Jam Digital display 7 segment 6 digit

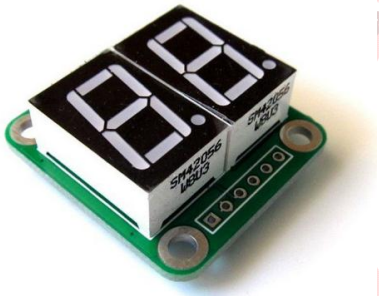
Sistem Kerja Alat:

Arduino membaca data RTC (Real Time Clock) data yang diperoleh berupa jam, menit, detik, hari ke-, tanggal, bulan dan tahun.

Pada project kali ini kita membuat jam digital dengan tampilan seven segment 6 digit dengan sistem scanning data 7 segment. Angka yang ditampilkan pada masing masing digit ditampilkan secara bergantian dari digit 1 sampai digit 6 dengan jeda penampilan 3mS/digit sehingga seolah olah angkanya tampil secara bersamaan. RTC yang digunakan DS1307 sebagai sumber clock-nya.

Kebutuhan Hardware :

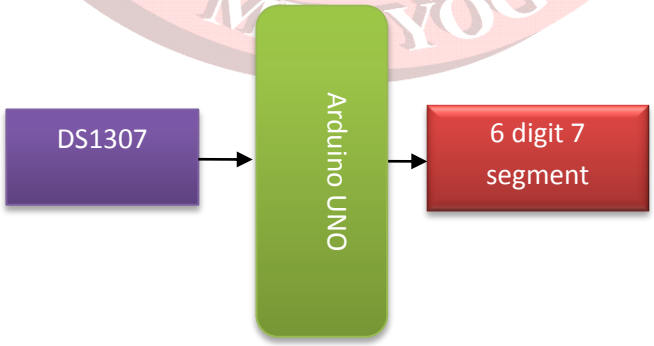
- Modul Jam Digital display 7 segment 6 digit
- Modul RTC DS1307
- Modul Arduino UNO
- Power supply +9Volt



