LAMPIRAN A

PROGRAM PADA MIKROKONTROLER ATMEGA 16

```
/*****************************************************
This program was produced by the
CodeWizardAVR V1.25.3 Professional
Automatic Program Generator
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Project : Tugas Akhir
Version : 1.0
Date    : 7/1/2009
Author  : Awaludin Hakim
Company : Teknik Elektro Maranatha
Comments: Sistem Alarm Kebakaran via SMS dan MMS


Chip type           : ATmega16
Program type        : Application
Clock frequency     : 11.059200 MHz
Memory model        : Small
External SRAM size  : 0
Data Stack size     : 256
*****************************************************/

#include <mega16.h>
#include <stdio.h>
#include <stdlib.h>
#include <delay.h>

// Alphanumeric LCD Module functions
#asm
   .equ __lcd_port=0x18 ;PORTB
#endasm
#include <lcd.h>

// Standard Input/Output functions
#include <stdio.h>

#define ADC_VREF_TYPE 0x20

// Read the 8 most significant bits
// of the AD conversion result
unsigned char read_adc(unsigned char adc_input)
{
ADMUX=adc_input | (ADC_VREF_TYPE & 0xff);
// Start the AD conversion
ADCSRA|=0x40;
// Wait for the AD conversion to complete
while ((ADCSRA & 0x10)==0);
ADCSRA|=0x10;
return ADCH;
}

// Declare your global variables here
```

```
void main(void)
{
// Declare your local variables here
   unsigned int vin,asap;
   float suhu;
   char casap[33],temp[33];


// Input/Output Ports initialization
// Port A initialization
// Func7=In Func6=In Func5=In Func4=In Func3=In Func2=In Func1=In
Func0=In
// State7=T State6=T State5=T State4=T State3=T State2=T State1=T
State0=T
PORTA=0x00;
DDRA=0x00;

// Port B initialization
// Func7=In Func6=In Func5=In Func4=In Func3=In Func2=In Func1=In
Func0=In
// State7=T State6=T State5=T State4=T State3=T State2=T State1=T
State0=T
PORTB=0x00;
DDRB=0x00;

// Port C initialization
// Func7=Out Func6=Out Func5=Out Func4=Out Func3=Out Func2=Out
Func1=Out Func0=Out
// State7=1 State6=1 State5=1 State4=1 State3=1 State2=1 State1=1
State0=1
PORTC=0xFF;
DDRC=0xFF;

// Port D initialization
// Func7=Out Func6=Out Func5=Out Func4=Out Func3=Out Func2=In
Func1=In Func0=Out
// State7=0 State6=0 State5=0 State4=0 State3=0 State2=T State1=T
State0=0
PORTD=0x00;
DDRD=0xF9;

// Timer/Counter 0 initialization
// Clock source: System Clock
// Clock value: Timer 0 Stopped
// Mode: Normal top=FFh
// OC0 output: Disconnected
TCCR0=0x00;
TCNT0=0x00;
OCR0=0x00;

// Timer/Counter 1 initialization
// Clock source: System Clock
// Clock value: Timer 1 Stopped
// Mode: Normal top=FFFFh
```

```
// OC1A output: Discon.
// OC1B output: Discon.
// Noise Canceler: Off
// Input Capture on Falling Edge
// Timer 1 Overflow Interrupt: Off
// Input Capture Interrupt: Off
// Compare A Match Interrupt: Off
// Compare B Match Interrupt: Off
TCCR1A=0x00;
TCCR1B=0x00;
TCNT1H=0x00;
TCNT1L=0x00;
ICR1H=0x00;
ICR1L=0x00;
OCR1AH=0x00;
OCR1AL=0x00;
OCR1BH=0x00;
OCR1BL=0x00;

// Timer/Counter 2 initialization
// Clock source: System Clock
// Clock value: Timer 2 Stopped
// Mode: Normal top=FFh
// OC2 output: Disconnected
ASSR=0x00;
TCCR2=0x00;
TCNT2=0x00;
OCR2=0x00;

// External Interrupt(s) initialization
// INT0: Off
// INT1: Off
// INT2: Off
MCUCR=0x00;
MCUCSR=0x00;

// Timer(s)/Counter(s) Interrupt(s) initialization
TIMSK=0x00;

// Analog Comparator initialization
// Analog Comparator: Off
// Analog Comparator Input Capture by Timer/Counter 1: Off
ACSR=0x80;
SFIOR=0x00;

// ADC initialization
// ADC Clock frequency: 86.400 kHz
// ADC Voltage Reference: AREF pin
// ADC Auto Trigger Source: None
// Only the 8 most significant bits of
// the AD conversion result are used
ADMUX=ADC_VREF_TYPE & 0xff;
ADCSRA=0x87;
```

```
// LCD module initialization
lcd_init(16);


while (1)
      {
      // Place your code here
      lcd_clear();

      vin=read_adc(0);
      suhu=(vin*1.96);  // [(vin/255)*5*100]

      asap=read_adc(1);

      itoa(asap,casap);

      // ========== kondisi suhu dan kadar asap normal =============

       if(suhu<=35 & asap<=200)
      {
        PORTD=63; // 11111100 -> alarm ataupun penyemprot tidak
aktif
      }

      // =============== kondisi ruangan berasap =================

      if(asap>200)
      {
        PORTC=0;  // aktifkan semua led
        PORTD=63; // 11111100 -> alarm ataupun penyemprot tidak
aktif
      }

      // ================ kondisi Kebakaran ====================

      if(suhu>35 && asap>200)
      {
        lcd_gotoxy(0,0);
        lcd_clear();
        lcd_putsf(" KEBAKARAN !!! ");
        PORTC=0;   // aktifkan semua LED
        PORTD=255; // 11111111 -> aktifkan alarm + penyemprot
        delay_ms(500);
        PORTD=192; // 00000011 -> aktifkan alarm + penyemprot +
untuk capture gambar + kirim SMS & MMS
        delay_ms(500);
        PORTD=255; // 11111111 -> aktifkan alarm + penyemprot
       }

      // ========= kontrol buzzer dan penyemprot dari SMS ==========

      if(PIND.1==1)
      {
       PIND.7=1;          // aktifkan penyemprot
```

```
      }

      if(PIND.2==1)
      {
       PIND.6=1;          // aktifkan alarm
      }

      // ============ Tampilkan Kadar asap dan Suhu ===============

      lcd_gotoxy(0,0);
      lcd_putsf("Asap  :");
      lcd_gotoxy(8,0);
      lcd_puts(casap);

      lcd_gotoxy(0,1);
      lcd_putsf("Suhu  : ");
      lcd_gotoxy(8,1);
      sprintf(temp,"%.2f oC",suhu);
      lcd_puts(temp);

      delay_ms(1000);
      PORTC=255;       // LED tidak aktif

      };
}
```

