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ESCUELA POLITÉCNICA NACIONAL

FACULTAD DE INGENIERÍA ELÉCTRICA

TEMA: CONSTRUCCIÓN DE UN MÓDULO DIDÁCTICO PARA SENSAR
PRESIÓN DENTRO DE UN EDIFICIO

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TESIS PREVIA A LA OBTENCIÓN DEL TÍTULO DE INGENIERO
EN ELECTRÓNICA Y CONTROL
(ANEXOS)

QUITO, AGOSTO / 98

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ANEXO 1 : PROGRAMA FUENTE PARA EL MICROCONTROLADOR INTEL 8751

```
ORG 00H
LJMP INICIO
INICIO:
    CLR  P0.0
    CLR  P0.1
    CLR  P0.2
    MOV  SP,#30H
    MOV  TMOD,#00100000B ;TIMER 1 EN MODO DE AUTORECARGA
    MOV  SCON,#01010000B ;PORTICO SERIAL EN MODO 1
                                ;( 8 BIT UART )
    MOV  PCON,#00H ;SMOD = 0 BIT DUPLICADOR DE BAUDIOS
    MOV  TH1,#0F0H ;BAUD RATE = 1200
    MOV  TL1,#0F0H ;BAUD RATE = 1200
    SETB TR1 ;ACTIVO BAUD RATE
    CLR  RI ;DESACTIVACION DE FLAG DE
                                ;RECEPCION SERIAL
    CLR  TI ;DESACTIVACION DE FLAG DE
                                ;TRANSMISION SERIAL
    SETB P0.2 ;PULSO PARA ASEGURAR LA CONVERSION
                                ;A/D
    LCALL RETARDO
    CLR  P0.2
INICIAR:
    LCALL TRANS ;SE LLAMA A LA SUBROUTINA
                                ;DE TRANSMISION SERIAL
    SJMP INICIAR
TRANS:
    SETB P0.0 ;LED INDICADOR PARA LA RECEPCION
    JNB  RI,$ ;ESPERA RECIBIR UN UNO
    LCALL RETARDO
    CLR  RI ;SE LIMPIA EL FLAG DE RECEPCION
                                ;SERIAL
    CLR  P0.0
    LCALL RETARDO
    MOV  A,SBUF ;MOVEMOS LA INFORMACION DEL SBUF
                                ;AL ACUMULADOR
    CJNE A,#01H,FIN ;SE COMPARA EL BYTE RECIBIDO CON
                                ;UNO
    MOV  A,P1 ;MOVEMOS EL DATO DEL CONVERTIDOR
                                ;AL ACUMULADOR
    MOV  SBUF,A ;TRANSMITIMOS EL DATO
    SETB P0.1 ;LED INDICADOR PARA LA TRANSMISION
    JNB  TI,$ ;ESPERAMOS QUE SE TERMINE
                                ;DE TRANSMITIR LA INFORMACION
    CLR  TI ;SE LIMPIA EL FLAG DE
                                ;TRANSMISION SERIAL
    LCALL RETARDO
    CLR  P0.1
    SETB P0.0 ;LED INDICADOR PARA LA RECEPCION
    JNB  RI,$ ;ESPERA CONFIRMACION DEL
                                ;COMPUTADOR
```

```

CLR    RI
LCALL  RETARDO
CLR    P0.0
MOV    A, SBUF
CJNE   A,#00,FIN          ;SE COMPARA EL BYTE CON 0
                                ;PARA TERMINAR

FIN:
    RET

RETARDO:
    MOV    R1,#10
salto:
    MOV    R0,#0FFh      ;GENERACION DE UN RETARDO
                                ;PARA ASEGURAR LA LECTURA
                                ;DEL CONVERTOR ADC0804

    DJNZ   R0,$
    DJNZ   R1,salto

RET
END

```


ANEXO 2 : PROGRAMA FUENTE CFPP 1 DESARROLLADO EN VISUAL BASIC

```
STAR.FRM
C:\WINDOWS\SYSTEM\GRID.VBX
C:\WINDOWS\SYSTEM\MSOLE2.VBX
C:\WINDOWS\SYSTEM\ANIBUTTON.VBX
C:\WINDOWS\SYSTEM\CMDIALOG.VBX
C:\WINDOWS\SYSTEM\CRYSTAL.VBX
C:\WINDOWS\SYSTEM\GAUGE.VBX
C:\WINDOWS\SYSTEM\GRAPH.VBX
C:\WINDOWS\SYSTEM\KEYSTAT.VBX
C:\WINDOWS\SYSTEM\MSCOMM.VBX
C:\WINDOWS\SYSTEM\MSMASKED.VBX
C:\WINDOWS\SYSTEM\MSOUTLIN.VBX
C:\WINDOWS\SYSTEM\PICCLIP.VBX
C:\WINDOWS\SYSTEM\SPIN.VBX
C:\WINDOWS\SYSTEM\THREED.VBX
MOD.BAS
ACER.FRM
GRAF_1.FRM
SER_1.FRM
VAR_1.FRM
GRAF.FRM
VAR.FRM
SER.FRM
ProjWinSize=82,596,199,275
ProjWinShow=2
IconForm="Form1"
```

VERSION 2.00

```
Begin Form Form11
  BackColor = &H00C0C0C0&
  BorderStyle = 1 'Fixed Single
  Caption = "Acerca de CFPP_1"
  ClientHeight = 1515
  ClientLeft = 3870
  ClientTop = 2445
  ClientWidth = 4650
  Height = 1920
  Left = 3810
  LinkTopic = "Form11"
  MaxButton = 0 'False
  ScaleHeight = 1515
  ScaleWidth = 4650
  Top = 2100
  Width = 4770
  Begin CommandButton Command1
    Caption = "O&K"
    Height = 375
    Left = 360
    TabIndex = 0
    Top = 960
    Width = 1215
  End
  Begin Image Image1
    Height = 480
    Left = 720
    Picture = ACER.FRX:0000
    Top = 240
    Width = 480
  End
  Begin Label Label2
    BackColor = &H00C0C0C0&
    Caption = "Copyright 1997 todos los derechos reservados"
    Height = 615
    Left = 2520
    TabIndex = 2
    Top = 720
    Width = 1695
  End
  Begin Label Label1
    BackColor = &H00C0C0C0&
```

```

Caption      = "Programa desarrollado por Christian Parreño Pérez"
Height      = 495
Left        = 2160
TabIndex    = 1
Top         = 120
Width       = 2295
End
End
Sub Command1_Click ()
Unload Me
End Sub

```

```

VERSION 2.00
Begin Form Form2
  AutoRedraw      = -1 'True
  BackColor       = &H00C0C0C0&
  BorderStyle     = 1 'Fixed Single
  Caption         = "CFPP_1 /// Gráfico de recepción serial"
  ClientHeight    = 8175
  ClientLeft      = 900
  ClientTop       = 300
  ClientWidth     = 10125
  Height          = 8580
  Left            = 840
  LinkTopic       = "Form2"
  MaxButton       = 0 'False
  ScaleHeight     = 8175
  ScaleWidth      = 10125
  Top             = -45
  Width           = 10245
  Begin CommonDialog CMDialog1
    CancelError    = -1 'True
    Filename        = "*.bmp"
    FilterIndex     = 2
    Flags           = 4
    InitDir         = "c:\\"
    Left            = 7200
    Top             = 7440
  End
  Begin TextBox Text3
    Alignment       = 2 'Center
    BackColor       = &H00FFFFFF&
    Enabled         = 0 'False
    FontBold        = -1 'True
    FontItalic      = 0 'False
    FontName        = "MS Sans Serif"
    FontSize        = 13,5
    FontStrikethru  = 0 'False
    FontUnderline   = 0 'False
    Height          = 480
    Left            = 6000
    TabIndex        = 4
    Top             = 7440
    Width           = 735
  End
  Begin TextBox Text2
    Alignment       = 2 'Center
    BackColor       = &H00FFFFFF&
    Enabled         = 0 'False
    Height          = 285
    Left            = 2880
    TabIndex        = 11
    Top             = 7560
    Width           = 2295
  End
  Begin TextBox Text1
    Alignment       = 2 'Center
    BackColor       = &H00FFFFFF&
    Enabled         = 0 'False
    Height          = 285
    Left            = 240
    TabIndex        = 10
    Top             = 7560
  End

```

```

Width      = 2295
End
Begin SSCommand Command3D4
  DragIcon  = GRAF.FRX:0000
  Height    = 615
  Left      = 8640
  Picture   = GRAF.FRX:0302
  TabIndex  = 3
  Top       = 7440
  Width     = 615
End
Begin SSCommand Command3D3
  Height    = 615
  Left      = 9240
  Picture   = GRAF.FRX:0604
  TabIndex  = 2
  Top       = 7440
  Width     = 615
End
Begin SSCommand Command3D1
  Height    = 615
  Left      = 8040
  Picture   = GRAF.FRX:0906
  TabIndex  = 1
  Top       = 7440
  Width     = 615
End
Begin GRAPH graph1
  AsciiColor = "0"
  AsciiFamily = "0"
  AsciiFStyle = "0"
  AsciiPattern = "0~1~1"
  AsciiSymbol = "1~1~0~2~2~5"
  DragMode    = 1 'Automatic
  DrawMode    = 1 'Clear
  Foreground  = 0 'Black
  GraphCaption = "Gráfico de recepción serial"
  GraphTitle  = "Gráfico de recepción serial"
  GraphType   = 6 'Line
  Height      = 6975
  IndexStyle  = 1 'Enhanced
  LabelEvery  = 50
  Left        = 120
  LegendStyle = 1 'Color
  NumPoints   = 3800
  PrintStyle  = 3 'Color with Border
  RandomData  = 0 'Off
  TabIndex    = 0
  TickEvery   = 100
  Top         = 120
  Width       = 9885
  YAxisStyle  = 2 'User-defined
  YAxisTicks  = 10
End
Begin Label Label10
  AutoSize   = -1 'True
  BackColor  = &H00C0C0C0&
  Caption    = "Número de muestras"
  Height     = 195
  Index      = 0
  Left       = 5400
  TabIndex   = 12
  Top        = 7200
  Width      = 1740
End
Begin Label Label6
  AutoSize   = -1 'True
  BackColor  = &H00C0C0C0&
  Caption    = "Hora fin"
  Height     = 195
  Left       = 2880
  TabIndex   = 9
  Top        = 7320
  Width      = 690
End
Begin Label Label5

