

LAMPIRAN A

PERANGKAT LUNAK

My SQL handler

```
Imports MySql.Data.MySqlClient
Public Class MySqlHandler
    Public connection As MySql.Data.MySqlClient.MySqlConnection
    Public oppened As Boolean = False

    Sub New()
        Dim conStr As String
        Dim arrStr(5) As String
        arrStr(0) = "localhost"
        arrStr(1) = "root"
        arrStr(2) = "root"
        arrStr(3) = "radar_db"

        conStr = String.Format("server={0}; user id={1}; password={2};
database={3}; pooling=false", _
arrStr(0), arrStr(1), arrStr(2), arrStr(3))

        connection = New MySql.Data.MySqlClient.MySqlConnection()
        connection.ConnectionString = conStr
    End Sub

    Public Sub Open()
        Try
            If oppened = True Then connection.Close()
            connection.Open()
            oppened = True
        Catch ex As Exception
            MsgBox("Gagal koneksi ke database", MsgBoxStyle.Information)
        End
    End Try
End Sub

    Public Sub Close()
        connection.Close()
        oppened = False
    End Sub

    Public Function GetDataTable(ByVal sql As String) As DataTable
        Dim data As New DataTable
        Dim mAdapter As New MySqlDataAdapter(sql, connection)
        Dim mCommandBuilder As New MySqlCommandBuilder(mAdapter)

        mAdapter.Fill(data)
        Return data
    End Function

    Public Function GetDataAdapter(ByVal sql As String) As MySqlDataAdapter
        Dim mAdapter As New MySqlDataAdapter(sql, connection)
        Return mAdapter
    End Function
End Class
```

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    Public Function CreateCommand(ByVal formattedSql As String, ByVal args()
As Object) As MySqlCommand
        Try
            Dim sql As String
            If args IsNot Nothing Then
                Dim i As Integer = 0
                For i = 0 To args.Length - 1
                    If TypeOf args(i) Is String Then
                        args(i) = args(i).Replace("'", "''")
                    End If
                Next
                sql = String.Format(formattedSql, args)
            Else
                sql = formattedSql
            End If
            Dim cmd As New MySqlCommand(sql, connection)
            Return cmd
        Catch ex As Exception
            MsgBox(ex.Message)
            Return Nothing
        End Try
    End Function

    Public Function CreateCommand(ByVal sql As String) As MySqlCommand
        Return CreateCommand(sql, Nothing)
    End Function

```

End Class

Protocol

```

Public Class Protocol
    'Session untuk mengidentifikasi sesi data apa yang dikirimkan oleh radar
    '0 = tidak ada sesi
    '1 = Statistical data
    Public session As Integer = 0
    Public statistic As TrafficStatistical
    Private koneksi As MySqlHandler

    Private message As ArrayList
    Private prevData As Integer
    Private isMessage As Boolean
    Private maxLen As Integer
    Sub New()
        koneksi = New MySqlHandler
        message = New ArrayList()
        prevData = -1
        isMessage = False
        maxLen = -1
    End Sub

    Public Sub getByte(ByVal data As Integer)
        If data = 170 And prevData = 255 Then
            isMessage = True

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        message.Clear()
        message.Add(prevData)
        message.Add(data)
    ElseIf isMessage = True Then
        message.Add(data)
        If message.Count = 4 Then
            maxlen = message.Item(3) + 5 'max len this message = 3
            (HEADER+LEN BYTE) + LENGTH(DATA):SEBANYAK LEN BYTE + 2 (CHECK SUM)
            ElseIf message.Count = maxlen Then
                'TRANSLATE MESSAGE
                prevData = -1
                isMessage = False
                maxlen = -1
                translate(message)
            End If
        End If
        prevData = data
    End Sub