LAMPIRAN B

PROGRAM PADA MICROSOFT VISUAL BASIC

```
'deklarasi untuk capture webcam:
Private Declare Function BitBlt Lib "gdi32" (ByVal hDestDC As Long,
ByVal x As Long, ByVal y As Long, ByVal nWidth As Long, ByVal
nHeight As Long, ByVal hSrcDC As Long, ByVal xSrc As Long, ByVal
ySrc As Long, ByVal dwRop As Long) As Long
Dim hwdc As Long
Dim startcap As Boolean

'deklarasi untuk MMS

Option Explicit

Private Declare Function GetTempPath Lib "kernel32" Alias
"GetTempPathA" (ByVal nBufferLength As Long, ByVal lpBuffer As
String) As Long
Private Const MAX_PATH = 260

Dim objMm1Protocol As AXmsCtrl.MmsProtocolMm1
Dim objMmsConstants As AXmsCtrl.MmsConstants
Dim objMmsSlide As AXmsCtrl.MmsSlide
Dim objMmsMessage As AXmsCtrl.MmsMessage

'deklarasi untuk SMS
Dim objGsmProtocol As AXmsCtrl.SmsProtocolGsm
Dim objSmsMessage As AXmsCtrl.SmsMessage
Dim objSmsConstants As AXmsCtrl.SmsConstants

Dim ShowReference As Boolean

Private Sub buttonReceive_Click()
 Dim NumMessages As Long
 Dim i As Long
 Set objGsmProtocol = CreateObject("ActiveXperts.SmsProtocolGsm")
 Set objSmsMessage = CreateObject("ActiveXperts.SmsMessage")
 Set objSmsConstants = CreateObject("ActiveXperts.SmsConstants")

    buttonReceive.Enabled = False

    Screen.MousePointer = vbHourglass

    Text2.Text = ""

    objGsmProtocol.Device = ComboDevice.Text
'Set Device
    objGsmProtocol.MessageStorage = objSmsConstants.asSTORAGE_DEVICE
'ambil dari inbox HP

    NumMessages = objGsmProtocol.Receive
'Retrieve messages

    If GetResult = 0 Then                    ' Success?

        For i = 0 To NumMessages - 1
            On Error Resume Next
```

```
            Set objSmsMessage =
objGsmProtocol.GetMessage(NumMessages - 1)
            On Error GoTo 0

            If GetResult = 0 Then

                Text2.Text = objSmsMessage.Data     ' Add data to
list control

            End If
        Next
    End If


    Screen.MousePointer = vbDefault
    buttonReceive.Enabled = True
End Sub

Private Sub Command1_Click()
Dim temp As Long

  hwdc = capCreateCaptureWindow("Dixanta Vision System", ws_child Or
ws_visible, 0, 0, 320, 240, Picture1.hWnd, 0)
  If (hwdc <> 0) Then
    temp = SendMessage(hwdc, wm_cap_driver_connect, 0, 0)
    temp = SendMessage(hwdc, wm_cap_set_preview, 1, 0)
    temp = SendMessage(hwdc, WM_CAP_SET_PREVIEWRATE, 100, 0)
    startcap = True
    Else
    MsgBox ("No Webcam found")
  End If
End Sub


Private Sub Command2_Click()
SaveFormImageToFile Form1, Picture1, "C:\kebakaran.bmp"
PicFormat321.SaveBmpToJpeg "C:\kebakaran.bmp", "C:\kebakaran.jpg",
"65"
End Sub

Private Sub Command3_Click()
Dim temp As Long
If startcap = True Then
temp = SendMessage(hwdc, WM_CAP_DRIVER_DISCONNECT, 0&, 0&)
startcap = False
End If

Unload Me
End Sub

Public Sub SaveFormImageToFile(ByRef ContainerForm As Form, ByRef
PictureBoxControl As PictureBox, ByVal ImageFileName As String)
  Dim FormInsideWidth As Long
  Dim FormInsideHeight As Long
```

```
  Dim FormInsideLeft As Long
  Dim FormInsideTop As Long
  Dim PictureBoxLeft As Long
  Dim PictureBoxTop As Long
  Dim PictureBoxWidth As Long
  Dim PictureBoxHeight As Long
  Dim FormAutoRedrawValue As Boolean

  With PictureBoxControl
    'Set PictureBox properties
    .Visible = True
    .AutoRedraw = True
    .Appearance = 0 ' Flat
    .AutoSize = False
    .BorderStyle = 0 'No border

    'Store PictureBox Original Size and location Values
    PictureBoxHeight = 3615: PictureBoxWidth = 4815: PictureBoxLeft
= 0: PictureBoxTop = 0

    'Make PictureBox to size to inside of form.
    '.Align = vbAlignTop: .Align = vbAlignLeft
    DoEvents

    FormInsideHeight = 3615: FormInsideWidth = 4815: FormInsideLeft
= 0: FormInsideTop = 0

    'Restore PictureBox Original Size and location Values
