i-8092 快速上手手冊

(Version 2.2)

i-8092 C++ 巨集指令函式庫快速上手
PAC WinCon-8000、I-8000 系列控制器
(適用於 i-8092, i-8092F)

ICP DAS CO., LTD.
泓格科技股份有限公司

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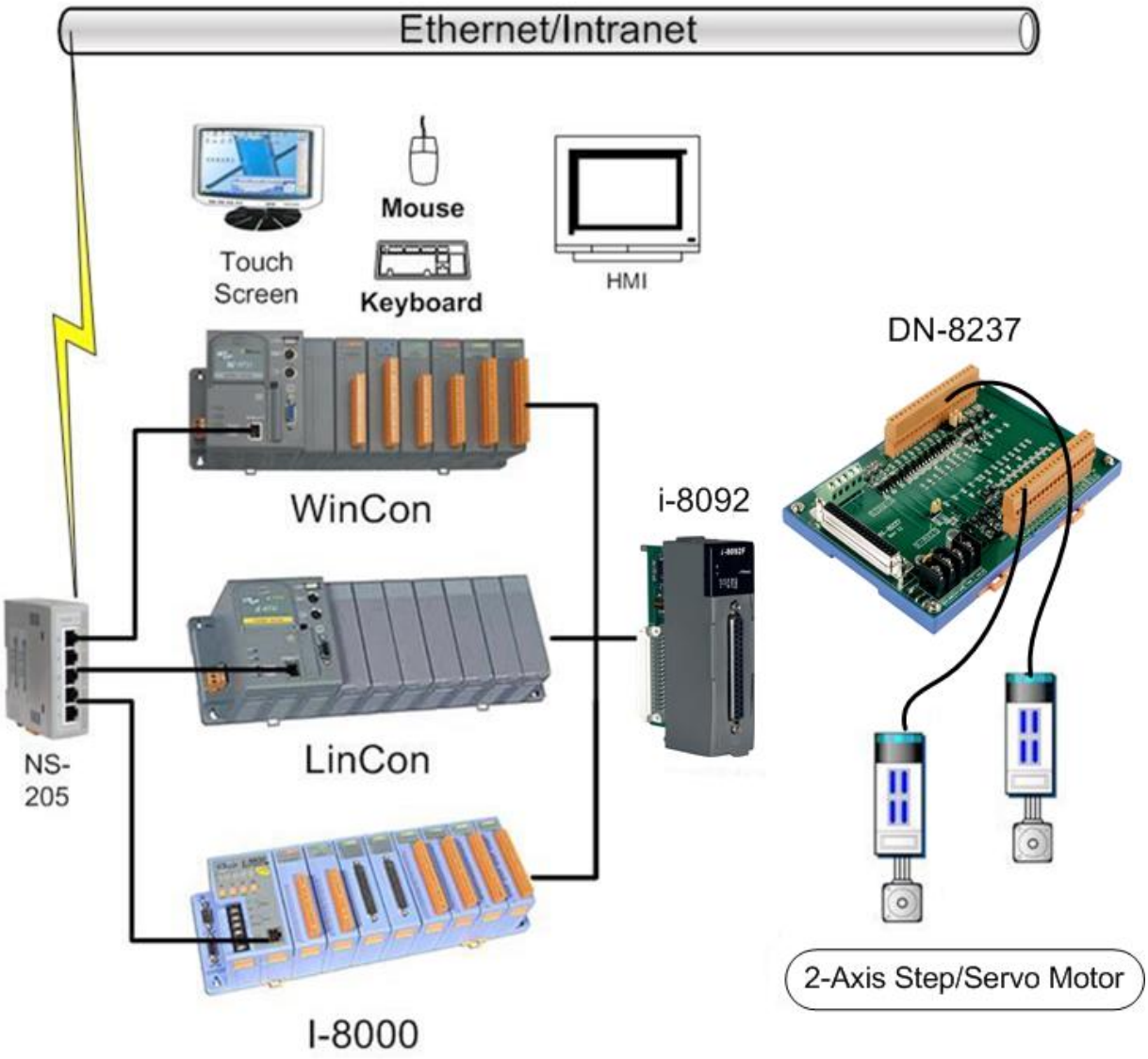
目錄

1 i-8092/F 運動控制器模組簡介

1.1 i-8092/F簡介

i-8092/F 是一個支援 2 軸 步進/伺服 馬達運動控制模組，輸出 Pulse 可高達 4M PPS，配合泓格公司 I-8000、WinCon-8000、LinCon-8000 等控制器上。i-8092 運動控制模組適合一般運動控制應用，提供非常多的運動控制功能讓客戶使用，例如 2 軸直線補間、 2 軸圓(弧)補間、T/S 加減速曲線、原點返回運動等等，而 i-8092 在執行上述功能時，並不需耗用 I-8000、WinCon、LinCon 系統資源，CPU 可同時監控其他執行狀態，由於只耗用少量系統資源，因此可以在 I-8000、WinCon-8000、LinCon-8000 插上多個 i-8092 模組，以多軸(2、4....)運動控制於同一控制器上。泓格亦提供相當多的範例程式及巨集功能，以減少程式設計的工時，符合低成本高效能的運動控制系統設計平台。



i-8092 與控制器規劃圖 (WinCon-8000、LinCon-8000、I-8000)

1.2 硬體規格

1.2.1 主要規格

- 控制晶片 — MCX312
- 控制軸數 — 2 軸,脈波式輸出(步進或伺服馬達)
- 最大輸出脈波速度 — 4 M PPS

1.2.2 補間功能

2-軸 直線補間

- 每一軸補間區間 — −8,388,607 ~ +8,388,607
- 補間向量速度 — 1 PPS ~ 4 M PPS
- 補間精度 — ± 0.5 LSB

圓弧補間

- 每一軸補間區間 — −8,388,607 ~ +8,388,607
- 補間向量速度 — 1 PPS ~ 4 M PPS
- 補間精度 — ± 1 LSB

位元補間

- 補間向量速度 — 1 ~ 4 MPPS (Dependent on CPU data writing time)

相關補間功能

- 固定向量速度
- 可連續補間

1.2.3 輸出脈衝

- 脈衝輸出速度範圍 — 1 PPS ~ 4 MPPS
- 脈衝輸出精度 — ± 0.1%
- S-曲線衝量(Jerk) 範圍 — 954 ~ 62.5 x 10^6 PPS/S^2
  477 x 10^3 ~ 31.25 x 10^9 PPS/S^2
- 加減速範圍 — 125 ~ 1 x 10^6 PPS/S
  62.5×10^3 ~ 500 x 10^6 PPS/S
- 速度精度 — 1 PPS 到 500PPS(依最高速而定)
- 脈衝輸出數 — 0 ~ 268,435,455 (定量驅動)
- 速度曲線型態:
  - 定速

- ◆ 對稱與非對稱線性加減速
- ◆ 對稱S型加減速

- ■ 減速度模式
  - ◆ 自動(對稱線性加減速) Auto
  - ◆ 自訂

- ■ 於驅動中途可以動態改變速度及脈波數
- ■ 定數脈波輸出可以用 T/S-曲線加減速
- ■ 可選脈波輸出為CW/CCW 或 PULSE/DIR 方式
- ■ 可以選擇邏輯準位

1.2.4 編碼器輸入

- ■ 可選擇 A/B 相脈衝輸入或 Up/Down 脈衝輸入
- ■ 可選擇 1、2 及 4 除頻 (A/B 相脈衝輸入)
- ■ 編碼器輸入可設定反方向

1.2.5 位置計數器

- ■ 指令位置計數器範圍 −2,147,483,648 ~ +2,147,483,647
- ■ 實際位置(編碼器輸入)計數器範圍 −2,147,483,648 ~ +2,147,483,647
- ■ 可設定為環狀計數器功能(圓位置)
- ■ 編碼器輸入可設定反方向
- ■ 位置計數器可以讀取，也可以設定

1.2.6 伺服馬達輸入訊號 Servo Motor Input Signal

- ■ 警告 (Alarm)
- ■ 可選擇伺服到位(In Position Check) 或 伺服就序(Servo Ready)
- ■ 可以選擇 有效/無效 及 邏輯準位

1.2.7 極限訊號輸入

- ■ 各軸 2 個極限訊號輸入+ 極限, − 極限
- ■ 可以選擇 邏輯準位 及碰觸極限後可 減速停或急停

1.2.8 其它輸入訊號 Other Input Signals

- 各軸 IN3 可以用來做一般DI輸入用途

1.2.9 緊急停止訊號輸入, Emergency Stop Signal Input

- 每一模組提供一個緊急停止信號輸入

1.2.10 一般輸出訊號 General Output Signal

- 各軸 nOUT0 作為一般 DO On/Off 信號
- 各軸 nOUT1 作為控制Servo On/Off 信號

1.2.11 整合輸入濾波器Contents of integral type filters

- 對模組中一般DI輸入信號可以設定雜訊數位濾波(時間參數)功能

1.2.12 軟體極限

- 各軸可支援 2 個軟體極限 + 極限, − 極限 (−2,147,483,646 ~ +2,147,483,646)

1.2.13 手動外部輸入信號驅動

- 固定Pulse數驅動(Fixed Pulse Driving Mode)
- 連續Pulse驅動(Continuous Pulse Driving Mode)
- 手輪Pulse驅動(Manual pulsar mode)

1.2.14 模組狀態顯示LED

- 紅燈 → 電源指示燈
- 橘燈 → Servo Alarm 指示燈 (驅動器輸出ON橘燈亮)
  例:三菱驅動器故障(ALM)，無異警時輸出ON，橘燈亮
- 綠燈 → Motion 動作指示燈

1.2.15 FRnet分散式DI/O (i8092F 專用功能)

- DI → 128 點

- DO → 128 點

可搭配 FRnet I/O 模組動態增減點數

1.3 環境參數Environment

工作溫度	-20 ~ + 75°C
儲存溫度	-30 ~ +85°C
工作濕度	10 ~ 85%，非結露non-condensing
儲存濕度	5 ~ 90%，非結露non-condensing
I/O 信號隔離	2500Vrms
外部供給電壓	24V DC (接線子板)

1.4 採購資訊Ordering Information

I-8000、W-8000、L-8000	嵌入式控制器系列主機(請洽相關業務單位)
i-8092F	2 軸運動控制器模組
DN-8237	i8092 端子板
CA-3710D	37 Pin Dsub 連接線 1M
I-8092F-G/S	整組(i8092F+DN-8237+CA-3710D)

2 硬體接線

2.1 i-8092 檢查包裝,及安裝

2.1.1 檢查包裝

i-8092/F 是一個支援 2 軸 步進/伺服 馬達運動控制模組，配合泓格公司 I-8000、WinCon-8000、嵌入式控制器系列主機使用，基本上須配和如下主機產品

- I-8000、W-8000 嵌入式PAC控制器系列主機(擇其一)

i-8092 需用之產品(i8092/F-G/S)

- i8092 4軸運動控制器模組
- i8092F 4軸運動控制器模組(含FRNET控制器)
- DN-8237 i-8092 配線端子板
- CA-3702 37 Pin Dsub接頭線，長度:2 m

2.1.2 i-8092 安裝

準備控制器

I-8000、W-8000、嵌入式控制器系列主機(擇其一),並選用有空 IO 插槽之型號,請先將電源關閉。

插入模組,及連接線

選一嵌入式控制器空IO插槽，將i-8092小心依導槽插入I-8000、W-8000 嵌入式控制器,並用CA-3702聯接到 DN-8237配線端子板，如下圖:

2.2 DN-8237 端子板

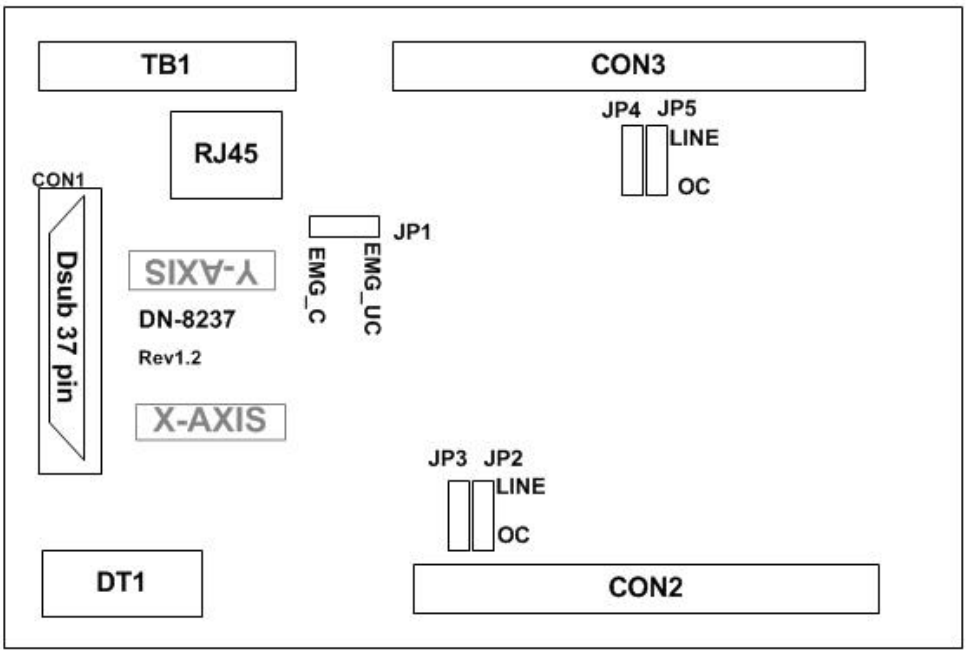


Fig. 2.0 DN-8237 位置圖

2.2.1 腳位定義

■ DT1

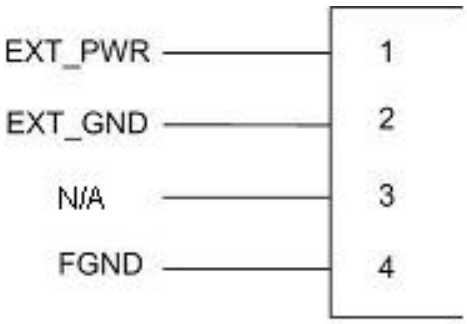


Fig. 2.1 Pin definition for DT1

Table 2.1 DT1 Signal Connection

Pin name	Description
EXT_PWR	EXT power supply +24V
EXT_GND	EXT power ground
N/A	N/A
FGND	Frame ground

■ **CON1**

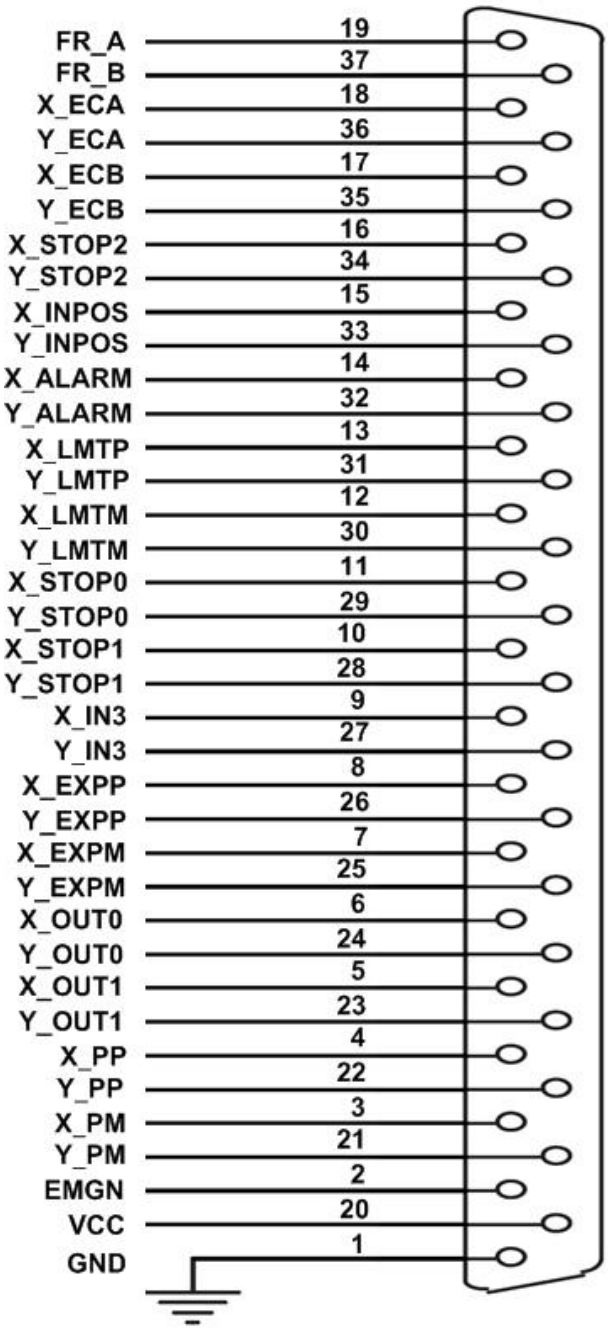


Fig. 2.2 DN-8237 連接線 I/O 腳位圖

Table 2.2 DN-8237 連接線 I/O 腳位說明 1

Pin name	Pin number	Description
FR_A	19	FRnet A-phase signal
FR_B	37	FRnet B-phase signal
X_ECA	18	Encoder A-phase signal for the X axis
Y_ECA	36	Encoder A-phase signal for the Y axis
X_ECB	17	Encoder B-Phase signal for the X axis
Y_ECB	35	Encoder B-Phase signal for the Y axis
X_STOP2	16	Stop 2 signal for the X axis
Y_STOP2	34	Stop 2 signal for the Y axis
X_INPOS	15	In-position signal for the X axis
Y_INPOS	33	In-position signal for the Y axis
X_ALARM	14	Alarm signal for the X axis
Y_ALARM	32	Alarm signal for the Y axis
X_LMTP	13	Limit switch input signal (+) for the X axis
Y_LMTP	31	Limit switch input signal (+) for the Y axis
X_LMTM	12	Limit switch input signal (-) for the X axis
Y_LMTM	30	Limit switch input signal (-) for the Y axis
X_STOP0	11	Stop 0 signal for the X axis
Y_STOP0	29	Stop 0 signal for the Y axis
X_STOP1	10	Stop 1 signal for the X axis
Y_STOP1	28	Stop 1 signal for the Y axis
X_IN3	9	Input 3 signal for the X axis
Y_IN3	27	Input 3 signal for the Y axis
X_EXPP	8	EXT pulsar input signal (+) for the X axis
Y_EXPP	26	EXT pulsar input signal (+) for the Y axis
X_EXPM	7	EXT pulsar input signal (-) for the X axis
Y_EXPM	25	EXT pulsar input signal (-) for the Y axis
X_OUT0	6	Output 0 signal for the X axis
Y_OUT0	24	Output 0 signal for the Y axis
X_OUT1	5	Output 1 signal for the X axis
Y_OUT1	23	Output 1 signal for the Y axis
XPP	4	Driving pulsar signal (+) for the X axis
YPP	22	Driving pulsar signal (+) for the Y axis
XPM	3	Driving pulsar signal (+) for the X axis
YPM	21	Driving pulsar signal (+) for the Y axis
EMGN	2	Emergency stop input signal

