

MONTRONOL

敏石系統有限公司

TSM教育訓練



大綱

- ◆ 接線前準備工作
- ◆ 基本接線
- ◆ 軟體介面介紹
- ◆ 基本指令操作
- ◆ 使用程式控制(以VB6為例)

接線前準備工作

- ◆ 確認電源供應器是否調整到適當範圍

TSM11 15~30VDC (24VDC 推薦)

TSM17 12~48VDC

TSM23 12~70VDC

- ◆ 直/交流電的腳位選定

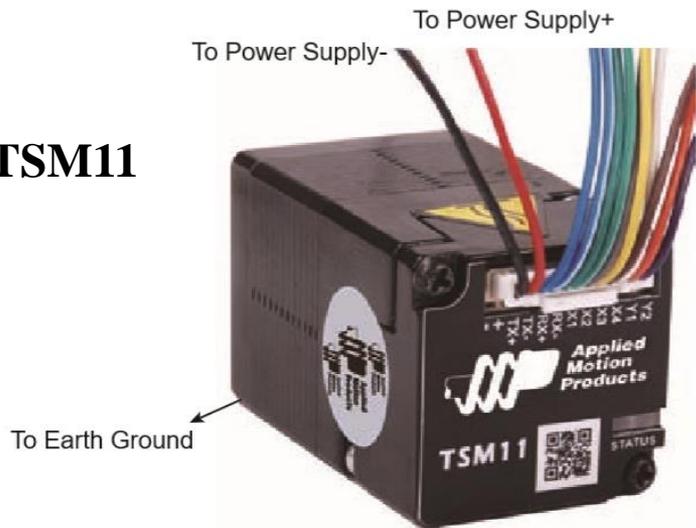


基本接線-電源

注意+-位置避免接錯!!

- ◆ 馬達+-插孔位置確認
- ※不同型號+-位置不同

TSM11



TSM23



To Power Supply+
To Power Supply-



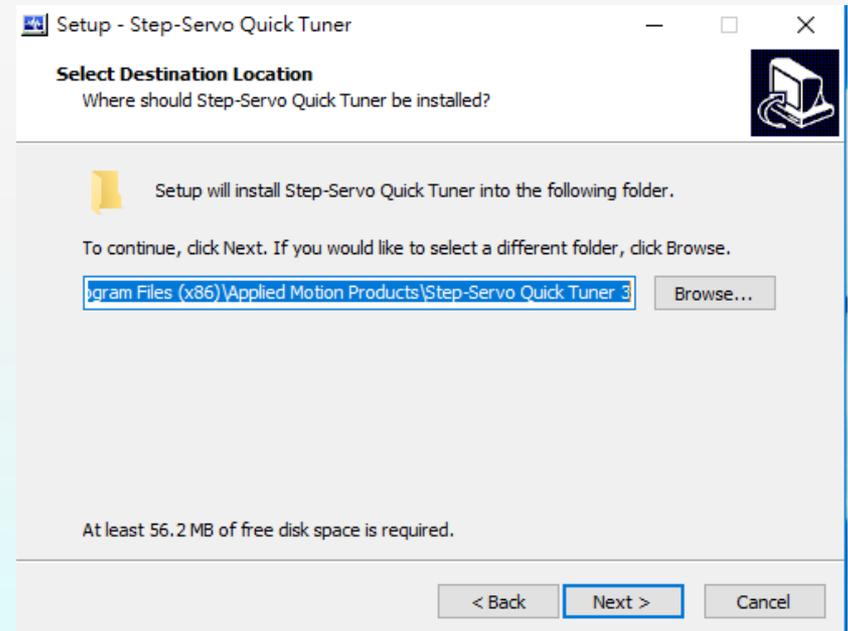
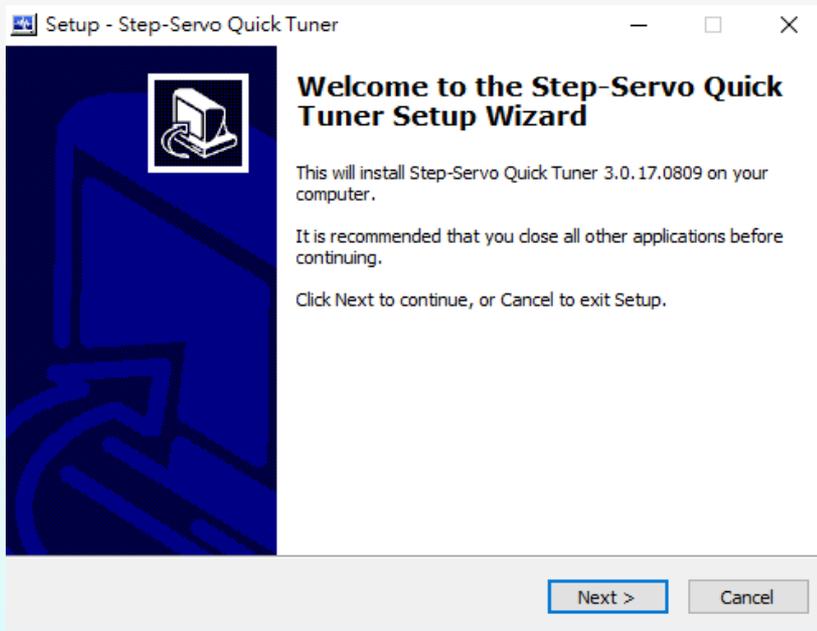
TSM17

