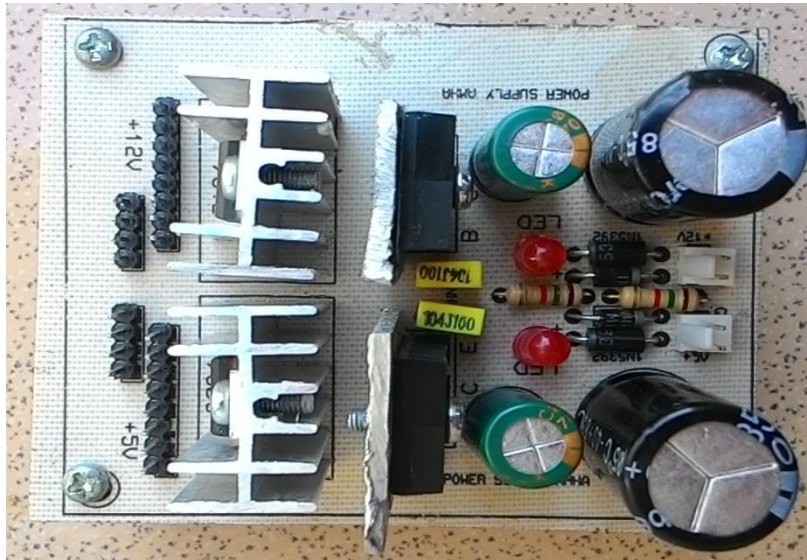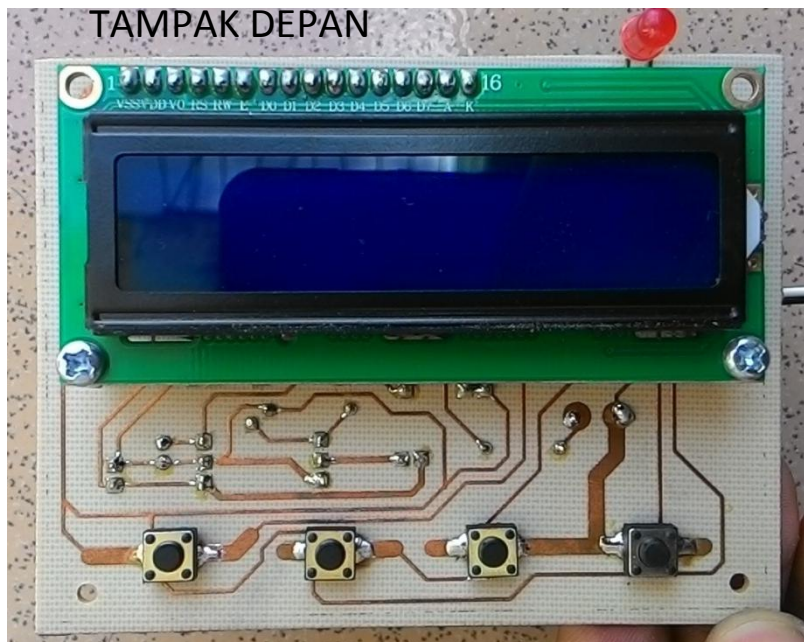**Lampiran**
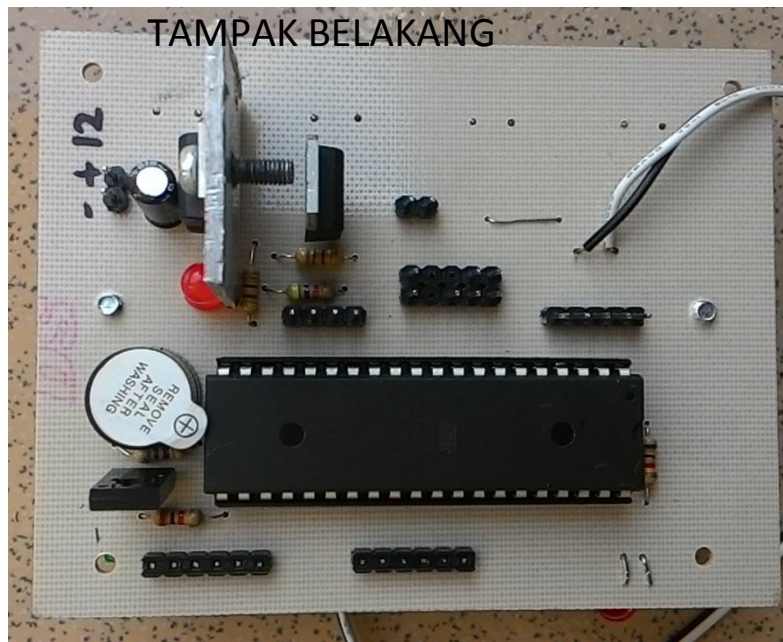
A. Rangkaiandan box mixer

