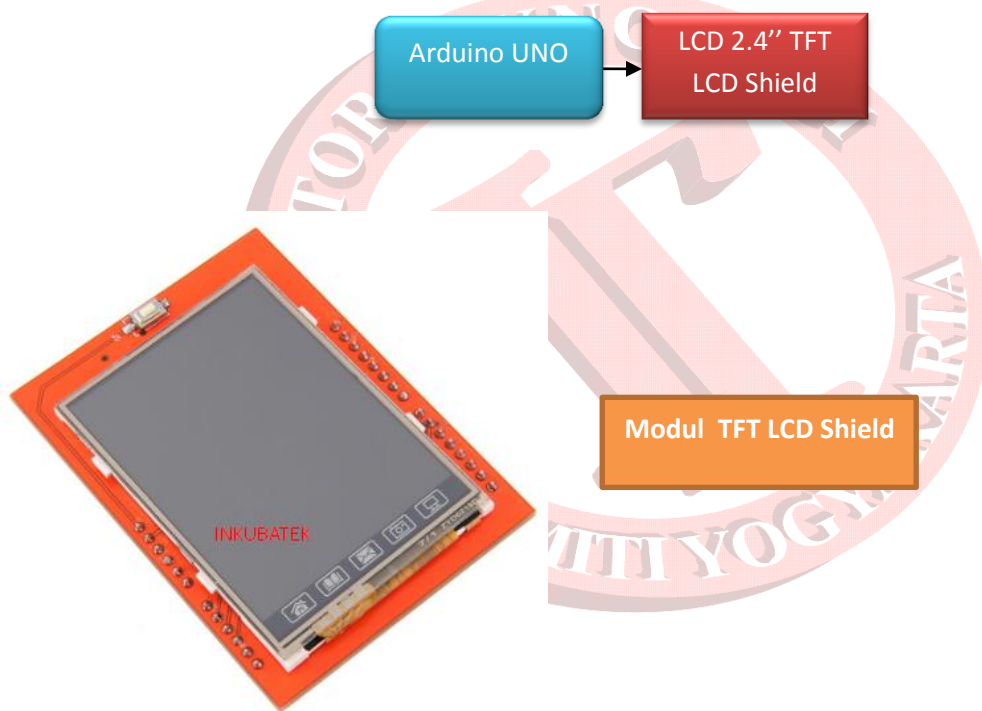# Kalkulator LCD Touch screen

Sistem Kerja Alat:

Alat yang kita buat kali ini adalah LCD Touchscreen diprogram menjadi sebuah kalkulator sederhana menggunakan Arduino UNO. Modul LCD yang digunakan adalah 2.4'' TFT LCD Shield.
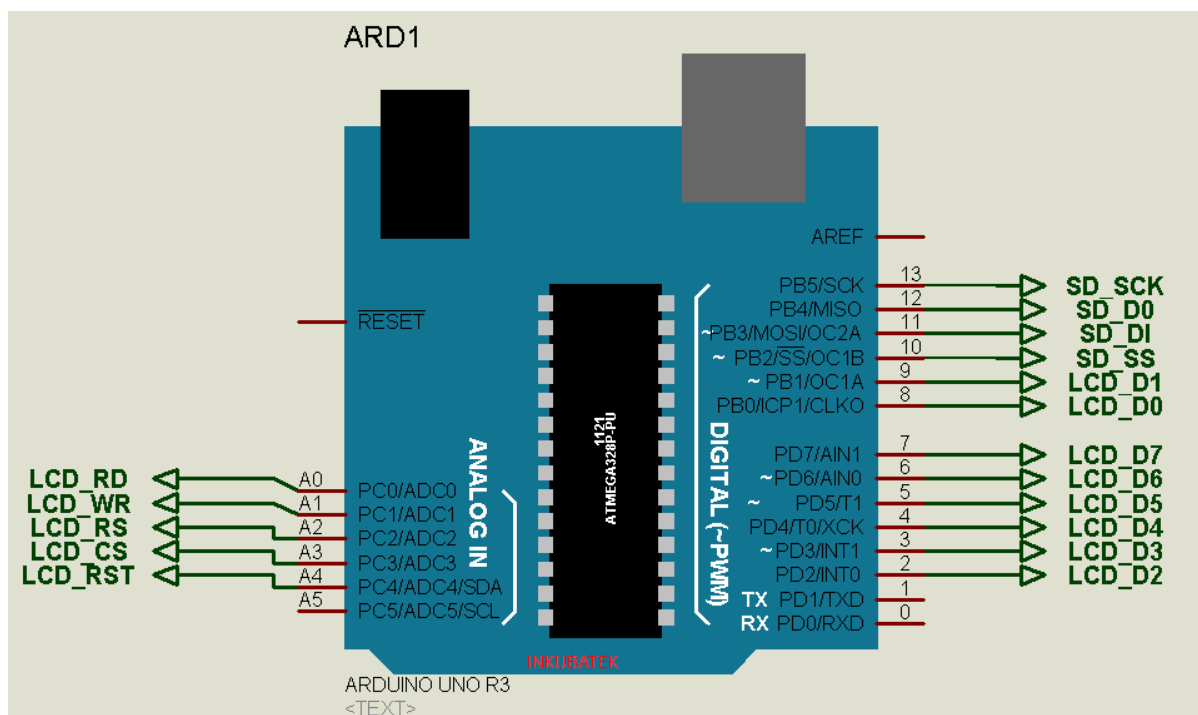
Kebutuhan Hardware :