SSQT基本介紹

安裝程式



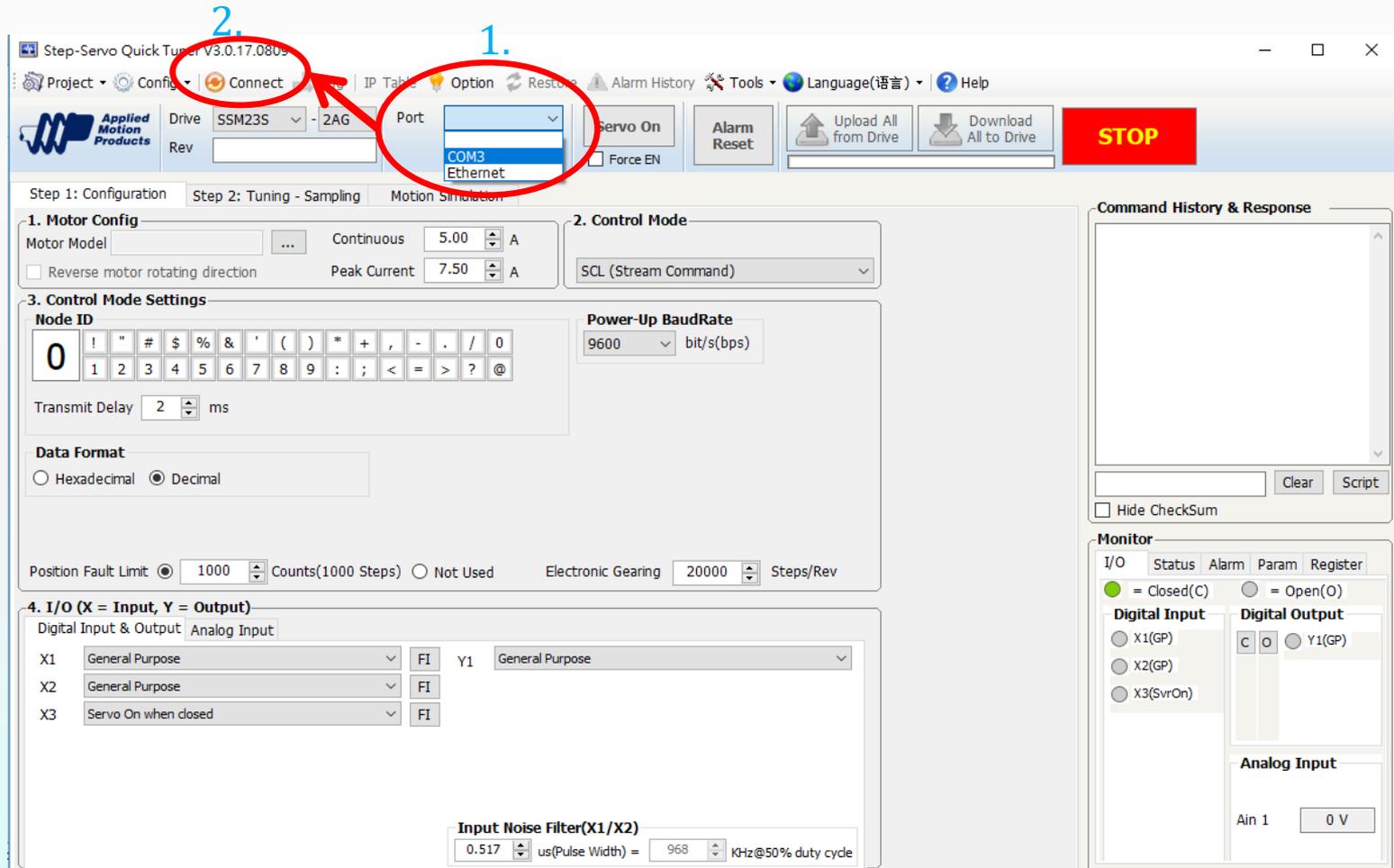
- ◆ 請執行SSQT安裝檔並依照選單依序執行下一步即可完成安裝
- ◆ ※SSQT安裝檔可於AMP官網下載