VCC	**20**	**Module power (+5V)**
GND	**1**	**Ground**

■ CON2,3 X、Y 軸 I/O 信號接線

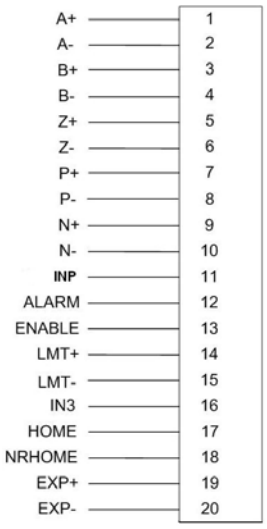


Fig. 2.3 CON2~3 腳位定義

Table 2.4 CON2/3

Pin name	Description
A+	**Encoder A-Phase (+)**
A-	**Encoder A-Phase (-)**
B+	**Encoder B-Phase (+)**
B-	**Encoder B-Phase (-)**
Z+	**Encoder Z-Phase (+)**
Z-	**Encoder Z-Phase (-)**
P+	**Positive Direction Pulse Output(+)**
P-	**Positive Direction Pulse Output(-)**
N+	**Negative Direction Pulse Output(+)**
N-	**Negative Direction Pulse Output(-)**
READY	**Servo Ready Input Signal**
ALARM	**Alarm Input Signal**
ENABLE	**Driver Enable Output Signal (Servo**
LMT+	**Limit Switch Input Signal (+)**
LMT-	**Limit Switch Input Signal (-)**
IN3	**Input Signal (IN3)**
HOME	**Home Sensor Input Signal**
NHOME	**Near Home Sensor Input Signal**
EXP+	**EXT Positive Direction Pulse (+)**

EXP-	**EXT Negative Direction Pulse (-)**

- **TB1**

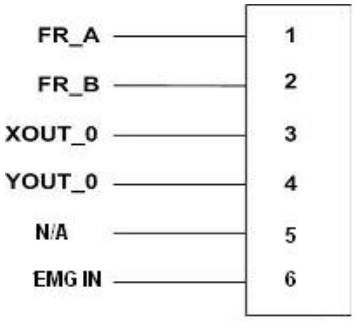


Fig. 2.4 CON6 腳位定義

Table 2.5 TB1

Pin name	Description
FR_A	FRnet's A-phase signal
FR_B	FRnet's B-phase signal
XOUT_0	Output 0 signal for X-axis
YOUT_0	Output 0 signal for Y-axis
N/A	N/A
EMG_IN	EMG input signal

- **RJ45**

為現場方便配線,我們為 FR_NET 另設計 RJ45 接頭,其腳位定義如下:

Table 2.6 RJ45

Pin name	Description
1	N/A
2	N/A
3	FRnet's A-phase signal
4	N/A
5	N/A
6	FRnet's B-phase signal
7	N/A
8	N/A

FRnet(For i8092F) 接線可以連接 FRnet 系列 IO 模組如 FR-2053,FR-2057….詳情請參考泓格網站:

http://www.icpdas.com/products/Remote_IO/frnet/frnet_introduction.htm

2.2.2 功能選擇(跳線設定)

■ **JP1**

Jumper 1 控制緊急停止輸入是否有接，1-2pin 短路為有接，2-3pin 短路為不接

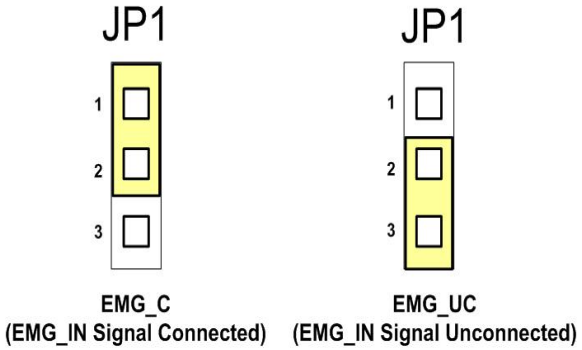


Fig. 2.5 Jumper 1 設定

■ **JP2/3、 JP4/5**

Jumper 2、3 控制X軸(CON1) XPP、XPM 是用差動輸出 2-3pin 短路(Differential)，開集極輸出 1-2pin 短路(Open Collector)，其他 Y(JP4/5)一樣相同設定，如下圖範例

注意: 開集極輸出(Open Collector)，P+ (N+)和 EXT_5V 短路，可供外部使用 (參考 Fig 2.10)。

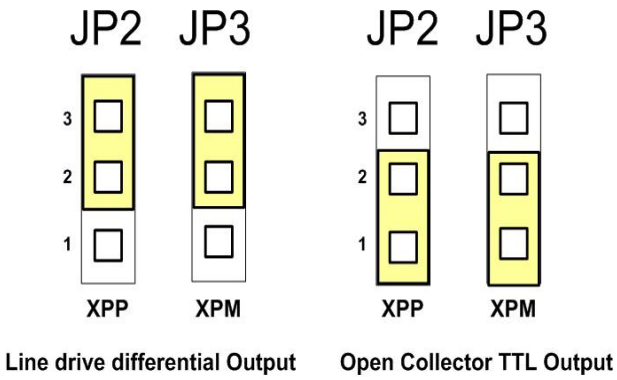


Fig. 2.6 Jumper 2, 3 設定

2.3 I/O 輸出入介面

2.3.1 脈波輸出介面

差動脈波輸出接線

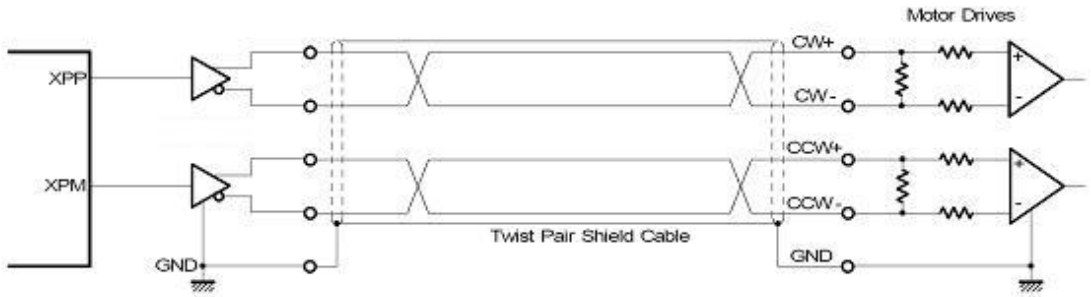


Fig. 2.8 差動脈波輸出接線

開集極輸出

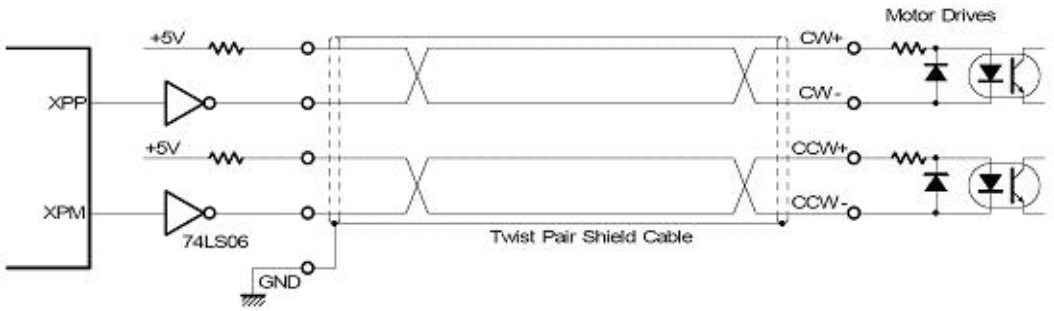


Fig. 2.9 開集極輸出

脈波信號接線範例

i-8092 脈波輸出命令，可以使用 CW/CCW 模式或用 PULSE/DIR 模式。利用 JP2 和 JP3 去選擇差動或開集極的接法。

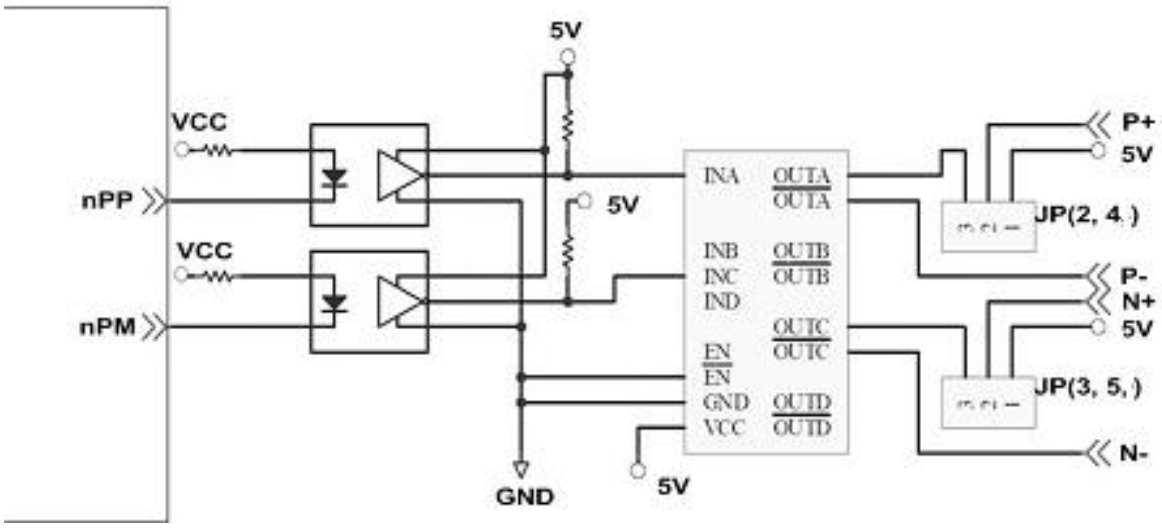


Fig. 2.10 脈波信號接線範例

2.3.2 極限開關接線(Connection for Limit switch Signal)

使用極限開關去防止機械過動作，設計者能透過本手冊的函式庫，去設定硬體極限開關的動作等級。下面圖例，極限開關信號的接續迴路是為了要隔離雜訊源。

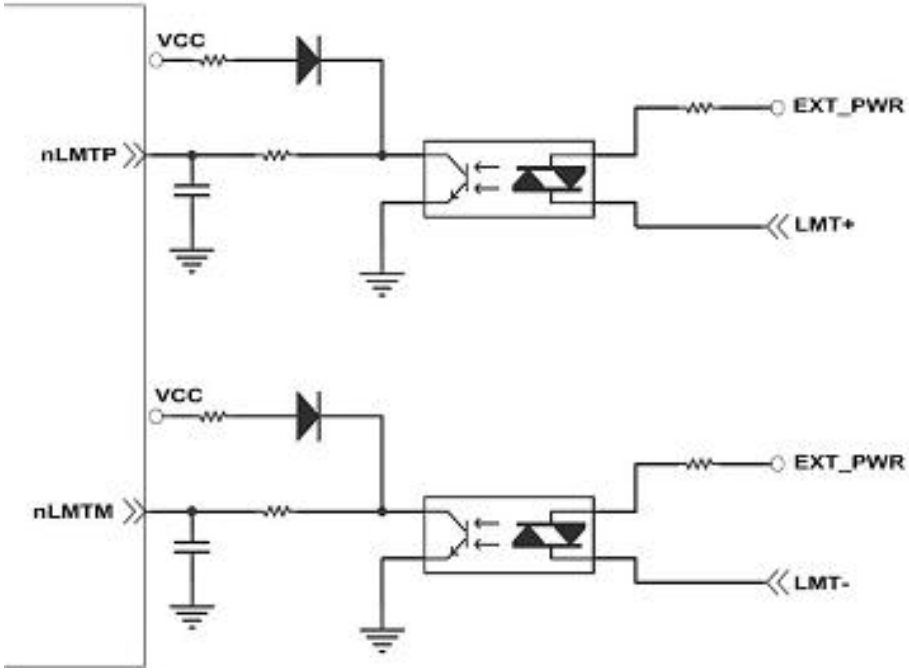


Fig. 2.11 極限開關接線範例

2.3.3 一般DI輸入接線(nINPOS,nALARM)

nINPOS 輸入信號，是伺服驅動器 **in-Position** 的檢查信號。設計者能透過本手冊的函式庫去 **enable/disable** 這個信號。硬體配線方面,使用者可以依照需求使用定位完成訊號(in-position)或伺服完成訊號(servo-ready)。

nALARM 輸入信號，是伺服驅動器警報輸出信號，當 **I8092** 收到這個信號可以停止輸出脈波。設計者能透過本手冊的函式庫去 **enable/disable** 這個信號。

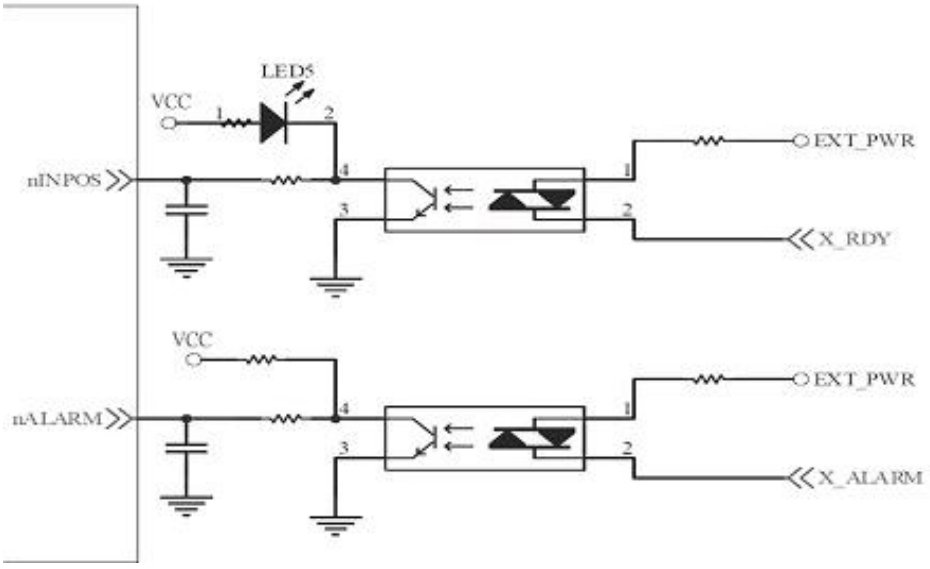


Fig. 2.12 一般 DI 輸入接線範例

2.3.4 Encoder輸入接線(Encoder Signals)

下圖是一個 Encoder 輸入接線範例，是用差動輸入信號接法。要接 Encoder 輸入時，A 相請連接 A+、A-，B 相請連接 B+、B-,經過高速光偶合 IC 就直接連到運動控制晶片。