- LCD 2,4'' TFT SHIELD
- Modul Arduino UNO
- Power supply +9Volt

Diagram Blok:

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
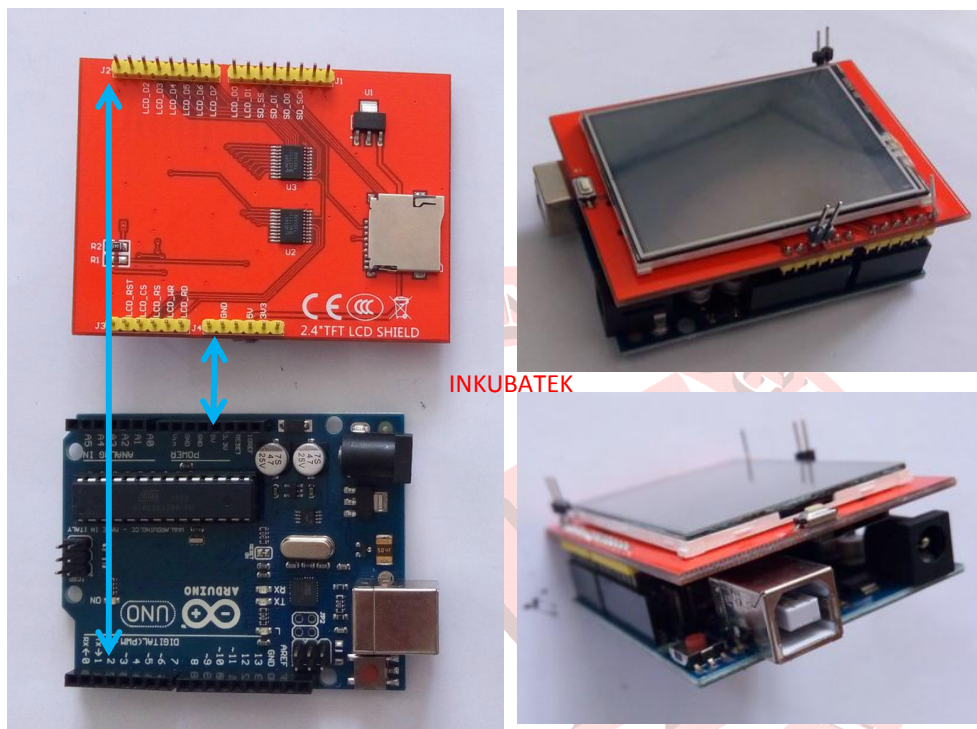
INKUBATEK

Source Code/Sketch :