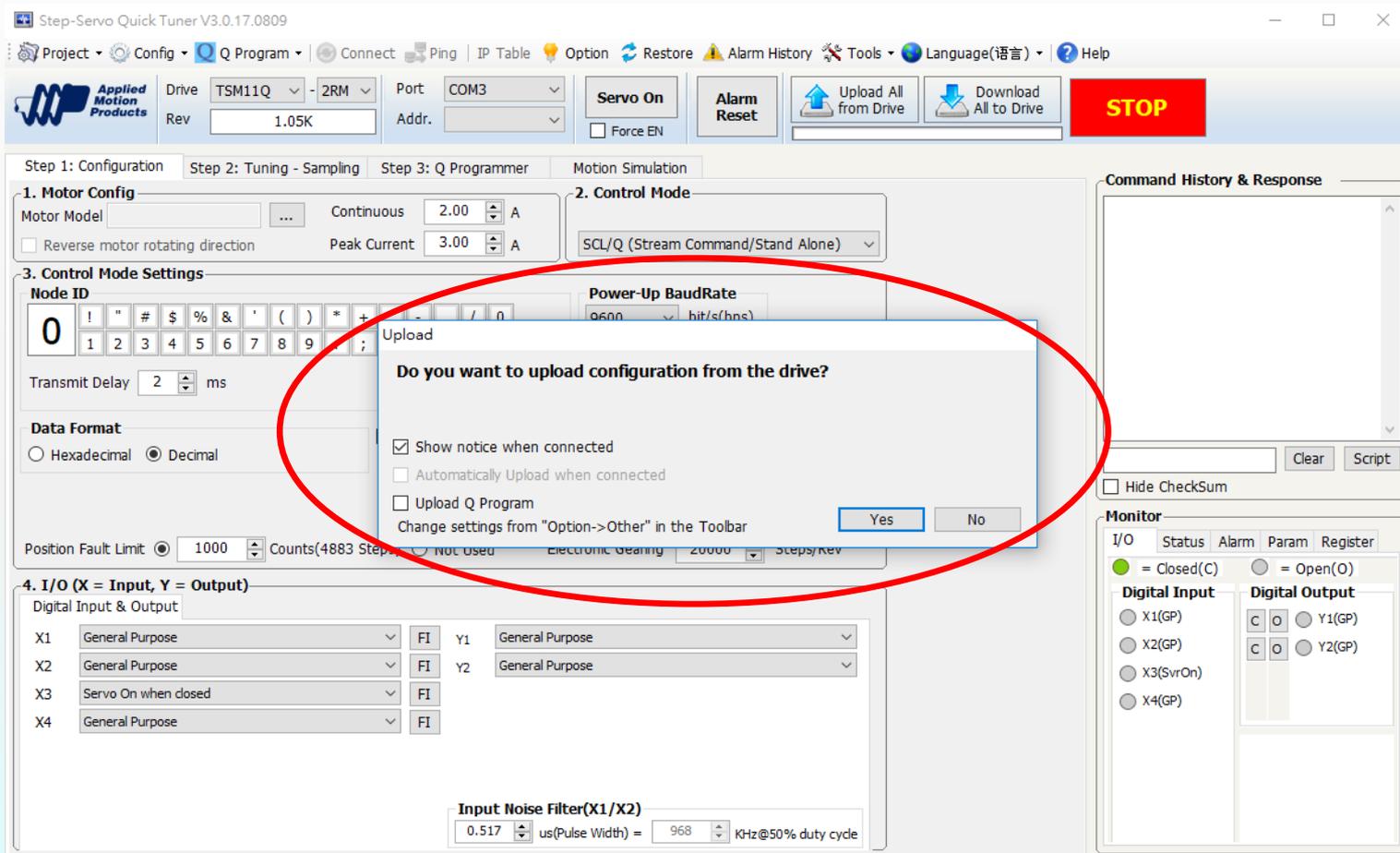
SSQT : Step-Servo Quick-Tuner

建立通訊

◆ 建立PC與TSM Step Servo通訊為使用SSQT軟體的第一步驟



- ◆ 若通訊成功將出現Upload視窗，此時表示硬體接線及軟體安裝皆為正確



- ◆ 介面將顯示出TSM Step Servo主要資訊，包括型號、韌體版本及電流

Step-Servo Quick Tuner V3.0.17.0809

Project Config Q Program Connect Ping IP Table Option Restore Alarm History Tools Language(语言) Help

