

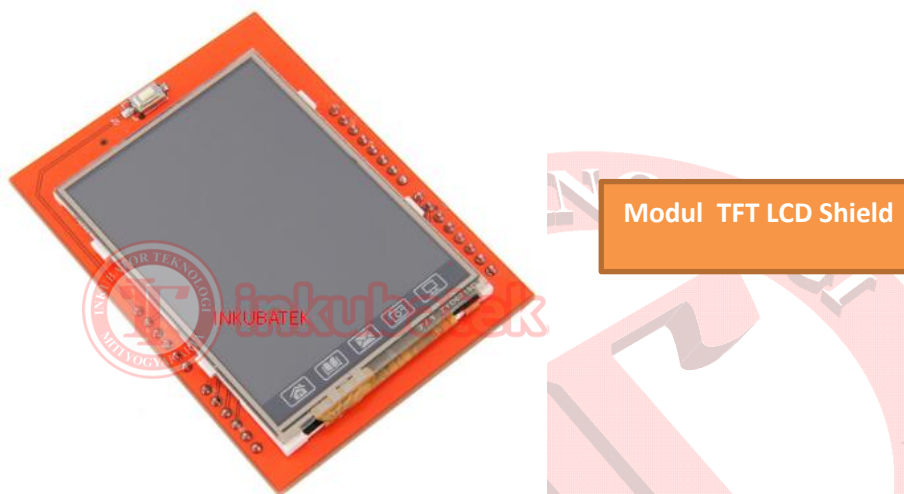
JAM ANALOG DENGAN LCD TFT 2'4" TOUCH SCREEN

Sistem Kerja Alat:

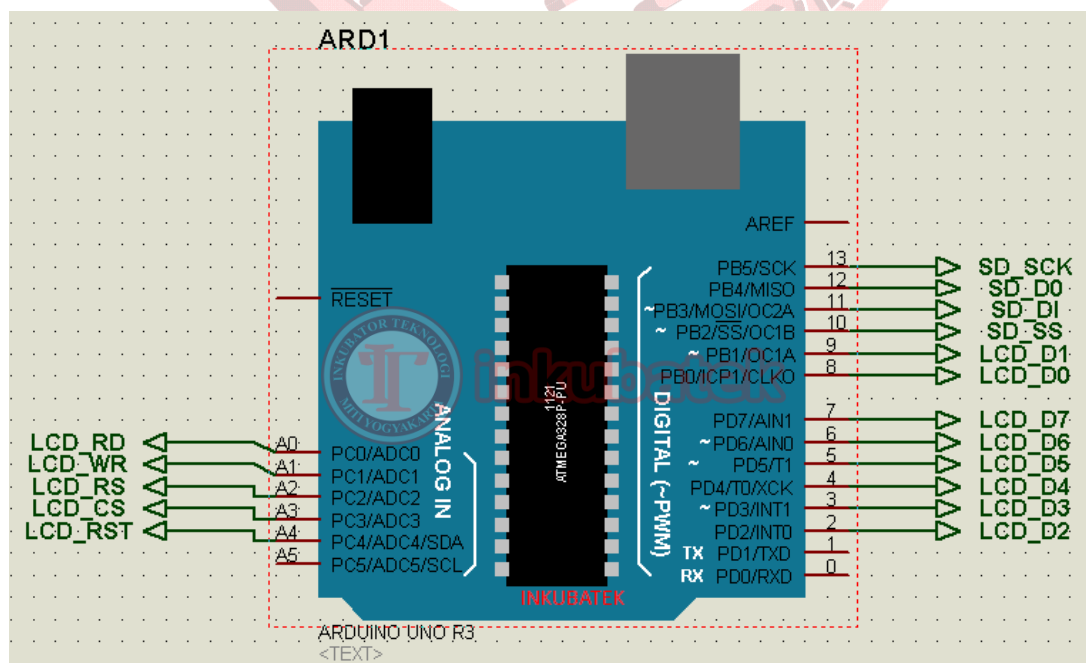
Membuat tampilan jam analog dengan LCD touch screen TFT 2'4" dengan Arduino UNO sebagai pemrosesnya.