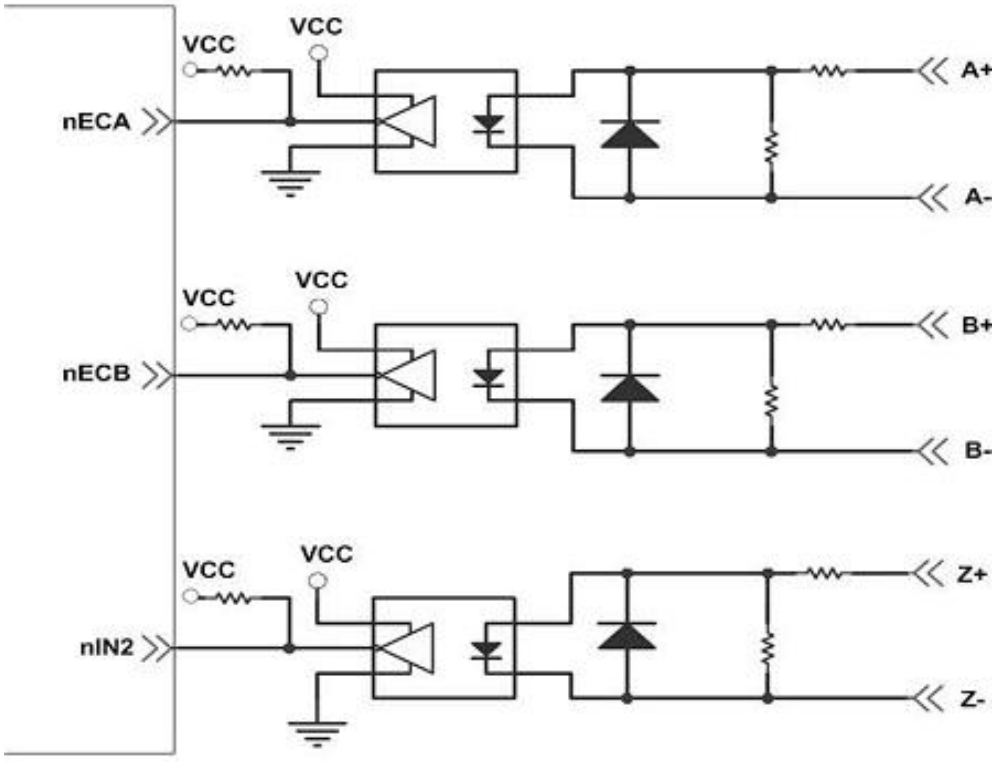


Fig. 2.13 Encoder 接線範例

2.3.5 外部輸入脈波接線(external pulse signal)

下圖是一個外部輸入脈波接線範例，經過高速光偶合 IC 就直接連到運動控制晶片。

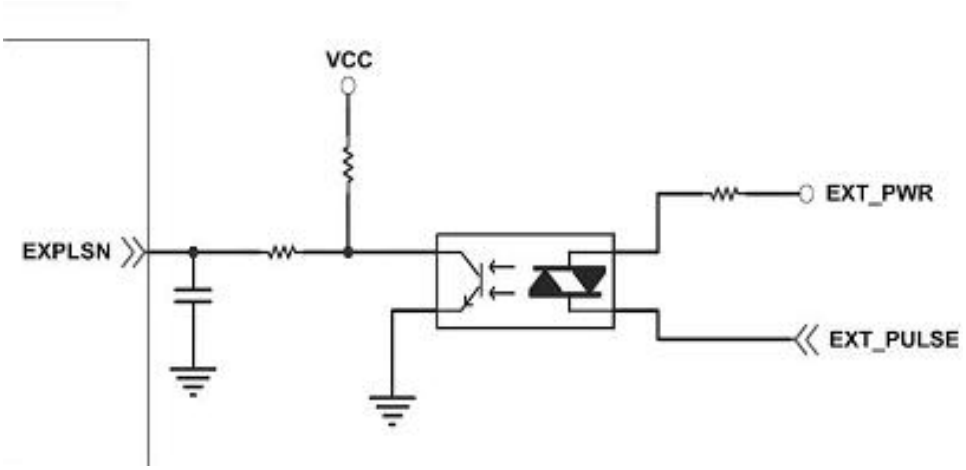


Fig. 2.14 外部輸入脈波接線範例

2.3.6 緊急停止輸入接線(emergency stop signal)

下圖是一個緊急停止輸入接線範例，當緊急停止輸入被按下時，所有軸會立即停止輸出，錯誤旗標將設為 1，這信號經過高速光偶合 IC 就直接連到運動控制晶片。

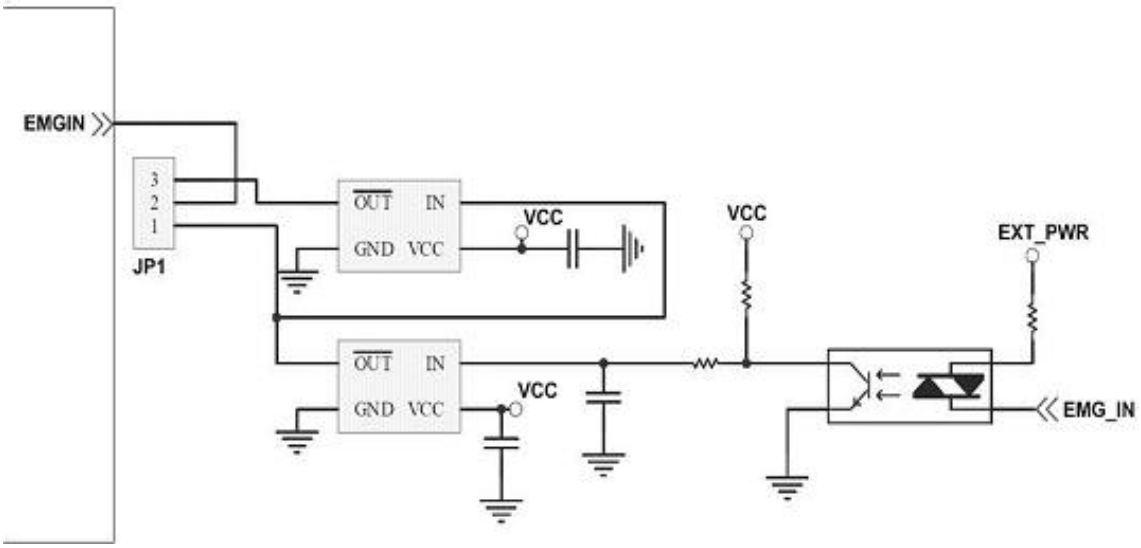


Fig. 2.15 緊急停止輸入接線範例

2.3.7 外部信號輸入接線(EXP+,EXP-)

本信號用於外部輸入驅動，下圖是外部信號 +/- 輸入接線範例，這輸入功能可用 5.1 章節中的固定脈波驅動、連續脈波驅動、手輪脈波驅動三個功能可以應用。

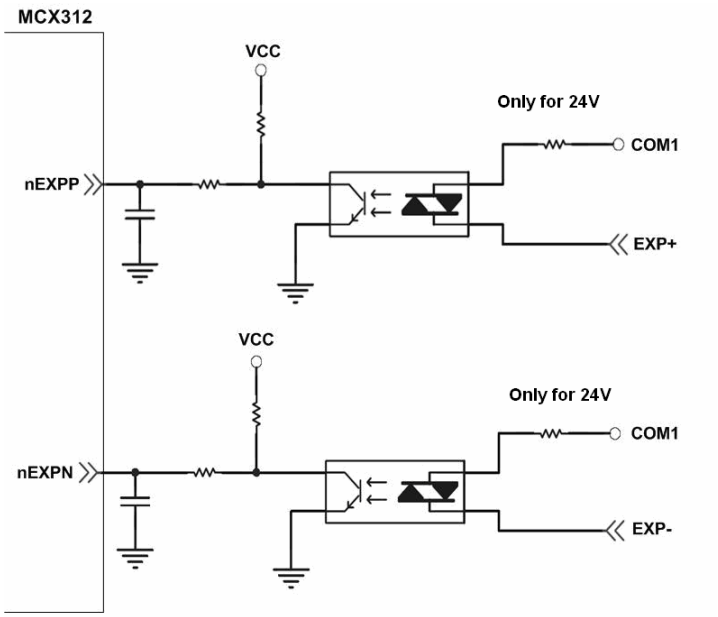


Fig. 2.16 外部信號 +/- 輸入接線範例

2.3.8 Servo On/Off信號輸出接線(ENABLE)

下圖是 Servo On/Off 信號輸出接線範例，這輸出功能用於使每軸伺服馬達伺服啟動/關閉。

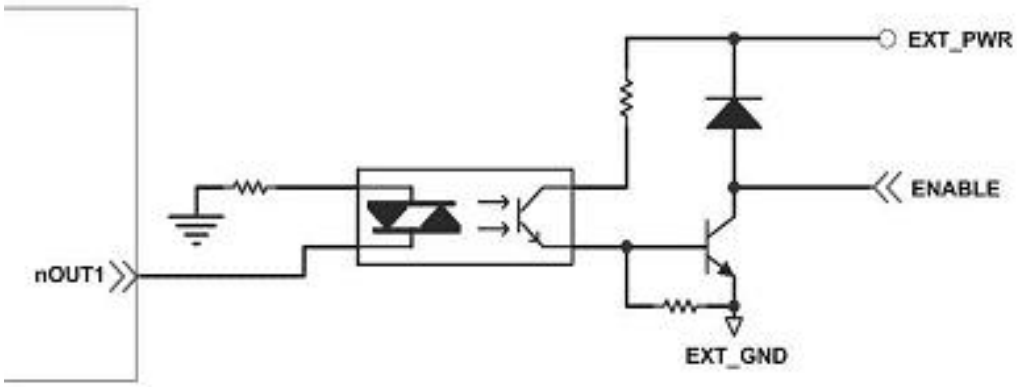


Fig. 2.17 Servo On/Off 信號輸出接線

2.4 接線範例

我們實際示範接 MITSUBISH MR-J2S AC 伺服馬達，連接到 DN-8237 的接線腳位圖

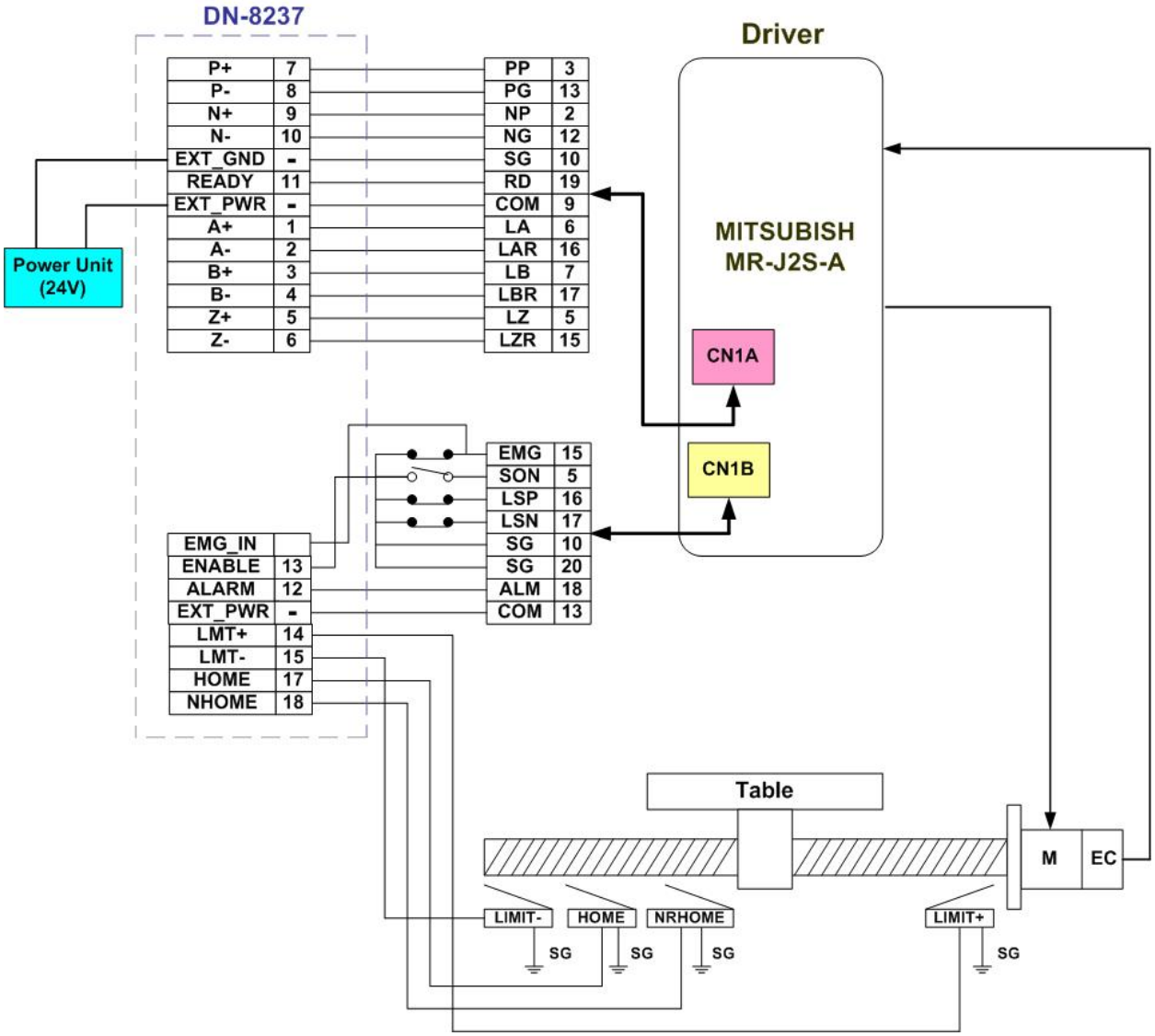
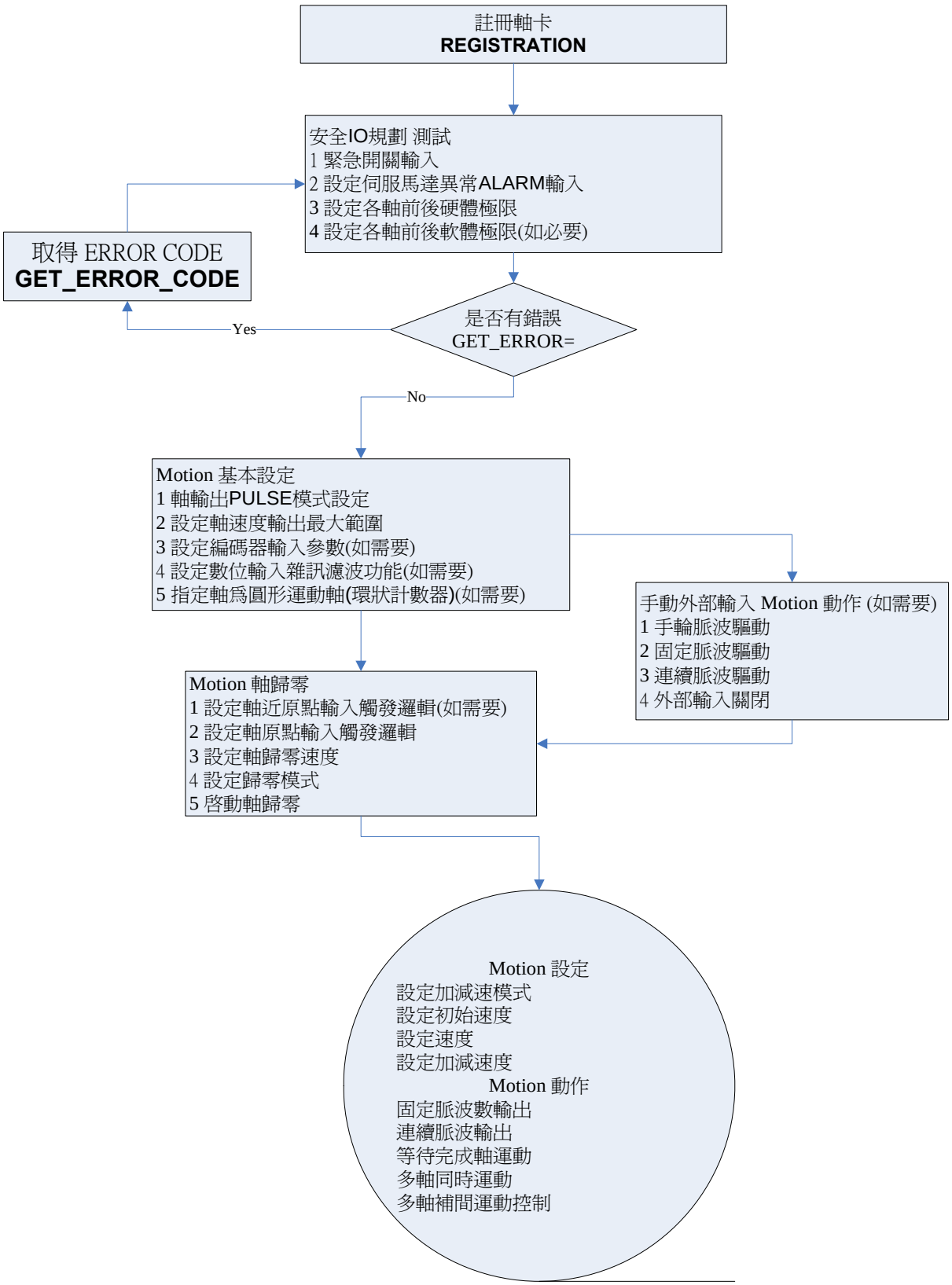


Fig. 2.18 MR-J2S AC 伺服馬達，連接到 DN-8237 的接線腳位圖

3 i-8092 軟體開發程序

3.1 軟體開發測試程序概觀

詳細請參考:demo_start 範例



3.1.1 註冊軸卡

每一軸卡要使用之前一定要先註冊，才能下其他指令，否則會產生錯誤。

i8092MF_REGISTRATION()詳情請參考 “i-8092 運動控制模組使用手冊 ” pdf

2.2。

3.2 安全IO規劃(會使Motion不動作原因)

3.2.1 緊急開關輸入

緊急開關，是為因應緊急狀況，讓使用者在緊急時可以立即使Motion 動作停止，以保護人機安全。
如果您不用緊急開關，在 1.2.3 的JP1接為2-3pin。
如果您要使用緊急開關，在 1.2.3 的JP1接為1-2pin，EMG_IN 請連到常閉型(N.C.)開關，並將開關安裝到適當位置。