    1. Rangkaian*Power Supply* yang telah dilarutkan dan dirakit

    2. Rangkaian Minimum sistem yang telah dilarutkan dan dirakit

TAMPAK BELAKANG

3. Rangkaian dalam box

4. Motor DC girbox

5. Dudukan motor DC

6. Tabung V

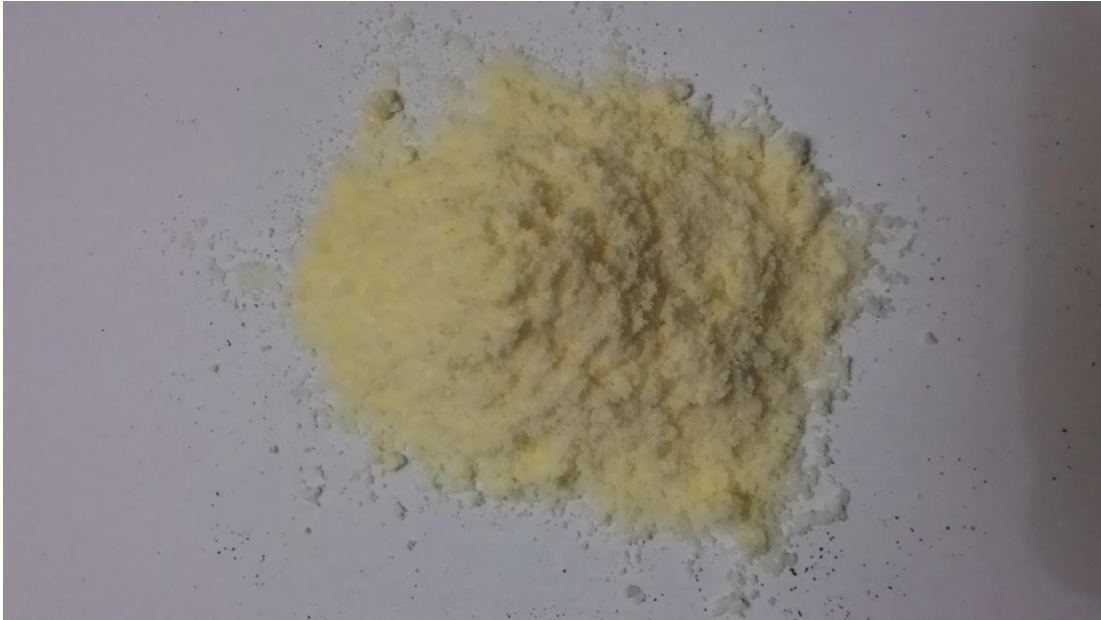7. KunciTabung

B. Pengukuran dan pengujian

1. Pengukuran pada Level 25 RPM

2. Pengukuran pada Level 24 rpm

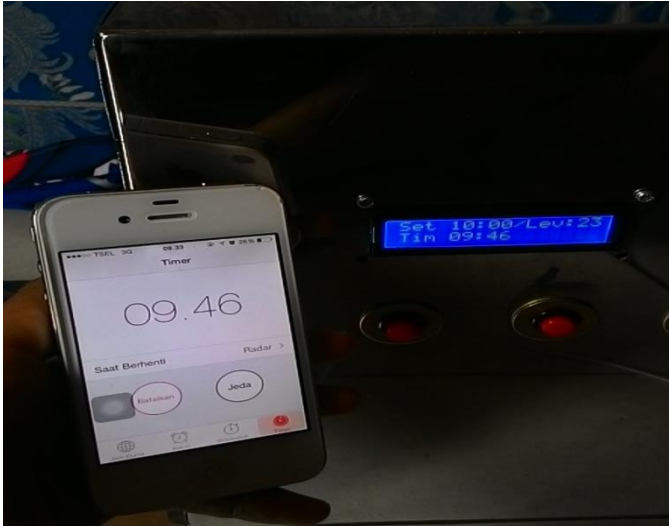3. Serbuk S sebelum pencampuran

4. Serbuk C sebelum pencampuran

5. Serbuk S&C setelah pencampuran

6. Pengukuran waktu pada 15 menit

7. Pengukuran waktu pada15 menit

C. Program

```
/**************************************************
This program was produced by the
CodeWizardAVR V2.05.3 Standard
Automatic Program Generator
© Copyright 1998-2011 PavelHaiduc, HP InfoTech s.r.l.
http://www.hpinfotech.com

Project :
Version :
Date    : 7/25/2016
Author  : AMHA.OUTDOOR
Company : DPM
Comments:



Chip type               : ATmega8535
Program type            : Application
AVR Core Clock frequency: 11.059200 MHz
Memory model            : Small
External RAM size        : 0
```

```
Data Stack size           : 128
**************************************************/

#include <mega8535.h>

// Alphanumeric LCD functions
#include <alcd.h>
#include <delay.h>
#include <stdio.h>
#define S1 PINB.0
#define S2 PINB.1
#define S3 PINB.2
#define S4 PINB.3

intx,s,m,f, buz;
eepromintmenu,sub,set,sr, rpm;
charbuf[33];



// Timer2 overflow interrupt service routine
interrupt [TIM2_OVF] void timer2_ovf_isr(void)
{
// Place your code here
    TCNT2=148;
x++;
if(x>99)
        {
if(f==1)s--;
if(s<0)
           {
if(m!=0){m--;s=59;}
else{s=0; f=0; OCR1A=0; PORTA.0=0; buz=1;}
           }
        x=0;


        }
}

voidbuzer()
{
 PORTD.7=1;
```

```
