## KALENDER DIGITAL ANIMASI DOT MATRIX

Sistem Kerja Alat:

Membuat kalender digital dengan modul LED dot matrix 32x8 dan RTC (*Real Time Clock*) DS3231. Tampilan berupa tanggal/bulan/tahun dan waktu jam : menit. Aruino sebagai pemroses sistem.

Kebutuhan Hardware :

- Arduino UNO Board
- Modul LED Dot Matrix ukuran 32x8 dengan driver MAX7219
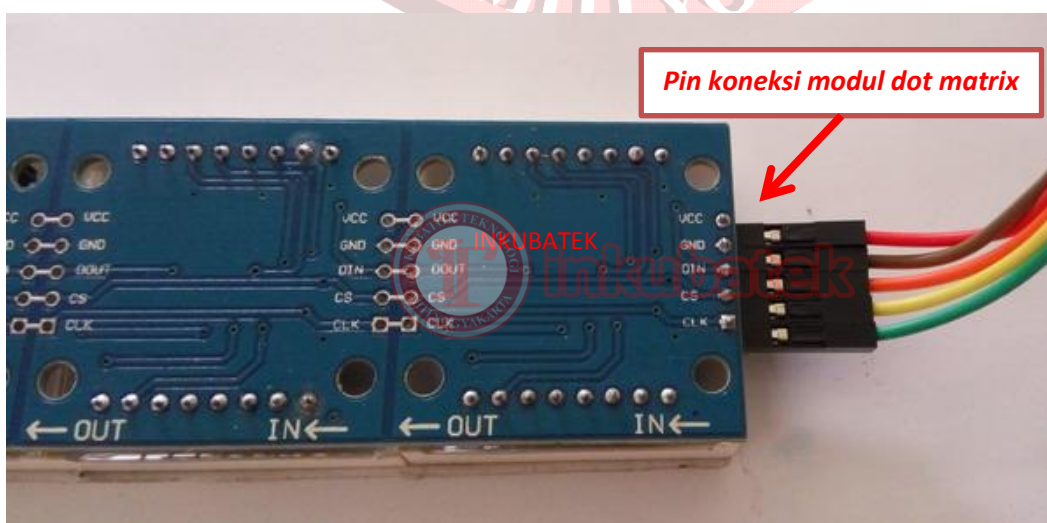- Modul RTC DS3231
- Power Supply 7-9 Vdc