3.2.2 設定伺服馬達異常ALARM輸入參數

是為因應伺服馬達ALARM發生時輸入，讓使用者可以判斷及處理，您可以選擇使用與否，與適當觸發邏輯。詳情請參考 “i-8092運動控制模組使用手冊 ” pdf 2.13
i8092MF_SET_ALARM()

3.2.3 設定各軸前後硬體極限

在一般機構設計時，為保護機構安全，會在機構的安全行程內設置前後硬體極限開關，讓使用者可以避免超出行程，如碰觸到前後硬體極限開關i-8092會自動停止，您可以選擇使用適當觸發邏輯。詳情請參考 “I8092運動控制模組使用手冊 ” pdf 2.6
i8092MF_SET_HLMT () 功能

3.2.4 設定各軸前後軟體極限

在一般機構設計時，為保護機構安全，會在機構的安全行程內設置前後硬體極限開關外，可以再加軟體極限，讓使用者可以提早避免超出行程，或免用硬體極限，如碰觸到前後軟體極限i-8092會自動停止，您可以選擇使用與否，與設定位置。詳情請參考 “I8092運動控制模組使用手冊 ” pdf 2.1.10
i8092MF_SET_SLMT ()，與i8092MF_CLEAR_SLMT() 功能

3.3 檢查是否有錯誤(GET_ERROR)

檢查是否有錯誤，如有再GET_ERROR_CODE 取得 ERROR_CODE並查相關原因，相關處理檢查，及正確設定詳情請參考 “i-8092運動控制模組使用手冊 ”pdf 3.6
也可以利用“I8092運動控制模組使用手冊 ”pdf 3.5 讀取目前DI狀態
i8092MF_GET_DI() 確認DI輸入是否正確

3.4 Motion 基本設定

Motion 基本設定主要是針對一般必要性設定分別如下:

1 軸輸出PULSE模式設定，Pulse/Dir、CW/CCW…

i8092MF_SET_PULSE_MODE() (詳情請參考 i-8092運動控制模組使用手冊 2.4)

2 設定軸速度輸出最大範圍，設定每一軸最高速度

i8092MF_SET_MAX_V ()(詳情請參考 i-8092運動控制模組使用手冊 2.5)

3 設定編碼器輸入參數(如需要)

i8092MF_SET_ENCODER()(詳情請參考 i-8092運動控制模組使用手冊 2.11)

4 設定數位輸入雜訊濾波功能(如需要)

i8092MF_SET_FILTER()(詳情請參考 i-8092運動控制模組使用手冊 2.15)

5 指定軸為圓形運動軸(環狀計數器)(如需要)

i8092MF_VRING_ENABLE()(詳情請參考 i-8092運動控制模組使用手冊 2.16)

3.5 Motion 動作測試(手動外部輸入)(如需要)

實際測試時可用手動驅動功能，做一些基本前後移動動作，確認DI信號是否正常，正負方向是否正確，以便做進一步線路及參數調整，主要有下列三種方法可以選其一運用:

1 手輪脈波驅動: 用A/B相手輪(手動脈波產生器，如附圖)做為前後之控制。

i8092MF_EXD_MP()(詳情請參考 i-8092運動控制模組使用手冊 2.18.1)

2 固定脈波驅動: 利用兩按鈕開關,可設定每按一下走幾步(Pulse),一按鈕控制Motion前進，另一按鈕控制後退。

i8092MF_EXD_FP()(詳情請參考 I8092運動控制模組使用手冊 2.18.2)

3 連續脈波驅動: 利用兩按鈕開關,可設定Pulse輸出速度(Hz)按下輸出，放開即停止，一按鈕控制Motion前進，另一按鈕控制後退。

i8092MF_EXD_CP ()(詳情請參考 I8092運動控制模組使用手冊 2.18.3)

4 外部輸入關閉: 使用完上述三項功能，必須用此指令，將它關閉。

i8092MF_EXD_DISABLE() (詳情請參考 I8092運動控制模組使用手冊 2.18.3)

3.6 軸歸零

i-8092 提供多種軟體歸零功能，只要經適當設定後，即可下指令自動執行，主要步驟如下:

- 以高速尋找近原點開關
- 以歸零速度尋找原點開關
- 以歸零速度尋找伺服馬達 Z 相信號

- 以高速運動到補正值(Offset)位置(程式原點)

3.6.1 軸歸零

1 設定軸近原點輸入觸發邏輯(如需要)

i8092MF_SET_NHOME() (詳情請參考 I8092_MANUAL-TC 2.8)

2 設定軸原點輸入觸發邏輯

i8092MF_SET_HOME_EDGE() (詳情請參考 I8092_MANUAL-TC 2.9)

3 軟體自動歸零功能

i8092MF_AUTO_HOME() (詳情請參考 I8092_MANUAL-TC 5.2)

4 軟體單步驟歸零功能

BYTE i8092MF_SEARCH_NHOME()

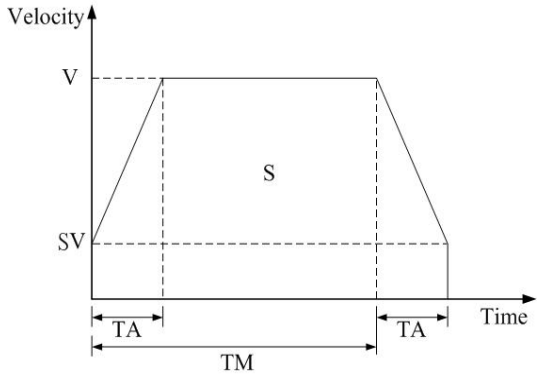
BYTE i8092MF_SEARCH_HOME()

BYTE i8092MF_SEARCH_ZPHASE()

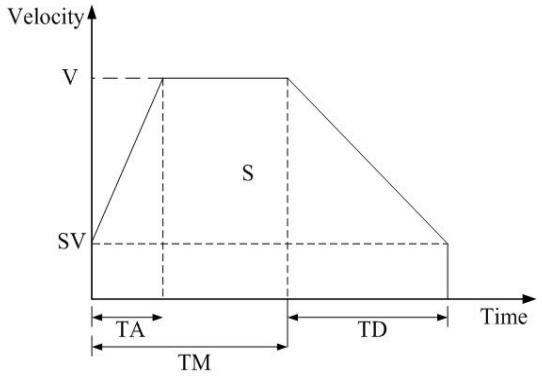
(詳情請參考 I8092_MANUAL-TC 5.3.1~5.3.3)

3.7 Motion 基本運作

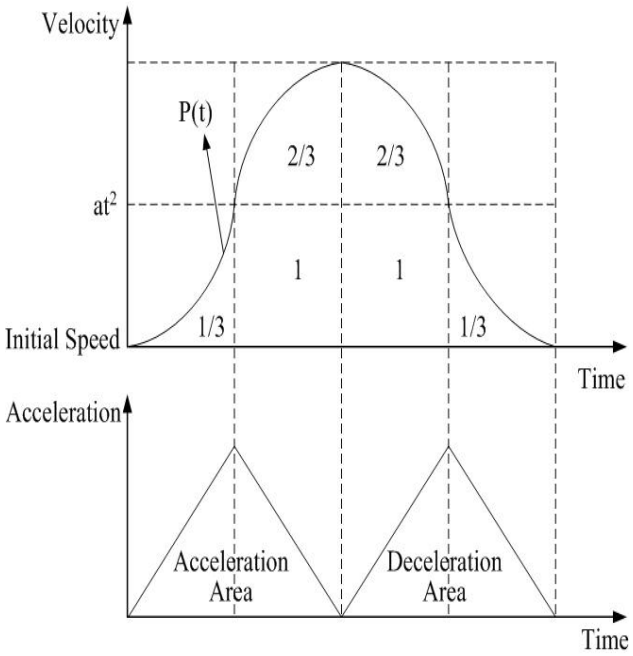
3.7.1 一般運動控制速度曲線分類



1 對稱 T 型運動控制速度曲線(如 SV 大於等於 V,將執行定速驅動)



2 非對稱 T 型運動控制速度曲線



3 對稱 S 型運動控制速度曲線

3.7.2 單軸Motion 基本設定

1 設定加減速模式: 有四種速度模式設定。

0 → 對稱 T 曲線 (SV、V、A、AO)

1 → 對稱 S 曲線 (SV、V、K、 AO)

2 → 非對稱 T 曲線 (SV、V、A、D、AO)

i8092MF_NORMAL_SPEED()(詳情請參考 i-8092運動控制模組使用手冊 6.1.1)

2 設定初始速度: 設定最低速度

i8092MF_SET_SV ()(詳情請參考 i-8092運動控制模組使用手冊 6.1.2)

3 設定速度: 指定運動速度

i8092MF_SET_V ()(詳情請參考 i-8092運動控制模組使用手冊 6.1.3)

4 設定加減速度: 指定運動時之加減速

i8092MF_ SET_A ()(詳情請參考 i-8092運動控制模組使用手冊 6.1.4)

i8092MF_ SET_D ()(詳情請參考 i-8092運動控制模組使用手冊 6.1.5)

3.7.3 單軸Motion 基本動作

1 固定脈波數輸出: 執行單軸固定步數輸出。

i8092MF_FIXED_MOVE()(詳情請參考 i-8092運動控制模組使用手冊 6.1.8)

2 連續脈波輸出: 執行單軸連續脈波輸出。

i8092MF_CONTIUNE_MOVE ()(詳情請參考i-8092運動控制模組使用手冊 6.1.9)

3 等待完成軸運動: 等待軸完成停止。

i8092MF_STOP_WAIT()(詳情請參考 i-8092 運動控制模組使用手冊 6.5.3)

3.7.4 兩軸補間(向量)Motion 基本設定

1 設定補間軸: 因只有兩軸已固定為 XY 免設定。

2 設定向量加減速模式: 設定向量加減速模式，共有如下7種模式

0 → 二軸(直線&弧&圓)固定向量速度 (VV)
1 → 二軸直線對稱 T 曲線 (VSV、VV、VA、VAO)
2 → 二軸直線對稱 S 曲線 (VSV、VV、VK、VAO)
3 → 二軸直線非對稱 T 曲線 (VSV、VV、VA、VD、VAO)
4 → N/A
5 → 二軸(弧&圓)對稱 T 曲線 (VSV、VV、VA、VAO)
6 → 二軸(弧&圓)非對稱 T 曲線 (VSV、VV、VA、VD、VAO)

i8092MF_VECTOR_SPEED()(詳情請參考 I8092運動控制模組使用手冊 6.2.2)

2 設定向量初始速度: 設定軸之向量初始速度。

i8092MF_SET_VSV()(詳情請參考 I8092運動控制模組使用手冊 6.2.3)

3 設定向量速度: 設定軸之向量定速度。

i8092MF_SET_VV()(詳情請參考 I8092運動控制模組使用手冊 6.2.4)

4 設定向量加減速度: 設定軸之向量加減速度。

i8092MF_SET_VA()(詳情請參考 I8092運動控制模組使用手冊 6.2.5)

i8092MF_SET_VD()(詳情請參考 I8092運動控制模組使用手冊 6.2.6)

3.7.5 多軸補間Motion 基本動作

1 二軸直線補間: 執行二軸直線補間。

i8092MF_LINE_2D()(詳情請參考 I8092 運動控制模組使用手冊 6.2.9)

2 二軸圓弧補間: 執行二軸圓弧補間。

i8092MF_ARC_CW ()(詳情請參考 I8092運動控制模組使用手冊 6.2.10)

i8092MF_ARC_CCW ()(詳情請參考 I8092運動控制模組使用手冊 6.2.10)

3 二軸圓補間: 執行二軸圓補間。

i8092MF_ CIRCLE _CW ()(詳情請參考 I8092運動控制模組使用手冊 6.2.11)

i8092MF_ CIRCLE _CCW ()(詳情請參考 I8092運動控制模組使用手冊 6.2.11)

3.8 Motion 進階運動

1 二軸矩形連續補間: 執行二軸矩形補間。

i8092MF_RECTANGLE()(詳情請參考 I8092 運動控制模組使用手冊 6.3.1)

2 二軸直線連續補間:

二軸直線連續補間初始設定(對稱 T 曲線加減速)。

i8092MF_LINE_2D_INITIAL()(詳情請參考 I8092 運動控制模組使用手冊 6.3.2)

執行二軸直線連續補間。

i8092MF_LINE_2D_CONTINUE()(詳情請參考 I8092 運動控制模組使用手冊 6.3.2)

3 其他補間: 多點連續補間,二軸比例運動, 二軸混合連續補間 (詳情請參考 I8092 運動控制模組使用手冊 6.3.3~6.3.5)

4 軟體快速上手

4.1 WinCon eVC++

4.1.1 確認相關檔案

請確認您有以下相關檔案:

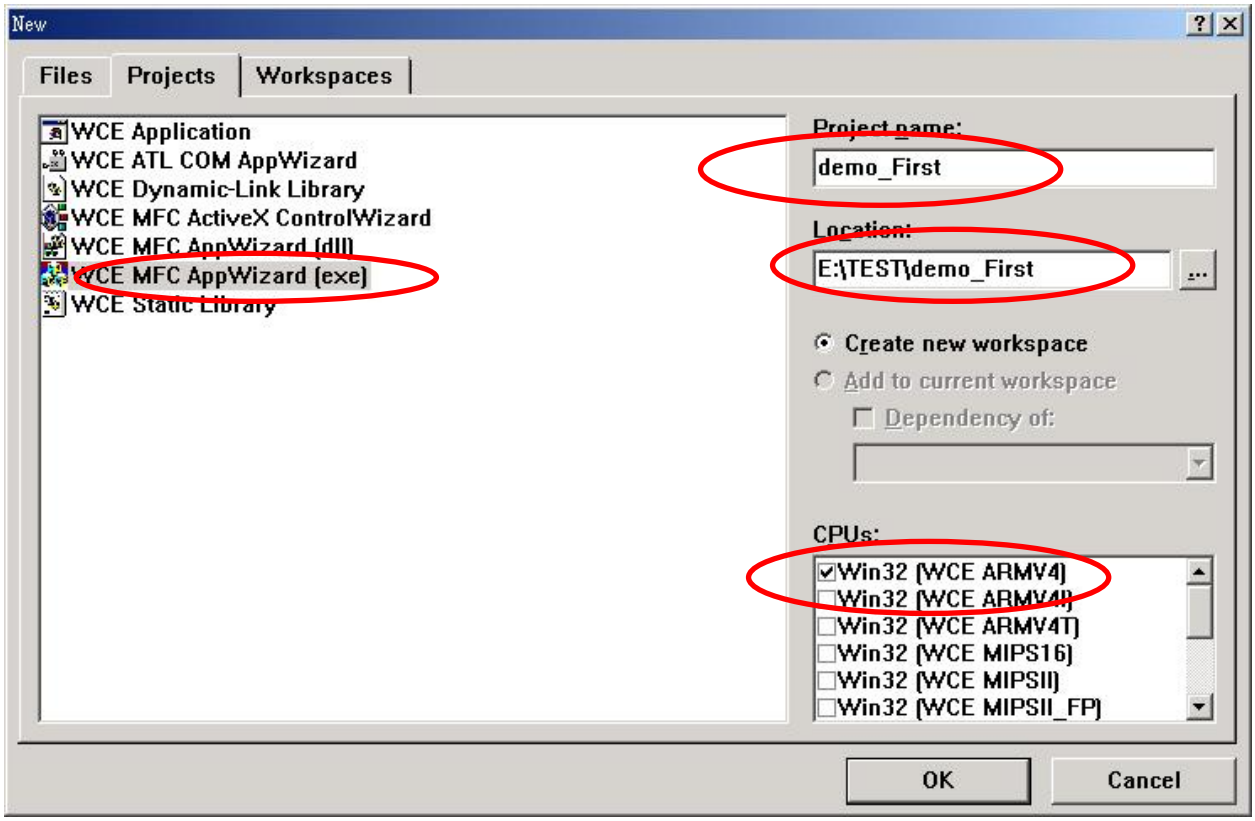
1. i8092.lib
2. i8092.dll
3. i8092.h

如您沒有,請找 CD 或到我們的網站下載最新版本資料

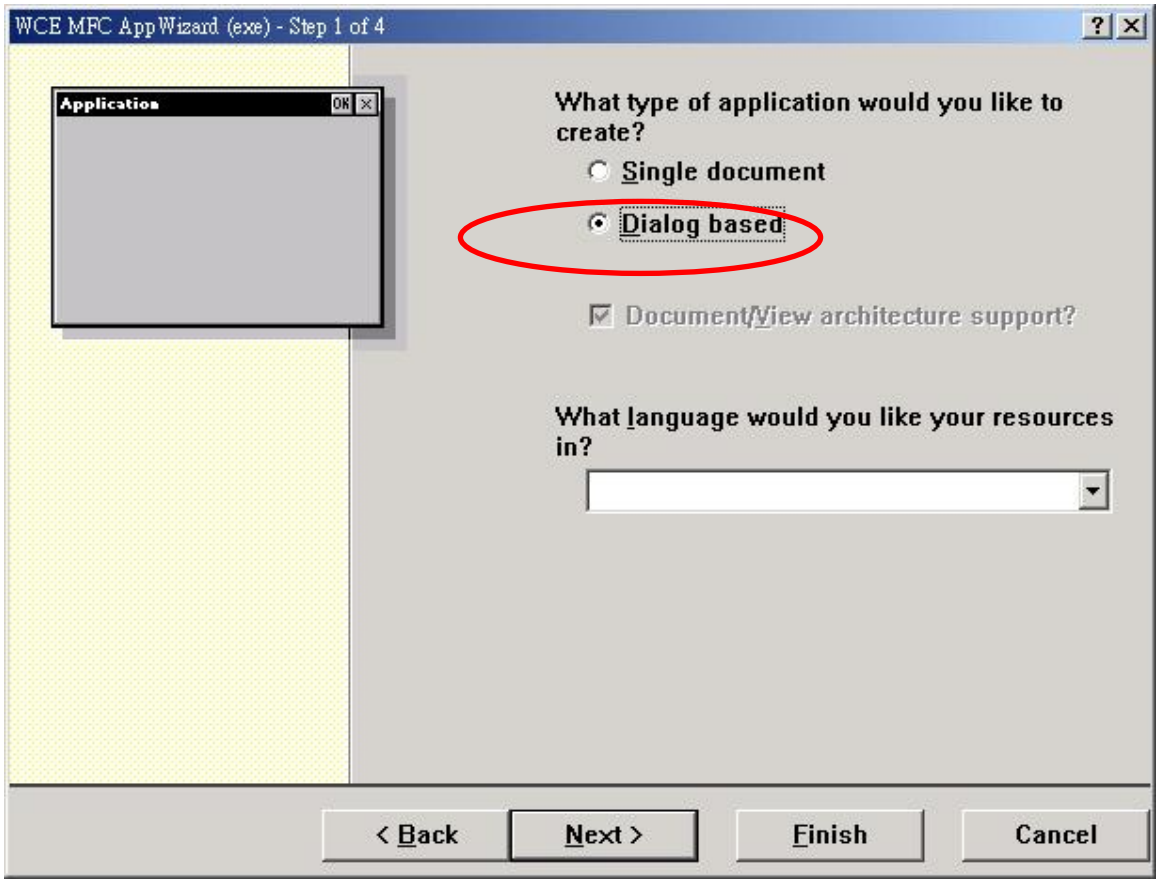
http://www.icpdas.com/download/download-list.htm