    .Align = vbAlignNone
    .Height = 3615: .Width = 4815: .Left = 0: .Top = 0

    FormAutoRedrawValue = ContainerForm.AutoRedraw
    ContainerForm.AutoRedraw = False
    DoEvents

    'Copy Form Image to Picture Box
    BitBlt .hDC, 0, 0, FormInsideWidth / Screen.TwipsPerPixelX,
FormInsideHeight / Screen.TwipsPerPixelY, ContainerForm.hDC, 0, 0,
vbSrcCopy
    DoEvents
    SavePicture .Image, ImageFileName
    DoEvents

    ContainerForm.AutoRedraw = FormAutoRedrawValue
    DoEvents
  End With
End Sub


Private Sub WcUpload1_OnConnectionStatusChanged(ByVal iStatusCode As
Long)

End Sub
```

```
Private Sub CommandSend_Click()
    MousePointer = vbHourglass
    CommandSend.Enabled = False
    TextResult.Text = "Tunggu sebentar, sedang mengirim MMS..."

    ' Device Properties
    objMm1Protocol.Device = ComboDevice.Text

    ' Server Properties
    objMm1Protocol.ProviderMMSC = "http://mmsc.indosat.com"
    objMm1Protocol.ProviderAPN = "indosatmms"
    objMm1Protocol.ProviderWAPGateway = "010.019.019.019"
    objMm1Protocol.ProviderAPNAccount = "indosat"
    objMm1Protocol.ProviderAPNPassword = "indosat"

    'LogFile
    objMm1Protocol.LogFile = TextLogfile.Text

    'Message Properties

    objMmsMessage.Clear
    objMmsMessage.AddRecipient Text3.Text        'kirim ke nomor
tujuan
    objMmsMessage.Subject = "KEBAKARAN"

    objMmsSlide.Duration = 5
    objMmsSlide.AddAttachment "c:\kebakaran.jpg"
    objMmsSlide.AddText "RUMAH KEBAKARAN!!! Telp.Pemadam:118"

    objMmsMessage.AddSlide objMmsSlide

    objMm1Protocol.Connect

    TextResult.Text = "ERROR #" & objMm1Protocol.LastError & " : " &
objMm1Protocol.GetErrorDescription(objMm1Protocol.LastError)
    TextResponse.Text = objMm1Protocol.ProviderResponse

    If (objMm1Protocol.LastError = 0) Then

        objMm1Protocol.Send objMmsMessage

        TextResult.Text = "ERROR #" & objMm1Protocol.LastError & " :
" & objMm1Protocol.GetErrorDescription(objMm1Protocol.LastError)
        TextResponse.Text = objMm1Protocol.ProviderResponse

        objMm1Protocol.Disconnect
    End If


    CommandSend.Enabled = True
    MousePointer = vbDefault

End Sub
```

```
Private Sub CommandView_Click()
    If FileExists(TextLogfile.Text) = True Then
    Shell "notepad " + TextLogfile.Text, vbNormalFocus
    End If
End Sub

Public Function FileExists(sFileName As String) As Boolean
  FileExists = CBool(Len(Dir$(sFileName))) And CBool(Len(sFileName))
End Function
Private Function SetDefaultLogFile()
    TextLogfile.Text = "C:\MmsLog.txt"
End Function
Private Function GetResult()
    Dim lError As Long

    lError = objMm1Protocol.LastError

    TextResult.Text = lError & " (" &
objMm1Protocol.GetErrorDescription(lError) & ")"
    TextResponse.Text = objMm1Protocol.ProviderResponse

    GetResult = lError
End Function
Private Sub Form_Load()
    Dim numDevices
    Dim i

    Set objGsmProtocol = CreateObject("ActiveXperts.SmsProtocolGsm")
    Set objSmsMessage = CreateObject("ActiveXperts.SmsMessage")
    Set objSmsConstants = CreateObject("ActiveXperts.SmsConstants")


    Set objMm1Protocol = CreateObject("ActiveXperts.MmsProtocolMm1")
    Set objMmsConstants = CreateObject("ActiveXperts.MmsConstants")
    Set objMmsMessage = CreateObject("ActiveXperts.MmsMessage")
    Set objMmsSlide = CreateObject("ActiveXperts.MmsSlide")


    numDevices = objMm1Protocol.GetDeviceCount

    For i = 0 To numDevices - 1
        ComboDevice.AddItem (objMm1Protocol.GetDevice(i))
        ComboDevice.ListIndex = 0
    Next

    SetDefaultLogFile
End Sub

Private Sub Timer1_Timer()
Dim tekan As Integer

'baca input dari paralel port
```

```
tekan = Inp(&H379)
Text1.Text = Str(tekan)
Select Case tekan
Case 255

'1. capture gambar dari webcam
SaveFormImageToFile Form1, Picture1, "C:\kebakaran.bmp"