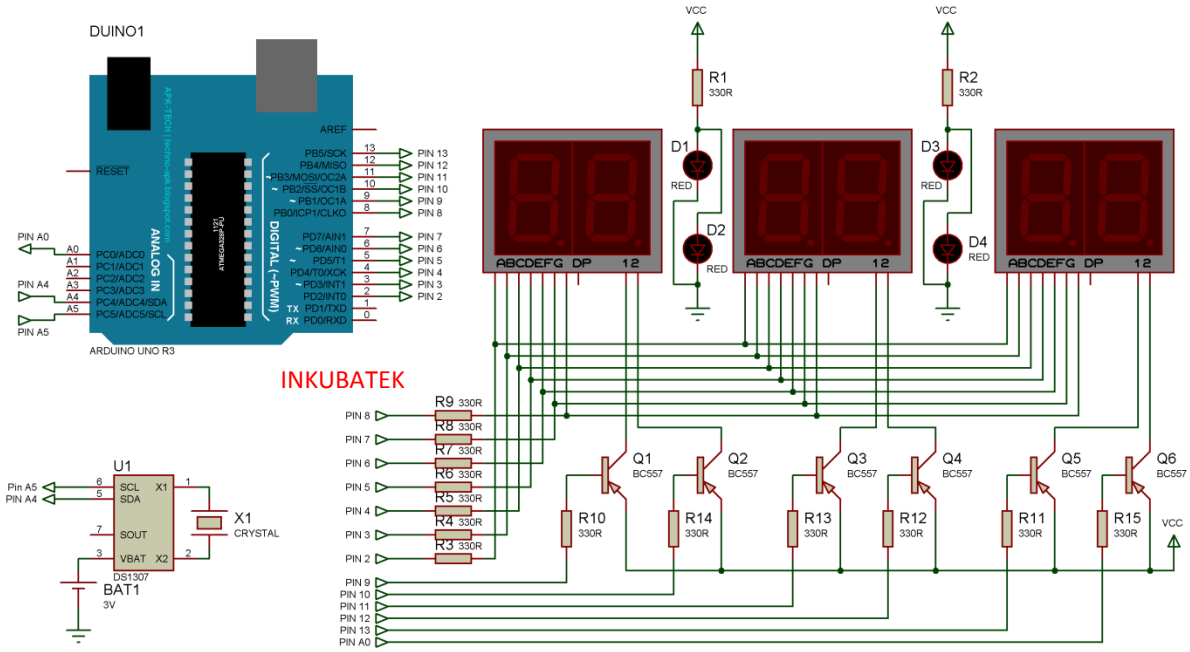
Modul 7 segment 2 digit

Module RTC DS1307

Diagram Blok:



Schematics



Koneksi Arduino UNO dengan 7 segment:

Pin ARDUINO	Segment
2	A
3	B
4	C
5	D
6	E
7	F
8	G

Pin ARDUINO	Koneksi
9	Digit 1
10	Digit 2
11	Digit 3
12	Digit 4
13	Digit 5
A0	Digit 6

Koneksi RTC:

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

Source Code/Sketch :

```
/************************************
 * Program : Project 44. Jam Digital display 7 segment 6 digit
```

```
 * 125 Proyek Arduino Inkubatek
 * www.inkubator-teknologi.com
 * www.tokotronik.com
 * ********************************/
#include <LiquidCrystal.h>
#include <Wire.h>
#define DS1307_ADDRESS 0x68
byte zero = 0x00;

byte nilai,i;
byte second ,minute,hour, weekDay;
byte monthDay,month,year;

byte seven_seg_digits[10][7] = { { 0,0,0,0,0,0,1 },  // = 0
                                 { 1,0,0,1,1,1,1 },  // = 1
                                 { 0,0,1,0,0,1,0 },  // = 2
                                 { 0,0,0,0,1,1,0 },  // = 3
                                 { 1,0,0,1,1,0,0 },  // = 4
                                 { 0,1,0,0,1,0,0 },  // = 5
                                 { 0,1,0,0,0,0,0 },  // = 6
                                 { 0,0,0,1,1,1,1 },  // = 7
                                 { 0,0,0,0,0,0,0 },  // = 8
                                 { 0,0,0,0,1,0,0 }  // = 9
                               };

void setup()
{
  pinMode(2, OUTPUT); //a
  pinMode(3, OUTPUT);//b
  pinMode(4, OUTPUT);//c
  pinMode(5, OUTPUT);//d
  pinMode(6, OUTPUT);//e
  pinMode(7, OUTPUT);//f
  pinMode(8, OUTPUT);//g
  pinMode(9, OUTPUT);//dig 1
  pinMode(10, OUTPUT);//dig 2
  pinMode(11, OUTPUT);//dig 3
  pinMode(12, OUTPUT);//dig 4
  pinMode(13, OUTPUT);//dig 5
  pinMode(A0, OUTPUT);//dig 6
  Wire.begin();
/*---------seting jam
  second = 5; //0-59
  minute = 36; //0-59
  hour = 11; //0-23
```

```
 setingRTC();
----------------------*/
}
void loop(){
 bacaRTC();
 digitalWrite(9,LOW);
 digitalWrite(10,HIGH);
 digitalWrite(11,HIGH);
 digitalWrite(12,HIGH);
 digitalWrite(13,HIGH);
 digitalWrite(A0,HIGH);
 sevenSegWrite(hour/10);
 delay(3);
 digitalWrite(9,HIGH);
 digitalWrite(10,LOW);
 digitalWrite(11,HIGH);
 digitalWrite(12,HIGH);
 digitalWrite(13,HIGH);
 digitalWrite(A0,HIGH);
 sevenSegWrite(hour%10);
 delay(3);
 digitalWrite(9,HIGH);
 digitalWrite(10,HIGH);
 digitalWrite(11,LOW);
 digitalWrite(12,HIGH);
 digitalWrite(13,HIGH);
 digitalWrite(A0,HIGH);
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 digitalWrite(12,LOW);
 digitalWrite(13,HIGH);
 digitalWrite(A0,HIGH);
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 delay(3);
 digitalWrite(9,HIGH);
 digitalWrite(10,HIGH);
 digitalWrite(11,HIGH);
 digitalWrite(12,HIGH);
 digitalWrite(13,LOW);
 digitalWrite(A0,HIGH);
 sevenSegWrite(second/10);
 delay(3);
```
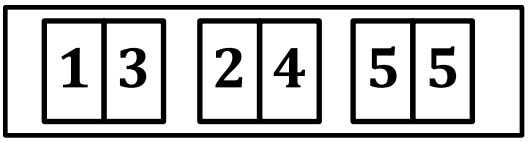

```
  digitalWrite(9,HIGH);
  digitalWrite(10,HIGH);
  digitalWrite(11,HIGH);
  digitalWrite(12,HIGH);
  digitalWrite(13,HIGH);
  digitalWrite(A0,LOW);
  sevenSegWrite(second%10);
  delay(3);
}

void sevenSegWrite(byte segment) {
  byte pin = 2;
  for (byte segCount = 0; segCount < 7; ++segCount) {
    digitalWrite(pin, seven_seg_digits[segment][segCount]);
    ++pin;
  }
}

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