4.1.2 新增一eVC++應用程式專案

請開啟 eVC++ 4.0 軟體。然後，請按滑鼠鍵“File” -> “New”來開啟新程式。在“Projects“ 標籤，選擇 “WCE MFC AppWizard (exe)” 並且設定專案名稱為 ”Demo_First”並在“Location”填入它的檔案路徑。然後，在中央處理器列表框中選擇 “Win 32[WCE ARMV4]“ ，如果必要的話也一起勾選其他的選項。最後按滑鼠鍵 ” OK” 。



選擇 Dialog based 按 “NEXT”



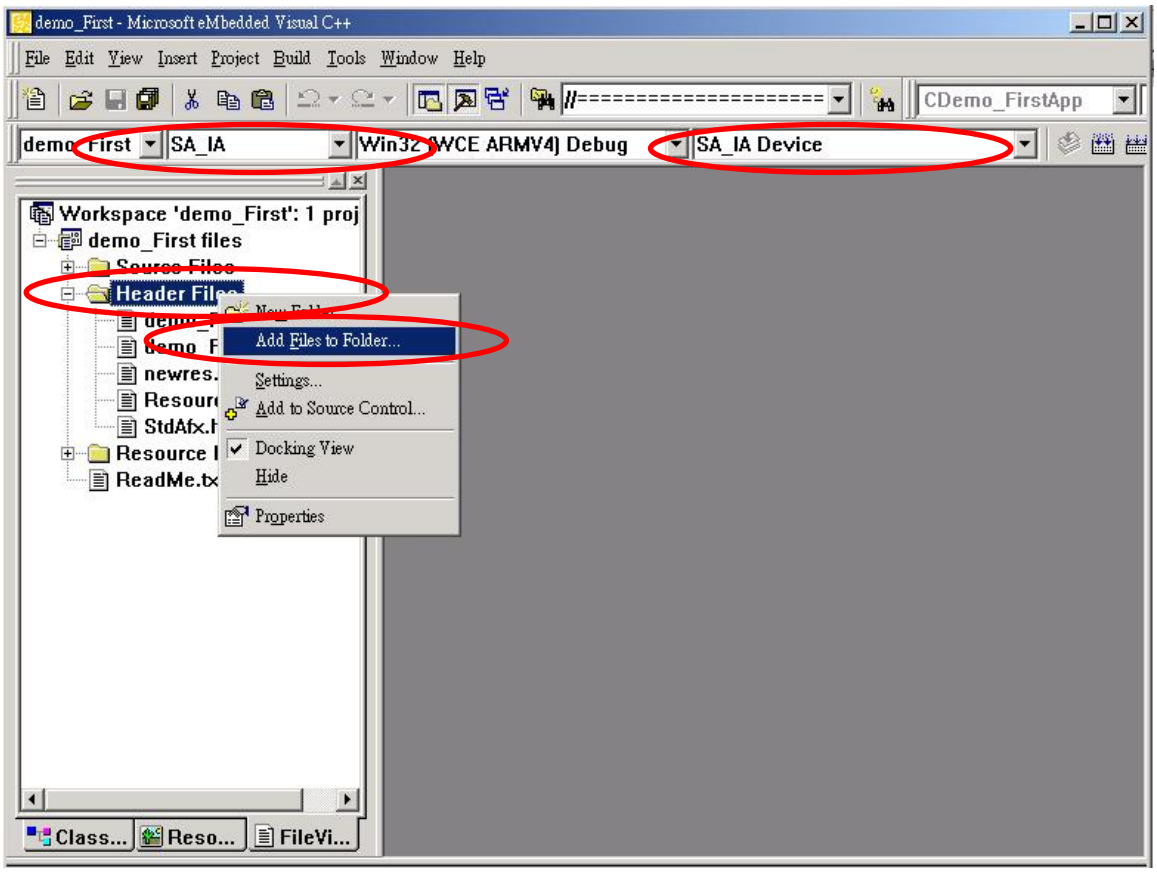
再按 “Finish”

即完成開一新專案

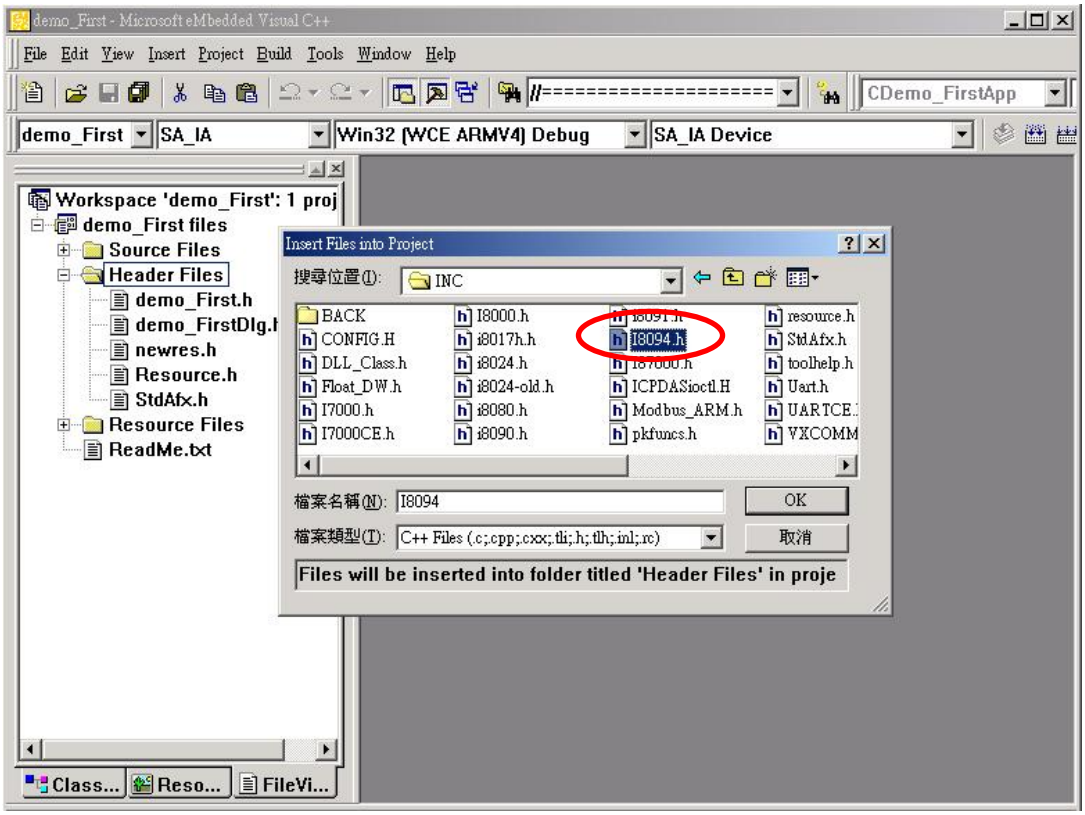
4.1.3 在eVC++專案中加入I8092.h

在專案的 WorkSpace 中加入 i8092.h 如下:

在 Header Files 按滑鼠右鍵，選 Add Files to Folder….



出現選檔對話框，找到並選擇 I8092.h 檔並按 OK



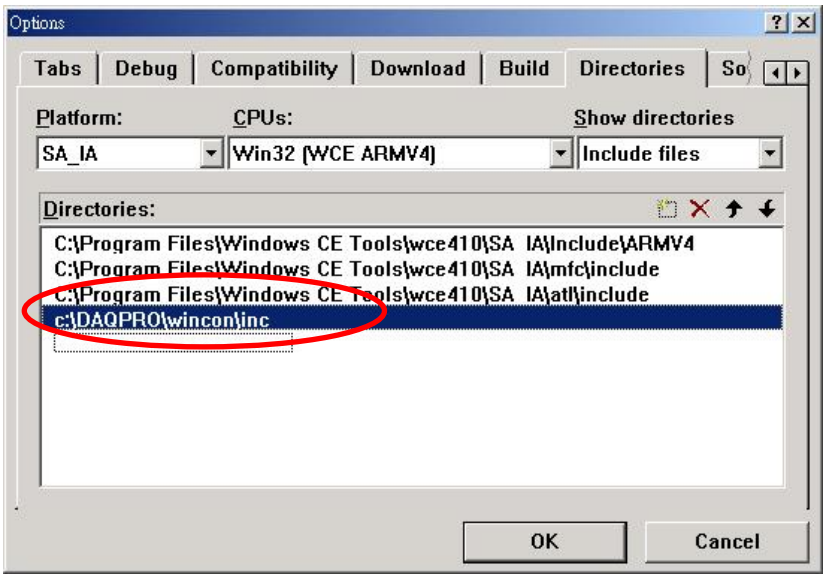
4.1.4 在eVC++ 專案中加入參考路徑

A. 在“Tools”工能表中開啟“Options”對話框。

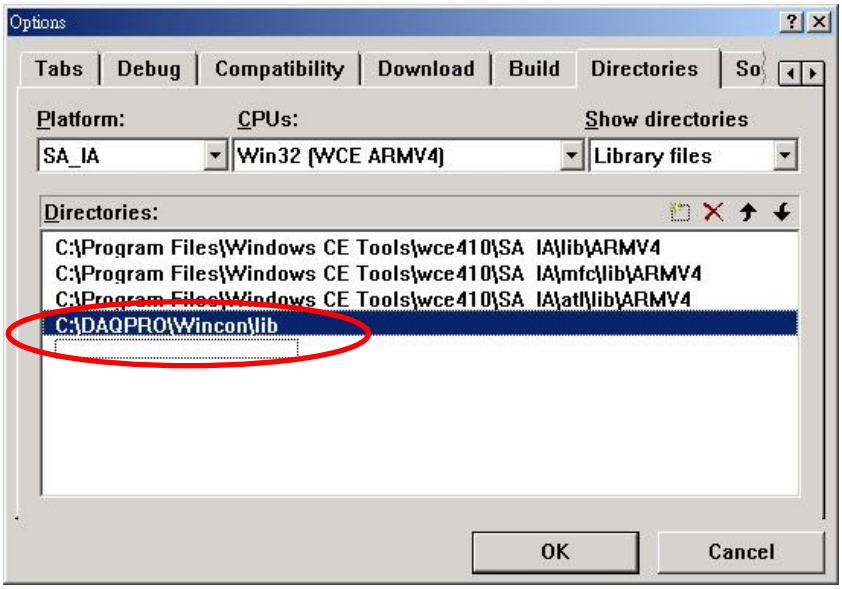
B. 選“D irectories“ 標籤，在 “Platform” 項目選擇 “SA_IA”， 在 “CPUs”項目選擇“Win32 [WCE ARMV4]”和在“include files”項目選擇“Show directories“。

C. 增加含括檔的路徑，在 “Directories” 下方空行處 (指出附近空的長方形)雙擊-按滑鼠鍵，如顯示在下列的圖片；請輸入包括用戶安裝驅動程式的檔案路徑。

D. 再來，於“Show directories”項目中選擇“Library files”。

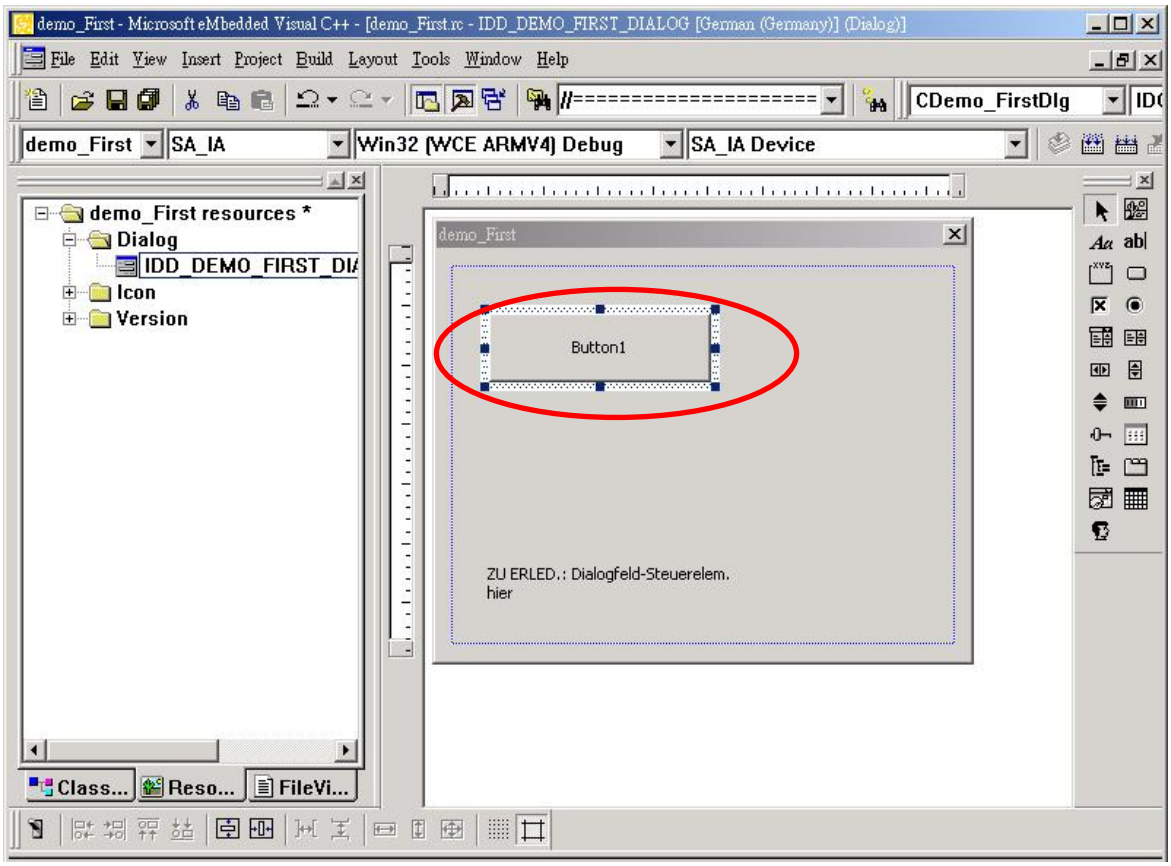


E. 增加程式庫的檔案路徑，在“Directories”下方空行處 (指出附近空的長方形) 雙擊-按滑鼠鍵，輸入包括含有用戶安裝程式庫的檔案路徑，如下圖。

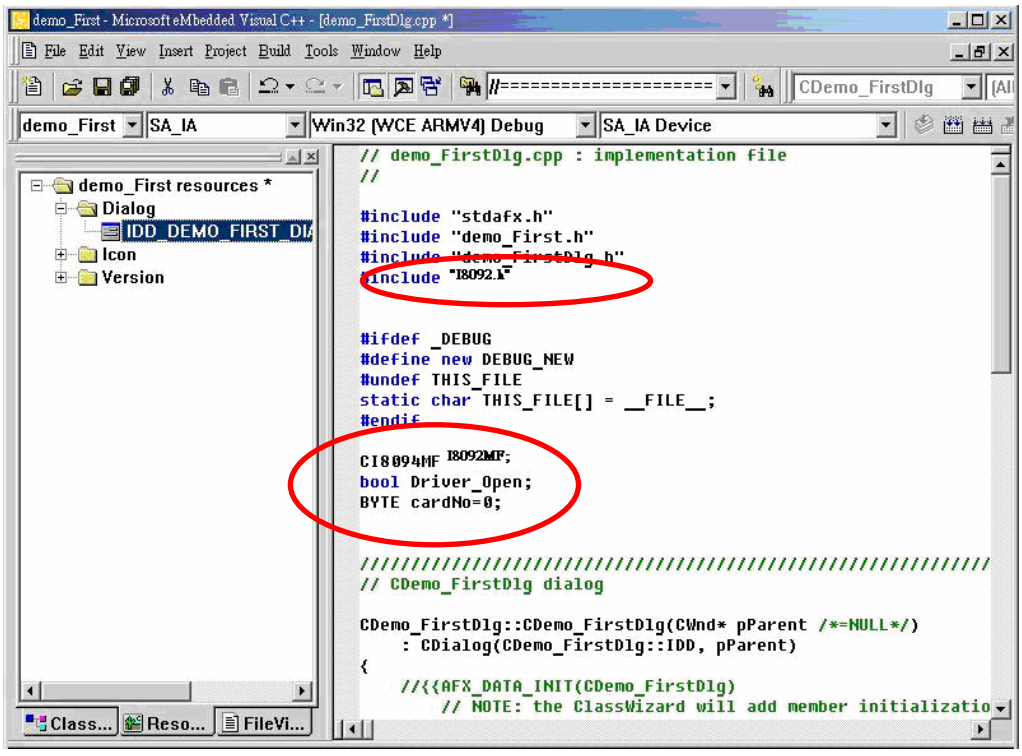


4.1.5 在eVC++ 專案中開始應用

在 Dialog 中加入一 BUTTON 如下圖:

