Lampiran

A. Program

1. Pembuatan listing program pada RTC

```
hile (1)
    {
    // Place your code here
     rtc_get_time(&j,&m,&s);
    sprintf(buffer,"%d:%d:%d",j,m,s); // LCD MENAMPILKAN JAM

    lcd_gotoxy(3,0);
    lcd_puts(buffer);
    lcd_gotoxy(0,0);
    lcd_putsf("J:");

    if((alarm_jam1!=255)&&(alarm_menit1!=255)&&(alarm_detik1!=255))
    {
    rtc_get_time(&j,&m,&s);
    sprintf(buffer,"%d:%d:%d",j,m,s); // LCD MENAMPILKAN JAM
    lcd_gotoxy(3,0);
    lcd_puts(buffer);
    lcd_gotoxy(0,0);
    lcd_putsf("J:");

    temp=read_adc(0);
    SUHU=((float)temp*0.488);

    sprintf(lcd_buf,"%0.2f",SUHU);
    lcd_gotoxy(12,0);
    lcd_puts(lcd_buf);

    if(SUHU<30){OCR2=1;}
    if((SUHU>=10)&&(SUHU<=20)){OCR2=1;}
    if((SUHU>=21)&&(SUHU<=25)){OCR2=1.9;}
    if((SUHU>=26)&&(SUHU<=59)){OCR2=2.5;}
    if((SUHU>=60)&&(SUHU<=89)){OCR2=2.6;}
    if((SUHU>=90)&&(SUHU<=100)){OCR2=2.7;}
    //if((SUHU>=41)&&(SUHU<=50)){OCR2=4;}
    //if(SUHU<=99){OCR2=0xff;}

    //PORTC.7=1; // MOTOR AKTIF

    data=1;
    sprintf(buffer,"T:   %d:%d:%d",alarm_jam1,alarm_menit1,alarm_detik1);
    //SKEDUL 1
    lcd_gotoxy(0,1);
    lcd_puts(buffer);
    delay_ms(500);

    while((alarm_jam1==j)&&(alarm_menit1==m)&&(alarm_detik1==s))
    {
    //PORTC.7=0; //MOTOR MATI
    OCR2=0;
    delay_ms(500);
    alarm_jam1=255;alarm_menit1=255;alarm_detik1=255;
    lcd_clear();
    break;

    }
    }

    PORTC.4 =0;PORTC.5=1;PORTC.6=1;PORTC.7=1;
    delay_ms(30);
    if (PIND.3 == 0) {a=0;lcd_clear();delay_ms(300);}
    while(a==0)
    {
      lcd_gotoxy(0,0);
      lcd_putsf("   SET  JAM    ");
      delay_ms(100);
      k=6;
      for (i=0;i<6;i++)
      {
          do {
              scand_keypad();//delay_ms(500);
          } while (data>9);
          sprintf(bof,"%x",data);
          lcd_puts(bof);
```

```
        nilai[i+1]=data;
    }
    j = (nilai[1]*10)+nilai[2];
    m = (nilai[3]*10)+nilai[4];
    s = (nilai[5]*10)+nilai[6];


    rtc_init(0,0,0);
    rtc_set_time(j,m,s);
    a=1;
    lcd_clear();
}

PORTC.4 =1;PORTC.5=1;PORTC.6=1;PORTC.7=0;
delay_ms(30);
if (PIND.0 == 0) {a=0;lcd_clear();delay_ms(300);}
while(a==0)
{
  lcd_gotoxy(0,0);
  lcd_putsf("   SET TIMER    ");
  delay_ms(100);
  k=6;
  for (i=0;i<6;i++)
  {
      do {
          scand_keypad();//delay_ms(500);
      } while (data>9);
      sprintf(bof,"%x",data);
      lcd_puts(bof);
      nilai[i+1]=data;
  }
  j = (nilai[1]*10)+nilai[2];
  m = (nilai[3]*10)+nilai[4];
  s = (nilai[5]*10)+nilai[6];

  alarm_jam1=j;
  alarm_menit1=m;
  alarm_detik1=s;

  rtc_get_time(&j,&m,&s);

  alarm_jam1=alarm_jam1+j;
  alarm_menit1=alarm_menit1+m;
  alarm_detik1=alarm_detik1+s;

  if(alarm_jam1>=24){alarm_jam1=alarm_jam1-24;};

   if(alarm_menit1>=60){alarm_jam1=alarm_jam1+1;alarm_menit1=alarm_me
   nit1-60;};

  a=1;
  lcd_clear();
}

};
}
```

