Kalender digital tampilan LCD

Sistem Kerja Alat:

Arduino membaca data RTC (Real Time Clock) data yang diperoleh berupa jam, menit, detik, hari ke-, tanggal, bulan dan tahun. Hasil pembacaan data RTC kemudian ditampilkan pada LCD 2x16. LCD menampilkan jam , hari dan tanggal. Disamping menapilkan display tersebut jam dapat diseting dengan 4 tombol yaitu tombol Next, Back, Up dan Down.

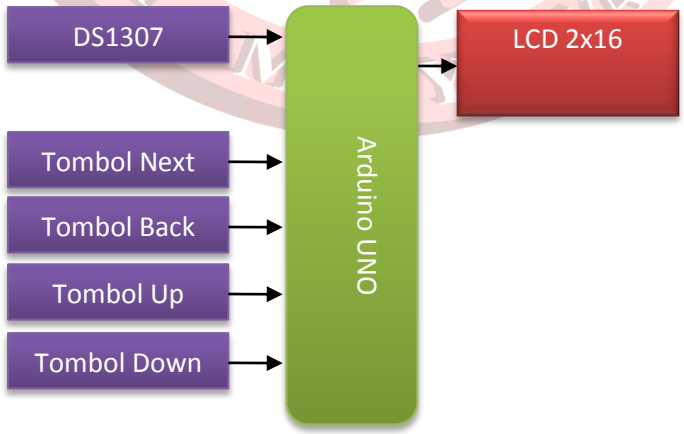
Kebutuhan Hardware :

- Modul LCD 2x16
- Modul RTC DS1307
- 4 Tombol push ON
- Modul Arduino UNO
- Power supply +9Volt

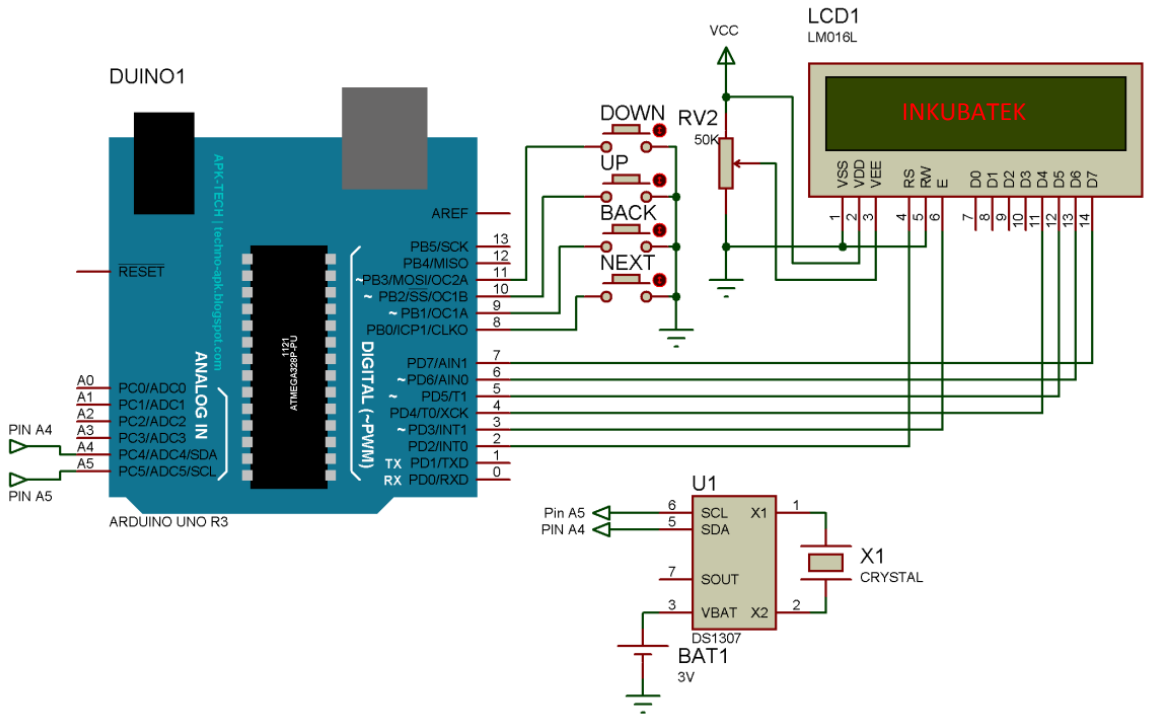
Module RTC DS1307

Tombol tack switch

Diagram Blok:



Schematics



Koneksi Arduino UNO:

Pin ARDUINO	LCD
2	RS
3	EN
4	D4
5	D5
6	D6
7	D7

Koneksi RTC:

Pin RTC	Pin ARDUINO
VCC	+5V
GND	GND
SDA	Pin A4
SCL	Pin A5

Koneksi Tombol:

