

ThisWorkbook - 1

Option Explicit

Private Sub Workbook\_Open()

    'afegir ArduinoExcel.dll com a referencia  
    addReference

End Sub

Private Sub addReference()

Dim dllName As String  
Dim ref As Object

    dllName = "C:\Windows\System32\ArduinoExcel.tlb"

    On Error GoTo ErrorHandler1:

    'Eliminar les referencies que falten

    For Each ref In ThisWorkbook.VBProject.References 'Application.VBE.ActiveVBProject.References  
        If ref.isbroken = True Then  
            ref.Remove  
            MsgBox ("Referències eliminades")  
        End If  
    Next ref

    'ThisWorkbook.VBProject.References.AddFromFile dllName

    Set ref = ThisWorkbook.VBProject.References.AddFromGuid("{274220d2-134c-43ed-aafc-b0f53695509d}", 1, 0)

Exit Sub

ErrorHandler1:

    If Err.Number = 1004 Then

        MsgBox ("configura 'Confiar en el acceso al modelo de objetos de proyectos de VBA' en les Opcions de Macro")

        Resume Next

    ElseIf Err.Number = 48 Then

        MsgBox ("'" & dllName & "' no trobat")

        Resume Next

    ElseIf Err.Number = 32813 Then

        'MsgBox ("'" & dllName & "' ja configurat")

        Resume Next

    Else

        MsgBox Err.Source & " " & Err.Number & " " & Err.Description

        'Stop

    End If

End Sub

Private Sub removeReference()

Dim ref As Object

On Error Resume Next

Set ref = ThisWorkbook.VBProject.References.Item("ArduinoExcel")  
ThisWorkbook.VBProject.References.Remove ref