 PORTA.0=1;
delay_ms(1000);
 PORTD.7=0;
 PORTA.0=0;
delay_ms(1000);
 PORTD.7=1;
 PORTA.0=1;
delay_ms(1000);
 PORTD.7=0;
 PORTA.0=0;
delay_ms(1000);
 PORTD.7=1;
 PORTA.0=1;
delay_ms(1000);
 PORTD.7=0;
 PORTA.0=0;
delay_ms(1000);
buz=0;


}

// Declare your global variables here

void main(void)
{
// Declare your local variables here

// 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=0x01;

// Port B initialization
//  Func7=In  Func6=In  Func5=In  Func4=In  Func3=In  Func2=In
          Func1=In Func0=In
```

```c
//    State7=T    State6=T    State5=T    State4=T    State3=P    State2=P
//             State1=P State0=P
PORTB=0x0F;
DDRB=0x00;

// Port C 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
PORTC=0x00;
DDRC=0x00;

// Port D initialization
//    Func7=Out  Func6=In  Func5=Out  Func4=Out  Func3=In  Func2=In
//             Func1=In Func0=In
//    State7=0    State6=T    State5=0    State4=0    State3=T    State2=T
//             State1=T State0=T
PORTD=0x00;
DDRD=0xB0;

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

// Timer/Counter 1 initialization
// Clock source: System Clock
// Clock value: 10.800 kHz
// Mode: Ph. correct PWM top=0x00FF
// OC1A output: Non-Inv.
// OC1B output: Non-Inv.
// Noise Canceler: Off
// Input Capture on Falling Edge
// Timer1 Overflow Interrupt: Off
// Input Capture Interrupt: Off
// Compare A Match Interrupt: Off
```

```c
// Compare B Match Interrupt: Off
TCCR1A=0xA1;
TCCR1B=0x02;
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: 10.800 kHz
// Mode: Normal top=0xFF
// OC2 output: Disconnected
ASSR=0x00;
TCCR2=0x07;
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=0x40;

// USART initialization
// USART disabled
UCSRB=0x00;

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