Tombol	Pin ARDUINO

NEXT	Pin 8
BACK	Pin 9
UP	Pin 10
DOWN	Pin 11

Source Code/Sketch :

```
/*************************************
 * Program : Project 49. Kalender digital tampilan LCD
 * 125 Proyek Arduino Inkubatek
 * www.inkubator-teknologi.com
 * www.tokotronik.com
 * ***********************************/
#include <LiquidCrystal.h>
#include "Wire.h"
#define DS1307_ADDRESS 0x68
byte zero = 0x00;
LiquidCrystal lcd(2, 3, 4, 5, 6, 7);

int menu;
byte second ,minute,hour, weekDay;
byte monthDay,month,year;

boolean up=false;
boolean down=false;

void setup(){
  pinMode(8,INPUT);
  pinMode(9,INPUT);
  pinMode(10,INPUT);
  pinMode(11,INPUT);
  digitalWrite(8,HIGH);
  digitalWrite(9,HIGH);
  digitalWrite(10,HIGH);
  digitalWrite(11,HIGH);
  Wire.begin();
  lcd.begin(16, 2);
  lcd.setCursor(0,0);
  lcd.print("Kalender digital");
  delay(2000);
  lcd.clear();
}
```

```
void loop(){
  bacaRTC();
  lcdDisplay();
  cekTombol();
  delay(1000);
}

byte decToBcd(byte val){
  return ( (val/10*16) + (val%10) );
}

byte bcdToDec(byte val)  {
  return ( (val/16*10) + (val%16) );
}

void bacaRTC(){
  Wire.beginTransmission(DS1307_ADDRESS);
  Wire.write(zero);
  Wire.endTransmission();
  Wire.requestFrom(DS1307_ADDRESS, 7);
  second = bcdToDec(Wire.read());
  minute = bcdToDec(Wire.read());
  hour = bcdToDec(Wire.read() & 0b111111);
  weekDay = bcdToDec(Wire.read());
  monthDay = bcdToDec(Wire.read());
  month = bcdToDec(Wire.read());
  year = bcdToDec(Wire.read());
}

void cekTombol(){
  if (digitalRead(8)==0){
    lcd.clear();
    lcd.print("Seting RTC");
    delay(2000);
    menu++;
    lcd.clear();
    lcdDisplay();
    lcd.blink();
    do{
      //------------------------next
      if (digitalRead(8)==0){
        delay(300);
        menu++;
      }
      //--------------------back
```

```
    else if (digitalRead(9)==0){
      delay(300);
      if (menu > 1){
       menu--;
      }
    }
    //--------------------------up
    else if(digitalRead(10)==0){
      delay(200);
      up=true;
    }

 //-------------------------down
    else if(digitalRead(11)==0){
      delay(200);
      down=true;
    }
//-----------------------edit data jam
    if (menu==1){
      if (up==true && hour < 24){
         hour++;
         lcdDisplay();
      }
      else if (down==true && hour>0){
         hour--;
         lcdDisplay();
      }
      up=false;
      down=false;
      if (hour<10){
       lcd.setCursor(5,0);
      }
      else  {
       lcd.setCursor(6,0);
      }
    }

//-----------------------edit data menit
    else if (menu==2){
      if (up==true && minute < 59){
         minute++;
         lcdDisplay();
       }
      else if (down==true && minute>0){
        minute--;
```

```
      lcdDisplay();
    }
      up=false;
      down=false;

    if (hour<10 && minute<10){
     lcd.setCursor(7,0);
    }
    else if (hour<10 && minute>9){
     lcd.setCursor(8,0);
    }
    else if (hour>9 && minute<10){
     lcd.setCursor(8,0);
    }
    else if (hour>9 && minute>9){
     lcd.setCursor(9,0);
    }
   }

//-------------------------edit data detik
   else if (menu==3){
    if (up==true && second < 59){
       second++;
       lcdDisplay();
     }
    else if (down==true && second>0){
      second--;
      lcdDisplay();
    }
    up=false;
    down=false;

    if (hour<10 && minute<10 && second<10){
     lcd.setCursor(9,0);
    }
    else if (hour<10 && minute<10 && second>9){
     lcd.setCursor(10,0);
    }
    else if (hour<10 && minute>9 && second<10){
     lcd.setCursor(10,0);
    }
    else if (hour>9 && minute<10 && second<10){
     lcd.setCursor(10,0);
    }
    else if (hour<10 && minute>9 && second>9){
```

```
      lcd.setCursor(11,0);
     }
     else if (hour>9 && minute>9 && second<10){