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

 * Program : Project 50. Kalkulator LCD Touch screen

 * Input   : LCD TFT

 * 125 Proyek Arduino Inkubatek

 * www.tokotronik.com

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

#include <Adafruit_GFX.h>

#include <Adafruit_TFTLCD.h>

#include <TouchScreen.h>

```
#define LCD_CS A3

#define LCD_CD A2

#define LCD_WR A1

#define LCD_RD A0


#define LCD_RESET A4


#define BLACK   0x0000

#define BLUE    0x001F

#define RED     0xF800

#define GREEN   0x07E0

#define CYAN    0x07FF

#define MAGENTA 0xF81F

#define YELLOW  0xFFE0

#define WHITE   0xFFFF


#define BLACK       0x0000      /*   0,   0,   0 */

#define NAVY        0x000F      /*   0,   0, 128 */

#define DARKGREEN   0x03E0      /*   0, 128,   0 */

#define DARKCYAN    0x03EF      /*   0, 128, 128 */

#define MAROON      0x7800      /* 128,   0,   0 */

#define PURPLE      0x780F      /* 128,   0, 128 */

#define OLIVE       0x7BE0      /* 128, 128,   0 */

#define LIGHTGREY   0xC618      /* 192, 192, 192 */

#define DARKGREY    0x7BEF      /* 128, 128, 128 */

#define BLUE        0x001F      /*   0,   0, 255 */

#define GREEN       0x07E0      /*   0, 255,   0 */

#define CYAN        0x07FF      /*   0, 255, 255 */

#define RED         0xF800      /* 255,   0,   0 */

#define MAGENTA     0xF81F      /* 255,   0, 255 */

#define YELLOW      0xFFE0      /* 255, 255,   0 */

#define WHITE       0xFFFF      /* 255, 255, 255 */
```

```
#define ORANGE      0xFD20      /* 255, 165,  0 */

#define GREENYELLOW  0xAFE5      /* 173, 255,  47 */

#define PINK        0xF81F


#define BUTTON_X 40

#define BUTTON_Y 100

#define BUTTON_W 60

#define BUTTON_H 30

#define BUTTON_SPACING_X 20

#define BUTTON_SPACING_Y 20

#define BUTTON_TEXTSIZE 2


#define TEXT_X 10

#define TEXT_Y 10

#define TEXT_W 220

#define TEXT_H 50

#define TEXT_TSIZE 3

#define TEXT_TCOLOR MAGENTA


#define TEXT_LEN 12

char textfield[TEXT_LEN+1] = "";

uint8_t textfield_i=0;

byte f_hitung=0;

String angkaStr="";

long hitung, angka;

long bil1, bil2, hasil;

byte geser, awal;


#define YP A3

#define XM A2

#define YM 9

#define XP 8
```

```
#define TS_MINX 150

#define TS_MINY 120

#define TS_MAXX 920

#define TS_MAXY 940

#define STATUS_X 10

#define STATUS_Y 65


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

TouchScreen ts = TouchScreen(XP, YP, XM, YM, 300);


Adafruit_GFX_Button buttons[15];
char buttonlabels[15][5] = {"+", "-", "del",
               "1", "2", "3",
               "4", "5", "6",
               "7", "8", "9",
               "=", "0", "C" };
uint16_t buttoncolors[15] = {MAROON, OLIVE, RED,
          BLUE,   BLUE,  BLUE,
          BLUE,   BLUE,  BLUE,
          BLUE,   BLUE,  BLUE,
          RED,    BLUE,  RED};


void setup(void) {
 tft.reset();


 uint16_t identifier = tft.readID();

 if(identifier==0x0101)identifier=0x9341;


 tft.begin(identifier);

 tft.fillScreen(BLACK);
```

```
// create buttons
for (uint8_t row=0; row<5; row++) {
  for (uint8_t col=0; col<3; col++) {
    buttons[col + row*3].initButton(&tft, BUTTON_X+col*(BUTTON_W+BUTTON_SPACING_X),
    BUTTON_Y+row*(BUTTON_H+BUTTON_SPACING_Y),
    BUTTON_W, BUTTON_H, WHITE, buttoncolors[col+row*3], WHITE,
    buttonlabels[col + row*3], BUTTON_TEXTSIZE);
    buttons[col + row*3].drawButton();
  }
}


  // Buat text berwarna putih
  tft.drawRect(TEXT_X, TEXT_Y, TEXT_W, TEXT_H, WHITE);
}


#define MINPRESSURE 10
#define MAXPRESSURE 1000


void loop(void) {
  digitalWrite(13, HIGH);
  TSPoint p = ts.getPoint();
  digitalWrite(13, LOW);


  pinMode(XM, OUTPUT);
  pinMode(YP, OUTPUT);



  if (p.z > MINPRESSURE && p.z < MAXPRESSURE) {
   p.x = map(p.x, TS_MINX, TS_MAXX, tft.width(), 0);
   p.y = map(p.y, TS_MINY, TS_MAXY, tft.height(), 0);