End Sub

Private Function Is64bit() As Boolean

    Is64bit = Len(Environ("ProgramW6432")) > 0

End Function

Dades - 1

```
Private Sub Entrardades_Click()
```

```
Dim iRow As Long
```

```
Dim ws As Worksheet
```

```
Set ws = Worksheets("Dades")
```

```
'find first empty row in database
```

```
'iRow = ws.Cells.Find(What:="*", SearchOrder:=xlRows, _ SearchDirection:=xlPrevious, LookIn:=xlValues).Row + 1
```

```
'Si no s'introdueix valor, equivaldrà a 0
```

```
If Trim(Me.Tempsfunh.Value) = "" Then
```

```
Me.Tempsfunh.SetFocus
```

```
MsgBox "Si us plau, completa tot el formulari."
```

```
Exit Sub
```

```
End If
```

```
If Trim(Me.Tempsfunm.Value) = "" Then
```

```
Me.Tempsfunm.SetFocus
```

```
MsgBox "Si us plau, completa tot el formulari."
```

```
Exit Sub
```

```
End If
```

```
If Trim(Me.Tempsmfunh.Value) = "" Then
```

```
Me.Tempsfunh.SetFocus
```

```
MsgBox "Si us plau, completa tot el formulari."
```

```
Exit Sub
```

```
End If
```

```
If Trim(Me.Tempsmfunm.Value) = "" Then
```

```
Me.Tempsmfunm.SetFocus
```

```
MsgBox "Si us plau, completa tot el formulari."
```

```
Exit Sub
```

```
End If
```

```
If Trim(Me.Tempseh.Value) = "" Then
```

```
Me.Tempseh.SetFocus
```

```
MsgBox "Si us plau, completa tot el formulari."
```

```
Exit Sub
```

```
End If
```

```
If Trim(Me.Tempsem.Value) = "" Then
```

```
Me.Tempsem.SetFocus
```

```
MsgBox "Si us plau, completa tot el formulari."
```

```
Exit Sub
```

```
End If
```

```
If Trim(Me.Tempsph.Value) = "" Then
```

```
Me.Tempsph.SetFocus
```

```
MsgBox "Si us plau, completa tot el formulari."
```

```
Exit Sub
```

```
End If
```

```
If Trim(Me.Tempsem.Value) = "" Then
```

```
Me.Tempspm.SetFocus
```

```
MsgBox "Si us plau, completa tot el formulari."
```

```
Exit Sub
```

```
End If
```

```
If Trim(Me.Consumfun.Value) = "" Then
```

```
Me.Consumfun.SetFocus
```

```
MsgBox "Si us plau, completa tot el formulari."
```

```
Exit Sub
```

```
End If
```

```
If Trim(Me.Consume.Value) = "" Then
```

```
Me.Consume.SetFocus
```

```
MsgBox "Si us plau, completa tot el formulari."
```

```
Exit Sub
```

```
End If
```

```
If Trim(Me.Consump.Value) = "" Then
```

```
Me.Consump.SetFocus
```

```
MsgBox "Si us plau, completa tot el formulari."
```

```
Exit Sub
```

```
End If
```

```
'Si no s'introdueix un número o és menor de 0
```

```
'O no és enter (encara per fer)
```

```
If IsNumeric(Me.Tempsfunh.Value) = False Or Me.Tempsfunh.Value < 0 Or Me.Tempsfunh.Value Mod 1 <> 0 Then
```

```
Me.Tempsfunh.SetFocus
```

```
Me.Tempsfunh.Value = ""
```

```
MsgBox "Si us plau, introduceix un valor vàlid per les hores de funcionament"
```

```

Exit Sub
End If
If IsNumeric(Me.Tempsfunm.Value) = False Or Me.Tempsfunm.Value < 0 Or Me.Tempsfunm.Value > 60 Or Me.Tempsfunm.Value Mod 1 <> 0 Then
Me.Tempsfunm.SetFocus
Me.Tempsfunm.Value = ""
MsgBox "Si us plau, introduceix un valor vàlid pels minuts de funcionament"
Exit Sub
End If
If IsNumeric(Me.Tempsmfunh.Value) = False Or Me.Tempsmfunh.Value < 0 Or Me.Tempsmfunh.Value Mod 1 <> 0 Then
Me.Tempsmfunh.SetFocus
Me.Tempsmfunh.Value = ""
MsgBox "Si us plau, introduceix un valor vàlid per les hores mínimes de funcionament"
Exit Sub
End If
If IsNumeric(Me.Tempsmfunm.Value) = False Or Me.Tempsmfunm.Value < 0 Or Me.Tempsmfunm.Value > 60 Or Me.Tempsmfunm.Value Mod 1 <> 0 Then
Me.Tempsmfunm.SetFocus
Me.Tempsmfunm.Value = ""
MsgBox "Si us plau, introduceix un valor vàlid pels minuts mínims de funcionament"
Exit Sub
End If
If IsNumeric(Me.Tempseh.Value) = False Or Me.Tempseh.Value < 0 Or Me.Tempseh.Value Mod 1 <> 0 Then
Me.Tempseh.SetFocus
Me.Tempseh.Value = ""
MsgBox "Si us plau, introduceix un valor vàlid per temps de posta en marxa"
Exit Sub
End If
If IsNumeric(Me.Tempsem.Value) = False Or Me.Tempsem.Value < 0 Or Me.Tempsem.Value > 60 Or Me.Tempsem.Value Mod 1 <> 0 Then
Me.Tempsem.SetFocus
Me.Tempsem.Value = ""
MsgBox "Si us plau, introduceix un valor vàlid pels minuts de posta en marxa"
Exit Sub
End If
If IsNumeric(Me.Tempsph.Value) = False Or Me.Tempsph.Value < 0 Or Me.Tempsph.Value Mod 1 <> 0 Then
Me.Tempsph.SetFocus
Me.Tempsph.Value = ""
MsgBox "Si us plau, introduceix un valor vàlid per les hores de parada"
Exit Sub
End If
If IsNumeric(Me.Tempspm.Value) = False Or Me.Tempspm.Value < 0 Or Me.Tempspm.Value > 60 Or Me.Tempspm.Value Mod 1 <> 0 Then
Me.Tempspm.SetFocus
Me.Tempspm.Value = ""
MsgBox "Si us plau, introduceix un valor vàlid pels minuts mínims de parada"
Exit Sub
End If
If IsNumeric(Me.Consumfun.Value) = False Or Me.Consumfun.Value < 0 Then
Me.Consumfun.SetFocus
Me.Consumfun.Value = ""
MsgBox "Si us plau, introduceix un valor vàlid pel consum en funcionament"
Exit Sub
End If
If IsNumeric(Me.Consume.Value) = False Or Me.Consume.Value < 0 Then
Me.Consume.SetFocus
Me.Consume.Value = ""
MsgBox "Si us plau, introduceix un valor vàlid pel consum en la posta en marxa"
Exit Sub
End If
If IsNumeric(Me.Consump.Value) = False Or Me.Consump.Value < 0 Then
Me.Consump.SetFocus
Me.Consump.Value = ""
MsgBox "Si us plau, introduceix un valor vàlid pel consum en la parada"
Exit Sub
End If

'Comprovar que el temps mínim de funcionament no sigui menor que el temps de funcionament

If Trim(Me.Tempsmfunh.Value) > Trim(Me.Tempsfunh.Value) Then
Me.Tempsmfunh.SetFocus
MsgBox "El valor del temps mínim de funcionament excedeix el temps de funcionament. Insereix un nou valor"
Exit Sub