      lcd.setCursor(11,0);
     }
     else if (hour>9 && minute<10 && second>9){
      lcd.setCursor(11,0);
     }
     else if (hour>9 && minute>9 && second>9){
      lcd.setCursor(12,0);
     }
    }

//-------------------------edit data hari
    else if (menu==4){
     if (up==true && weekDay < 6){
        weekDay++;
        lcdDisplay();
     }
     else if (down==true && weekDay>0){
        weekDay--;
        lcdDisplay();
     }
     up=false;
     down=false;
     lcd.setCursor(0,1);
    }

//-------------------------edit data tanggal
    else if (menu==5){
     if (up==true && monthDay < 31){
        monthDay++;
        lcdDisplay();
     }
     else if (down==true && monthDay>1){
        monthDay--;
        lcdDisplay();
     }
     up=false;
     down=false;
     if (monthDay<10){
      lcd.setCursor(5,1);
     }
     else  {
      lcd.setCursor(6,1);
```

```
    }
   }

//------------------------edit data bulan
   else if (menu==6){
    if (up==true && month < 12){
       month++;
       lcdDisplay();
     }
    else if (down==true && month>1){
      month--;
      lcdDisplay();
    }
      up=false;
      down=false;

    if (monthDay<10 && month<10){
     lcd.setCursor(7,1);
    }
    else if (monthDay<10 && month>9){
     lcd.setCursor(8,1);
    }
    else if (monthDay>9 && month<10){
     lcd.setCursor(8,1);
    }
    else if (monthDay>9 && month>9){
     lcd.setCursor(9,1);
    }
   }

//------------------------edit data tahun
   else if (menu==7){
    if (up==true && year < 99){
       year++;
       lcdDisplay();
     }
    else if (down==true && year>0){
      year--;
      lcdDisplay();
    }
    up=false;
    down=false;

    if (monthDay<10 && month<10 && year<10){
     lcd.setCursor(11,1);
```

```
      }
      else if (monthDay<10 && month<10 && year>9){
       lcd.setCursor(12,1);
      }
      else if (monthDay<10 && month>9 && year<10){
       lcd.setCursor(12,1);
      }
      else if (monthDay>9 && month<10 && year<10){
       lcd.setCursor(12,1);
      }
      else if (monthDay<10 && month>9 && year>9){
       lcd.setCursor(13,1);
      }
      else if (monthDay>9 && month>9 && year<10){
       lcd.setCursor(13,1);
      }
      else if (monthDay>9 && month<10 && year>9){
       lcd.setCursor(13,1);
      }
      else if (monthDay>9 && month>9 && year>9){
       lcd.setCursor(14,1);
      }
     }

 //-------------------------simpan data RTC
     if (menu==8)setingRTC();
   }
   while(menu < 8);
   lcd.clear();
   lcd.noBlink();
   lcd.print("Seting RTC OK!");
   delay(1000);
   lcd.clear();
   menu=0;
  }
}

void lcdDisplay(){
  lcd.setCursor(0,0);
  lcd.print("Jam:");
  lcd.setCursor(5,0);
  lcd.print(hour);
  lcd.print(":");
  lcd.print(minute);
  lcd.print(":");
```

```
  lcd.print(second);
  lcd.print("    ");

  lcd.setCursor(0,1);
  hari();
  lcd.setCursor(5,1);
  lcd.print(monthDay);
  lcd.print("/");
  lcd.print(month);
  lcd.print("/20");
  lcd.print(year);
  lcd.print("    ");
}

void hari(){
  if (weekDay==0){
    lcd.print("Ming, ");
  }
  else if (weekDay==1){
    lcd.print("Sen,");
  }
  else if (weekDay==2){
    lcd.print("Sel,");
  }
  else if (weekDay==3){
    lcd.print("Rab,");
  }
  else if (weekDay==4){
    lcd.print("Kam,");
  }
  else if (weekDay==5){
    lcd.print("Jum,");
  }
  else if (weekDay==6){
    lcd.print("Sab,");
  }
}

void setingRTC(){
  Wire.beginTransmission(DS1307_ADDRESS);
  Wire.write(zero); //stop RTC
  Wire.write(decToBcd(second));
  Wire.write(decToBcd(minute));
  Wire.write(decToBcd(hour));
  Wire.write(decToBcd(weekDay));
```

```
  Wire.write(decToBcd(monthDay));
  Wire.write(decToBcd(month));
  Wire.write(decToBcd(year));
  Wire.write(zero); //start
  Wire.endTransmission();
}
```