2. Pembuatan listing program pada Sensor Suhu LM 35

```
har lcd_buf[33];
float SUHU;
int temp;
int i,k;
// Input/Output Ports initialization
// Port A initialization
// Func7=In Func6=In Func5=In Func4=In Func3=In Func2=In Func1=In
Func0=In
// State7=T State6=T State5=T State4=T State3=T State2=T State1=T
State0=T
PORTA=0x00;
DDRA=0x00;

// Port B initialization
// Func7=In Func6=In Func5=In Func4=In Func3=In Func2=In Func1=In
Func0=In
// State7=T State6=T State5=T State4=T State3=T State2=T State1=T
State0=T
PORTB=0x00;
DDRB=0x00;

// Port C initialization
```

```c
// Func7=Out Func6=Out Func5=Out Func4=Out Func3=In Func2=In
Func1=In Func0=In
// State7=0 State6=0 State5=0 State4=0 State3=T State2=T State1=T
State0=T
PORTC=0x00;
DDRC=0xF0;

// Port D initialization
// Func7=Out Func6=In Func5=In Func4=In Func3=In Func2=In Func1=In
Func0=In
// State7=0 State6=T State5=T State4=T State3=P State2=P State1=P
State0=P
PORTD=0x0F;
DDRD=0x80;

// Timer/Counter 0 initialization
// Clock source: System Clock
// Clock value: Timer 0 Stopped
// Mode: Normal top=FFh
// OC0 output: Disconnected
TCCR0=0x00;
TCNT0=0x00;
OCR0=0x00;

// Timer/Counter 1 initialization
// Clock source: System Clock
// Clock value: Timer 1 Stopped
// Mode: Normal top=FFFFh
// OC1A output: Discon.
// OC1B output: Discon.
// Noise Canceler: Off
// Input Capture on Falling Edge
// Timer 1 Overflow Interrupt: Off
// Input Capture Interrupt: Off
// Compare A Match Interrupt: Off
// Compare B Match Interrupt: Off
TCCR1A=0x00;
TCCR1B=0x00;
TCNT1H=0x00;
TCNT1L=0x00;
ICR1H=0x00;
ICR1L=0x00;
OCR1AH=0x00;
OCR1AL=0x00;
OCR1BH=0x00;
OCR1BL=0x00;

// Timer/Counter 2 initialization
// Clock source: System Clock
// Clock value: 11059.200 kHz
// Mode: Fast PWM top=FFh
// OC2 output: Non-Inverted PWM
ASSR=0x00;
TCCR2=0x69;
TCNT2=0x00;
OCR2=0x00;

// External Interrupt(s) initialization
// INT0: Off
// INT1: Off
// INT2: Off
MCUCR=0x00;
MCUCSR=0x00;

// Timer(s)/Counter(s) Interrupt(s) initialization
TIMSK=0x00;

// Analog Comparator initialization
// Analog Comparator: Off
// Analog Comparator Input Capture by Timer/Counter 1: Off
ACSR=0x80;
SFIOR=0x00;

// ADC initialization
// ADC Clock frequency: 691.200 kHz
// ADC Voltage Reference: AREF pin
// ADC Auto Trigger Source: None
ADMUX=ADC_VREF_TYPE & 0xff;
ADCSRA=0x84;

// I2C Bus initialization
i2c_init();
```

```
                    // DS1307 Real Time Clock initialization
                    // Square wave output on pin SQW/OUT: Off
                    // SQW/OUT pin state: 0
                    rtc_init(0,0,0);
                    rtc_set_time(14,53,00);
                    rtc_set_date(24,02,16);

                    // LCD module initialization
                    lcd_init(16);
```