Kebutuhan Hardware :

- Arduino UNO Board
- Modul LCD TFT 2'4" Shield.
- Power Supply 7-9 Vdc

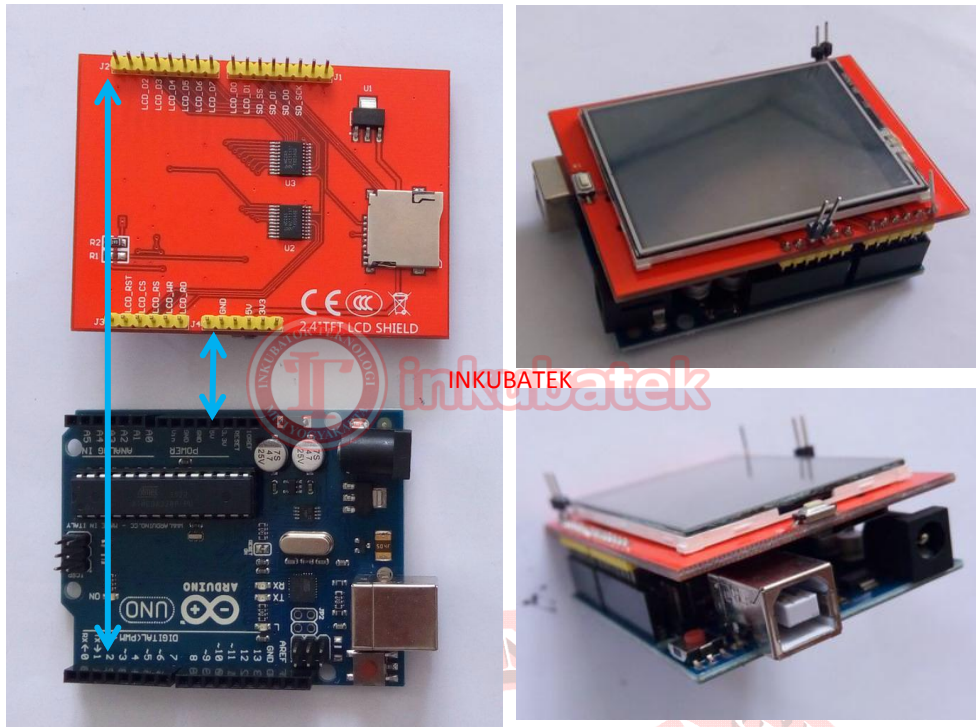


Schematics



Koneksi Arduino UNO dengan modul LCD TFT 2'4" tinggal dipasangkan ke pin header Arduino, seperti shield2 yang lain. Koneksi Arduino UNO dengan modul TFT LCD Shield :

Pin ARDUINO	Pin TFT LCD Shield
5V	5V
GND	GND
3.3V	3V3
A0	LCD_RD
A1	LCD_WR
A2	LCD_RS
A3	LCD_CS
A4	LCD_RST
2	LCD_D2
3	LCD_D3
4	LCD_D4
5	LCD_D5
6	LCD_D6
7	LCD_D7
8	LCD_D0
9	LCD_D1
10	SD_SS
11	SD_DI
12	SD_DO
13	SD_SCK



Library yang digunakan adalah **SPFD5408_Adafruit_TFTLCD.h** Anda instal dulu librarinya.

