hasil 9/8-25 :	✓	Konsultasi 5	

Lanjut ke halaman sebelah...

Parepare,

Mahasiswa

Randi Gunawan
NIM. 218180047

Perhatian :

1. Mahasiswa wajib konsultasi minimal 5 kali
2. Kartu ini wajib dibawa oleh mahasiswa disetiap konsultasi dan diisi oleh Pembimbing
3. Kartu ini wajib dilampirkan pada laporan skripsi dan menjadi salah satu persyaratan untuk ikut seminar proposal/ujian skripsi
4. Kartu ini dicetak di atas kertas karton berwarna hijau muda dan dicetak timbal balik