Jalannya Alat :

1. Koneksikan antara sistem Arduino dengan peripheral lain seperti pada rangkaian (skematik).
2. Pasang power supply (adaptor 9 V) dan hidupkan (colokkan ke sumber PLN 220V) sehingga lampu LED indikator nyala, LCD juga nyala.
3. Tampilan pertama pada LCD :

Kalender digital

4. Setelah 2 detik tampil menjadi tampilan normal yaitu menampilkan jam, hari dan tanggal:

Jam: 12:30:51
Sen, 10/5/2016

5. Selanjutnya jika ingin merubah/seting jam/tanggal, tekan tombol **Next** (tombol 1) sehingga tampil Seting RTC selama 2 detik:

Seting RTC

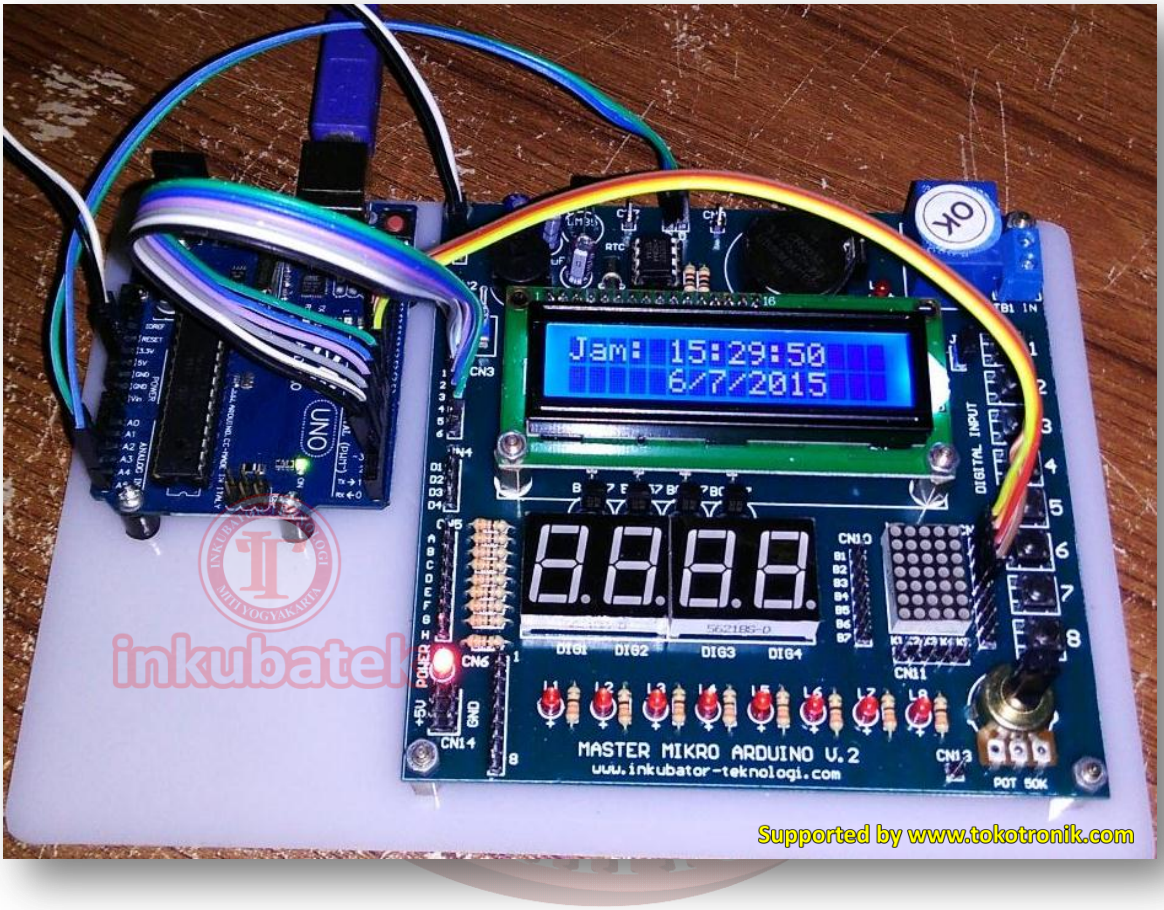
6. Kemudian menampilkan kursor berkedip pada jam:

Jam: 13:30:51
Sen, 10/5/2016

7. Tekan tombol **UP** (Tombol 3) untuk menambah jam, sedangkan untuk mengurangi tekan tombol **Down** (Tombol 4).
8. Jika sudah sesuai tekan tombol **Next**, selanjutnya seting menit prosesnya sama dengan seting jam.
9. Jika sudah seting menit tekan tombol Next lagi untuk seting detik, dan seterusnya.
10. Apabila ada setingan yang salah Anda bisa mengulangi dengan menekan tombol **Back** (Tombol 2).
11. Setelah semua di seting tekan tombol **Next** untuk menyimpan data tersebut, sehingga LCd menampilkan “Seting RTC OK!”:

Seting RTC OK!

12. Tampilan LCD kembali ke tampilan Normal.
13. OK!



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http://tokotronik.com/master-mikro-arduino-v2/]