Source Code/Sketch :

```
/* **** */
```

```
* Program : Project 42. Jam Analog dg LCD TFT 2'4
```

```
* 125 Proyek Arduino Inkubatek
```

```
* www.inkubator-teknologi.com
```

```
* www.tokotronik.com
```

```
* **** */
```

```
#include <SPFD5408_Adafruit_TFTLCD.h>
```

```
#define LCD_CS A3
```

```
#define LCD_CD A2
```

```
#define LCD_WR A1
```

```
#define LCD_RD A0
```

```
#define LCD_RESET A4
```

```
// Agar warna mudah dimengerti (Human Readable color):
```

```
#define TFT_BLACK 0x0000
```

```
#define TFT_BLUE 0x001F
```

```
#define TFT_RED    0xF800
#define TFT_GREEN  0x07E0
#define TFT_CYAN   0x07FF
#define TFT_MAGENTA 0xF81F
#define TFT_YELLOW 0xFFE0
#define TFT_WHITE   0xFFFF
#define TFT_GREY   0x5AEB
```

```
Adafruit_TFTLCD tft(LCD_CS, LCD_CD, LCD_WR, LCD_RD, LCD_RESET);
```

```
float sx = 0, sy = 1, mx = 1, my = 0, hx = -1, hy = 0;
float sdeg = 0, mdeg = 0, hdeg = 0;
uint16_t osx = 120, osy = 120, omx = 120, omy = 120, ohx = 120, ohy = 120;
int16_t x0 = 0, x1 = 0, yy0 = 0, yy1 = 0, x00 = 0, yy00 = 0;
uint32_t targetTime = 0;

uint16_t xpos;
uint8_t conv2d(const char* p) {
    uint8_t v = 0;
    if ('0' <= *p && *p <= '9')
        v = *p - '0';
    return 10 * v + *++p - '0';
}

uint8_t hh = conv2d(__TIME__), mm = conv2d(__TIME__ + 3), ss = conv2d(__TIME__ + 6);
boolean initial = 1;
char d;

void setup(void) {
    tft.reset();
    tft.begin(0x9341);
    tft.setRotation(1);

    tft.setTextColor(TFT_WHITE); // text color
```

```
tft.fillScreen(TFT_BLACK); // background color
```

```
xpos = tft.width() / 2;
```

```
tft.drawCircle(xpos, 120, 125, TFT_YELLOW);
```

```
tft.fillCircle(xpos, 120, 118, TFT_BLUE);
```

```
tft.fillCircle(xpos, 120, 110, TFT_BLACK);
```

```
for (int a=95; a<104; a++){
```

```
tft.drawCircle(xpos, 120, a, TFT_WHITE);}
```

```
for (int i = 0; i < 360; i += 30) {
```

```
  sx = cos((i - 90) * 0.0174532925);
```

```
  sy = sin((i - 90) * 0.0174532925);
```

```
  x0 = sx * 114 + xpos;
```

```
  yy0 = sy * 114 + 120;
```

```
  x1 = sx * 100 + xpos;
```

```
  yy1 = sy * 100 + 120;
```

```
  tft.drawLine(x0, yy0, x1, yy1, TFT_YELLOW);
```

```
}
```

```
for (int i = 0; i < 360; i += 6) {
```

```
  sx = cos((i - 90) * 0.0174532925);
```

```
  sy = sin((i - 90) * 0.0174532925);
```

```
  x0 = sx * 102 + xpos;
```

```
  yy0 = sy * 102 + 120;
```

```
  x00 = sx * 92 + xpos;
```

```
  yy00 = sy * 92 + 120;
```

```
  // Draw minute markers
```

```
  tft.drawPixel(x0, yy0, TFT_GREEN);
```

```
  tft.drawLine(x0, yy0, x00, yy00, TFT_BLACK);
```

```
  tft.drawLine(x0+1, yy0+1, x00+1, yy00+1, TFT_BLACK);
```

```

// Draw main quadrant dots
if (i == 0 || i == 180) tft.fillCircle(x0, yy0, 2, TFT_WHITE);
if (i == 90 || i == 270) tft.fillCircle(x0, yy0, 2, TFT_WHITE);
}

tft.fillCircle(xpos, 121, 3, TFT_WHITE);
targetTime = millis() + 1000;
}

void loop() {
  if (targetTime < millis()) {
    targetTime = millis() + 1000;
    ss++;
    if (ss == 60) {
      ss = 0;
      mm++;
      if (mm > 59) {
        mm = 0;
        hh++;
        if (hh > 23) {
          hh = 0;
        }
      }
    }
  }

  sdeg = ss * 6;           // 0-59 -> 0-354
  mdeg = mm * 6 + sdeg * 0.01666667; // 0-59 -> 0-360 - includes seconds, but these increments are
  not used
  hdeg = hh * 30 + mdeg * 0.08333333; // 0-11 -> 0-360 - includes minutes and seconds, but these
  increments are not used
  hx = cos((hdeg - 90) * 0.0174532925);

```



```

hy = sin((hdeg - 90) * 0.0174532925);
mx = cos((mdeg - 90) * 0.0174532925);
my = sin((mdeg - 90) * 0.0174532925);
sx = cos((sdeg - 90) * 0.0174532925);
sy = sin((sdeg - 90) * 0.0174532925);

if (ss == 0 || initial) {
    initial = 0;

    // Erase hour and minute hand positions every minute
    tft.drawLine(ohx, ohy, xpos, 121, TFT_BLACK);
    ohx = hx * 62 + xpos + 1;
    ohy = hy * 62 + 121;
    tft.drawLine(omx, omy, xpos, 121, TFT_BLACK);
    omx = mx * 84 + xpos;
    omy = my * 84 + 121;
}

// Redraw new hand positions, hour and minute hands not erased here to avoid flicker
tft.drawLine(osx, osy, xpos, 121, TFT_BLACK);
osx = sx * 90 + xpos + 1;
osy = sy * 90 + 121;
tft.drawLine(osx, osy, xpos, 121, TFT_RED);
tft.drawLine(ohx, ohy, xpos, 121, TFT_CYAN);
tft.drawLine(omx, omy, xpos, 121, TFT_WHITE);
tft.drawLine(osx, osy, xpos, 121, TFT_RED);
tft.fillCircle(xpos, 121, 3, TFT_RED);

tft.setCursor(xpos-55, 50);
tft.setTextSize(2);
tft.print("INKUBATEK");

// Draw MINI clock face "SECOND"