```

End If

'Copiar les dades en el formulari

```
ws.Cells(3, 8).Value = Me.Tempsfunh.Value
ws.Cells(5, 8).Value = Me.Tempsmfunh.Value
ws.Cells(7, 8).Value = Me.Tempseh.Value
ws.Cells(9, 8).Value = Me.Tempsph.Value
ws.Cells(3, 10).Value = Me.Tempsfunm.Value
ws.Cells(5, 10).Value = Me.Tempsmfunm.Value
ws.Cells(7, 10).Value = Me.Tempsem.Value
ws.Cells(9, 10).Value = Me.Tempspm.Value
ws.Cells(3, 15).Value = Me.Consumfun.Value
ws.Cells(5, 15).Value = Me.Consume.Value
ws.Cells(7, 15).Value = Me.Consump.Value
```

MsgBox "Data added", vbOKOnly + vbInformation, "Data Added"

'Netejar formulari

```
Me.Tempsfunh.Value = ""
Me.Tempsmfunh.Value = ""
Me.Tempseh.Value = ""
Me.Tempsph.Value = ""
Me.Tempsfunm.Value = ""
Me.Tempsmfunm.Value = ""
Me.Tempsem.Value = ""
Me.Tempspm.Value = ""
Me.Consumfun.Value = ""
```

Me.Tempsfunh.SetFocus

End Sub

Private Sub Tanca\_Click()

Unload Me

End Sub

## Option Explicit

```
Public mySerial As ArduinoExcel.ArduinoExcel
'declarat com a públic perquè ha de ser visible per tots els sub
```

```
Sub Macro()
```

```
    Dim endLoop As Boolean
    Dim excelVersion As String
    Dim vbaVersion As String
    Dim ret As Integer
```

```
#If VBA7 Then
    vbaVersion = "VBA7"
#Else
    vbaVersion = "VBA6"
#End If
    excelVersion = Application.Version & " " & vbaVersion
```

```
    Set mySerial = New ArduinoExcel.ArduinoExcel 'inicialització de la llibreria
    mySerial.Init (excelVersion)
    mySerial.ReadLineMode = True                'ordre per llegir
```

```
    mySerial.PortName = "COM" & Worksheets("Enviadades").Cells(2, 7).Value
    mySerial.BaudRate = Worksheets("Enviadades").Cells(3, 7).Value
```

```
    'agafem el valor del port serie i la velocitat de comunicació
```

```
    Worksheets("Enviadades").Cells(4, 7).Value = 1
    'donem el valor per iniciar comunicació com a 1
```

```
    'si el valor es 1, obrim port i comencem el readingloop
    If Worksheets("Enviadades").Cells(4, 7).Value = 1 Then
        mySerial.StartSerial
        'MsgBox ("COM opened")
        ReadingLoop
    End If
    'quan el valor és 0, es tanca el port i readingloop s'acaba
    endLoop = True
    mySerial.EndSerial
    'MsgBox ("COM closed")
```

```
End Sub
```

```
Private Sub ReadingLoop()
```

```
    Dim ret As Integer
    Dim l As Integer
    Dim InLine As String
    Dim Prm As Variant
    Dim str As String
    Dim endLoop As Boolean
```

```
    endLoop = False
```

```
    On Error GoTo ErrorHandler1:
```

```
    'loop principal per obtenir dades
    While endLoop = False And Worksheets("Enviadades").Cells(4, 7).Value = 1
```

```
        'comprovar si hi ha algo a la cua d'espera
        l = mySerial.QueueLength
```

```
        'obtenir una linia de la cua d'espera
        If l > 0 Then
```

```
            InLine = mySerial.ReadQueue()
```

```
        Else
```

```
            InLine = ""
```

```
        End If
```

```

If Left(Inline, 3) = "XLS" Then

    Prm = Split(Inline, ",")
    'El vector Prm està completat amb valors separats per comes

    ' El format del vector enviat a Excel està configurat:
    '   XLS, Comanda, Pàgina, Rang, Valor
    ' on:
    '   'XLS' és una constant per missatges a l'Excel
    '   'Comanda' especifica l'acció (netejar, escriure, obtenir, guardar)
    '   'Pàgina' especifica la pàgina on s'aplica la comanda
    '   'Rang' especifica un rang de cel·les on s'aplica la comanda
    '   'Valor' s'escriu el valor

    'si no s'especifica cap pàgina s'agafa la de defecte
    If Prm(1) <> "save" Then
        If Prm(2) = "" Then
            Prm(2) = "Enviadades"
        End If
    End If

    'Definició de les comandes
    'Netejar
    If Prm(1) = "clear" Then
        Worksheets(Prm(2)).Range(Prm(3)).ClearContents
    'Escriure
    ElseIf Prm(1) = "write" Then
        If Prm(4) = "%date%" Then Prm(4) = Replace(Prm(4), "%date%", Date)
        If Prm(4) = "%time%" Then Prm(4) = Replace(Prm(4), "%time%", Time)
        Worksheets(Prm(2)).Range(Prm(3)).Value = Prm(4)
    'Obtenir
    ElseIf Prm(1) = "get" Then
        'str = CStr(Worksheets(Prm(2)).Range(Prm(3)).Value)
        str = Replace(CStr(Worksheets(Prm(2)).Range(Prm(3)).Value), ",", ".")
        str = "VAL," & Prm(2) & "," & Prm(3) & "," & str
        ret = mySerial.WriteLine(str)
    'Guardar
    ElseIf Prm(1) = "save" Then
        ActiveWorkbook.Save
    'Acció desconeguda
    Else
        MsgBox ("unknown action: " & Inline)
    End If

End If

DoEvents 'necessari

Wend

Exit Sub