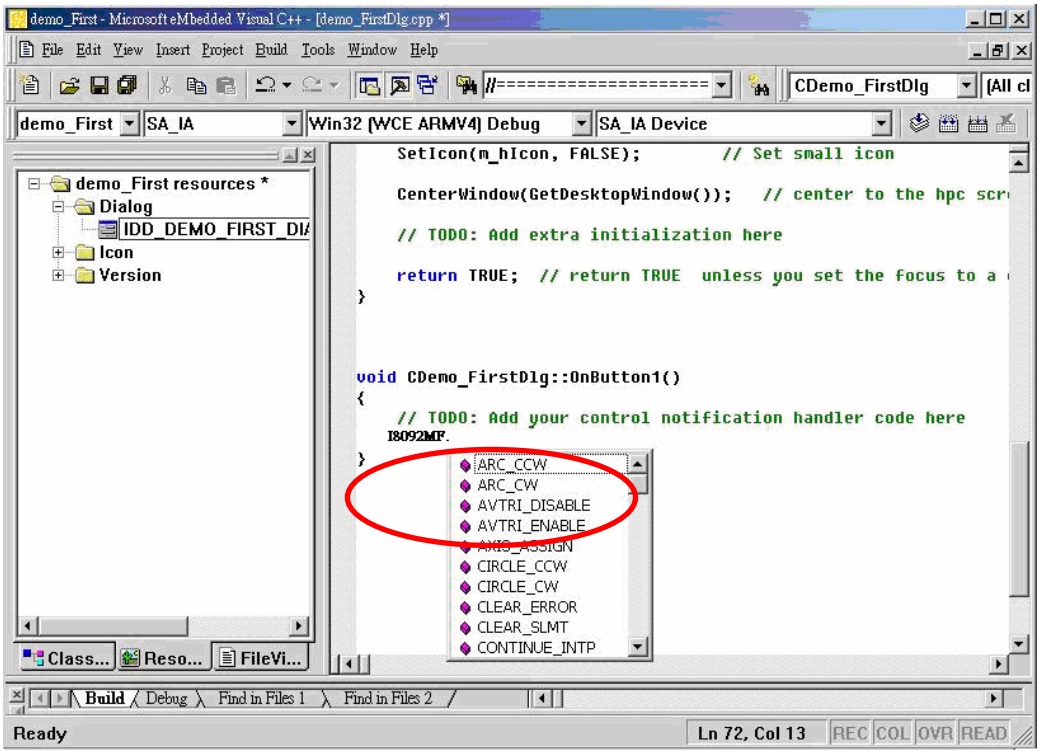


在 BUTTON 快按兩下，並產生一副程式，並在檔案起始位置加入”#include “i8092.h”
“WinConSDK.h”及宣告 CI8092MF I8092MF; bool Driver_Open;
BYTE cardNo=0;變數，如下圖:



由於我們有另建一類別(Class) CI8092MF(For 巨集指令)，方便導引程式設計，使用者也可以直接使用手冊指令。在 BUTTON 快按兩下，並產生一副程式中，鍵入”I8092MF.”

及會出現引導視窗，協助您選用相關指令.



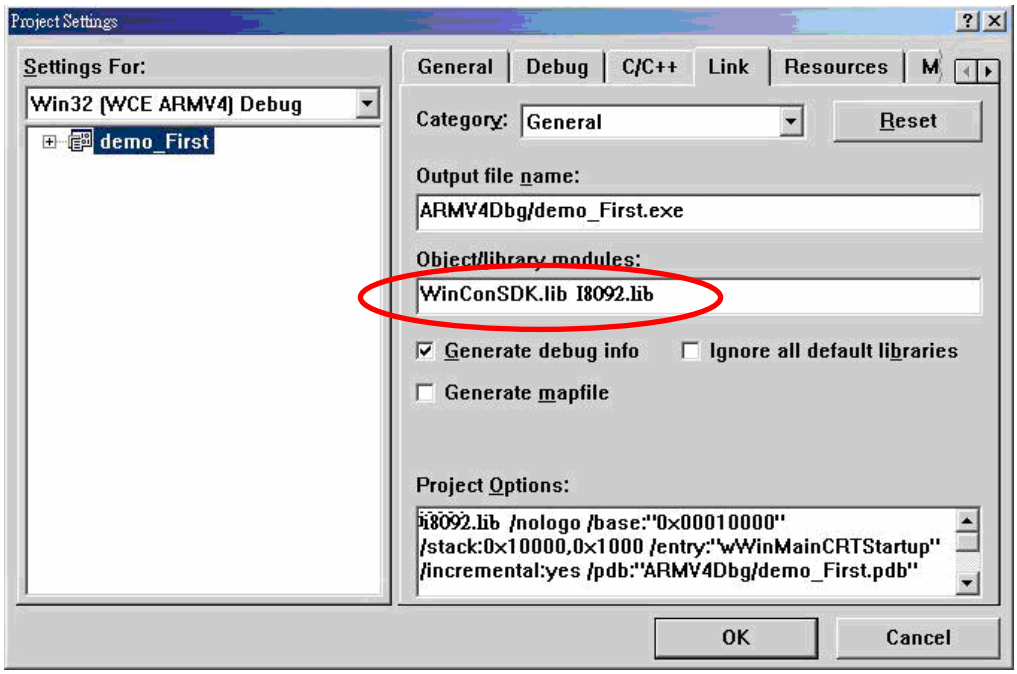
請選 “i8092MF.REGISTRATION”與輸入”(cardNo,3); “ 表示插在第 3 Slot 的 i8092 註冊為第 0 卡，輸入詳細程式如下:

```
//====='Step 1 Driver init
if   (!Driver_Open)
{
      I8092MF.REGISTRATION(cardNo,3);
      Driver_Open = true;
}
//====='Step 2 CONFIG IO
I8092MF.RESET_CARD (cardNo);
I8092MF.SET_PULSE_MODE (cardNo, AXIS_XY, 2);  //set the pulse output mode
I8092MF.SET_ALARM (cardNo, AXIS_XY, 0, 0);        //disable the SERVO ALARM Input
I8092MF.SET_ENCODER (cardNo, AXIS_XY, 0, 0, 0); //set the encoder input type
I8092MF.SET_MAX_V (cardNo, AXIS_XY, 16000);          //set the max speed for XYZU
I8092MF.EXD_DISABLE (cardNo, AXIS_XY);                //set the external input Off
I8092MF.SET_LP (cardNo, AXIS_XY, 0);                  //set the Logic position =0
I8092MF.SET_EP (cardNo, AXIS_XY, 0);                  //set the Encoger position =0
I8092MF.SET_A (cardNo, AXIS_XY, 1000);                //set the Acc =1000
I8092MF.SERVO_ON (cardNo, AXIS_XY);                   //set the Servo_ON to servo motors
//======'Step 3 Check ERROR
WORD KK=0;
KK= I8092MF.GET_ERROR(cardNo);
```

```
CString MSGG;
if (KK != YES)
{
    //No ERROR: Step 4 Move X axis
    BYTE axis=AXIS_X;   //for AXIS_X it can be to AXIS_XY
    I8092MF.SET_MAX_V(cardNo, axis, 20000);
    I8092MF.NORMAL_SPEED(cardNo, axis, 0);          //set axis as Symmetrical T curve mode
    I8092MF.SET_V(cardNo, axis, 20000);             //set v=10000 PPS
    I8092MF.SET_A(cardNo, axis, 100000);            //set acc=100000 PPS/S
    I8092MF.SET_SV(cardNo, axis, 10);               //set start speed=1000 PPS
    I8092MF.SET_AO(cardNo, axis, 0);                //set offset pulse (at SV speed)= 0 PS
    I8092MF.FIXED_MOVE(cardNo, axis, 10000);        //run the fixed 10000 Pulse move.
    while (I8092MF.STOP_WAIT(cardNo, axis) == NO)
    {
        DoEvents();
        Sleep(1);
        //wait for axis to stop
    }
    long AA= I8092MF.GET_LP(cardNo,axis);      //Get X Now position
}
else
{
    //Please check the ERROR CODE
    //Get X ERROR CODE
    KK= I8092MF.GET_ERROR_CODE(cardNo, AXIS_X);
    //Get Y ERROR CODE
    KK= I8092MF.GET_ERROR_CODE(cardNo, AXIS_Y);
    //====================================
}
```

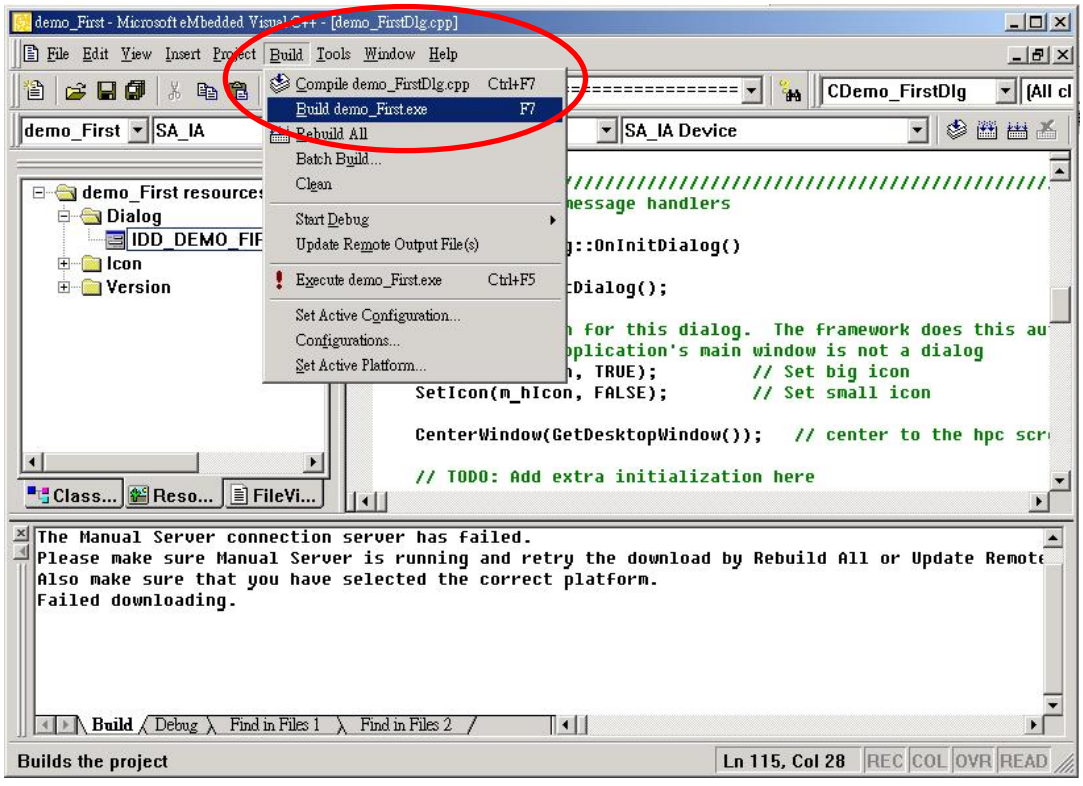
詳細請參考: demo_First 範例

完成後，請在功能表中選 “Project”->”Setting”出現如下對話框，選”Link”頁籤，並在 Object/library modules:輸入 WinConSDK.lib i8092.lib(如下圖)，並按 OK



4.1.6 編譯專案成可執行檔

請在功能表中選 “Build”->”Build All”如沒問題話，即完成這簡單的程式



4.1.7 下載與執行

請將執行檔”i8092Demo.exe” 與動態連結檔 “i8092.dll” 複製到 WinCon 同一目錄中(可用 eVC++ Online Download，或 FTP ，或 USB 行動碟) ，並用執行即可。

4.2 WinCon Microsoft Visual Studio .NET 2003(VB.NET，C#)

因 **Microsoft Visual Studio .NET 2003** 開發環境相似，因此我們以 **VB.NET** 作示範

4.2.1 確認相關檔案

請確認您有以下相關檔案:

i8092.dll

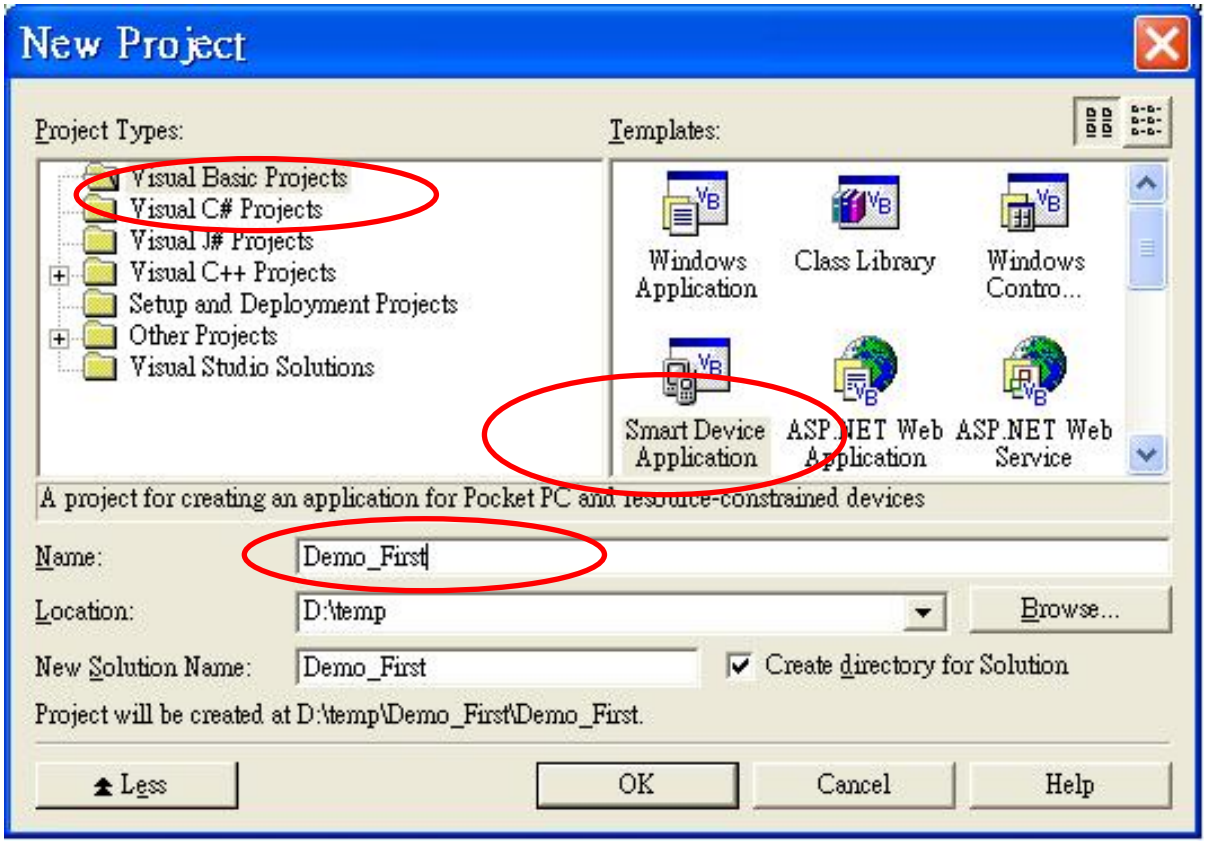
i8092_NET.dll

如您沒有,請找 **CD** 或到我們的網站下載最新版本資料

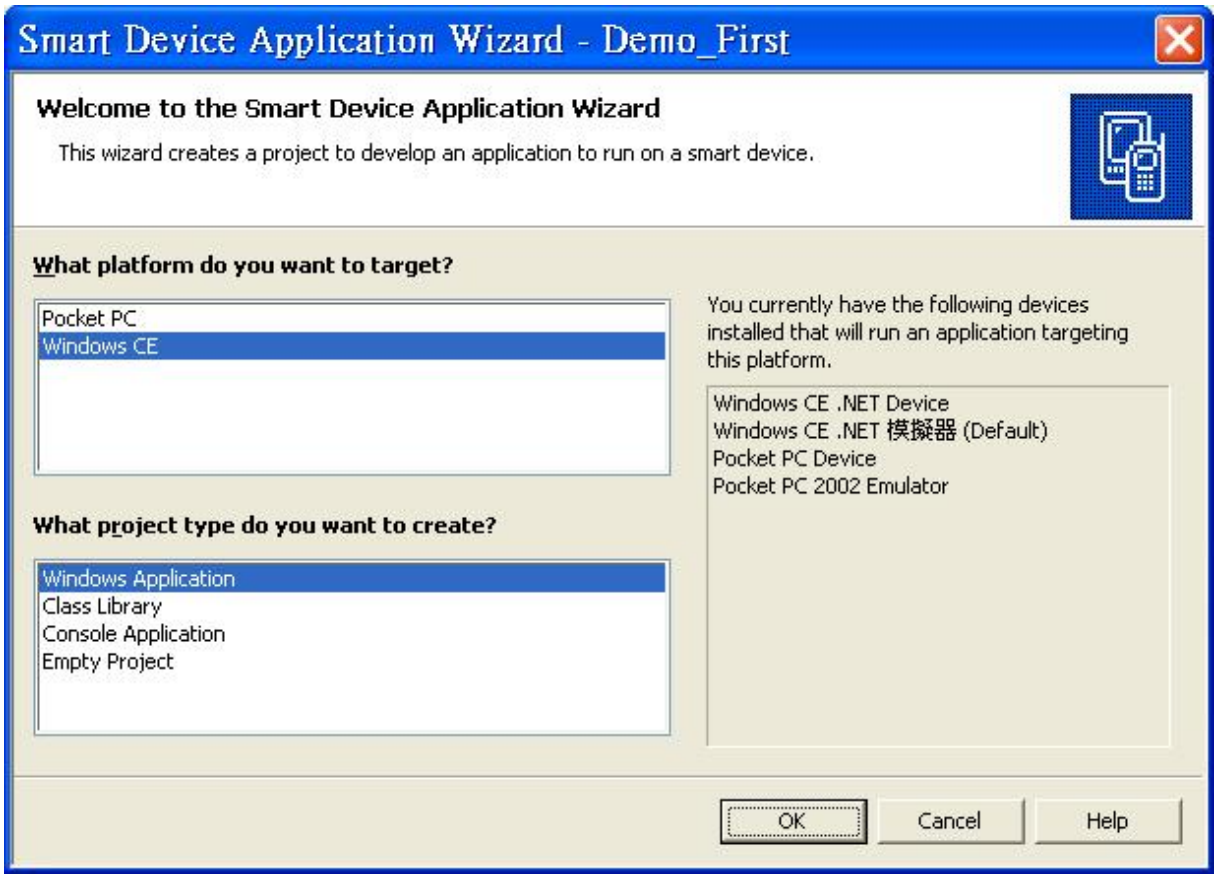
http://www.icpdas.com/download/download-list.htm