```



```

AutoSize      = -1 'True
BackColor     = &H00C0C0C0&
Caption       = "Hora inicio"
Height        = 195
Left          = 240
TabIndex      = 8
Top           = 7320
Width         = 930
End
Begin Label Label4
  BackColor   = &H0080FFFF&
  BorderStyle = 1 'Fixed Single
  Caption     = "Regresar"
  Height      = 255
  Left        = 9240
  TabIndex    = 7
  Top         = 7200
  Visible     = 0 'False
  Width       = 855
End
Begin Label Label3
  BackColor   = &H0080FFFF&
  BorderStyle = 1 'Fixed Single
  Caption     = "Grabar"
  Height      = 255
  Left        = 8640
  TabIndex    = 6
  Top         = 7200
  Visible     = 0 'False
  Width       = 615
End
Begin Label Label2
  BackColor   = &H0080FFFF&
  BorderStyle = 1 'Fixed Single
  Caption     = "Imprimir"
  Height      = 255
  Left        = 8040
  TabIndex    = 5
  Top         = 7200
  Visible     = 0 'False
  Width       = 735
End
End

Sub Command3D1_Click ()
Dim msg1
text1.Enabled = True
text2.Enabled = True
text3.Enabled = True
label2.Visible = False
label3.Visible = False
label4.Visible = False
On Error GoTo error1
PrintForm
'graph1.DrawMode = 5
text1.Enabled = False
text2.Enabled = False
text3.Enabled = False
Exit Sub
error1:
  msg1 = "Error al tratar de imprimir"
  MsgBox msg1, 64
  Resume Next
End Sub

Sub Command3D1_MouseMove (Button As Integer, Shift As Integer, X As Single, Y As Single)
label2.Visible = True
label3.Visible = False
label4.Visible = False
End Sub

Sub Command3D3_Click ()
Unload Me
End Sub

Sub Command3D3_MouseMove (Button As Integer, Shift As Integer, X As Single, Y As Single)

```

```

label2.Visible = False
label3.Visible = False
label4.Visible = True
End Sub

```

```

Sub Command3D4_Click ()
Dim filedata, i As Integer
Dim Filename As String
cmdialog1.FileName = "*.bmp"
cmdialog1.Filter = "Todos los archivos(*.*)|*.*{Mapa de bits(*.bmp)|*.bmp"
On Error GoTo 2
cmdialog1.Action = 2
If cmdialog1.FileName = "" Then Unload Me
If cmdialog1.FileName = "*.bmp" Then Unload Me
graph1.ImageFile = cmdialog1.FileName
graph1.DrawMode = 3
graph1.DrawMode = 6
GoTo 3
2:
Close
Exit Sub
3:
Close
End Sub

```

```

Sub Command3D4_MouseMove (Button As Integer, Shift As Integer, X As Single, Y As Single)
label2.Visible = False
label3.Visible = True
label4.Visible = False
End Sub

```

```

Sub Command3D5_Click ()
Unload Me
form2.Show
End Sub

```

```

Sub Command3D5_MouseMove (Button As Integer, Shift As Integer, X As Single, Y As Single)
label2.Visible = False
label3.Visible = False
label4.Visible = False
End Sub

```

```

Sub Form_Load ()
graph1.GraphCaption = "Gráfica de recepción serial"
graph1.YAxisMax = esc1
graph1.DrawMode = 1
command3d1.Enabled = False
command3d4.Enabled = False
Dim filedata, i, Errort As Integer
Dim hora As String
Dim c, d As String
On Error GoTo archivo1
i = 0
command3d1.Enabled = True
command3d4.Enabled = True
Open filename1 For Input As #1
Do While Not EOF(1)
i = i + 1
Input #1, filedata1, hora
If i = 1 Then
graph1.LeftTitle = filedata1
Else
If i = 2 Then text1.Text = hora
hora1 = hora
graph1.GraphData = filedata1
End If
Loop
Close #1
graph1.NumPoints = i
text2.Text = hora
text3.Text = i - 2
If i <= 500 Then graph1.LabelEvery = 25
If i >= 500 Then graph1.LabelEvery = 50
If i >= 1000 Then graph1.LabelEvery = 100
If i >= 1500 Then graph1.LabelEvery = 150
If i >= 2000 Then graph1.LabelEvery = 200

```

```

If i >= 2500 Then graph1.LabelEvery = 250
If i >= 3000 Then graph1.LabelEvery = 300
If i >= 4000 Then graph1.LabelEvery = 400
If i >= 5000 Then graph1.LabelEvery = 500
If i <= 500 Then graph1.TickEvery = 25
If i >= 500 Then graph1.TickEvery = 50
If i >= 1000 Then graph1.TickEvery = 100
If i >= 1500 Then graph1.TickEvery = 150
If i >= 2000 Then graph1.TickEvery = 200
If i >= 2500 Then graph1.TickEvery = 250
If i >= 3000 Then graph1.TickEvery = 300
If i >= 4000 Then graph1.TickEvery = 400
If i >= 5000 Then graph1.TickEvery = 500
graph1.BottomTitle = "Número de muestras =" & (i - 2)
graph1.DrawMode = 2
text1.Enabled = False
text2.Enabled = False
text3.Enabled = False
Exit Sub
archivo1:
Errorr = Err
Beep
Select Case Errorr
    Case 53
        MsgBox "No se encontró el archivo", 64
        Exit Sub
    Case 55
        MsgBox "El archivo está abierto", 64
        Close
        Exit Sub
    Case 64
        MsgBox "Nombre de archivo no válido", 64
        Exit Sub
    Case 71
        MsgBox "Unidad no preparada", 64
        Exit Sub
    Case 72
        MsgBox "Error de superficie del disco", 64
        Exit Sub
    Case 76
        MsgBox "Vía de acceso no encontrada", 64
        Exit Sub
    Case Else
        MsgBox "Se ha producido un error no conocido", 64
        Exit Sub
End Select
End Sub

Sub Form_MouseMove (Button As Integer, Shift As Integer, X As Single, Y As Single)
label2.Visible = False
label3.Visible = False
label4.Visible = False
End Sub

Sub Graph1_MouseMove (Button As Integer, Shift As Integer, X As Single, Y As Single)
label2.Visible = False
label3.Visible = False
label4.Visible = False
End Sub

```

```

VERSION 2.00
Begin Form Form22
    AutoRedraw    = -1 'True
    BackColor     = &H00C0C0C0&
    BorderStyle   = 1 'Fixed Single
    Caption       = "CFPP_1 /// Gráfico de recepción serial"
    ClientHeight  = 8175
    ClientLeft    = 900
    ClientTop     = 300
    ClientWidth   = 10125
    Height        = 8580
    Left         = 840
    LinkTopic     = "Form2"
    MaxButton     = 0 'False

```

```

ScaleHeight = 8175
ScaleWidth = 10125
Top = -45
Width = 10245
Begin CommonDialog CMDialog1
  CancelError = -1 'True
  FilterIndex = 2
  Flags = 4
  InitDir = "c:\\"
  Left = 6840
  Top = 7440
End
Begin TextBox Text3
  Alignment = 2 'Center
  BackColor = &H00FFFFFF&
  Enabled = 0 'False
  FontBold = -1 'True
  FontItalic = 0 'False
  FontName = "MS Sans Serif"
  FontSize = 13.5
  FontStrikethru = 0 'False
  FontUnderline = 0 'False
  Height = 480
  Left = 6000
  TabIndex = 15
  Top = 7440
  Width = 735
End
Begin SSCommand Command3D5
  Height = 615
  Left = 7440
  Picture = GRAF_1.FRX:0000
  TabIndex = 13
  Top = 7440
  Width = 615
End
Begin TextBox Text2
  Alignment = 2 'Center
  BackColor = &H00FFFFFF&
  Enabled = 0 'False
  Height = 285
  Left = 2880
  TabIndex = 12
  Top = 7560
  Width = 2295
End
Begin TextBox Text1
  Alignment = 2 'Center
  BackColor = &H00FFFFFF&
  Enabled = 0 'False
  Height = 285
  Left = 240
  TabIndex = 11
  Top = 7560
  Width = 2295
End
Begin SSCommand Command3D4
  DragIcon = GRAF_1.FRX:0302
  Height = 615
  Left = 8640
  Picture = GRAF_1.FRX:0604
  TabIndex = 4
  Top = 7440
  Width = 615
End
Begin SSCommand Command3D3
  Height = 615
  Left = 9240
  Picture = GRAF_1.FRX:0906
  TabIndex = 3
  Top = 7440
  Width = 615
End
Begin SSCommand Command3D2
  Height = 615
  Left = 7440