'ubah format bmp ke jpeg
PicFormat321.SaveBmpToJpeg "C:\kebakaran.bmp", "C:\kebakaran.jpg",
"65"

'2. kirim SMS:
    Dim MessageType As Long
    Dim strReference As String

    TextResult.Text = "Mengirim Pesan : KEBAKARAN!"
    TextResult.Refresh

    ' Set Device
    objGsmProtocol.Device = ComboDevice.Text
    objGsmProtocol.MessageStorage = objSmsConstants.asSTORAGE_SIM

    ' Set LogFile
    objGsmProtocol.LogFile = TextLogfile.Text


    ' Create Message Object
    Set objSmsMessage = CreateObject("ActiveXperts.SmsMessage")

    ' Set recipient
    objSmsMessage.Recipient = Text3.Text

    ' Set Message parameters
    objSmsMessage.Data = "RUMAH ANDA KEBAKARAN!"


    ' Send the message
    strReference = objGsmProtocol.Send(objSmsMessage)

    TextResult.Text = "SMS terkirim!"
    TextResult.Refresh


'3. kirim MMS:
 MousePointer = vbHourglass
    CommandSend.Enabled = False
    TextResult.Text = "Tunggu sebentar, sedang mengirim MMS..."

    ' Device Properties
    objMm1Protocol.Device = ComboDevice.Text

    ' Server Properties
    objMm1Protocol.ProviderMMSC = "http://mmsc.indosat.com"
    objMm1Protocol.ProviderAPN = "indosatmms"
```

```
    objMm1Protocol.ProviderWAPGateway = "010.019.019.019"
    objMm1Protocol.ProviderAPNAccount = "indosat"
    objMm1Protocol.ProviderAPNPassword = "indosat"

    'LogFile
    objMm1Protocol.LogFile = TextLogfile.Text

    'Message Properties

    objMmsMessage.Clear
    objMmsMessage.AddRecipient Text3.Text        'kirim ke nomor
tujuan
    objMmsMessage.Subject = "KEBAKARAN"

    objMmsSlide.Duration = 5
    objMmsSlide.AddAttachment "c:\kebakaran.jpg"
    objMmsSlide.AddText "RUMAH KEBAKARAN!!! Telp.Pemadam:118"

    objMmsMessage.AddSlide objMmsSlide

    objMm1Protocol.Connect

    TextResult.Text = "ERROR #" & objMm1Protocol.LastError & " : " &
objMm1Protocol.GetErrorDescription(objMm1Protocol.LastError)
    TextResponse.Text = objMm1Protocol.ProviderResponse

    If (objMm1Protocol.LastError = 0) Then

        objMm1Protocol.Send objMmsMessage

        TextResult.Text = "ERROR #" & objMm1Protocol.LastError & " :
" & objMm1Protocol.GetErrorDescription(objMm1Protocol.LastError)
        TextResponse.Text = objMm1Protocol.ProviderResponse

        objMm1Protocol.Disconnect
    End If


    CommandSend.Enabled = True
    MousePointer = vbDefault


End Select

End Sub

Private Sub Timer2_Timer()
Dim NumMessages As Long
 Dim i As Long
 Set objGsmProtocol = CreateObject("ActiveXperts.SmsProtocolGsm")
 Set objSmsMessage = CreateObject("ActiveXperts.SmsMessage")
 Set objSmsConstants = CreateObject("ActiveXperts.SmsConstants")

    buttonReceive.Enabled = False
```

```
    Screen.MousePointer = vbHourglass

    Text2.Text = ""

    objGsmProtocol.Device = ComboDevice.Text
'Set Device
    objGsmProtocol.MessageStorage = objSmsConstants.asSTORAGE_DEVICE
'ambil dari inbox HP

    NumMessages = objGsmProtocol.Receive
'Retrieve messages

    If GetResult = 0 Then                       ' Success?

        For i = 0 To NumMessages - 1
            On Error Resume Next
            Set objSmsMessage =
objGsmProtocol.GetMessage(NumMessages - 1)
            On Error GoTo 0

            If GetResult = 0 Then

                Text2.Text = objSmsMessage.Data     ' Add data to
list control
            End If
        Next
    End If

    'objGsmProtocol.DeleteMessage (0)

    Screen.MousePointer = vbDefault
    buttonReceive.Enabled = True

Dim inbox As String

'cek SMS inbox untuk control alarm dan pompa

inbox = Text2.Text
Select Case inbox
Case "Alarm=1"
   Out &H378, 1
Case "Alarm=0"
   Out &H378, 0
Case "Pompa=1"
   Out &H378, 2
Case "Pompa=0"
   Out &H378, 0
Case "Alarm+pompa=1"
   Out &H378, 3
Case Default
   Out &H378, 0
End Select
End Sub
```