    Public Function translate(ByVal bytes As ArrayList) As Boolean
        Dim valid As Boolean = True
        'MsgBox(arrListJoin(" ", bytes))
        If (bytes.Count >= 6) Then
            If bytes.Item(0) = 255 And bytes.Item(1) = 170 Then 'Valid header
command
                If session = 1 Then
                    Return statisticalData(bytes)
                Else
                    'MsgBox(bytes.Item(2))
                    Select Case bytes.Item(2)
                        Case 128
                            Return statisticalData(bytes)
                    End Select
                End If
            Else
                Return False
            End If
        Else
            Return False
        End If
        Return valid
    End Function

    Private Function statisticalData(ByVal bytes As ArrayList) As Boolean
        'MsgBox("Statistical 2: " & bytes.Item(2))
        Select Case Integer.Parse(bytes.Item(2))
            Case 128 'HEADER
                session = 1
                statistic = New TrafficStatistical(koneksi)
                With statistic
                    .RTMSid_MSB = bytes.Item(4)
                    .RTMSid_LSB = bytes.Item(5)
                    .messageNumber = bytes.Item(6)
                    '.TimeStamp = New Date(Integer.Parse(bytes.Item(16)),
Integer.Parse(bytes.Item(15)), Integer.Parse(bytes.Item(14)),
Integer.Parse(bytes.Item(13)), Integer.Parse(bytes.Item(12)),

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Integer.Parse(bytes.Item(11)), Integer.Parse(bytes.Item(10)),
DateTimeKind.Local)

        'check date time format
        Dim binari As String
        binari = Convert.ToString(Integer.Parse(bytes.Item(9)),
2)
        binari = String.Format("{0:00000000}",
Integer.Parse(binari))

        If binari.Substring(4, 2) = "01" Then
            'jika formatnya ss:mm:hh Day dd/mm/yy
            '.TimeStamp = New Date(decimalToHex(bytes.Item(16)),
decimalToHex(bytes.Item(15)), decimalToHex(bytes.Item(14)),
decimalToHex(bytes.Item(13)), decimalToHex(bytes.Item(12)),
decimalToHex(bytes.Item(11)), decimalToHex(bytes.Item(10)),
DateTimeKind.Local)

            '.TimeStamp = New Date(bytes.Item(16),
bytes.Item(15), bytes.Item(14), bytes.Item(13), bytes.Item(12),
bytes.Item(11), bytes.Item(10), DateTimeKind.Local)
            '.TimeStamp = New Date(Integer.Parse(bytes.Item(16)),
Integer.Parse(bytes.Item(15)), Integer.Parse(bytes.Item(14)),
Integer.Parse(bytes.Item(13)), Integer.Parse(bytes.Item(12)),
Integer.Parse(bytes.Item(11)), Integer.Parse(bytes.Item(10)),
DateTimeKind.Local)

            .TimeStamp = New Date(decimalToHex(bytes.Item(16)) +
2000, decimalToHex(bytes.Item(15)), decimalToHex(bytes.Item(14)),
decimalToHex(bytes.Item(12)), decimalToHex(bytes.Item(11)),
decimalToHex(bytes.Item(10)))

            'ElseIf binari.Substring(4, 2) = "00" Then
            '    'jika formatnya CTIME
            '    Dim ctime As Int64
            '    ctime = decimalHexDecimal(New Integer()
{bytes.Item(10), bytes.Item(11), bytes.Item(12), bytes.Item(13)})
            '    .TimeStamp = New DateTime(1970, 1,
1).Add(TimeSpan.FromTicks(ctime * TimeSpan.TicksPerSecond))
            'ElseIf binari.Substring(4, 2) = "10" Then
            '    'Jika formatnya TICKS
            '    Dim ticks As Int64
            '    ticks = decimalHexDecimal(New Integer()
{bytes.Item(10), bytes.Item(11), bytes.Item(12), bytes.Item(13)})
            '    .TimeStamp = New DateTime(1970, 1,
1).Add(TimeSpan.FromTicks(ticks))