```

```

Picture      = GRAF_1.FRX:0C08
TabIndex    = 2
Top         = 7440
Width      = 615
End
Begin SSCommand Command3D1
Height     = 615
Left      = 8040
Picture   = GRAF_1.FRX:0F0A
TabIndex  = 1
Top       = 7440
Width    = 615
End
Begin GRAPH graph1
AsciiColor = "0"
AsciiFamily = "0"
AsciiStyle = "0"
AsciiPattern = "0~1~1"
AsciiSymbol = "1~1~0~2~2~5"
BottomTitle = "Número de muestras"
DragMode    = 1 'Automatic
DrawMode    = 1 'Clear
Foreground  = 0 'Black
GraphCaption = "Gráfico de recepción serial"
GraphTitle  = "Gráfico de recepción serial"
GraphType   = 6 'Line
Height     = 6975
IndexStyle = 1 'Enhanced
LabelEvery = 100
Left      = 120
LegendStyle = 1 'Color
NumPoints = 3800
PrintStyle = 3 'Color with Border
RandomData = 0 'Off
TabIndex  = 0
TickEvery = 100
Top       = 120
Width    = 9885
YAxisStyle = 2 'User-defined
YAxisTicks = 10
End
Begin Label Label10
AutoSize = -1 'True
BackColor = &H00C0C0C0&
Caption   = "Número de muestras"
Height   = 195
Index    = 0
Left     = 5400
TabIndex = 16
Top      = 7200
Width   = 1740
End
Begin Label Label7
AutoSize = -1 'True
BackColor = &H0080FFFF&
BorderStyle = 1 'Fixed Single
Caption    = "Nuevo gráfico"
Height    = 225
Index     = 0
Left     = 7200
TabIndex = 14
Top      = 7200
Width   = 1245
End
Begin Label Label6
AutoSize = -1 'True
BackColor = &H00C0C0C0&
Caption   = "Hora fin"
Height   = 195
Left     = 2880
TabIndex = 10
Top      = 7320
Width   = 690
End
Begin Label Label5
AutoSize = -1 'True

```

```

BackColor = &H00C0C0C0&
Caption = "Hora inicio"
Height = 195
Left = 240
TabIndex = 9
Top = 7320
Width = 930
End
Begin Label Label4
BackColor = &H0080FFFF&
BorderStyle = 1 'Fixed Single
Caption = "Regresar"
Height = 255
Left = 9240
TabIndex = 8
Top = 7200
Visible = 0 'False
Width = 855
End
Begin Label Label3
BackColor = &H0080FFFF&
BorderStyle = 1 'Fixed Single
Caption = "Grabar"
Height = 255
Left = 8640
TabIndex = 7
Top = 7200
Visible = 0 'False
Width = 615
End
Begin Label Label2
BackColor = &H0080FFFF&
BorderStyle = 1 'Fixed Single
Caption = "Imprimir"
Height = 255
Left = 8040
TabIndex = 6
Top = 7200
Visible = 0 'False
Width = 735
End
Begin Label Label1
BackColor = &H0080FFFF&
BorderStyle = 1 'Fixed Single
Caption = "Graficar"
Height = 255
Left = 7440
TabIndex = 5
Top = 7200
Visible = 0 'False
Width = 735
End
End

Sub Command3D1_Click ()
Dim msg1
text1.Enabled = True
text2.Enabled = True
text3.Enabled = True
label1.Visible = False
label2.Visible = False
label3.Visible = False
label4.Visible = False
label7(0).Visible = False
On Error GoTo error1
PrintForm
'graph1.DrawMode = 5
text1.Enabled = False
text2.Enabled = False
text3.Enabled = False
Exit Sub
error1:
msg1 = "Error al tratar de imprimir"
MsgBox msg1, 64
Resume Next
End Sub

```

```

Sub Command3D1_MouseMove (Button As Integer, Shift As Integer, X As Single, Y As Single)
label1.Visible = False
label2.Visible = True
label3.Visible = False
label4.Visible = False
label7(0).Visible = False
End Sub

Sub Command3D2_Click ()
Dim filedata, i, Errorr As Integer
Dim hora As String
Dim c, d As String
cmdialog1.DialogTitle = "Abrir archivo de datos"
cmdialog1.FileName = "*.txt"
cmdialog1.Filter = "Todos los archivos (*.*)|*.|Archivos de texto (*.txt)|*.txt"
On Error GoTo archivo
cmdialog1.Action = 1
If cmdialog1.FileName = "*.txt" Then Unload Me
If cmdialog1.FileName = "" Then Unload Me
MsgBox "El path del archivo de datos es " & cmdialog1.FileName, 64
On Error GoTo archivo
i = 0
command3d1.Enabled = True
command3d4.Enabled = True
Open cmdialog1.FileName For Input As #1
  Do While Not EOF(1)
    i = i + 1
    Input #1, filedata1, hora
    If i = 1 Then
      graph1.LeftTitle = filedata1
    Else
      If i = 2 Then text1.Text = hora
      hora1 = hora
      graph1.GraphData = filedata1
    End If
  Loop
Close #1
graph1.NumPoints = i
If i <= 500 Then graph1.LabelEvery = 25
If i >= 500 Then graph1.LabelEvery = 50
If i >= 1000 Then graph1.LabelEvery = 100
If i >= 1500 Then graph1.LabelEvery = 150
If i >= 2000 Then graph1.LabelEvery = 200
If i >= 2500 Then graph1.LabelEvery = 250
If i >= 3000 Then graph1.LabelEvery = 300
If i >= 4000 Then graph1.LabelEvery = 400
If i >= 5000 Then graph1.LabelEvery = 500
If i <= 500 Then graph1.TickEvery = 25
If i >= 500 Then graph1.TickEvery = 50
If i >= 1000 Then graph1.TickEvery = 100
If i >= 1500 Then graph1.TickEvery = 150
If i >= 2000 Then graph1.TickEvery = 200
If i >= 2500 Then graph1.TickEvery = 250
If i >= 3000 Then graph1.TickEvery = 300
If i >= 4000 Then graph1.TickEvery = 400
If i >= 5000 Then graph1.TickEvery = 500
graph1.BottomTitle = "Número de muestras =" & (i - 3)
graph1.DrawMode = 2
text2.Text = hora
text3.Text = i - 3
1 :
command3d2.Visible = False
command3d5.Visible = True
text1.Enabled = False
text2.Enabled = False
text3.Enabled = False
Exit Sub
archivo:
Errorr = Err
Beep
Select Case Errorr
  Case 32755
  Close
  Exit Sub
  Case 53

```

```

MsgBox "No se encontró el archivo", 64
Close
Exit Sub
Case 55
MsgBox "El archivo está abierto", 64
Close
Exit Sub
Case 64
MsgBox "Nombre de archivo no válido", 64
Close
Exit Sub
Case 71
MsgBox "Unidad no preparada", 64
Close
Exit Sub
Case 72
MsgBox "Error de superficie del disco", 64
Close
Exit Sub
Case 76
MsgBox "Vía de acceso no encontrada", 64
Close
Exit Sub
Case Else
MsgBox "Se ha producido un error no conocido ", 64
Close
Exit Sub
End Select

End Sub

Sub Command3D2_MouseMove (Button As Integer, Shift As Integer, X As Single, Y As Single)
label1.Visible = True
label2.Visible = False
label3.Visible = False
label4.Visible = False
End Sub

Sub Command3D3_Click ()
Unload Me
End Sub

Sub Command3D3_MouseMove (Button As Integer, Shift As Integer, X As Single, Y As Single)
label1.Visible = False
label2.Visible = False
label3.Visible = False
label4.Visible = True
label7(0).Visible = False
End Sub

Sub Command3D4_Click ()
Dim filedata, i As Integer
cmdialog1.DialogTitle = "Guardar gráfico como mapa de bits"
cmdialog1.FileName = "*.bmp"
cmdialog1.Filter = "Todos los archivos(*.*)|*..*|Mapa de bits(*.bmp)|*.bmp"
On Error GoTo 5
cmdialog1.Action = 2
If cmdialog1.FileName = "" Then Unload Me
If cmdialog1.FileName = "*.bmp" Then Unload Me
graph1.ImageFile = cmdialog1.FileName
graph1.DrawMode = 3
graph1.DrawMode = 6
GoTo 3
5:
Close
Exit Sub
3:
Close
End Sub

Sub Command3D4_MouseMove (Button As Integer, Shift As Integer, X As Single, Y As Single)
label1.Visible = False
label2.Visible = False
label3.Visible = True
label4.Visible = False
label7(0).Visible = False