Modul RTC DS3231

Modul Dot Matrix 32x8
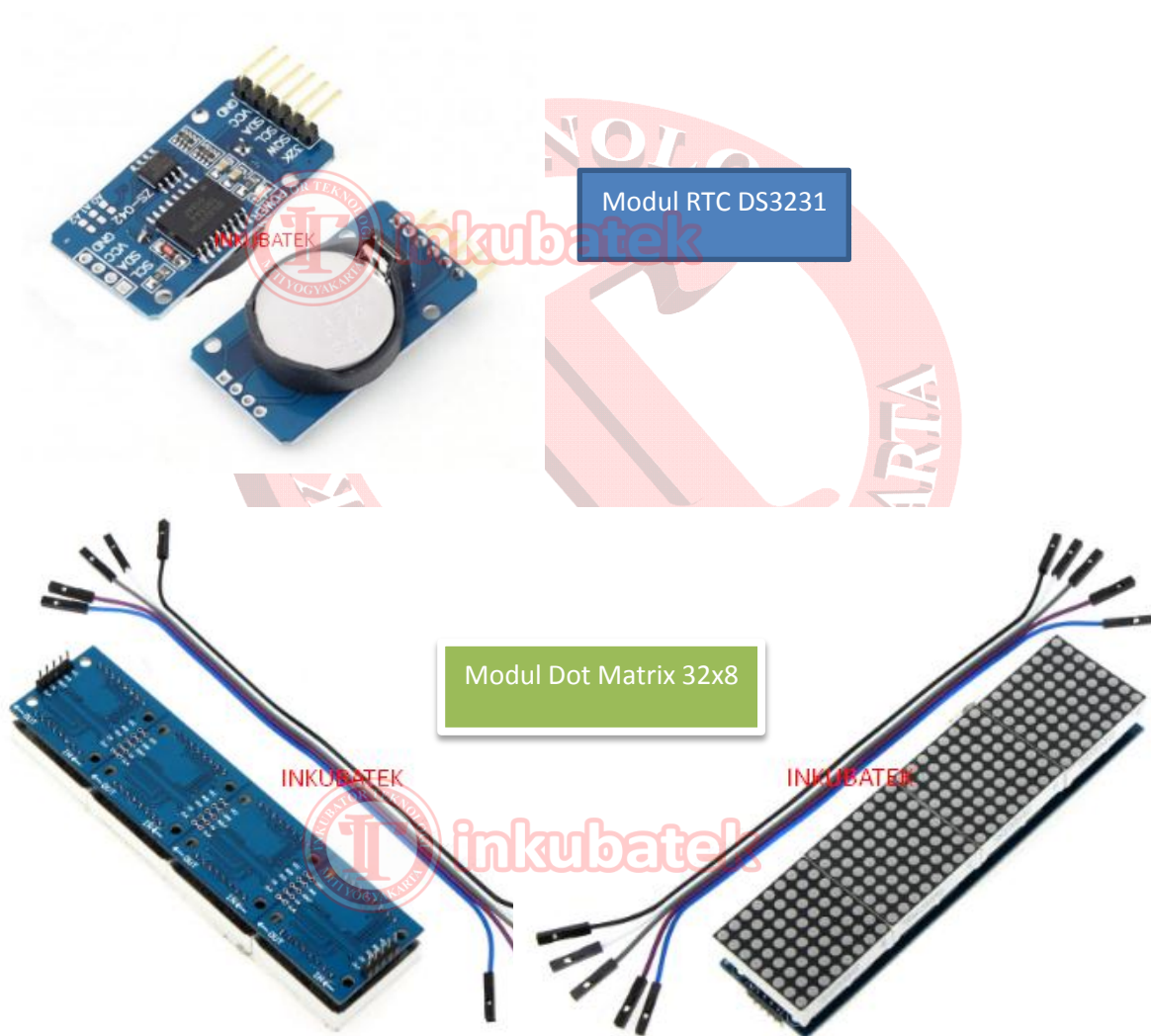
Schematics
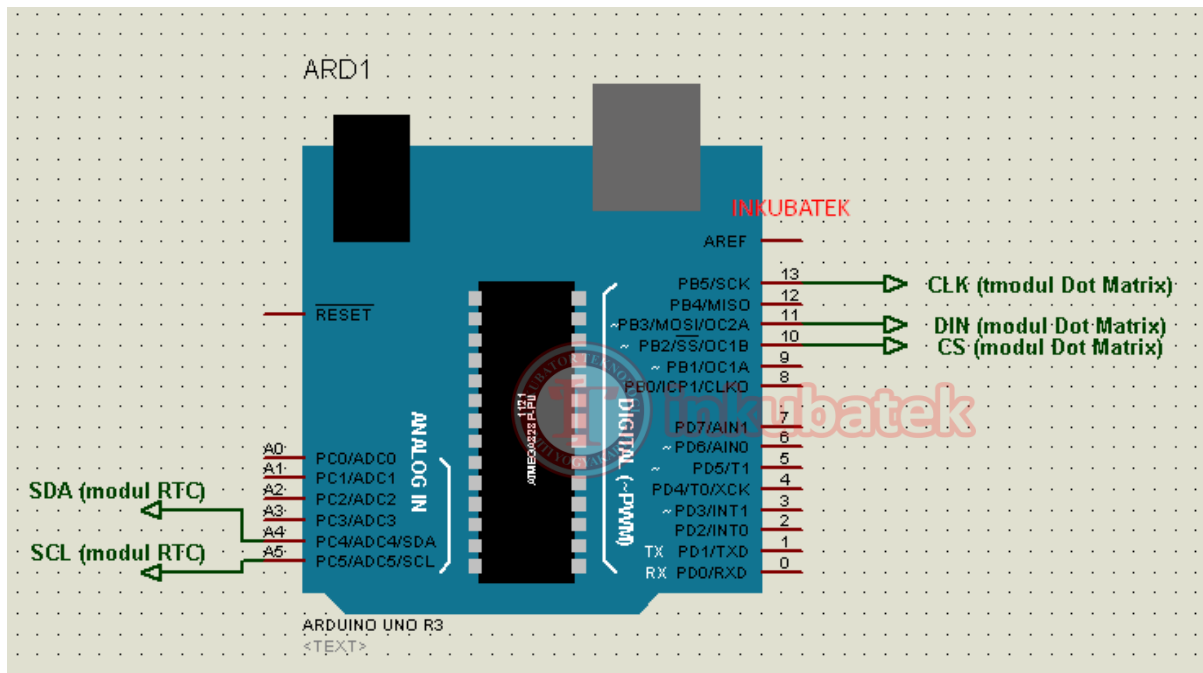
Koneksi Arduino UNO dengan modul LED Dot Matrix 32x8 :