        End If

    End With
Case 129 'STAT END
    session = 0
    If statistic.messageNumber = bytes.Item(6) Then
        statistic.saveCurrentTrafficStat()
        statistic = Nothing
    End If
Case Else

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Dim lines As Integer = (bytes.Item(3) - 2) / 2
Dim data(lines) As Integer

Dim i As Integer = 0
Dim idx As Integer = 0

'Build statistical object
For i = 0 To lines - 1
    If statistic.linesStatistic(i) Is Nothing Then
        statistic.linesStatistic(i) = New Statistic()
    End If
Next

'Get statistical data
For i = 6 To 5 + (lines * 2) Step 2
    data(idx) = decimalHexDecimal(New Integer(
{bytes.Item(i), bytes.Item(i + 1)})) '(concat bytes ke i dan ke i+1)
    idx += 1
Next

If bytes.Item(2) = 16 Then 'VOLUME
    For i = 0 To lines - 1
        statistic.linesStatistic(i).volume = data(i)
    Next
ElseIf bytes.Item(2) = 17 Then 'OCC
    For i = 0 To lines - 1
        statistic.linesStatistic(i).occ = data(i) / 10
    Next
ElseIf bytes.Item(2) = 18 Then 'SPEED
    For i = 0 To lines - 1
        statistic.linesStatistic(i).speed = data(i)
    Next
ElseIf bytes.Item(2) = 19 Then 'GAP
    For i = 0 To lines - 1
        statistic.linesStatistic(i).gap = data(i) / 10
    Next
ElseIf bytes.Item(2) = 20 Then 'C1
    For i = 0 To lines - 1
        statistic.linesStatistic(i).c1 = data(i)
    Next
ElseIf bytes.Item(2) = 21 Then 'C2
    For i = 0 To lines - 1
        statistic.linesStatistic(i).c2 = data(i)
    Next
ElseIf bytes.Item(2) = 22 Then 'C3
    For i = 0 To lines - 1
        statistic.linesStatistic(i).c3 = data(i)
    Next
ElseIf bytes.Item(2) = 23 Then 'C4
    For i = 0 To lines - 1
        statistic.linesStatistic(i).c4 = data(i)
    Next
ElseIf bytes.Item(2) = 24 Then 'C5
    For i = 0 To lines - 1
        statistic.linesStatistic(i).c5 = data(i)
    Next

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        End If
    End Select
End Function
End Class

```

Statistic

```

Public Class Statistic
    Public volume As Integer 'jumlah kendaraan, 0-3000, satuan kendaraan,
    resolusi 1
    Public occ As Double 'occupancy, 0-1000, satuan %, resolusi 0.1
    Public speed As Integer 'kecepatan rata2, 0-200, satuan Km/Jam atau MPH,
    resolusi 1

    Public gap As Double 'jarak/kepadatan, 0-3600, satuan detik, resolusi
    0.1
    Public c1 As Integer 'jumlah kendaraan class 1, 0-3000, satuan kendaraan,
    resolusi 1
    Public c2 As Integer 'jumlah kendaraan class 2, 0-3000, satuan kendaraan,
    resolusi 1
    Public c3 As Integer 'jumlah kendaraan class 3, 0-3000, satuan kendaraan,
    resolusi 1
    Public c4 As Integer 'jumlah kendaraan class 4, 0-3000, satuan kendaraan,
    resolusi 1
    Public c5 As Integer 'jumlah kendaraan class 5, 0-3000, satuan kendaraan,
    resolusi 1
End Class

```

Traffic statistical

```

Public Class TrafficStatistical

    Private dbKoneksi As MySqlConnection

    Public RTMSid_MSB As Integer 'id radar (MSB)
    Public RTMSid_LSB As Integer 'id radar (LSB)
    Public TimeStamp As Date
    Public TimeStamp2 As Date
    Public messageNumber As Integer
    Public linesStatistic(12) As Statistic

