

***LAMPIRAN –
LAMPIRAN***

PROGRAM ARDUINO KESELURUHAN

```
#include <LiquidCrystal.h>

LiquidCrystal lcd(2, 3, 4, 5, 6, 7);

unsigned long start, finished, elapsed;

long lastButtonPressTime = 0;

long debounceDelay = 50;

int x;

int hasil;

int DataAndroid = 0;

//inisialisasi baca tegangan max dari sini

int value;

int index = 0;

float numReadings = 8;

float readings[8];

int sensorMax;

float maxFix;

float teganganMax; // sampai sini

void(* direset) (void) = 0;

void setup()

{

Serial.begin(9600);

lcd.begin(16, 2); // inisialisasi lcd (16 kolom, 2 baris)

lcd.setCursor(2, 0);

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

```
delay(1000);

lcd.clear();

lcd.setCursor(0, 1);

lcd.print("READY");

sensorMax = analogRead(0); //variable baca tegangan max

}

void loop()

{

if(Serial.available() > 0){ // Cek data dari serial port

DataAndroid = Serial.read(); // Membaca data dari serial

port

}

CheckStartStop();

Display();

reset();

Vmax();

}

void CheckStartStop()

{

x = analogRead (0);

if (x < 800 && x > 20.46 )

{

if ((millis() - lastButtonPressTime) > debounceDelay)
```

```
{

lcd.clear();
lcd.setCursor(0, 0);
lcd.print("Time:");
start = millis();
}

lastButtonPressTime = millis();
}

if (x < 800 && x > 20.46){
finished = millis();
float h, m, s, ms;
unsigned long over;

elapsed = finished - start;

h = int(elapsed / 3600000);
over = elapsed % 3600000;
m = int(over / 60000);
over = over % 60000;
s = int(over / 1000);
ms = over % 1000;

hasil = ms;

lcd.setCursor(0, 1);
lcd.print(s, 0);
lcd.print("s ");
```

```
if (h < 10)
{
  lcd.print(ms, 0);
  lcd.print("ms ");
}
}
}

void Display()
{
  if (x == LOW)
  {
    Serial.println(hasil);
  }

  if (hasil >= 1)
  {
    digitalWrite(8, HIGH);
  }
}

void reset()
{
  if (DataAndroid == '0')
  {
    direset();
  }
}
```

```
void Vmax()
{
value = analogRead(0);
readings[index] = value;
index++;
if (index >= numReadings) index = 0;

if (value > sensorMax) sensorMax = value;
teganganMax = sensorMax * (5.0 / 1023.0);
maxFix = teganganMax;