```

ErrorHandler1:

```

If Err.Number = 9 Then          'aquest error quan Prm(n) està buit o mal format
    Dim totalSheets As Integer
    totalSheets = Worksheets.Count
    Worksheets.Add(After:=Worksheets(totalSheets)).Name = Prm(2)
    Resume
ElseIf Err.Number = 1004 Then    'quan el rang està malament

    Resume Next
Else
    'MsgBox Err.Source & " " & Err.Number & " " & Err.Description
    'Stop
End If

```

End Sub

Sub Calcular()

```

Dim i As Integer
Dim k As Integer
Dim z As Integer
Dim l As Integer

```

```

Dim r As Integer
Dim o As Integer
Dim celdas As Integer
Dim Tfun As Integer
Dim Te As Integer
Dim Cfun As Integer
Dim Ce As Integer
Dim Tp As Integer
Dim Cp As Integer
Dim Tmin As Integer
Dim horaengegada As Integer
Dim horaparada As Integer
Dim horaengegada1 As Integer
Dim horaparada1 As Integer
Dim D As Byte
Dim ws As Worksheet
Set ws = Worksheets("Hoja3")

```

```

'Conta totes les celes plenes amb dades
celdas = WorksheetFunction.Count(Range("A1:A65536"))

```

```

'Definir les diferents variables: Temps funcionament, Temps engegada, Consum func, Consum engegada
'Falta afegir temps de parada, consum de parada i temps mínim de funcionament

```

```

Tfun = ws.Cells(2, 4).Value
Te = ws.Cells(4, 4).Value
Cfun = ws.Cells(3, 4).Value
Ce = ws.Cells(5, 4).Value
Tp = ws.Cells(6, 4).Value
Cp = ws.Cells(7, 4).Value
Tmin = ws.Cells(8, 4).Value

```

```

'Netejar les columnes on es treballa
Worksheets("Hoja3").Columns("F:Z").ClearContents
ws.Cells(1, 7).Value = 120000

```

```

'Càlcul iteratiu del cost mínim sense interrupcions

```

```

For i = 1 To celdas + 1 - Te - Tfun - Tp
For z = 1 To Te
ws.Cells(i + 1, 9).Value = Ce * ws.Cells(z + i, 2) + ws.Cells(i + 1, 9).Value
Next z
For k = 1 To Tfun
ws.Cells(i + 1, 10).Value = Cfun * (ws.Cells(k + i + Te, 2)) + ws.Cells(i + 1, 10).Value
Next k
For l = 1 To Tp
ws.Cells(i + 1, 11).Value = Cp * (ws.Cells(l + i + Te + Tfun, 2)) + ws.Cells(i + 1, 11).Value
Next l
ws.Cells(i + 1, 7).Value = ws.Cells(i + 1, 11) + ws.Cells(i + 1, 10) + ws.Cells(i + 1, 9)