3. Pembuatan listing program pada Keypad Matrix.

```
oid scand_keypad()
{
    char keluar=0;
    char lama=50;
    do
    {
        PORTC.4 =0;PORTC.5=1;PORTC.6=1;PORTC.7=1;
        delay_ms(30);
        if (PIND.0 == 0) {data=1;keluar=1;delay_ms(lama);}
        if (PIND.1 == 0) {data=4;keluar=1;delay_ms(lama);}
        if (PIND.2 == 0) {data=7;keluar=1;delay_ms(lama);}
        if (PIND.3 == 0) {delay_ms(300);}

        PORTC.4 =1;PORTC.5=0;PORTC.6=1;PORTC.7=1;
        delay_ms(30);
        if (PIND.0 == 0) {data=2;keluar=1;delay_ms(lama);}
        if (PIND.1 == 0) {data=5;keluar=1;delay_ms(lama);}
        if (PIND.2 == 0) {data=8;keluar=1;delay_ms(lama);}
        if (PIND.3 == 0) {data=0;keluar=1;delay_ms(lama);}

        PORTC.4 =1;PORTC.5=1;PORTC.6=0;PORTC.7=1;
        delay_ms(30);
        if (PIND.0 == 0) {data=3;keluar=1;delay_ms(lama);}
        if (PIND.1 == 0) {data=6;keluar=1;delay_ms(lama);}
        if (PIND.2 == 0) {data=9;keluar=1;delay_ms(lama);}
        if (PIND.3 == 0) {delay_ms(300);}

        PORTC.4 =1;PORTC.5=1;PORTC.6=1;PORTC.7=0;
        delay_ms(30);
        if (PIND.0 == 0) {delay_ms(300);}
        if (PIND.1 == 0) {delay_ms(300);}
        if (PIND.2 == 0) {delay_ms(300);}
        if (PIND.3 == 0) {delay_ms(300);}
    }
    while (keluar ==0);
```

4. Pembuatan listing program pada Driver Motor AC

```
//PORTC.7=1; // MOTOR AKTIF

        data=1;
        sprintf(buffer,"T:   %d:%d:%d",alarm_jam1,alarm_menit1,alarm_detik1);
//SKEDUL 1
        lcd_gotoxy(0,1);
        lcd_puts(buffer);
        delay_ms(500);

        while((alarm_jam1==j)&&(alarm_menit1==m)&&(alarm_detik1==s))
        {
        //PORTC.7=0; //MOTOR MATI
        OCR2=0;
        delay_ms(500);
        alarm_jam1=255;alarm_menit1=255;alarm_detik1=255;
        lcd_clear();
        break;

        }
        }

        PORTC.4 =0;PORTC.5=1;PORTC.6=1;PORTC.7=1;
        delay_ms(30);
        if (PIND.3 == 0) {a=0;lcd_clear();delay_ms(300);}
        while(a==0)
        {
          lcd_gotoxy(0,0);
          lcd_putsf("    SET  JAM     ");
```

```c
delay_ms(100);
k=6;
for (i=0;i<6;i++)
{
    do {
        scand_keypad();//delay_ms(500);
    } while (data>9);
    sprintf(bof,"%x",data);
    lcd_puts(bof);
    nilai[i+1]=data;
}
j = (nilai[1]*10)+nilai[2];
m = (nilai[3]*10)+nilai[4];
s = (nilai[5]*10)+nilai[6];


rtc_init(0,0,0);
rtc_set_time(j,m,s);
a=1;
lcd_clear();
```