```


End Sub

```
Sub Command3D5_Click ()
Unload Me
form22.Show
End Sub
```

```
Sub Command3D5_MouseMove (Button As Integer, Shift As Integer, X As Single, Y As Single)
label1.Visible = False
label2.Visible = False
label3.Visible = False
label4.Visible = False
label7(0).Visible = True
End Sub
```

```
Sub Form_Load ()
graph1.GraphCaption = "Gráfica de recepción serial"
graph1.DrawMode = 1
command3d1.Enabled = False
command3d4.Enabled = False
command3d5.Visible = False
label7(0).Visible = False
End Sub
```

```
Sub Form_MouseMove (Button As Integer, Shift As Integer, X As Single, Y As Single)
label1.Visible = False
label2.Visible = False
label3.Visible = False
label4.Visible = False
label7(0).Visible = False
End Sub
```

```
Sub Graph1_MouseMove (Button As Integer, Shift As Integer, X As Single, Y As Single)
label1.Visible = False
label2.Visible = False
label3.Visible = False
label4.Visible = False
label7(0).Visible = False
End Sub
```

```
Global t As Integer
Global incremento, incremento0, incremento1, incremento2 As Integer
Global file, filename1 As String
Global canal As String
Global escala1, escala11 As Single
Global esc1, esc11 As Single
Global uni1, uni11 As String
Global filename11 As String
```

```
VERSION 2.00
Begin Form Form3
  BackColor = &H00C0C0C0&
  BorderStyle = 1 'Fixed Single
  Caption = "CFPP_1 /// Visualización de las variables"
  ClientHeight = 4110
  ClientLeft = 2550
  ClientTop = 1635
  ClientWidth = 6495
  ClipControls = 0 'False
  ControlBox = 0 'False
  FillColor = &H00FFFFFF&
  FillStyle = 0 'Solid
  FontBold = 0 'False
  FontItalic = 0 'False
  FontName = "MS Sans Serif"
  FontSize = 8,25
  FontStrikethru = 0 'False
  FontUnderline = 0 'False
  Height = 4515
  Left = 2490
  LinkTopic = "Form2"
  MaxButton = 0 'False
  ScaleHeight = 3837,908
```

```

ScaleMode      = 0 'User
ScaleWidth     = 6495
Top            = 1290
Width         = 6615
Begin CommonDialog CMDialog1
  CancelError  = -1 'True
  FilterIndex  = 2
  Flags        = 4
  Left         = 6000
  Top          = 1320
End
Begin TextBox Text2
  BackColor    = &H00808080&
  ForeColor    = &H00000000&
  Height       = 285
  Left         = 1080
  TabIndex     = 5
  Text         = "0"
  Top          = 1800
  Width        = 1335
End
Begin CommandButton Command2
  Caption      = "&Graficar"
  Enabled      = 0 'False
  Height       = 375
  Left         = 360
  TabIndex     = 11
  Top          = 3600
  Width        = 1335
End
Begin TextBox Text4
  BackColor    = &H00C0C0C0&
  Height       = 285
  Left         = 3840
  TabIndex     = 10
  Top          = 480
  Width        = 2295
End
Begin TextBox Text3
  BackColor    = &H00C0C0C0&
  Height       = 285
  Left         = 3840
  TabIndex     = 9
  Top          = 1080
  Width        = 2295
End
Begin Gauge Gauge1
  Autosize    = -1 'True
  BackColor    = &H00C0C0C0&
  ForeColor    = &H00C0C0C0&
  Height       = 3060
  InnerBottom  = 15
  InnerLeft    = 25
  InnerRight   = 30
  InnerTop     = 5
  Left         = 240
  Max          = 510
  NeedleWidth  = 1
  Picture      = SER.FRX;0000
  Style        = 3 "Full" Needle
  TabIndex     = 1
  Top          = 120
  Width        = 2940
End
Begin CommandButton command4
  Caption      = "<< &Regresar"
  Height       = 375
  Left         = 1680
  TabIndex     = 6
  Top          = 3600
  Width        = 1335
End
Begin CommandButton command3
  Caption      = "&Detener"
  Enabled      = 0 'False
  Height       = 375

```

```

Left      = 360
TabIndex = 4
Top       = 3240
Width     = 1335
End
Begin MSComm Comm1
Interval  = 1000
Left      = 6000
Top       = 720
End
Begin Timer Timer1
Enabled   = 0 'False
Interval  = 456
Left      = 6000
Top       = 120
End
Begin TextBox Text1
BackColor = &H00C0C0C0&
FontBold  = -1 'True
FontItalic = 0 'False
FontName  = "Arial"
FontSize  = 12
FontStrikethru = 0 'False
FontUnderline = 0 'False
Height    = 420
Left      = 4560
TabIndex  = 2
Text      = "0"
Top       = 2040
Width     = 735
End
Begin CommandButton Command1
Caption   = "&Empezar"
Enabled   = 0 'False
Height    = 375
Left      = 1680
TabIndex  = 0
Top       = 3240
Width     = 1335
End
Begin Label Label7
AutoSize  = -1 'True
BackColor = &H00C0C0C0&
BorderStyle = 1 'Fixed Single
Caption   = "XXXXX"
FontBold  = -1 'True
FontItalic = 0 'False
FontName  = "MS Sans Serif"
FontSize  = 13.5
FontStrikethru = 0 'False
FontUnderline = 0 'False
Height    = 390
Left      = 4560
TabIndex  = 15
Top       = 3480
Width     = 1170
End
Begin Label Label6
AutoSize  = -1 'True
BackColor = &H00C0C0C0&
BorderStyle = 1 'Fixed Single
Caption   = "00000"
FontBold  = -1 'True
FontItalic = 0 'False
FontName  = "MS Sans Serif"
FontSize  = 13.5
FontStrikethru = 0 'False
FontUnderline = 0 'False
Height    = 390
Left      = 4560
TabIndex  = 14
Top       = 2760
Width     = 870
End
Begin Label Label5
AutoSize  = -1 'True

```

```

BackColor = &H00C0C0C0&
Caption = "Unidad"
Height = 195
Left = 3840
TabIndex = 13
Top = 3600
Width = 615
End
Begin Label Label3
AutoSize = -1 'True
BackColor = &H00C0C0C0&
Caption = "Valor máximo"
Height = 195
Left = 3360
TabIndex = 12
Top = 2880
Width = 1125
End
Begin Label Label4
BackColor = &H00C0C0C0&
Caption = "Hora fin"
Height = 255
Left = 4560
TabIndex = 8
Top = 840
Width = 735
End
Begin Label Label1
BackColor = &H00C0C0C0&
Caption = "Hora inicio"
Height = 255
Left = 4440
TabIndex = 7
Top = 240
Width = 975
End
Begin Label Label2
BackColor = &H00C0C0C0&
Caption = "Número de muestra"
Height = 255
Left = 4080
TabIndex = 3
Top = 1680
Width = 1695
End
End
Dim k As Integer

Sub Command1_Click ()
text4.Text = ""
text3.Text = ""
text1.Text = ""
k = 1
p = 0
cmdialog1.dialogtitle = "Crear archivo de datos"
cmdialog1.filename = "*.txt"
cmdialog1.filter = "Todos los archivos (*.*)|*.|Archivos de texto (*.txt)|*.txt"
On Error GoTo 2
cmdialog1.Action = 1
Filename11 = cmdialog1.filename
If cmdialog1.filename = "*.txt" Then Unload Me
If cmdialog1.filename = "" Then Unload Me
MsgBox "El path del archivo de datos es " & Filename11, 64
command4.Enabled = False
limer1.Enabled = True
Open Filename11 For Output As #1
text4.Text = Now
Print #1, un1
command1.Enabled = False
command2.Enabled = False
command3.Enabled = True
GoTo 3
2:
Close
Exit Sub
3:

```

End Sub

```
Sub Command10_Click ()
command1.Enabled = True
End Sub
```

```
Sub Command2_Click ()
form2.Show
End Sub
```

```
Sub command3_Click ()
command4.Enabled = True
timer1.Enabled = False
text3.Text = Now
Print #1, 0; Now
Close #1
command1.Enabled = True
command2.Enabled = True
command3.Enabled = False
End Sub
```

```
Sub command4_Click ()
incremento = 0
incremento0 = 0
incremento1 = 0
incremento2 = 0
Unload Me
End Sub
```

```
Sub Form_Load ()
command1.Enabled = True
command2.Enabled = False
text1.Enabled = False
Text2.Enabled = False
text3.Enabled = False
text4.Enabled = False
label7.Caption = un1
label6.Caption = esc1
End Sub
```

```
Sub Timer1_Timer ()
Dim e1 As Single
Dummy = DoEvents()
comm1.CommPort = 1
comm1.Settings = "1200,N,8,1"
comm1.PortOpen = True
text1.Text = k
If k = 3800 Then
Beep
MsgBox "El máximo número de muestras es 3800", 64
comm1.PortOpen = False
timer1.Enabled = False
text3.Text = Now
Print #1, 0; Now
Close #1
command4.Enabled = True
command3.Enabled = False
command2.Enabled = True
command1.Enabled = True
Exit Sub
End If
k = k + 1
comm1.Output = Chr$(1)
Do
p = p + 1
If p = 10000 Then
Beep
MsgBox "Verificar conexión del cable serial", 64
comm1.PortOpen = False
timer1.Enabled = False
text3.Text = Now
Print #1, 0; Now
Print #1, 0; Now
Print #1, 0; Now
Close #1
text4.Text = ""
```

```

text3.Text = ""
command4.Enabled = True
command3.Enabled = False
command2.Enabled = False
command1.Enabled = True
Exit Sub
Else
End If
Loop While comm1.InBufferCount = 0
canal1$ = comm1.Input
d1 = Asc(canal1$)
If d1 < 0 Then d1 = 0
If d1 > 255 Then d1 = 255
comm1.Output = Chr$(0)
e1 = escala1 * d1
Print #1, e1; Now
gauge1.Value = d1
Text2.Text = e1
command1.Enabled = False
comm1.PortOpen = False
End Sub