```c
// ADC initialization
// ADC disabled
ADCSRA=0x00;

// SPI initialization
// SPI disabled
SPCR=0x00;

// TWI initialization
// TWI disabled
TWCR=0x00;

// Alphanumeric LCD initialization
// Connections are specified in the
// Project|Configure|CCompiler|Libraries|Alphanumeric LCD menu:
// RS - PORTC Bit 0
// RD - PORTC Bit 1
// EN - PORTC Bit 2
// D4 - PORTC Bit 4
// D5 - PORTC Bit 5
// D6 - PORTC Bit 6
// D7 - PORTC Bit 7
// Characters/line: 16
lcd_init(16);
lcd_gotoxy(0,0);
lcd_putsf(" MIXSER TABUNG V ");
lcd_gotoxy(0,1);
lcd_putsf("Ahmad Muammal HA");
delay_ms(3000);
lcd_clear();

// Global enable interrupts
#asm("sei")

while (1)
      {
      // Place your code here
if(menu==0)
        {   if(sub==0)
            {
```

```c
lcd_gotoxy(0,0);
lcd_putsf("Pilih Menu      ");
lcd_gotoxy(0,1);
lcd_putsf("1.Set Timer    <");
if(!S4){sub=1;delay_ms(300);}
if(!S3){menu=1;delay_ms(300);}


          }
if (sub==1)
            {
lcd_gotoxy(0,0);
lcd_putsf("Set Timer       ");
sprintf(buf,"%d menit         ",set);
lcd_gotoxy(0,1);
lcd_puts(buf);

if(!S3){set++; if(set>30) {set=30;} delay_ms(300);}
if(!S2){set--; if(set<0 ) {set=0; } delay_ms(300);}
if(!S1){sub=0;delay_ms(300);}
            }
        }
if(menu==1)
        {
if(sub==0)
            {
lcd_gotoxy(0,0);
lcd_putsf("1.Set Timer     ");
lcd_gotoxy(0,1);
lcd_putsf("2.Set RPM      <");
if(!S4){sub=1;delay_ms(300);}
if(!S3){menu=2;delay_ms(300);}
if(!S2){menu=0;delay_ms(300);}
            }
if (sub==1)
            {
lcd_gotoxy(0,0);
lcd_putsf("Set RPM         ");
sprintf(buf,"Level %d        ",rpm);
lcd_gotoxy(0,1);
lcd_puts(buf);
sr=rpm*10;
```

```c
            OCR1A=sr;
            if(!S3){rpm++;          if(rpm>25){          rpm=25;}
        delay_ms(300);}
if(!S2){rpm--; if(rpm<0) { rpm=0; } delay_ms(300);}
if(!S1){sub=0;delay_ms(200); OCR1A=0;}