Module1.bas untuk webcam:

```
Public Const ws_child As Long = &H40000000
Public Const ws_visible As Long = &H10000000

Global Const WM_USER = 1024
Global Const wm_cap_driver_connect = WM_USER + 10
Global Const wm_cap_set_preview = WM_USER + 50
Global Const WM_CAP_SET_PREVIEWRATE = WM_USER + 52
Global Const WM_CAP_DRIVER_DISCONNECT As Long = WM_USER + 11
Public Const WM_CAP_DLG_VIDEOFORMAT As Long = WM_USER + 41
Declare Function SendMessage Lib "user32" Alias "SendMessageA"
(ByVal hWnd As Long, ByVal wMsg As Long, ByVal wParam As Long, ByVal
lParam As Long) As Long
Declare Function capCreateCaptureWindow Lib "avicap32.dll" Alias
"capCreateCaptureWindowA" (ByVal a As String, ByVal b As Long, ByVal
c As Integer, ByVal d As Integer, ByVal e As Integer, ByVal f As
Integer, ByVal g As Long, ByVal h As Integer) As Long
```

Module2.bas untuk input/output paralel port:

```
Public Declare Function Inp Lib "inpout32.dll" Alias "Inp32" (ByVal
PortAddress As Integer) As Integer
Public Declare Sub Out Lib "inpout32.dll" Alias "Out32" (ByVal
PortAddress As Integer, ByVal Value As Integer)
```

LAMPIRAN C

DATA SHEET LM35

DATA SHEET AF-30

DATA SHEET ULN 2803A