  }
```

```
// baca semua tombol apakah ada yang ditekan
for (uint8_t b=0; b<15; b++) {
  if (buttons[b].contains(p.x, p.y)) {
    //Serial.print("Pressing: "); Serial.println(b);
    buttons[b].press(true);  // tell the button it is pressed
  } else {
    buttons[b].press(false);  // tell the button it is NOT pressed
  }
}


// now we can ask the buttons if their state has changed
for (uint8_t b=0; b<15; b++) {
  if (buttons[b].justReleased()) {
    buttons[b].drawButton();  //gambar tombol normal
  }

  if (buttons[b].justPressed()) {
    buttons[b].drawButton(true);  //gambar tombol dibalik/invert

    // Jika tombol yang ditekan bukan +, -, del, =, dan C
    // maka ambil data array sesuai dengan panjang text
    if ((b != 0) && (b != 1) && (b != 2) && (b != 12) && (b != 14)) {
      if (textfield_i < TEXT_LEN) {
        textfield[textfield_i] = buttonlabels[b][0];  //ambil data array
        textfield_i++;   //counter jumlah data array
        textfield[textfield_i] = 0;
      }
    }

    //---- penanganan tombol "del"
    if (b == 2) {
      textfield[textfield_i] = 0;
```

```
  if (textfield_i > 0) {  //jika textfield lebih besar dari nol
    textfield_i--;     //kurangi 1 datanya
    textfield[textfield_i] = ' '; //isi dengan spasi / kosong
  }
}


if (f_hitung>0){
  tft.setCursor((TEXT_X + 2)+(geser+18), TEXT_Y+10);
  tft.setTextColor(TEXT_TCOLOR, BLACK); // BLACK = text block
  tft.setTextSize(TEXT_TSIZE);        //ambil data ukuran text
  tft.print(textfield);        //tampilkan tulisan pada LCD
  tft.print(" ");
  angkaStr=textfield;
  angka=angkaStr.toInt();
  bil2=angka;
}
else{
  if(awal==0){ hapusDisplay(); awal=1; }
  tft.setCursor(TEXT_X + 2, TEXT_Y+10); // atur posisi kursor
  tft.setTextColor(TEXT_TCOLOR, BLACK); // BLACK = text block
  tft.setTextSize(TEXT_TSIZE);        //ambil data ukuran text
  tft.print(textfield);        //tampilkan tulisan pada LCD
  tft.print(" ");
  angkaStr=textfield;
  angka=angkaStr.toInt();
  bil1=angka;
}


//---- penanganan tombol "+"
if (b == 0) {
  f_hitung=1;
  geser=textfield_i*18;
```

```
tft.setCursor((TEXT_X+2)+geser, TEXT_Y+10);

tft.print('+');

for(char i=0;i<textfield_i;i++){

  textfield[i]=' ';

}

textfield_i=0;

}


//---- penanganan tombol "-"

if (b == 1) {

  f_hitung=2;

  geser=textfield_i*18;

  tft.setCursor((TEXT_X+2)+geser, TEXT_Y+10);

  tft.print('-');

  for(char i=0;i<textfield_i;i++){

    textfield[i]=' ';

  }

  textfield_i=0;

}


//---- penanganan tombol "="

if (b == 12) {

  if (f_hitung==1){

    hasil=bil1+bil2;

  }

  else if (f_hitung==2){

    hasil=bil1-bil2;

  }

  hapusDisplay();

  tft.setCursor(TEXT_X+2, TEXT_Y+10);

  tft.print(hasil);

  f_hitung=0;
```

```
        for(char i=0;i<textfield_i;i++){
          textfield[i]=' ';
        }
        angka=0;
        bil1=0;
        bil2=0;
        awal=0;
        geser=0;
        textfield_i=0;
      }


      //---- penanganan tombol "C"
      if (b == 14) {
        for(char i=0;i<textfield_i;i++){
          textfield[i]=' ';
        }
        textfield_i=0;
        geser=0;
        angka=0;
        awal=0;
        hapusDisplay();
      }

    delay(200); //debouncing
    }
  }


}
void hapusDisplay(){
   tft.fillRect(TEXT_X+2, TEXT_Y+2, TEXT_W-4, TEXT_H-4, BLACK);
}
```
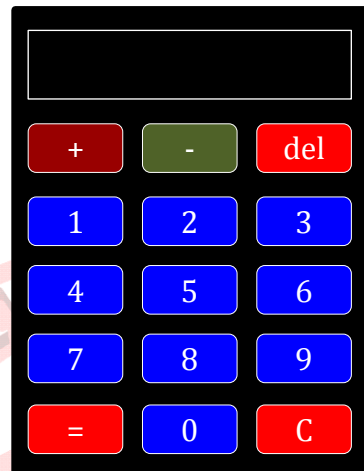
Jalannya Alat :

1. Koneksikan antara sistem Arduino dengan 2.4'' TFT LCD Shield 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. Pastikan library TFT LCD sudah terinstal.
4. Upload program diatas.
5. Kondisi awal LCD menampilkan kalkulator.

6. Silahkan anda coba untuk mengerjakan penambahan ataupun pengurangan.
7. Untuk menghapus tulisan 1 per 1 tekan tombol "del".
8. Sedangkan untuk menghapus semua tekan tombol "C".