```

VERSION 2.00

```

Begin Form Form33
    BackColor = &H00C0C0C0&
    BorderStyle = 1 'Fixed Single
    Caption = "CFPP_1 /// Monitoreo de la variable"
    ClientHeight = 4095
    ClientLeft = 2550
    ClientTop = 1635
    ClientWidth = 6495
    ClipControls = 0 'False
    ControlBox = 0 'False
    FillColor = &H00FFFFFF&
    FillStyle = 0 'Solid
    FontBold = 0 'False
    FontItalic = 0 'False
    FontName = "MS Sans Serif"
    FontSize = 8,25
    FontStrikethru = 0 'False
    FontUnderline = 0 'False
    Height = 4500
    Left = 2490
    LinkTopic = "Form2"
    MaxButton = 0 'False
    ScaleHeight = 3823,901
    ScaleMode = 0 'User
    ScaleWidth = 6495
    Top = 1290
    Width = 6615
    Begin TextBox Text2
        BackColor = &H00808080&
        ForeColor = &H00000000&
        Height = 285
        Left = 1080
        TabIndex = 5
        Text = "0"
        Top = 1800
        Width = 1335
    End
    Begin TextBox Text4
        BackColor = &H00C0C0C0&
        Height = 285
        Left = 3840
        TabIndex = 10
        Top = 480
        Width = 2295
    End
    Begin TextBox Text3
        BackColor = &H00C0C0C0&
        Height = 285
        Left = 3840
        TabIndex = 9
        Top = 1080
    End

```

```

Width      = 2295
End
Begin Gauge Gauge1
  Autosize      = -1 'True
  BackColor     = &H00C0C0C0&
  ForeColor     = &H00C0C0C0&
  Height        = 3060
  InnerBottom   = 15
  InnerLeft     = 25
  InnerRight    = 30
  InnerTop      = 5
  Left          = 240
  Max           = 510
  NeedleWidth   = 1
  Picture       = SER_1.FRX:0000
  Style         = 3 'Full' Needle
  TabIndex      = 1
  Top          = 120
  Width        = 2940
End
Begin CommandButton command4
  Caption       = "<< &Regresar"
  Height        = 375
  Left         = 2040
  TabIndex     = 6
  Top          = 3480
  Width        = 1215
End
Begin CommandButton command3
  Caption       = "&Detener"
  Enabled       = 0 'False'
  Height        = 375
  Left         = 240
  TabIndex     = 4
  Top          = 3480
  Width        = 855
End
Begin MSComm Comm1
  Interval     = 1000
  Left         = 6000
  Top          = 720
End
Begin Timer Timer1
  Enabled       = 0 'False'
  Interval     = 456
  Left         = 6000
  Top          = 120
End
Begin TextBox Text1
  BackColor    = &H00C0C0C0&
  FontBold     = -1 'True'
  FontItalic   = 0 'False'
  FontName     = "Arial"
  FontSize    = 12
  FontStrikethru = 0 'False'
  FontUnderline = 0 'False'
  Height       = 420
  Left        = 4560
  TabIndex    = 2
  Text        = "0"
  Top         = 1800
  Width       = 735
End
Begin CommandButton Command1
  Caption       = "&Empezar"
  Enabled       = 0 'False'
  Height        = 375
  Left         = 1080
  TabIndex     = 0
  Top          = 3480
  Width        = 975
End
Begin Label Label7
  AutoSize     = -1 'True'
  BackColor    = &H00C0C0C0&
  BorderStyle  = 1 'Fixed Single'

```

```

Caption      = "XXXXX"
FontBold    = -1 'True
FontItalic  = 0 'False
FontName    = "MS Sans Serif"
FontSize    = 13,5
FontStrikethru = 0 'False
FontUnderline = 0 'False
Height      = 390
Left        = 4560
TabIndex    = 14
Top         = 3240
Width       = 1170
End
Begin Label Label6
  AutoSize   = -1 'True
  BackColor  = &H00C0C0C0&
  BorderStyle = 1 'Fixed Single
  Caption    = "0000"
  FontBold   = -1 'True
  FontItalic = 0 'False
  FontName   = "MS Sans Serif"
  FontSize   = 13,5
  FontStrikethru = 0 'False
  FontUnderline = 0 'False
  Height     = 390
  Left       = 4560
  TabIndex   = 13
  Top        = 2520
  Width      = 705
End
Begin Label Label5
  AutoSize   = -1 'True
  BackColor  = &H00C0C0C0&
  Caption    = "Unidad"
  Height     = 195
  Left       = 3840
  TabIndex   = 12
  Top        = 3360
  Width      = 615
End
Begin Label Label3
  AutoSize   = -1 'True
  BackColor  = &H00C0C0C0&
  Caption    = "Valor Máximo"
  Height     = 195
  Left       = 3360
  TabIndex   = 11
  Top        = 2640
  Width      = 1140
End
Begin Label Label4
  BackColor  = &H00C0C0C0&
  Caption    = "Hora fin"
  Height     = 255
  Left       = 4560
  TabIndex   = 8
  Top        = 840
  Width      = 735
End
Begin Label Label1
  BackColor  = &H00C0C0C0&
  Caption    = "Hora inicio"
  Height     = 255
  Left       = 4440
  TabIndex   = 7
  Top        = 240
  Width      = 975
End
Begin Label Label2
  BackColor  = &H00C0C0C0&
  Caption    = "Número de muestra"
  Height     = 255
  Left       = 4080
  TabIndex   = 3
  Top        = 1560
  Width      = 1695

```



```

End
End
Dim k As Integer

Sub Command1_Click ()
text4.Text = ""
text3.Text = ""
text1.Text = ""
k = 1
p = 0
command4.Enabled = False
timer1.Enabled = True
text4.Text = Now
command1.Enabled = False
command3.Enabled = True
End Sub

Sub Command10_Click ()
command1.Enabled = True
End Sub

Sub command3_Click ()
command4.Enabled = True
timer1.Enabled = False
text3.Text = Now
command1.Enabled = True
command3.Enabled = False
End Sub

Sub command4_Click ()
incremento = 0
incremento0 = 0
incremento1 = 0
incremento2 = 0
Unload Me
End Sub

Sub Form_Load ()
command1.Enabled = True
text1.Enabled = False
Text2.Enabled = False
text3.Enabled = False
text4.Enabled = False
label7.Caption = uní1
label6.Caption = esc1
End Sub

Sub Timer1_Timer ()
Dim e11 As Single
Dummy = DoEvents()
comm1.CommPort = 1
comm1.Settings = "1200,N,8,1"
comm1.PortOpen = True
text1.Text = k
k = k + 1
comm1.Output = Chr$(1)
Do
p = p + 1
If p = 10000 Then
Beep
MsgBox "Verificar conexión del cable serial", 64
comm1.PortOpen = False
timer1.Enabled = False
text3.Text = Now
text4.Text = ""
text3.Text = ""
command4.Enabled = True
command3.Enabled = False
command1.Enabled = True
Exit Sub
Else
End If
Loop While comm1.InBufferCount = 0
canal11$ = comm1.Input
d11 = Asc(canal11$)
If d11 < 0 Then d11 = 0

```

```

If d11 > 255 Then d11 = 255
comm1.Output = Chr$(0)
e11 = escala11 * d11
gauge1.Value = d11
Text2.Text = e11
command1.Enabled = False
comm1.PortOpen = False
End Sub

```

VERSION 2.00

```

Begin Form Form1
  AutoRedraw = -1 'True
  BackColor = &H00C0C0C0&
  BorderStyle = 1 'Fixed Single
  Caption = "CFPP_1 /// Programa para adquisición de datos"
  ClientHeight = 3900
  ClientLeft = 2565
  ClientTop = 1860
  ClientWidth = 6495
  Height = 4590
  Left = 2505
  LinkTopic = "Form1"
  MaxButton = 0 'False
  ScaleHeight = 3900
  ScaleWidth = 6495
  Top = 1230
  Width = 6615
  Begin Label Label1
    BackColor = &H00C0C0C0&
    Caption = "Programa para adquisición de datos por el p rtico Serial de un computador . AUTOR :
    Christian Parre o P ez Diciembre / 1997"
    ForeColor = &H00000000&
    Height = 855
    Left = 1200
    TabIndex = 0
    Top = 2520
    Width = 4335
  End
  Begin Image Image1
    BorderStyle = 1 'Fixed Single
    Height = 1680
    Left = 2400
    Picture = STAR.FRX:0000
    Top = 360
    Width = 1680
  End
  Begin Menu Men 
    Caption = "&Men  Principal"
    Begin Menu Visor
      Caption = "&Visor de variables"
      Begin Menu Completo
        Caption = "&Adquisici n de datos"
      End
      Begin Menu Monitoreo
        Caption = "&Monitoreo de datos"
      End
      Begin Menu Gr fico
        Caption = "&Graficaci n de informaci n"
      End
    End
    Begin Menu Salir
      Caption = "&Salir"
    End
  End
  Begin Menu Acercade
    Caption = "&Acerca de"
  End
End

Sub Acercade_Click ()
form11.Show
End Sub

Sub Ajuste_Click ()

```

```

form111.Show
End Sub

Sub Cana1_Click ()
form3.Show
End Sub

Sub Command1_Click ()
End

End Sub

Sub Completo_Click ()
form111.Show
End Sub

Sub Gráfico_Click ()
form22.Show
End Sub

Sub Monitoreo_Click ()
form111.Show
End Sub

Sub Salir_Click ()
End
End Sub