    Sub New(ByVal koneksi As MySqlConnection)
        dbKoneksi = koneksi
    End Sub

    Public Sub saveCurrentTrafficStat()
        dbKoneksi.Open()
        'dbkoneksi.CreateCommand("INSERT INTO statistic VALUES
        ('{0:G}', '{1:Y}')
        Dim arr As ArrayList

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arr = New ArrayList
arr.Add(RTMSid_LSB)
arr.Add(TimeStamp)

Dim i As Integer = 0
For i = 0 To linesStatistic.Length - 1
    If linesStatistic(i) IsNot Nothing Then
        Dim sql = String.Format("INSERT INTO statistic (RTMS_ID,
TAKE_DATE, LINE_NUMBER, VOLUME, OCC, SPEED, GAP, C1, C2, C3, C4, C5) " & _
                                "VALUES
('{0:G}', '{1:yyyy-MM-dd HH:mm:ss}', {2:G},
{3:G}, {4:G}, {5:G}, {6:G}, {7:G}, {8:G}, {9:G}, {10:G}, {11:G})", RTMSid_LSB,
TimeStamp, i, linesStatistic(i).volume, linesStatistic(i).occ,
linesStatistic(i).speed, linesStatistic(i).gap, linesStatistic(i).c1,
linesStatistic(i).c2, linesStatistic(i).c3, linesStatistic(i).c4,
linesStatistic(i).c5)
        dbKoneksi.CreateCommand(sql).ExecuteNonQuery()
        MsgBox("Saved")
    End If
Next
dbKoneksi.Close()
End Sub
End Class

```

Main form

```

Public Class MainForm
    Dim prevData As Integer
    Dim prosesData As Boolean = False
    Dim idx As Integer = 0
    Dim isFinish As Boolean = False
    Dim panjangData As Integer = 0
    Dim dataStream As String
    Dim kamus As Protocol
    Dim dbHandler As MySqlHandler

    Private Sub refreshData()
        gridStatistic.DataSource = dbHandler.GetDataTable("SELECT * FROM
STATISTIC ORDER BY TAKE_DATE DESC")
    End Sub
    Private Sub btnActPort_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles btnActPort.Click
        If radarPort.IsOpen = False Then
            kamus = New Protocol()
            radarPort.PortName = txtCom.Text
            radarPort.BaudRate = txtBaudrate.Text
            radarPort.DataBits = txtDatabits.Text

            radarPort.Open()
            btnActPort.Text = "Close Port"
            conSetup.Enabled = False
            lblStatus.Text = "Status: listening..."
            Timer1.Enabled = True
        Else

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        Timer1.Enabled = False
        radarPort.Close()
        btnActPort.Text = "Open Port"
        conSetup.Enabled = True
        lblStatus.Text = "Status: port closed"
    End If
End Sub

Private Sub MainForm_FormClosing(ByVal sender As Object, ByVal e As
System.Windows.Forms.FormClosingEventArgs) Handles Me.FormClosing
    radarPort.Close()
    dbHandler.Close()
End Sub

Private Sub radarPort_DataReceived(ByVal sender As Object, ByVal e As
System.IO.Ports.SerialDataReceivedEventArgs) Handles radarPort.DataReceived
    Dim bite As String = radarPort.ReadByte
    kamus.getBytes(bite)
End Sub

Private Sub Timer1_Tick(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles Timer1.Tick
    refreshData()
End Sub

Private Sub MainForm_Load(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles MyBase.Load
    dbHandler = New MySqlHandler()
    dbHandler.Open()
    refreshData()
End Sub

Private Sub btnRefresh_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles btnRefresh.Click
    refreshData()
End Sub
End Class

```

LAMPIRAN B

Gambar perangkat



Gambar perangkat radar tampak samping



Gambar perangkat radar tampak depan



Gambar perangkat MS connector



Gambar perangkat RS-232



Gambar kegiatan percobaan radar