Pin ARDUINO	Pin modul LED Dot Matrix
5V	VCC
GND	GND
13	CLK
11	DIN
10	CS

Pin koneksi modul dot matrix

Koneksi Arduino UNO dengan modul RTC DS3231 :

Pin ARDUINO	Pin modul RTC DS3231
5V	VCC
GND	GND
SCL	SCL
SDA	SDA

Pin koneksi modul RTC

SDA SCL
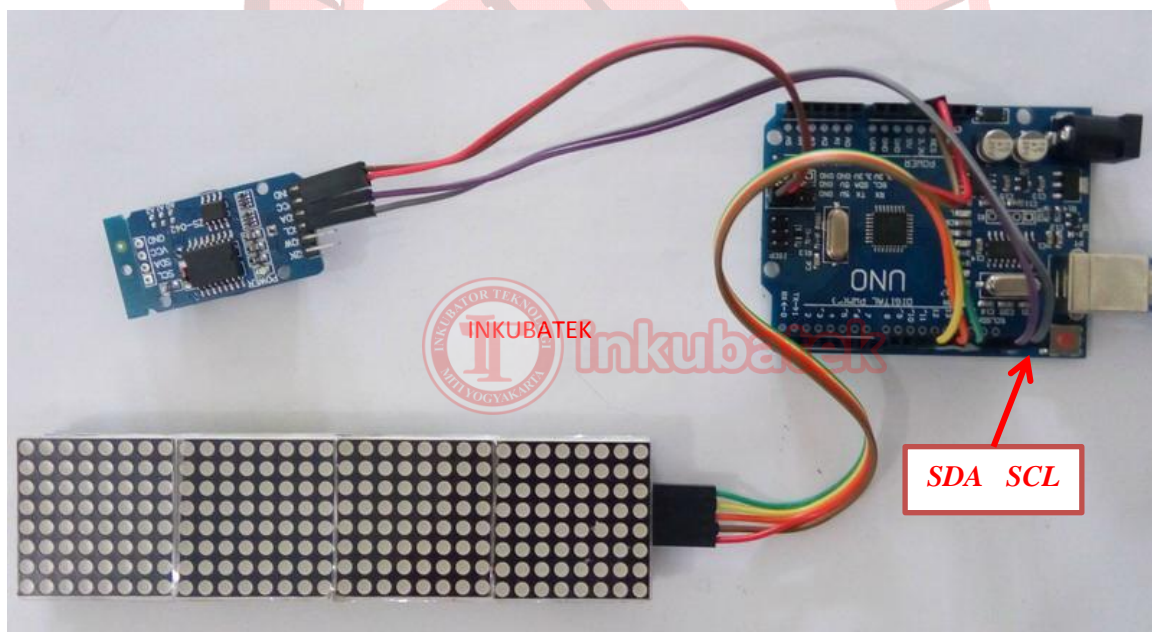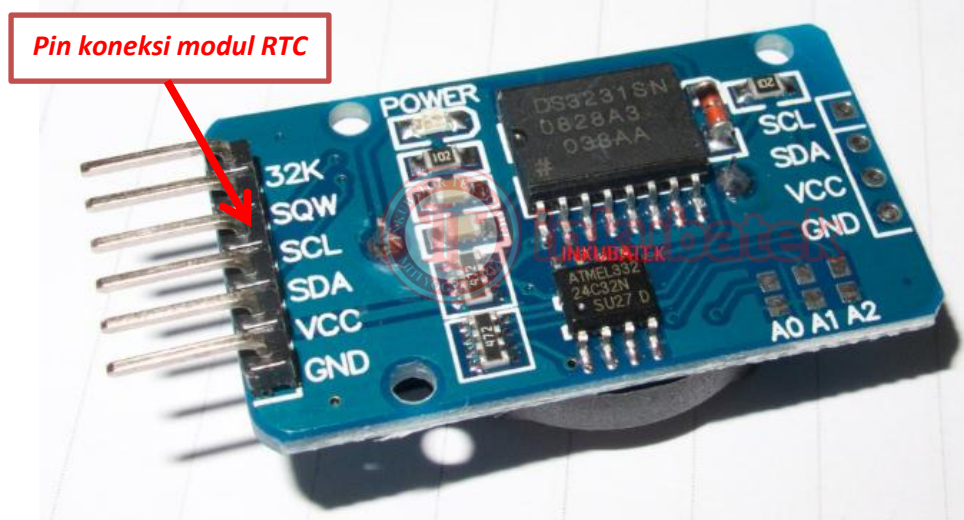
Source Code/Sketch :