Applied Motion Products Drive TSM11Q -2RM Port COM3 Servo On Alarm Reset Upload All from Drive Download All to Drive STOP

1.05K Addr.

Step 1: Configuration Step 2: Tuning - Sampling Step 3: Q Programmer Motion Simulation

1. Motor Config

Motor Model Continuous 1.50 A

Reverse motor rotating direction Peak Current 2.25 A

2. Control Mode

Control Mode Velocity (I/O Controlled)

3. Control Mode Settings

Velocity Control Type

Speed only Position over time

Velocity Control

Fix speed at 5.000 rps Note: The speed will be limited by maximum speed

Accel 100.000 rps/s

Decel 100.000 rps/s

Position Fault Limit 1000 Counts(1000 Steps) Not Used Electronic Gearing 4096 Steps/Rev

4. I/O (X = Input, Y = Output)

Digital Input & Output

I/O	Status	Alarm	Param	Register
X1	Not used. Motor runs continuously	FI	Y1	Closed on fault
X2	Direction	FI	Y2	Open when dynamic pos. err < 20 Counts
X3	Servo On when open	FI		
X4	Change motor speed to 50.000 rps	FI		

Input Noise Filter(X1/X2) 0.517 us(Pulse Width) = 968 KHz@50% duty cycle

Command History & Response

Clear Script

Hide CheckSum

Monitor

I/O Status Alarm Param Register

● = Closed(C) ○ = Open(O)

Digital Input

- X1(GP)
- X2(Dir)
- X3(SvrOn)
- X4(Speed2)

Digital Output

- Y1(Fault)
- Y2(DynPE)

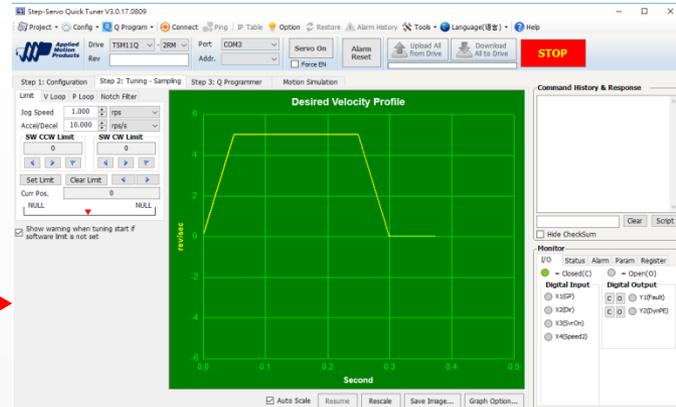
SSQT標準控制介面

The screenshot shows the Step-Servo Quick Tuner V3.0.17.0809 software interface. The interface is divided into several sections:

- 1. Motor Config:** Includes Motor Model, Reverse motor rotating direction, and a red annotation "狀態區" (Status Area).
- 2. Control Mode:** Includes Control Mode (Velocity (I/O Controlled)) and a red annotation "控制區" (Control Area).
- 3. Control Mode Settings:** Includes Velocity Control Type (Speed only), Velocity Control (Fix speed at 5.000 rps), Accel (100.000 rps/s), Decel (100.000 rps/s), Position Fault Limit (1000 Counts), and Electronic Gearing (4096 Steps/Rev).
- 4. I/O (X = Input, Y = Output):** Includes Digital Input & Output settings for X1, X2, X3, and X4, and a red annotation "I/O區" (I/O Area).
- Command History & Response:** A large text area with a red annotation "指令區" (Command Area).
- Monitor:** Includes I/O Status, Alarm, Param, and Register sections, with a red annotation "監控區" (Monitoring Area).

Additional features include a menu bar (Project, Config, Q Program, Connect, Ping, IP Table, Option, Restore, Alarm History, Tools, Language, Help), a toolbar (Servo On, Alarm Reset, Upload All from Drive, Download All to Drive, STOP), and a status bar (Drive: TSM11Q, Rev: -2RM, Port: COM3, Addr:).