```

VERSION 2.00

```

Begin Form Form111
  AutoRedraw = -1 'True
  BackColor = &H00C0C0C0&
  BorderStyle = 1 'Fixed Single
  Caption = "CFPP_1 /// Ajuste de escalas"
  ClientHeight = 1170
  ClientLeft = 3465
  ClientTop = 3660
  ClientWidth = 4710
  Height = 1575
  Left = 3405
  LinkTopic = "Form111"
  ScaleHeight = 1170
  ScaleWidth = 4710
  Top = 3315
  Width = 4830
  Begin TextBox Text9
    Height = 375
    Left = 1320
    TabIndex = 1
    Top = 120
    Width = 1215
  End
  Begin CommandButton Command1
    Caption = "O&K"
    Height = 375
    Left = 3000
    TabIndex = 2
    Top = 360
    Width = 1455
  End
  Begin TextBox Text1
    Height = 375
    Left = 1320
    TabIndex = 3
    Top = 600
    Width = 1215
  End
  Begin Label Label12
    AutoSize = -1 'True
    BackColor = &H00C0C0C0&
    Caption = "Unidad"
    Height = 195
    Left = 360
    TabIndex = 4

```

```

    Top      = 240
    Width    = 615
End
Begin Label Label1
    AutoSize = -1 'True
    BackColor = &H00C0C0C0&
    Caption   = "Valor máximo"
    Height    = 195
    Left      = 120
    TabIndex  = 0
    Top       = 720
    Width     = 1125
End
End

```

```

Sub Command1_Click ()
If text1.Text = "" Then Exit Sub
uni1 = text9.Text
esc1 = Val(text1.Text)
If esc1 > 16350 Then
MsgBox "El valor máximo es de 16350 "
Exit Sub
End If
escala1 = esc1 / 255
form3.Show
Unload Me
End Sub

```

```

Sub Command3D1_Click ()
Unload Me
form111.Show
End Sub

```

```

Sub Form_Load ()
esc1 = 0
incremento = 0
incremento0 = 0
incremento1 = 0
incremento2 = 0
End Sub

```

```

Sub Text1_KeyPress (keyascii As Integer)
If keyascii = 8 Then
incremento2 = incremento2 - 1
End If
If keyascii <> 8 Then
If keyascii = Asc(".") Then GoTo punto
If keyascii < Asc("0") Or keyascii > Asc("9") Then
Beep
keyascii = 0
Else
punto:
incremento2 = incremento2 + 1
End If
End If
If incremento2 <= 0 Then
incremento2 = 0
End If
If incremento2 = 6 Then
incremento2 = 5
Beep
keyascii = 0
End If
End Sub

```

```

Sub Text9_KeyPress (keyascii As Integer)
If keyascii <> 8 Then
incremento1 = incremento1 + 1
Else
incremento1 = incremento1 - 1
If incremento1 <= 0 Then incremento1 = 0
End If
If incremento1 = 11 Then
incremento1 = 10
Beep
keyascii = 0

```

```
Else
End If
End Sub
```

VERSION 2.00

```
Begin Form Form1111
  AutoRedraw = -1 'True
  BackColor = &H00C0C0C0&
  BorderStyle = 1 'Fixed Single
  Caption = "CFPP_1 /// Ajuste de escalas"
  ClientHeight = 1170
  ClientLeft = 3450
  ClientTop = 3660
  ClientWidth = 4710
  Height = 1575
  Left = 3390
  LinkTopic = "Form111"
  ScaleHeight = 1170
  ScaleWidth = 4710
  Top = 3315
  Width = 4830
  Begin TextBox Text9
    Height = 375
    Left = 1320
    TabIndex = 1
    Top = 120
    Width = 1215
  End
  Begin CommandButton Command1
    Caption = "O&K"
    Height = 375
    Left = 3000
    TabIndex = 2
    Top = 360
    Width = 1455
  End
  Begin TextBox Text1
    Height = 375
    Left = 1320
    TabIndex = 3
    Top = 600
    Width = 1215
  End
  Begin Label Label12
    AutoSize = -1 'True
    BackColor = &H00C0C0C0&
    Caption = "Unidad"
    Height = 195
    Left = 360
    TabIndex = 4
    Top = 240
    Width = 615
  End
  Begin Label Label1
    AutoSize = -1 'True
    BackColor = &H00C0C0C0&
    Caption = "Valor máximo"
    Height = 195
    Left = 120
    TabIndex = 0
    Top = 720
    Width = 1125
  End
End
End

Sub Command1_Click ()
If text1.Text = "" Then Exit Sub
uni11 = text9.Text
esc11 = Val(text1.Text)
If esc11 > 16350 Then
MsgBox "El valor máximo es de 16350 "
Exit Sub
End If
escala11 = esc11 / 255
```

```
form33.Show
Unload Me
End Sub
```

```
Sub Command3D1_Click ()
Unload Me
form111.Show
End Sub
```

```
Sub Form_Load ()
esc11 = 0
incremento = 0
incremento0 = 0
incremento1 = 0
incremento2 = 0
End Sub
```

```
Sub Text1_KeyPress (keyascii As Integer)
If keyascii <> 8 Then
If keyascii = Asc(".") Then GoTo punto
If keyascii < Asc("0") Or keyascii > Asc("9") Then
Beep
keyascii = 0
Else
punto:
incremento0 = incremento0 + 1
End If
End If
If incremento0 <= 0 Then
incremento0 = 0
End If
If incremento0 = 6 Then
incremento0 = 5
Beep
keyascii = 0
End If
End Sub
```

```
Sub Text9_KeyPress (keyascii As Integer)
If keyascii <> 8 Then
incremento = incremento + 1
Else
incremento = incremento - 1
If incremento <= 0 Then incremento = 0
End If
If incremento = 11 Then
incremento = 10
Beep
keyascii = 0
Else
End If
End Sub
```

0 11/10/1997 12:26:00 PM
0 11/10/1997 12:26:00 PM

5 11/10/1997 12:25:27 PM
5 11/10/1997 12:25:28 PM
5 11/10/1997 12:25:28 PM
5 11/10/1997 12:25:29 PM
5 11/10/1997 12:25:29 PM
5 11/10/1997 12:25:30 PM
5 11/10/1997 12:25:30 PM
5 11/10/1997 12:25:31 PM
5 11/10/1997 12:25:31 PM
5 11/10/1997 12:25:32 PM
5 11/10/1997 12:25:33 PM
5 11/10/1997 12:25:33 PM
5 11/10/1997 12:25:34 PM
5 11/10/1997 12:25:34 PM
5 11/10/1997 12:25:35 PM
5 11/10/1997 12:25:35 PM
5 11/10/1997 12:25:36 PM
5 11/10/1997 12:25:36 PM
4.980392 11/10/1997 12:25:37 PM
4.980392 11/10/1997 12:25:37 PM
4.960784 11/10/1997 12:25:38 PM
4.764706 11/10/1997 12:25:39 PM
4.764706 11/10/1997 12:25:39 PM
4.568627 11/10/1997 12:25:40 PM
4.568627 11/10/1997 12:25:40 PM
4.372549 11/10/1997 12:25:41 PM
4.372549 11/10/1997 12:25:41 PM
4.352941 11/10/1997 12:25:42 PM
4.333333 11/10/1997 12:25:42 PM
4.313725 11/10/1997 12:25:43 PM
4.117647 11/10/1997 12:25:43 PM
3.921569 11/10/1997 12:25:44 PM
3.72549 11/10/1997 12:25:45 PM
3.529412 11/10/1997 12:25:46 PM
3.137255 11/10/1997 12:25:46 PM
2.745098 11/10/1997 12:25:46 PM
2.54902 11/10/1997 12:25:47 PM
2.156863 11/10/1997 12:25:47 PM
1.764706 11/10/1997 12:25:48 PM
1.568627 11/10/1997 12:25:48 PM
1.372549 11/10/1997 12:25:49 PM
1.176471 11/10/1997 12:25:50 PM
.7843137 11/10/1997 12:25:50 PM
.5882353 11/10/1997 12:25:51 PM
.3921569 11/10/1997 12:25:51 PM
.1960784 11/10/1997 12:25:52 PM
0 11/10/1997 12:25:52 PM
0 11/10/1997 12:25:53 PM
0 11/10/1997 12:25:53 PM
0 11/10/1997 12:25:54 PM
0 11/10/1997 12:25:55 PM
0 11/10/1997 12:25:55 PM
0 11/10/1997 12:25:56 PM
0 11/10/1997 12:25:56 PM
0 11/10/1997 12:25:57 PM
0 11/10/1997 12:25:57 PM
0 11/10/1997 12:25:58 PM
0 11/10/1997 12:25:58 PM
0 11/10/1997 12:25:59 PM
0 11/10/1997 12:25:59 PM