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

 * Program : Project 48. Kalender Digital Animasi Dot Matrix

 * 125 Proyek Arduino Inkubatek

```
 * www.inkubator-teknologi.com
 * www.tokotronik.com
 * ********************************/
#include <MD_MAX72xx.h>
#include <SPI.h>
#include <Wire.h>
#include <DS1307.h>


#define    MAX_DEVICES    4
#define    CLK_PIN       13  // or SCK
#define    DATA_PIN    11  // or MOSI
#define    CS_PIN       10  // or SS


// SPI hardware interface
MD_MAX72XX mx = MD_MAX72XX(CS_PIN, MAX_DEVICES);
#define    CHAR_SPACING   1    // pixels between characters
#define    BUF_SIZE    75
#define UNIT_DELAY     25
#define SCROLL_DELAY   (4 * UNIT_DELAY)


static  boolean bRestart = true;
uint32_t prevTimeAnim = 0;
char str[30];


//============================
bool scrollText(bool bInit, char *pmsg)
// Callback function for data that is required for scrolling into the display
{
  static char   curMessage[BUF_SIZE];
  static char   *p = curMessage;
  static uint8_t  state = 0;
  static uint8_t  curLen, showLen;
```

```
static uint8_t  cBuf[8];
uint8_t        colData;


// are we initializing?
if (bInit)
{
  resetMatrix();
  strcpy(curMessage, pmsg);
  state = 0;
  p = curMessage;
  bInit = false;
}


// Is it time to scroll the text?
if (millis()-prevTimeAnim < SCROLL_DELAY)
  return(bInit);


// scroll the display
mx.transform(MD_MAX72XX::TSL);  // scroll along
prevTimeAnim = millis();     // starting point for next time


// now run the finite state machine to control what we do
switch (state)
{