            }


        }
if(menu==2)
        {
if(sub==0)
            {
lcd_gotoxy(0,0);
lcd_putsf("2.Set RPM        ");
lcd_gotoxy(0,1);
lcd_putsf("3.Run           <");
if(!S4){sub=1;delay_ms(300);  m=set; f=1; PORTA.0=1; OCR1A=sr;}
if(!S2){menu=1;delay_ms(300);}
if(!S1){sub=0;delay_ms(300);}
            }
if (sub==1)
            {

sprintf(buf,"Set %.2d:%.2d/Lev:%.2d",set,0,rpm);
lcd_gotoxy(0,0);
lcd_puts(buf);
sprintf(buf,"Tim %.2d:%.2d           ",m,s);
lcd_gotoxy(0,1);
lcd_puts(buf);
if(!S4){sub=0; menu=0; delay_ms(300);  OCR1A=0;}
if(!S3 && f==0){  m=set; s=0; f=1; PORTA.0=1; OCR1A=sr; }
if(!S2){  m=0; s=0; f=0; PORTA.0=0; OCR1A=0;}

if(buz==1) buzer();
            }

        }
      }
```
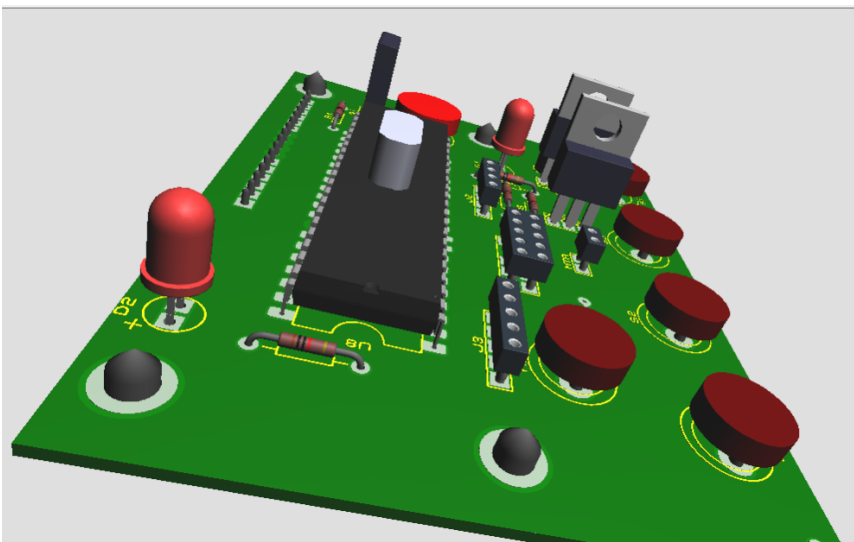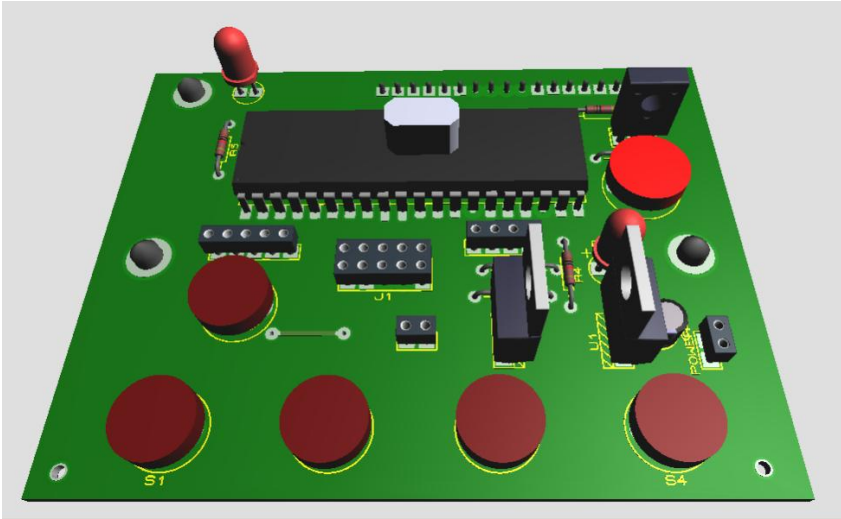
D. Rangkaian 3D

E. Data Sheet Komponen