4 11/10/1997 12:24:53 PM
4 11/10/1997 12:24:54 PM
4 11/10/1997 12:24:54 PM
4 11/10/1997 12:24:55 PM
4 11/10/1997 12:24:55 PM
4 11/10/1997 12:24:56 PM
4 11/10/1997 12:24:56 PM
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4 11/10/1997 12:24:58 PM
4 11/10/1997 12:24:58 PM
4 11/10/1997 12:24:59 PM
4 11/10/1997 12:24:59 PM
4 11/10/1997 12:25:00 PM
4 11/10/1997 12:25:00 PM
4 11/10/1997 12:25:01 PM
4 11/10/1997 12:25:01 PM
4 11/10/1997 12:25:02 PM
4 11/10/1997 12:25:02 PM
4.196078 11/10/1997 12:25:03 PM
4.196078 11/10/1997 12:25:03 PM
4.196078 11/10/1997 12:25:04 PM
4.392157 11/10/1997 12:25:05 PM
4.392157 11/10/1997 12:25:05 PM
4.588235 11/10/1997 12:25:06 PM
4.588235 11/10/1997 12:25:06 PM
4.588235 11/10/1997 12:25:07 PM
4.588235 11/10/1997 12:25:07 PM
4.588235 11/10/1997 12:25:08 PM
4.588235 11/10/1997 12:25:08 PM
4.588235 11/10/1997 12:25:09 PM
4.588235 11/10/1997 12:25:10 PM
4.588235 11/10/1997 12:25:10 PM
4.784314 11/10/1997 12:25:11 PM
4.784314 11/10/1997 12:25:11 PM
4.784314 11/10/1997 12:25:12 PM
4.784314 11/10/1997 12:25:12 PM
4.803922 11/10/1997 12:25:13 PM
4.803922 11/10/1997 12:25:14 PM
4.823529 11/10/1997 12:25:14 PM
4.823529 11/10/1997 12:25:15 PM
4.843137 11/10/1997 12:25:15 PM
4.843137 11/10/1997 12:25:16 PM
4.862745 11/10/1997 12:25:17 PM
4.862745 11/10/1997 12:25:18 PM
4.882353 11/10/1997 12:25:18 PM
4.882353 11/10/1997 12:25:19 PM
4.901961 11/10/1997 12:25:19 PM
4.901961 11/10/1997 12:25:20 PM
4.921568 11/10/1997 12:25:20 PM
4.921568 11/10/1997 12:25:21 PM
4.921568 11/10/1997 12:25:22 PM
4.921568 11/10/1997 12:25:22 PM
4.941176 11/10/1997 12:25:23 PM
4.941176 11/10/1997 12:25:23 PM
4.960784 11/10/1997 12:25:24 PM
4.960784 11/10/1997 12:25:25 PM
4.980392 11/10/1997 12:25:25 PM
4.980392 11/10/1997 12:25:26 PM
4.980392 11/10/1997 12:25:26 PM
4.980392 11/10/1997 12:25:26 PM

ANEXO 4

ANEXO 4 : MANUAL DE USUARIO

Al ejecutar el programa CFPP_1.EXE, aparecerá la ventana de inicio que se muestra en la figura A4-1, en donde tenemos en la parte superior la barra de menús principales: Menú Principal y Acerca de.



Fig. A4-1 Ventana de inicio

Al activar el Menú principal aparecen las siguientes opciones (figura A4-2):

- Visor de variables , que contiene a su vez :
 - Adquisición de datos
 - Monitoreo de datos
 - Graficación de información
- Salir, para finalizar la sesión de trabajo con CFPP_1

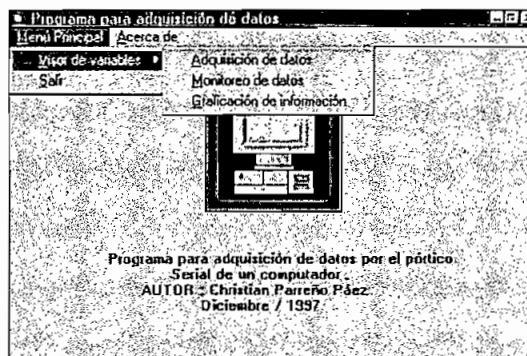


Fig. A4-2 Menús Principales

Al activar el menú Acerca de aparece una ventana de información : autor y año de desarrollo del programa(figura A4-3):

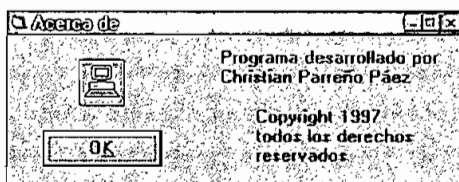


Fig. A4-3 Ventana Acerca de

Cuando ingresamos a la opción de adquisición de datos aparece una ventana (figura A4-4) en donde se debe ingresar el nombre de la variable física que se va a analizar y el valor máximo que alcanzará la misma; con estos datos el programa realiza un ajuste de escalas.

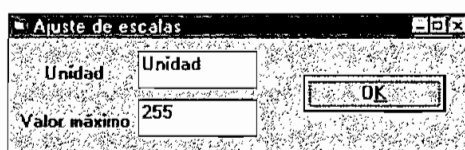


Fig. A4-4 Ajuste de escalas

Si no se ingresa toda la información que se requiere se volverá a la misma ventana hasta que la información este completa. Luego de esto aparece la ventana de visualización de las variables (figura A4-5); donde existen varios botones de control, los mismos que son:

- Detener, que no esta activo; con esta opción se detiene la adquisición de datos.
- Empezar, con esta opción se inicia la adquisición de datos por el pórtico serial (COMM1) y los datos que se reciben se almacenan en un archivo con formato ASCII.
- Graficar, que no esta activo; esta opción permite realizar una gráfica de los datos que se han guardado en la presente sesión de trabajo.
- << Regresar, esta opción permite retornar a la ventana de inicio.

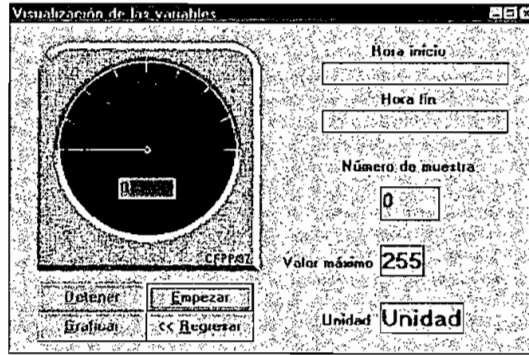


Fig. A4-5 Visualización de variables

Existe información que el usuario no puede alterar como: hora de inicio , hora fin , número de muestras , valor máximo y la unidad de la variable. Al presionar el botón de empezar aparece una ventana (figura A4-6), donde se debe dar la ruta de acceso del archivo que se crea y en donde se guardará la información en formato ASCII. En el archivo generado en esta opción los datos almacenados se ordenan de la siguiente forma : dato , fecha y hora y cuya extensión será *.txt .

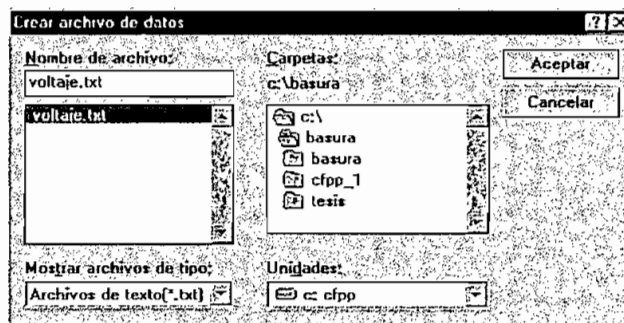


Fig. A4-6 Ruta de acceso del archivo de datos.

Una vez ingresado la ruta de acceso, se inicia la adquisición de datos (figura A4-7), se desactivan los botones de empezar y regresar, se activa el botón de detener, se actualiza la información de la hora de inicio y dependiendo de la variación de los datos cambiará el GAUGE (tacómetro) y el número de muestras (aprox. cada segundo)

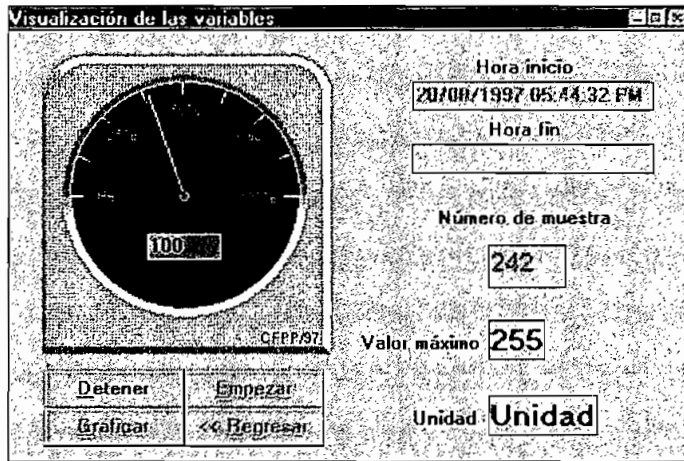


Fig. A4-7 Inicio de la adquisición de datos.

Para detener la adquisición de datos se debe presionar el botón de detener luego de lo cual se producen las siguientes acciones (figura A4-8): se actualiza la hora fin , se activan los botones de empezar, graficar y regresar, se desactiva el botón de detener y se cierra el archivo de datos.