```
  Wire.write(decToBcd(hour));
  Wire.write(zero); //start
  Wire.endTransmission();
}
```

Jalannya Alat :

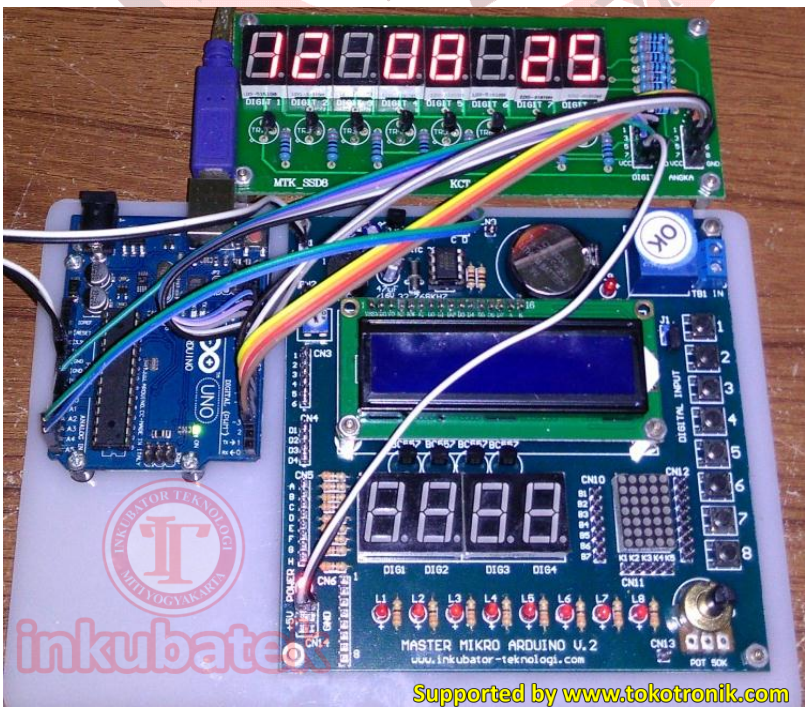
Seven segment langsung menampilkan jam sesuai setingan RTC (Untuk merubah/seting waktu ada pada pembahasan program):



Untuk seting jam hilangkan tanda komentar /*----------seting jam dan ----------*/.

```
/*---------seting jam
  second = 5; //0-59
  minute = 36; //0-59
  hour = 11; //0-23
  setingRTC();
----------*/
```

Ganti isi variable jam (second, minute dan hour) sesuai dengan waktu sekarang.
Kemudian Anda upload programnya.
Jika sudah, tulis kembali tanda komentar tadi selanjutnya Anda upload programnya (agar jam bisa update).



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