SSQT具有多樣及實用功能 使用者可依需求應用 進階操作說明請參考 SSQT HELP...



Line	Label	Cmd	Param1	Param2	Comment
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					

基本指令操作

將指令傳送至馬達

--請於Command History & Response執行--

- ◆ AC10
- ◆ DE10
- ◆ VE1
- ◆ DI20000
- ◆ FL
- ◆ 設定加速度為10 rps/s
- ◆ 設定減速度為10 rps/s
- ◆ 設定速度為1 rps
- ◆ 設定相對位置20000步
- ◆ 執行相對位置運動

亦可將程式下載至馬達(僅適用Q-programmer)



傳送至馬達後，可於指令欄依程式執行

常用指令

(請下載[Host-Command-Reference](#))

速度模式

- ◆ AC: 加速度
- ◆ DE: 減速度
- ◆ VE: 速度

位置模式

- ◆ SH: 回原點
- ◆ SP: 設定馬達的絕對位置
- ◆ DI: 設定方向或移動位置
- ◆ FP: 絕對位置運動
- ◆ FL: 相對位置運動
- ◆ EP: 回傳現在位置
- ◆ ST: 運動停止

其他

- ◆ WT: 延遲時間
- ◆ DL: 設定極限開關的模式
- ◆ QR: 重複迴圈
- ◆ QG: 跳至指令的指令行
- ◆ GC: 輸出電流(單位:0.01A)
- ◆ AR: 消除警報
- ◆ MD: 解除激磁
- ◆ ME: 激磁

PID指令

([StepSERVO Tuning Guide](#))

速度環

- ◆ VP: 速度模式比例增益
- ◆ VI: 速度模式積分增益
- ◆ KK: 前饋增益
- ◆ KC: 濾波因子

位置環

- ◆ KP: 比例增益(0~32767)
- ◆ KD: 微分增益(0~32767)
- ◆ KE: 濾波因子

詳情請參考

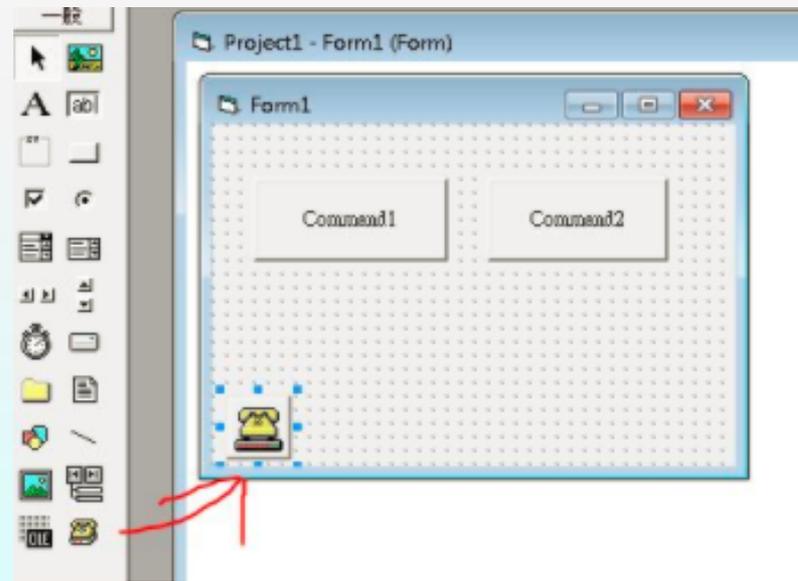
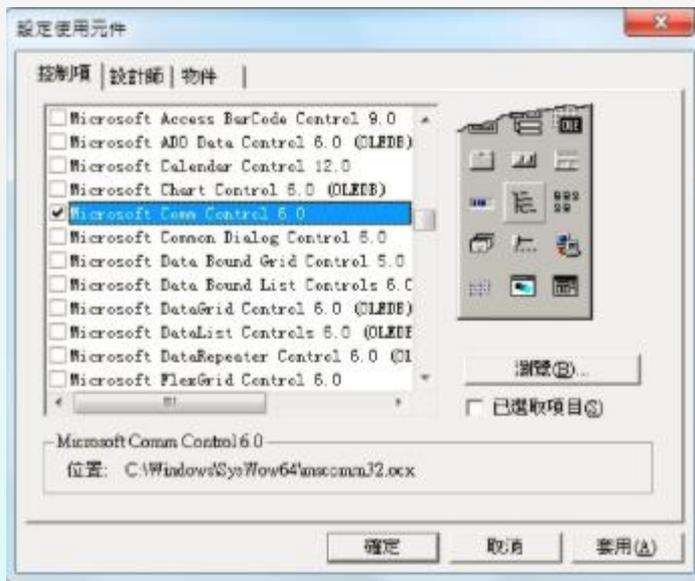
敏石官網-技術支援