```



```

tft.drawCircle(xpos, 155, 20, TFT_YELLOW);
tft.drawCircle(xpos, 155, 18, TFT_BLUE);
tft.drawCircle(xpos, 155, 17, TFT_CYAN);
tft.drawCircle(xpos, 155, 16, TFT_CYAN);
tft.fillRect(xpos-10, 149,22,15,TFT_BLACK); //erase
if(ss<10){tft.setCursor(xpos-10, 149); tft.setTextSize(2);
tft.print('0'); tft.setCursor(xpos+2, 149);}
else{
tft.setCursor(xpos-10, 149);}
tft.setTextSize(2);
tft.print(ss);

// Draw MINI clock face "Minutes"
tft.drawCircle(xpos+35, 117, 20, TFT_YELLOW);
tft.drawCircle(xpos+35, 117, 18, TFT_BLUE);
tft.drawCircle(xpos+35, 117, 17, TFT_CYAN);
tft.drawCircle(xpos+35, 117, 16, TFT_CYAN);
tft.fillRect(xpos+25, 111,22,15,TFT_BLACK); //erase
if(mm<10){tft.setCursor(xpos+25, 111); tft.setTextSize(2);
tft.print('0'); tft.setCursor(xpos+37, 111);}
else{
tft.setCursor(xpos+25, 111);}
tft.println(mm);

// Draw MINI clock face "Hour"
tft.drawCircle(xpos-35, 117, 20, TFT_YELLOW);
tft.drawCircle(xpos-35, 117, 18, TFT_BLUE);
tft.drawCircle(xpos-35, 117, 17, TFT_CYAN);
tft.drawCircle(xpos-35, 117, 16, TFT_CYAN);
tft.fillRect(xpos-45, 111,22,15,TFT_BLACK); //erase
if(hh<10){tft.setCursor(xpos-45, 111); tft.setTextSize(2);
tft.print('0'); tft.setCursor(xpos-33, 111);}

```



```

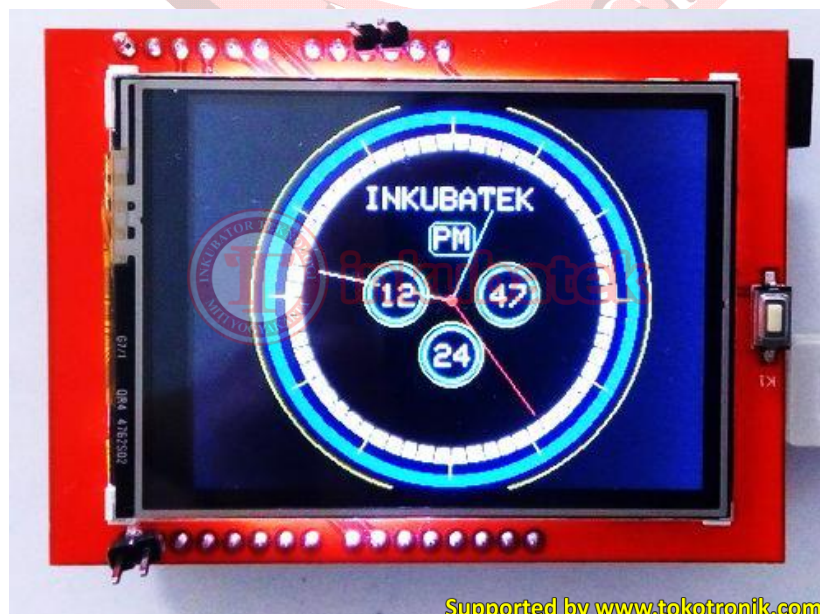
else{
tft.setCursor(xpos-45, 111);}
tft.setTextSize(2);
tft.print(hh);
//tft.setCursor(xpos-65, 111);
//tft.println(':');

if (hh>=0 && hh<12) d='A'; else {d='P'};
tft.drawRoundRect(xpos-14,72,29,21,5,TFT_CYAN);
tft.fillRect(xpos-11, 75,23,15,TFT_BLACK); //erase
tft.setCursor(xpos-11, 75);
tft.setTextSize(2);
tft.print(d);
tft.println('M');
}
}

```

Jalannya Alat :

Pada modul TFT LCD Shield akan tampil sebuah jam analog, dengan 2 jarum penunjuk jam. Ditambah tampilan angka untuk Jam, Menit dan Detik.



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Untuk memodifikasi tulisan (merk, dalam contoh ini : INKUBATEK) cukup ganti string yang ada di baris perintah ini :

```
tft.print("INKUBATEK");
```