```

```

'Definim moment i cost mínim
If ws.Cells(i + 1, 7).Value < ws.Cells(1, 7).Value Then
ws.Cells(1, 7).Value = ws.Cells(i, 7).Value
ws.Cells(1, 6).Value = i - 1
End If

```

```

Next i

```

```

'Càlcul iteratiu del cost mínim amb una interrupció

```

```

'Worksheets("Hoja3").Columns("H:Z").ClearContents
'r = Tfun \ Tmin
'Condicions
' If r > 0 And Celdas > (2 * Te + 2 * Tp + Tfun + 1) And Tfun - Tmin > Tmin Then

```

```

' ws.Cells(1, 8).Value = 120000
' For o = 1 To Celdas + 1 - 2 * Te - Tfun - 2 * Tp

' For z = 1 To Te
' ws.Cells(o + 1, 9).Value = Ce * ws.Cells(z + o, 2) + ws.Cells(o + 1, 9).Value
' Next z
' For k = 1 To Tmin
' ws.Cells(o + 1, 10).Value = Cfun * (ws.Cells(k + o + Te, 2)) + ws.Cells(o + 1, 10).Value
' Next k
' For l = 1 To Tp
' ws.Cells(o + 1, 11).Value = Cp * (ws.Cells(l + o + Te + Tmin, 2)) + ws.Cells(o + 1, 11).Value

```

```

' Next l
' ws.Cells(o + 1, 9).Value = ws.Cells(o + 1, 9) + ws.Cells(o + 1, 10) + ws.Cells(o + 1, 11)

' Worksheets("Hoja2").Range(ws.Cells(o + 1, 10), ws.Cells(o + 1, 13)).ClearContents
' ws.Cells(o + 1, 10).Value = 120000

' For j = Te + Tmin + Tp + o To Celdas + 1 - Te - Tfun - Tp + Tmin
' For z = 1 To Te
' ws.Cells(j + 1, 10).Value = Ce * ws.Cells(z + j, 2) + ws.Cells(j + 1, 10).Value
' Next z
' For k = 1 To Tfun - Tmin
' ws.Cells(j + 1, 11).Value = Cfun * (ws.Cells(k + j + Te, 2)) + ws.Cells(j + 1, 11).Value
' Next k
' For l = 1 To Tp
' ws.Cells(j + 1, 12).Value = Cp * (ws.Cells(l + j + Te + Tfun - Tmin, 2)) + ws.Cells(j + 1, 12).Value
' Next l
' ws.Cells(j + 1, 10).Value = ws.Cells(j + 1, 10) + ws.Cells(j + 1, 11) + ws.Cells(j + 1, 12)

'Definim el moment i cost minim
' If ws.Cells(j + 1, 10).Value <= ws.Cells(o + 1, 10).Value Then
'   ws.Cells(o + 1, 10).Value = ws.Cells(j + 1, 10).Value
'   ws.Cells(1, 11).Value = i + 1

'   End If

'Worksheets("Hoja3").Range(ws.Cells(j, 10), ws.Cells(j + 10, 13)).ClearContents

'Next j

'ws.Cells(o + 1, 8).Value = ws.Cells(o + 1, 9).Value + ws.Cells(o + 1, 10).Value

'If ws.Cells(o + 1, 8).Value <= ws.Cells(1, 8).Value Then
'   ws.Cells(1, 8).Value = ws.Cells(o + 1, 8).Value
'   ws.Cells(1, 9).Value = o + 1

'   End If

'Next o
'End If

'Comparar els dos minims
If ws.Cells(1, 7).Value < ws.Cells(1, 8).Value Then
    horaengegada = ws.Cells(1, 6).Value
    horaparada = ws.Cells(1, 6).Value + Te + Tfun + Tp
    horaengegada1 = 0
    horaparada1 = 0

End If

If ws.Cells(1, 7).Value > ws.Cells(1, 8).Value Then
    horaengegada = ws.Cells(1, 8).Value
    horaparada = ws.Cells(1, 9).Value + Te + Tmin + Tp
    horaengegada1 = ws.Cells(1, 11).Value
    horaparada1 = ws.Cells(1, 11).Value + Te + Tfun - Tmin + Tp

End If

End Sub

Sub Entradades()

Dades.Show

End Sub

```