[TSM一體型步進伺服馬達PID調整](#) 文章

TSM系列使用程式控制(以VB6為例)

1. 建立通訊

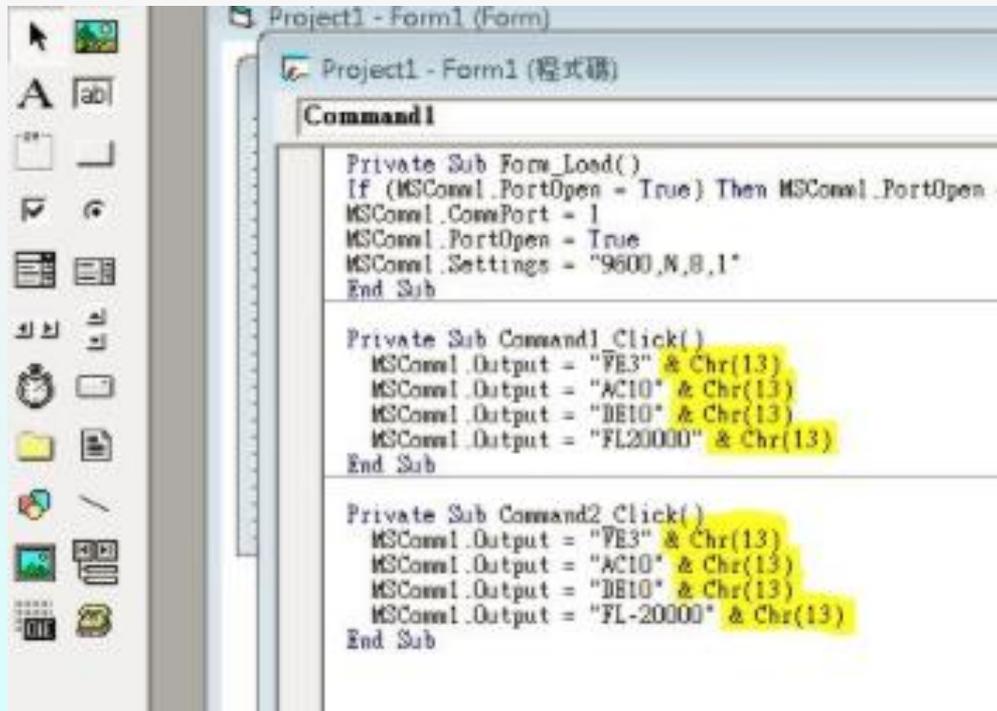
- ◆ A. 專案 > 設定使用元件 > 勾選"Microsoft Comm Control 6.0 "
- ◆ B. 建立一個MS Comm物件，並設定所使用"通訊連接Port"(其餘設定預設即可)



TSM系列使用程式控制(以VB6為例)

2.傳送字串

- ◆ 在使用的物件傳送字串，並在字串之後加上 &Chr(13)，就可控制TSM了
- ◆ EX. MSComm1.Output = "FL200000" & Chr(13)



The screenshot shows the Visual Basic 6.0 IDE with the Project Explorer on the left and the Code Editor on the right. The Code Editor displays the code for 'Project1 - Form1 (Form)'. The code is as follows:

```
Project1 - Form1 (Form)
Project1 - Form1 (程式碼)
Command1

Private Sub Form_Load()
    If (MSComm1.PortOpen = True) Then MSComm1.PortOpen =
MSComm1.CommPort = 1
MSComm1.PortOpen = True
MSComm1.Settings = "9600,N,8,1"
End Sub

Private Sub Command1 Click()
    MSComm1.Output = "FE3" & Chr(13)
    MSComm1.Output = "AC10" & Chr(13)
    MSComm1.Output = "DE10" & Chr(13)
    MSComm1.Output = "FL20000" & Chr(13)
End Sub

Private Sub Command2 Click()
    MSComm1.Output = "FE3" & Chr(13)
    MSComm1.Output = "AC10" & Chr(13)
    MSComm1.Output = "DE10" & Chr(13)
    MSComm1.Output = "FL-20000" & Chr(13)
End Sub
```