lcd.setCursor(9, 0);
lcd.print("| ");
lcd.print("Vmax");
lcd.setCursor(9, 1);
lcd.print("| ");
lcd.print(maxFix);
}
```

DESAIN PROGRAM ANDROID DENGAN MIT APP INVENTOR

The screenshot displays the MIT App Inventor web interface. At the top, the MIT App Inventor logo is on the left, and navigation menus for Projects, Connect, Build, Help, My Projects, Gallery, Guide, Report an Issue, English, and user profile (hudakhairul7@gmail.com) are on the right. Below the header, the project name 'ExposureTimeDisplay_copy' is shown, along with 'Screen1' and buttons for 'Add Screen ...' and 'Remove Screen'. On the right side of this bar are 'Designer' and 'Blocks' buttons.

The main workspace is divided into four panels:

- Palette:** Lists various UI components under 'User Interface' (Button, CheckBox, DatePicker, Image, Label, ListPicker, ListView, Notifier, PasswordTextBox, Slider, Spinner, TextBox, TimePicker, WebView) and 'Layout'.
- Viewer:** Shows a mobile device preview. The app's status bar displays 'Exposure Time Meter'. The main content area has a blue header 'Exposure Time Meter Display', a Bluetooth icon, the text 'Tidak Terkoneksi', a large display 'Waktu Ekspos:' with a value of '0' and unit 'ms', and a red 'Reset' button. The bottom shows an Android navigation bar.
- Components:** A tree view showing the hierarchy of components on the screen: Screen1, HorizontalArrangement, Label1, BluetoothList, StatusBluetooth, Label3, hasil, Label5, and ResetButton.
- Properties:** Shows the configuration for the selected 'Screen1' component, including AboutScreen, AlignHorizontal (Left: 1), AlignVertical (Top: 1), AppName (ExposureTimeDisplay), BackgroundColor (White), BackgroundImage (None...), CloseScreenAnimation (Default), Icon (None...), and ScreenOrientation (Unspecified).

A watermark 'Activate Windows' is visible in the bottom right corner of the interface.

PROGRAM ANDROID KESELURUHAN DENGAN MIT APP INVENTOR

The image displays four distinct code blocks from MIT App Inventor, arranged vertically. Each block is a 'when' event handler for a specific UI component.

- Block 1:** A 'when BluetoothList .BeforePicking' event handler. The 'do' block contains a 'set BluetoothList .Elements to BluetoothClient1 .AddressesAndNames' block.
- Block 2:** A 'when BluetoothList .AfterPicking' event handler. The 'do' block contains an 'if' block with a 'call BluetoothClient1 .Connect address BluetoothList .Selection' block. The 'then' block contains a 'set BluetoothList .Elements to BluetoothClient1 .AddressesAndNames' block.
- Block 3:** A 'when Clock1 .Timer' event handler. The 'do' block contains three 'if' blocks:
 - The first 'if' block checks 'BluetoothClient1 .IsConnected'. The 'then' block contains two 'set' blocks: 'set StatusBluetooth .Text to "Terkoneksi"' and 'set StatusBluetooth .TextColor to green'.
 - The second 'if' block checks 'not BluetoothClient1 .IsConnected'. The 'then' block contains two 'set' blocks: 'set StatusBluetooth .Text to "Tidak Terkoneksi"' and 'set StatusBluetooth .TextColor to red'.
 - The third 'if' block checks 'BluetoothClient1 .IsConnected'. The 'then' block contains another 'if' block: 'if call BluetoothClient1 .BytesAvailableToReceive > 0'. The 'then' block of this nested 'if' contains a 'set hasil .Text to call BluetoothClient1 .ReceiveText numberOfBytes call BluetoothClient1 .BytesAvailableToReceive' block.
- Block 4:** A 'when ResetButton .Click' event handler. The 'do' block contains a 'call BluetoothClient1 .Send1ByteNumber number 48' block and a 'set hasil .Text to "0"' block.

Additionally, there is a separate 'when Screen1 .BackPressed' event handler block with a 'do close application' block.

TAMPILAN PROGRAM ANDROID



Tabel ASCII

TABEL ASCII				
Dec	Hx	Oct	Char	
0	0	000	NUL (null)	32 20 040 Space
1	1	001	SOH (start of heading)	33 21 041 ! !
2	2	002	STX (start of text)	34 22 042 " "
3	3	003	ETX (end of text)	35 23 043 # #
4	4	004	EOT (end of transmission)	36 24 044 $ \$
5	5	005	ENQ (enquiry)	37 25 045 % %
6	6	006	ACK (acknowledge)	38 26 046 & &
7	7	007	BEL (bell)	39 27 047 ' '
8	8	010	BS (backspace)	40 28 050 ((
9	9	011	TAB (horizontal tab)	41 29 051))
10	A	012	LF (NL line feed, new line)	42 2A 052 * *
11	B	013	VT (vertical tab)	43 2B 053 + +
12	C	014	FF (NP form feed, new page)	44 2C 054 , ,
13	D	015	CR (carriage return)	45 2D 055 - -
14	E	016	SO (shift out)	46 2E 056 . .
15	F	017	SI (shift in)	47 2F 057 / /
16	10	020	DLE (data link escape)	48 30 060 0 0
17	11	021	DC1 (device control 1)	49 31 061 1 1
18	12	022	DC2 (device control 2)	50 32 062 2 2
19	13	023	DC3 (device control 3)	51 33 063 3 3
20	14	024	DC4 (device control 4)	52 34 064 4 4
21	15	025	NAK (negative acknowledge)	53 35 065 5 5
22	16	026	SYN (synchronous idle)	54 36 066 6 6
23	17	027	ETB (end of trans. block)	55 37 067 7 7
24	18	030	CAN (cancel)	56 38 070 8 8
25	19	031	EM (end of medium)	57 39 071 9 9
26	1A	032	SUB (substitute)	58 3A 072 : :
27	1B	033	ESC (escape)	59 3B 073 ; ;
28	1C	034	FS (file separator)	60 3C 074 < <
29	1D	035	GS (group separator)	61 3D 075 = =
30	1E	036	RS (record separator)	62 3E 076 > >
31	1F	037	US (unit separator)	63 3F 077 ? ?
				64 40 100 @ @
				65 41 101 A A
				66 42 102 B B
				67 43 103 C C
				68 44 104 D D
				69 45 105 E E
				70 46 106 F F
				71 47 107 G G
				72 48 110 H H
				73 49 111 I I
				74 4A 112 J J
				75 4B 113 K K
				76 4C 114 L L
				77 4D 115 M M
				78 4E 116 N N
				79 4F 117 O O
				80 50 120 P P
				81 51 121 Q Q
				82 52 122 R R
				83 53 123 S S
				84 54 124 T T
				85 55 125 U U
				86 56 126 V V
				87 57 127 W W
				88 58 130 X X
				89 59 131 Y Y
				90 5A 132 Z Z
				91 5B 133 [[
				92 5C 134 \ \
				93 5D 135]]
				94 5E 136 ^ ^
				95 5F 137 _ _
				96 60 140 ` `
				97 61 141 a a
				98 62 142 b b
				99 63 143 c c
				100 64 144 d d
				101 65 145 e e
				102 66 146 f f
				103 67 147 g g
				104 68 150 h h
				105 69 151 i i
				106 6A 152 j j
				107 6B 153 k k
				108 6C 154 l l
				109 6D 155 m m
				110 6E 156 n n
				111 6F 157 o o
				112 70 160 p p
				113 71 161 q q
				114 72 162 r r
				115 73 163 s s
				116 74 164 t t
				117 75 165 u u
				118 76 166 v v
				119 77 167 w w
				120 78 170 x x
				121 79 171 y y
				122 7A 172 z z
				123 7B 173 { {
				124 7C 174 |
				125 7D 175 } }
				126 7E 176 ~ ~
				127 7F 177 DEL

Source: www.LookupTables.com

Standar Operasional Prosedur (SOP)

I. SOP Alat Pendeteksi

1. Tekan tombol ON/OFF untuk menyalakan alat
2. Letakkan alat 100cm di bawah (center) dengan tabung x-ray

II. SOP Alat Penampil (Android)

1. Instal aplikasi android untuk penampilnya melalui link atau QRcode
2. Aktifkan bluetooth
3. Tekan tombol bluetooth pada aplikasi dan sambungkan dengan HC-05
4. Jika sudah terkoneksi, maka siap dilakukan pengukuran

Lampiran Aplikasi Android

- APK Android (Aplikasi Penampil)



<https://drive.google.com/open?id=0B9-7Nu8XH7wET1NpYUxldnk4QIU>

- File *project* (MIT App Inventor) aplikasi penampil di android



<https://drive.google.com/open?id=0B9-7Nu8XH7wERWE2OURjR3FBBeHM>

Lampiran Foto Hasil Data Pengukuran