  case 0: // Load the next character from the font table
    showLen = mx.getChar(*p++, sizeof(cBuf)/sizeof(cBuf[0]), cBuf);
    curLen = 0;
    state = 1;
  case 1: // display the next part of the character
    colData = cBuf[curLen++];
    mx.setColumn(0, colData);
    if (curLen == showLen)
```

```
      {
        showLen = ((*p != '\0') ? CHAR_SPACING : mx.getColumnCount()-1);
        curLen = 0;
        state = 2;
      }
      break;


    case 2: // display inter-character spacing (blank column) or scroll off the display
      mx.setColumn(0, 0);
      if (++curLen == showLen)
      {
        state = 0;
        bInit = (*p == '\0');
      }
      break;
    default:
      state = 0;
  }
  return(bInit);
}
//=============

void setup()
{
 mx.begin();
 delay(1000);
}


void loop()
{
 //--------------------------- baca jam, menit, tanggal
  char h(RTC.get(DS1307_HR,true));
```

```
char m(RTC.get(DS1307_MIN,false));

char d(RTC.get(DS1307_DATE,false));

char t(RTC.get(DS1307_MTH,false));

word y(RTC.get(DS1307_YR,false));

//----------------------------

sprintf(str,"Tgl=%d/%d/%d Jam=%d:%d",d,t,y,h,m);

bRestart = scrollText(bRestart, str);

}



//===============================

void resetMatrix(void)

{

mx.control(MD_MAX72XX::INTENSITY, MAX_INTENSITY/2);

mx.control(MD_MAX72XX::UPDATE, MD_MAX72XX::ON);

mx.clear();

prevTimeAnim = 0;

}
```
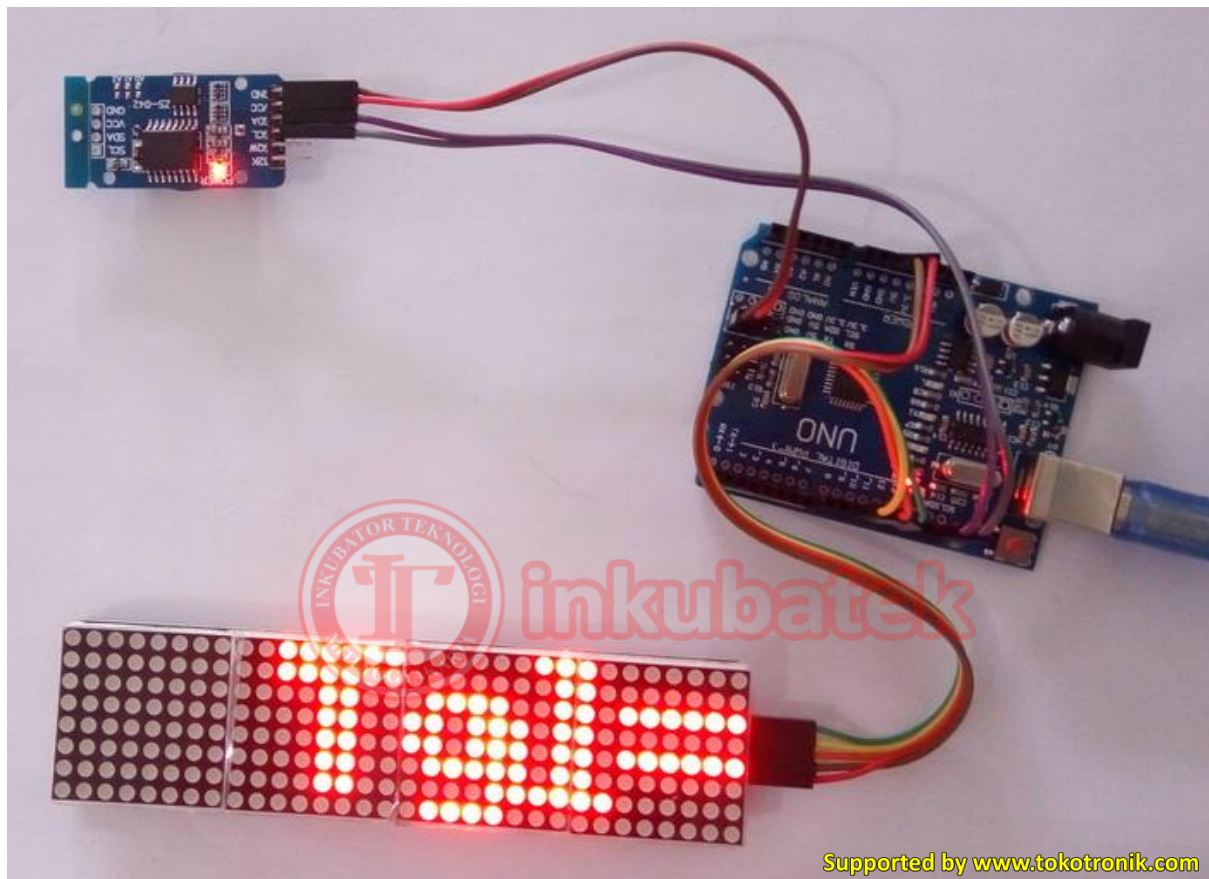
Jalannya Alat :

Pada modul LED Dot Matrix 32x8 akan tampil tanggal , kemudian tampil nilai Jam. Tampilan berjalan geser ke kiri. Nilai tanggal dan jam akan ter-update secara *real time*.