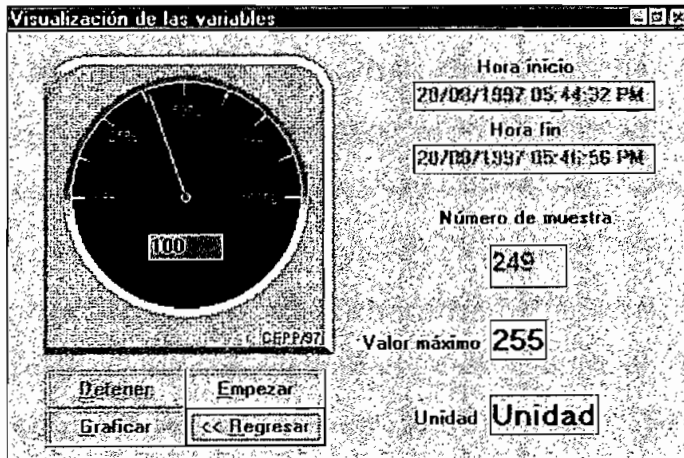


Fig. A4-8 Estado de la ventana al detener la adquisición de datos.

Si se quiere graficar la información de la última adquisición de datos se debe presionar el botón de graficar, luego de esto aparece la ventana de Gráfico de recepción serial (figura A4-9).

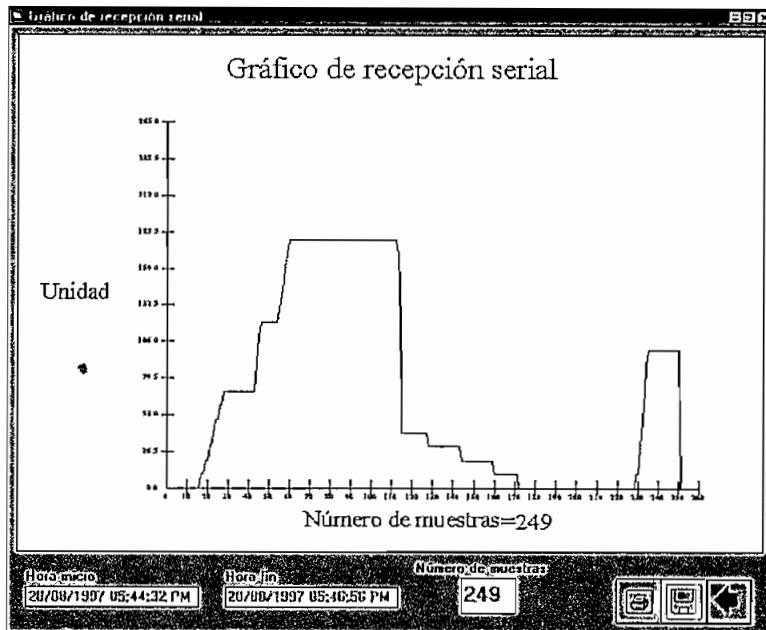





Fig. A4-9 Gráfico de recepción serial.

En esta ventana aparecen 3 botones de control : imprimir , grabar y regresar. Al hacer un click en el botón  se genera la impresión de la forma en la impresora que este activa en ese momento. Para grabar el gráfico se debe presionar el botón  ; el archivo que se crea es del tipo de mapa de bits (figura A4-10). Si se presiona el botón  se regresa a la ventana de adquisición de datos.

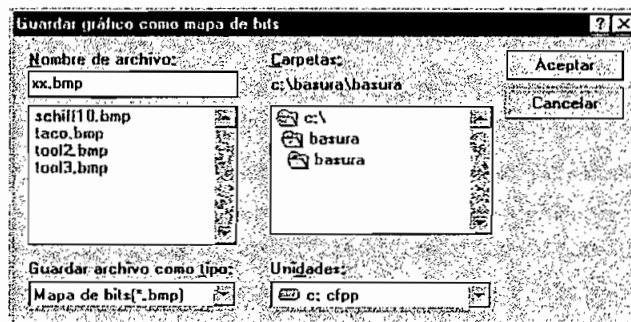


Fig. A4-10 Ruta de acceso del archivo de mapa de bits.

Al ingresar a la opción monitoreo de datos aparece la ventana de ajustes de escala (figura A4-4) y luego de ingresar toda la información aparece

una ventana (figura A4-11), que es similar a la que se obtiene cuando se adquieren datos , la diferencia radica en que se tiene solamente tres botones de control :

- Detener, que no esta activo ; con esta opción se detiene el monitoreo de la variable que se analiza.
- Empezar, con esta opción se comienza el monitoreo .
- << Regresar , al presionar este botón se regresa a la ventana de inicio.

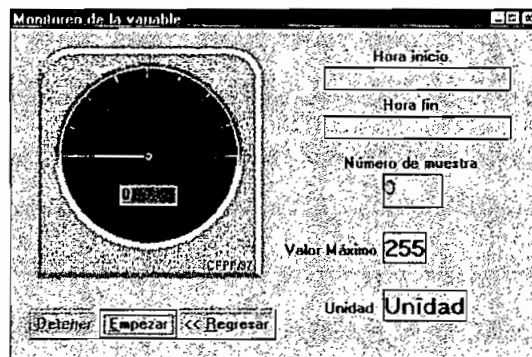


Fig. A4-11 Monitoreo de la variable.

Cuando presionamos el botón de empezar se desactivan los botones de empezar y de regresar , activándose el botón de detener y al igual que en la ventana de visualización de la variable se actualiza la hora de inicio , el número de muestras . En esta opción no se guarda los datos en archivo , sólo se los visualiza en pantalla. Al presionar el botón de detener se actualiza la hora fin se desactiva el botón de detener y se activan los otros dos botones (figura A4-12).

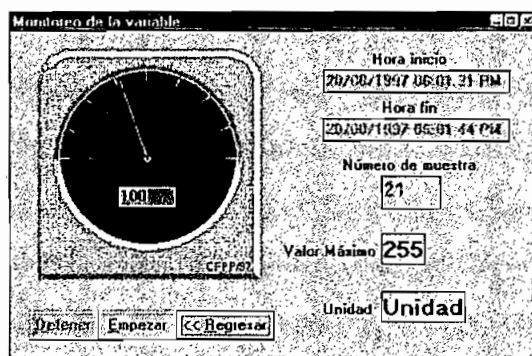


Fig. A4-12 Estado de la ventana al detener el monitoreo de datos

Al ingresar a la tercera opción del menú Visor de variables , Graficación de información aparece la ventana de gráfico de recepción serial (figura A4-13) en donde existen varias opciones , las mismas son :






-  , graficar ; con este botón se genera el gráfico a partir de un archivo.
-  , imprimir ; se envía el gráfico a la impresora.
-  , grabar ; se graba el gráfico en un archivo de extensión BMP.
-  , regresar ; se retorna a la ventana de inicio.
-  , nuevo gráfico ; se genera otro gráfico.



Fig. A4-13 Graficación de información.

Cuando presionamos el botón de graficar aparece una ventana en la que se debe ingresar la ruta de acceso del archivo de datos del cual queremos obtener la gráfica (figura A4-14).

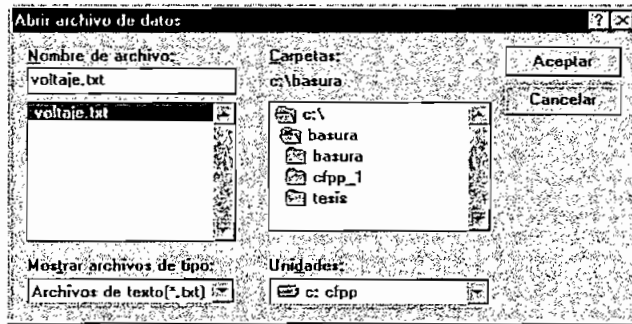


Fig. A4-14 Ruta de acceso del archivo a graficarse

Una vez ingresada esta información se leerá el archivo de datos, el mismo que debe ser compatible para poder realizar el gráfico y el número de datos no debe exceder de 3800; con esto se obtiene el gráfico (figura A4-15). Luego de esto desaparece la opción de graficar activándose el botón de Nuevo gráfico.

Con esto se ha analizado las opciones que para el usuario están disponibles, existe internamente en el programa el soporte de errores que no dependen directamente de la persona que usa el mismo, por ejemplo: fallos en la comunicación, daños del disco ó errores al imprimir. Estas situaciones pueden ser detectadas por el programa y visualizadas en pantalla por el usuario; para entender mejor estas situaciones se recomienda analizar el programa fuente.

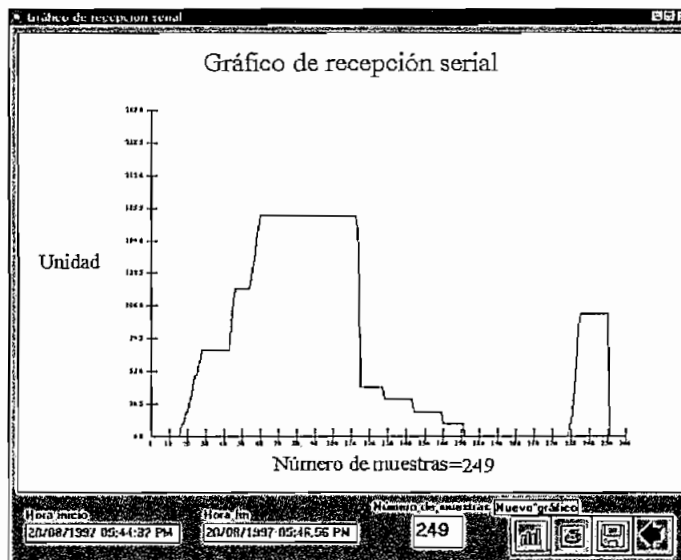


Fig. A4-15 Gráfico obtenido de la lectura de un archivo de datos compatible.