4.2.2 開一新專案

請啟動 **Microsoft Visual Studio .NET 2003** ，並新增一 **VB** 專案並選 "智慧型裝置" 如下圖選項:



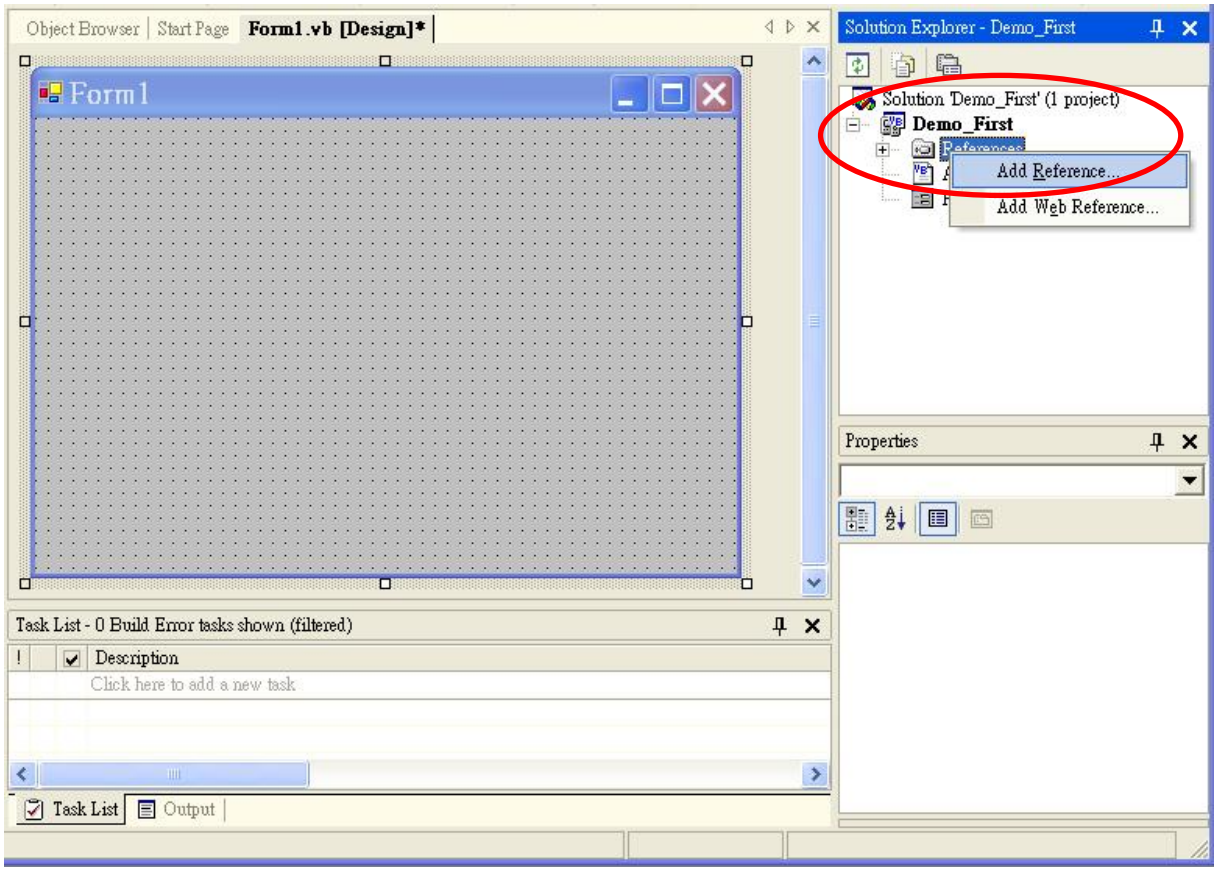
選 "確定" 後



再選 **WinDows CE** 及 **Windows Application**，再選 ”確定”

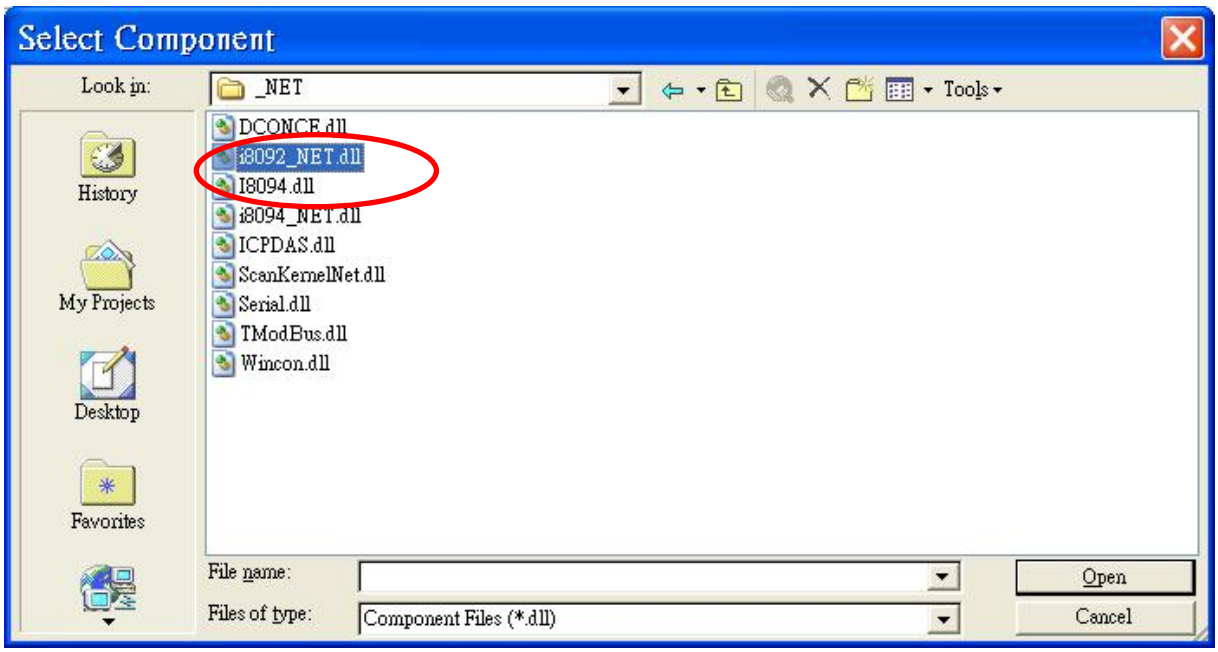
4.2.3 在專案中加入參考DLL

在方案總管中之參考上按滑鼠右鍵=>add Reference

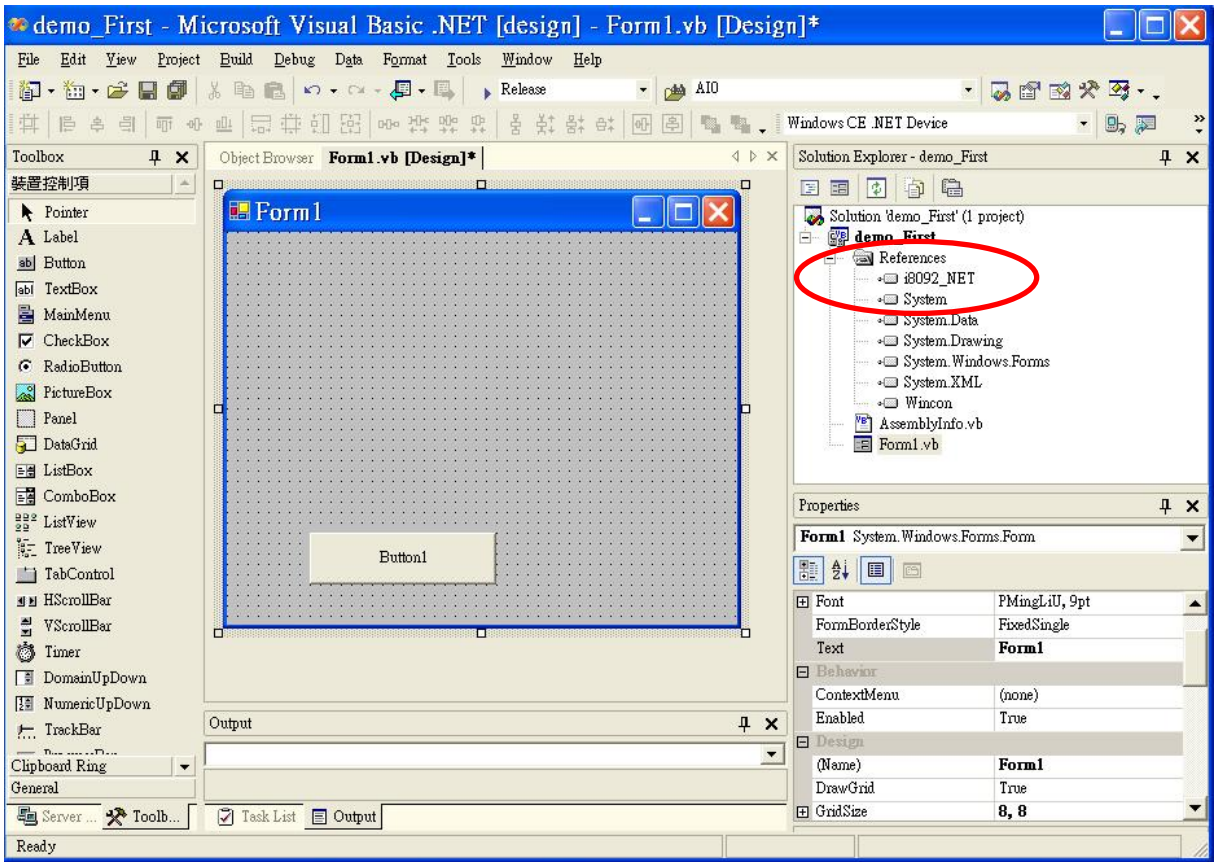


=>選擇 Browse

選擇 i8902 _NET.DLL

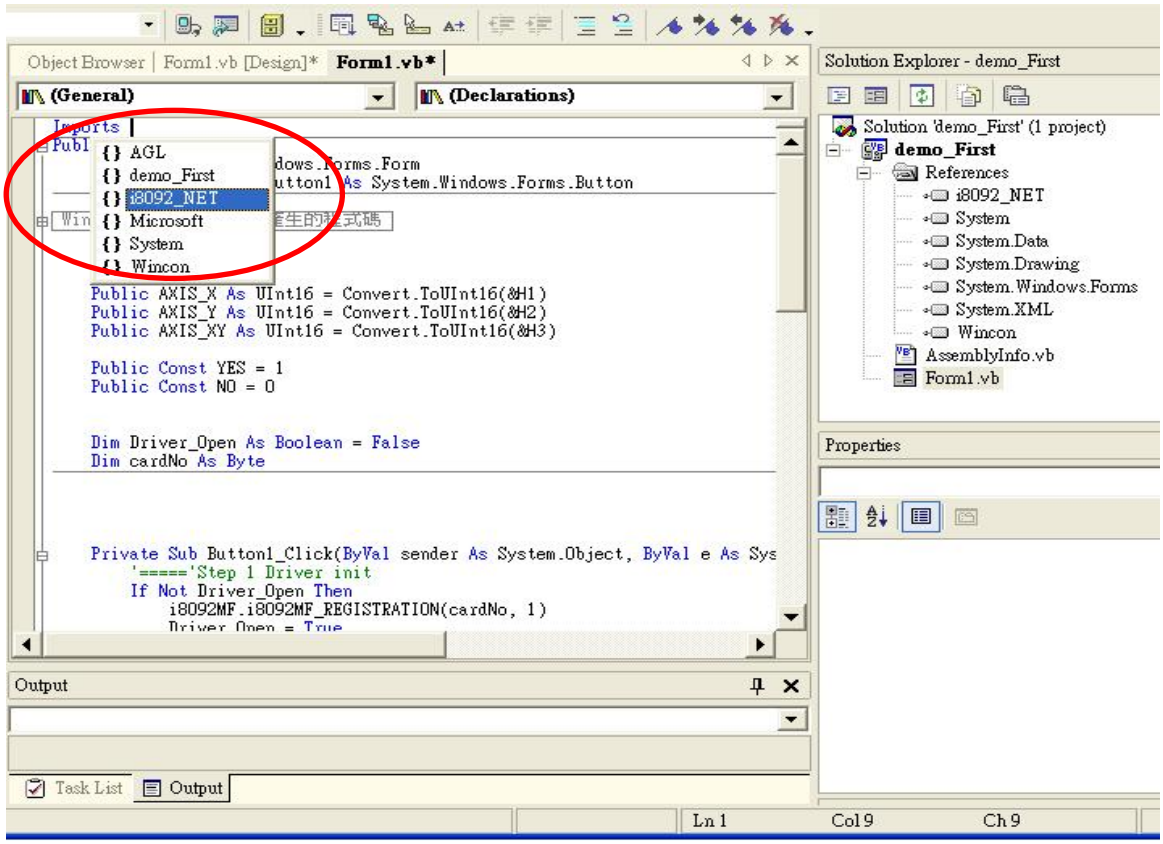


選擇 “Open” 如下圖:

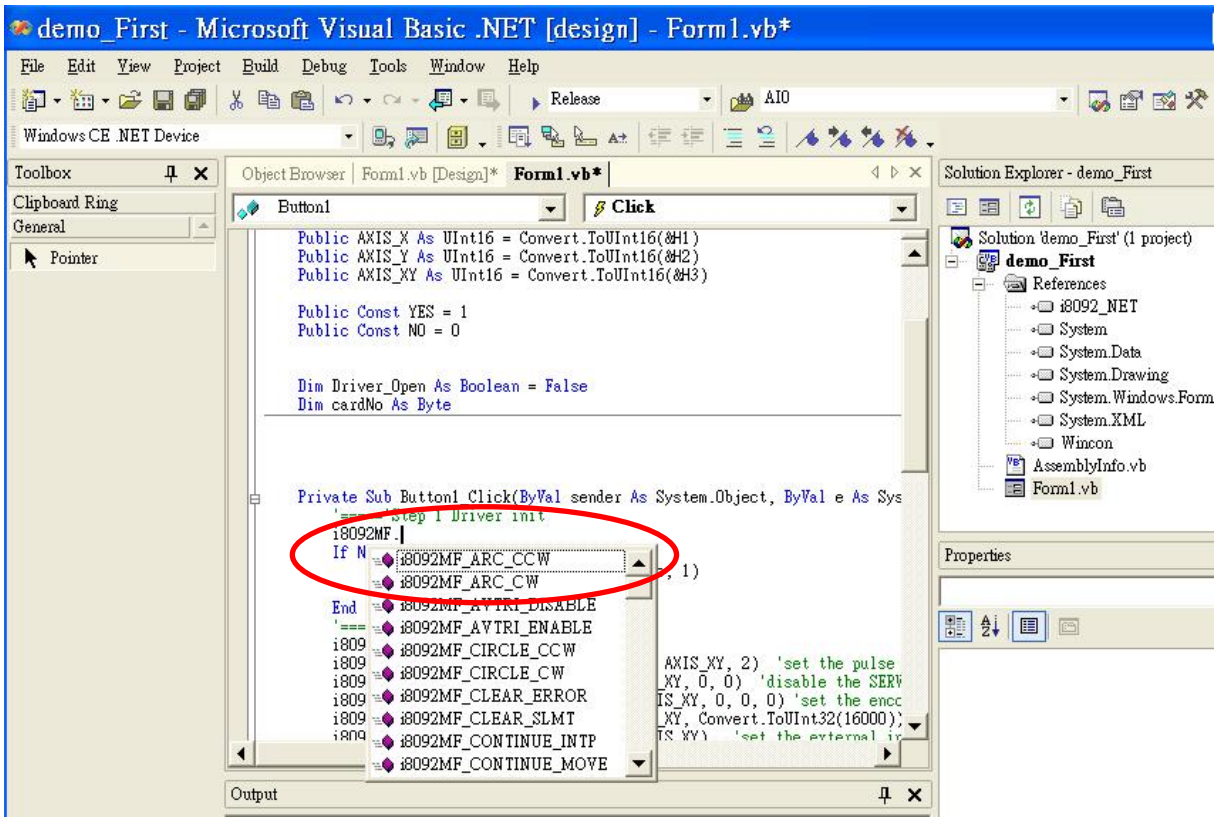


4.2.4 開始程式撰寫

在 Form1 中加入一 ”BUTTON” 物件，並雙擊 BUTTON，出現 Form1.vb 程式碼，並在最前面加入 “imports i8092_NET” 如下圖:



在 **Button1_Click** 中加入輸入程式 **“i8092MF.”**及會出現下拉式功能表，可以引導進行程式設計，



例如:程式輸入為➔ I8092MF.i8092MF_REGISTRATION(1, 3)

輸入詳細程式如下:

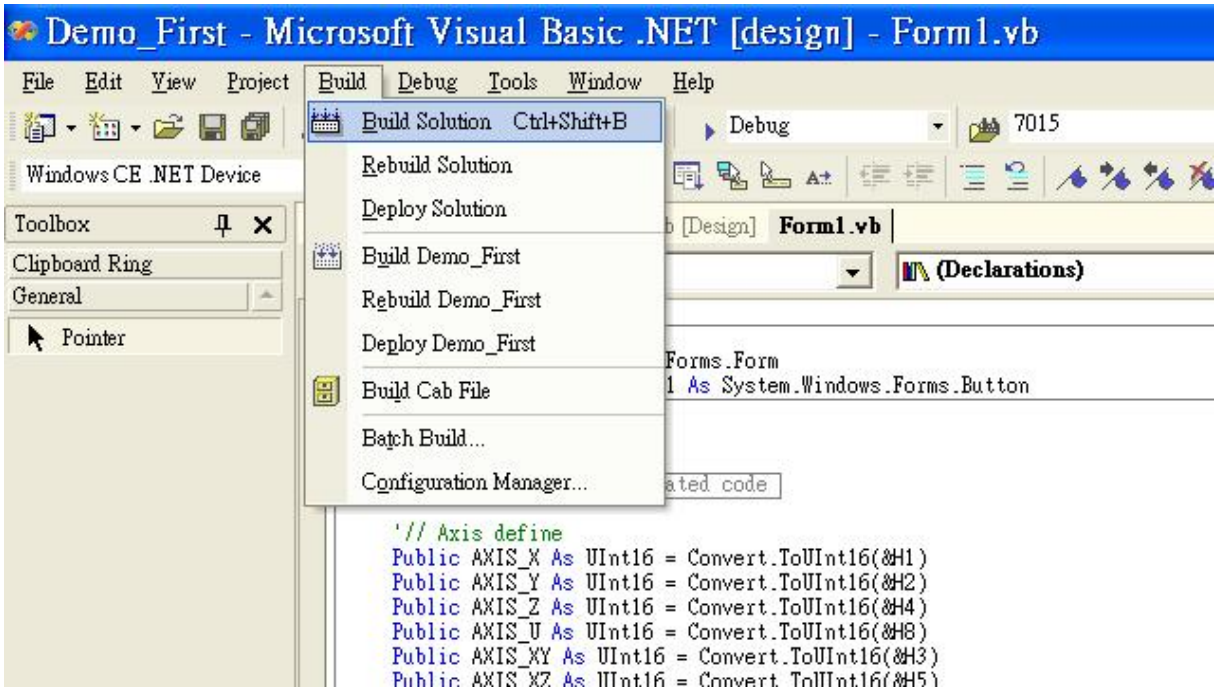
```
'=====Step 1 Driver init
        i8092MF.
        If Not Driver_Open Then
            i8092MF.i8092MF_REGISTRATION(cardNo, 1)
            Driver_Open = True
        End If
        '=====Step 2 CONFIG IO
        i8092MF.i8092MF_RESET_CARD(cardNo)
        i8092MF.i8092MF_SET_PULSE_MODE(cardNo, AXIS_XY, 2)   'set the pulse output mode
        i8092MF.i8092MF_SET_ALARM(cardNo, AXIS_XY, 0, 0)   'disable the SERVO ALARM Input
        i8092MF.i8092MF_SET_ENCODER(cardNo, AXIS_XY, 0, 0, 0) 'set the encoder input type
        i8092MF.i8092MF_SET_MAX_V(cardNo, AXIS_XY, Convert.ToUInt32(16000))   'set the max speed for XY
        i8092MF.i8092MF_EXD_DISABLE(cardNo, AXIS_XY)    'set the external input Off
        i8092MF.i8092MF_SET_LP(cardNo, AXIS_XY, 0)       'set the Logic position =0
        i8092MF.i8092MF_SET_EP(cardNo, AXIS_XY, 0)       'set the Encoger position =0
        i8092MF.i8092MF_SET_A(cardNo, AXIS_XY, Convert.ToUInt32(1000))    'set the Acc =1000
        i8092MF.i8092MF_SERVO_ON(cardNo, AXIS_XY)      'set the Servo_ON to servo motors
        '======Step 3 Check ERROR
        Dim KK As Long = 0
        KK = i8092MF.i8092MF_GET_ERROR(cardNo)
        Dim MSGG As String
        If (KK <> YES) Then
            'No ERROR: Step 4 Move X axis
            Dim axis As UInt16 = AXIS_X 'for AXIS_X it can be to AXIS_XY
            i8092MF.i8092MF_SET_MAX_V(cardNo, axis, Convert.ToUInt32(20000))
            i8092MF.i8092MF_NORMAL_SPEED(cardNo, axis, Convert.ToUInt16(0))   'set axis as Symmetrical T curve
mode
            i8092MF.i8092MF_SET_V(cardNo, axis, Convert.ToUInt32(20000))   'set v=10000 PPS
            i8092MF.i8092MF_SET_A(cardNo, axis, Convert.ToUInt32(100000))   'set acc=100000 PPS/S
            i8092MF.i8092MF_SET_SV(cardNo, axis, Convert.ToUInt32(10))    'set start speed=1000 PPS
            i8092MF.i8092MF_SET_AO(cardNo, axis, 0)    'set offset pulse (at SV speed)= 0 PS
            i8092MF.i8092MF_FIXED_MOVE(cardNo, axis, 10000) 'run the fixed 10000 Pulse move.
            Do While (i8092MF.i8092MF_STOP_WAIT(cardNo, axis) = NO)
                i8092MF.system.DoEvents()
                System.Threading.Thread.Sleep(1)
                'wait for axis to stop
            Loop
            Dim AA As Long = i8092MF.i8092MF_GET_LP(cardNo, axis)    'Get X Now position
        Else
```

```
        'Please check the ERROR CODE
        'Get X ERROR CODE
        KK = Convert.ToInt32(i8092MF.i8092MF_GET_ERROR_CODE(cardNo, AXIS_X))
        'Get Y ERROR CODE
        KK = Convert.ToInt32(i8092MF.i8092MF_GET_ERROR_CODE(cardNo, AXIS_Y))
        '====================================
    End If
```

詳細請參考: **demo_First** 範例

4.2.5 建置專案

在功能表上選擇“建置”➔”建置專案”如沒問題即可產生執行檔



4.2.6 下載與執行

請將執行檔”Demo_First.exe” 與動態連結檔 “I8092.dll” “I8092_NET.dll”複製到

WinCon 同一目錄中(可用 VS.NET Online Download，或 FTP ，或 USB 行動碟) ，執行即可。

4.3 I-8000 Turbo C

4.3.1 確認相關檔案

請確認您有以下相關檔案:

I8092.lib

I8092.h

I8000.lib

I8000.h

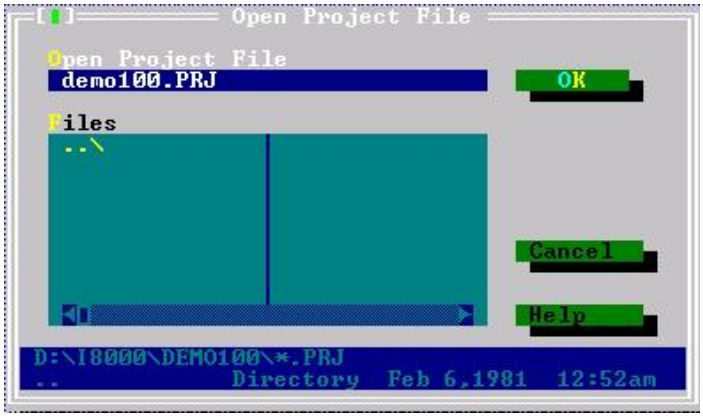
如您沒有,請找 CD 或到我們的網站下載最新版本資料

http://www.icpdas.com/download/download-list.htm

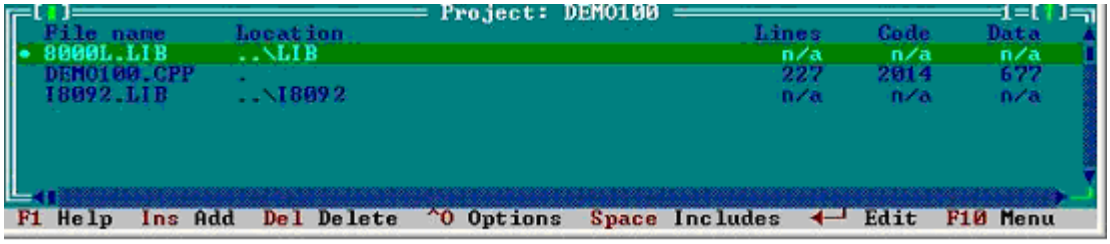
4.3.2 使用TC ++ 來編譯程式的方式如下：

4.3.3 開一新專案

1. 在 demo100 這個目錄下執行 TC.EXE，建一個新的 Project，demo100.prj

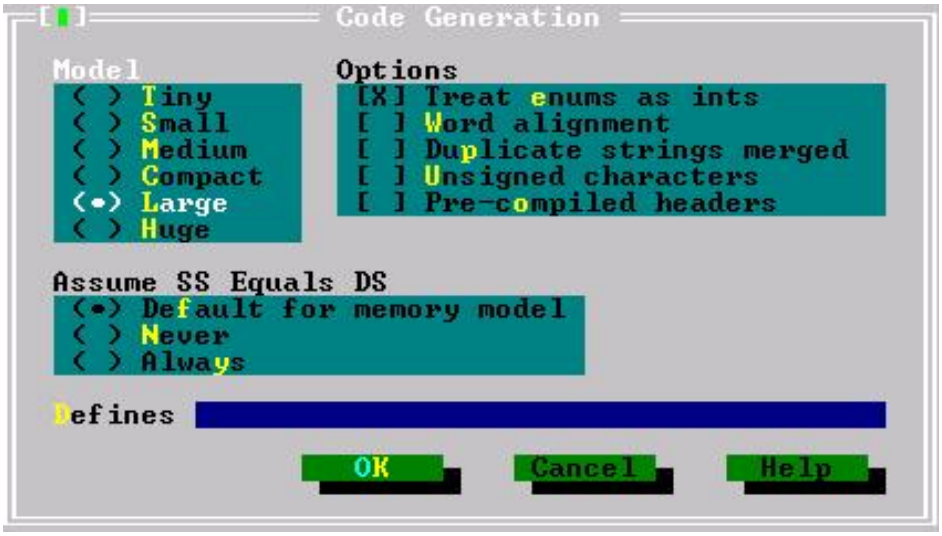


2. 加入 project 的內容：demo100.cpp 及 ..\lib\8000l.lib，I8092.lib

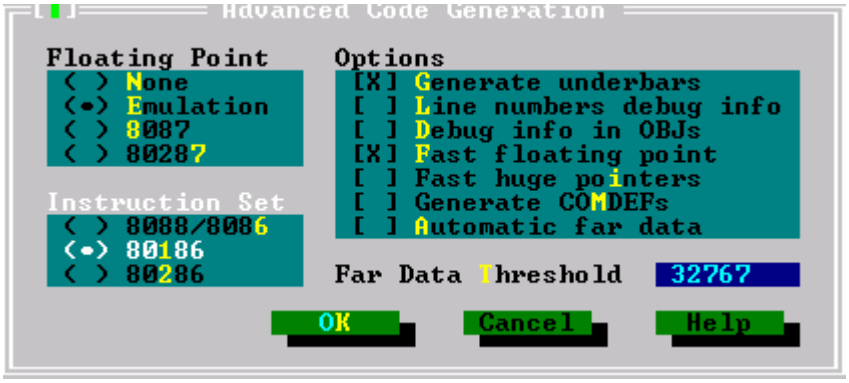


3. 設定有關的選項 (option)。

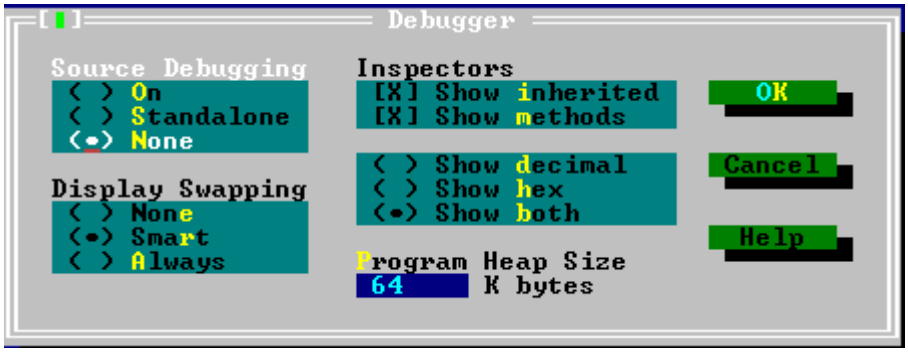
- Compiler -> Code Generation 的選項如下：



- Compiler -> Advance Code Generation 的選項如下：



- **Debugger 的設定如下，把 Source debugging 關掉。**



4.3.4 撰寫程式

1. 在 demo100.cpp 檔頭加入參考宣告:

```
#include <dos.h>
#include <math.h>
#include "8000.h"

#include "I8092.h"
```

2. 在主程式中加入相關程式(請參考demo100.cpp):

```
BYTE cardNo;
long   x_value, y_value;
//---------------------------------------------------------------
void main ()
{
    //=================== I-8000 ===================
```

```
    //Set (slot0~slot7) = cardNO (1~8)。
    BYTE slot;
    int Found = 0;
    for (slot = 0; slot < 8; slot++)
    {
        cardNo = slot + 1;
        if (i8092MF_REGISTRATION(cardNo, slot) == YES)
        {
            //Found Axis Card。
            i8092MF_RESET_CARD(cardNo);
            Found++;
        }
    }
    if (Found == 0)
    {
        //Not Found。
        Print("I-8092 card not found ! \r\n");
        return;
    }

    cardNo = 1;
    i8092MF_SET_PULSE_MODE(cardNo, AXIS_XY, 2);
    i8092MF_SET_ALARM(cardNo, AXIS_XY, 1, 1);
    i8092MF_SET_ENCODER(cardNo, AXIS_XY, 0, 0, 0);
    i8092MF_SET_MAX_V(cardNo, AXIS_XY, 16000);

    //=========================================================================
==
    BYTE ret1 = 0;
    BYTE chkey;
    DWORD sv;     //PPS
    DWORD v;      //PPS
    DWORD a;      //PPS/s
    i8092MF_SERVO_ON(cardNo, AXIS_XY);
    do
    {
        Print(" (0:Exit, 3:RATIO, 4:FRnet output, 5:FRnet input) \r\n");
        Print(" (6:Reset Encoder, 7:Stop, 8:Clear Error) \r\n");
        Print(" (X:Jog X, Y:Jog Y, S:Stop Jog) \r\n");
```

```
Print("\n");
Print("----------------------LOGIC AND REAL POSITION COUNTER----------------------\n");
x_value = i8092MF_GET_LP(cardNo, AXIS_X);
y_value = i8092MF_GET_LP(cardNo, AXIS_Y);
Print("LOGIC POSITION: x=%10ld,    y= %10ld \r\n", x_value, y_value);
x_value = i8092MF_GET_EP(cardNo, AXIS_X);
y_value = i8092MF_GET_EP(cardNo, AXIS_Y);
Print("REAL POSITION:    x=%10ld,    y= %10ld \r\n", x_value, y_value);

while (!Kbhit());
chkey=Getch();
Print("%s\r\n",&chkey);
switch (chkey)
{
      case '0':
                        i8092MF_RESET_CARD(cardNo);
                        Print("EXIT! \r\n");
                        return;
      //-------------------------------------------------------------

      //-------------------------------------------------------------
      case '3':
                        sv=300;//PPS。
                        v=30000;//PPS。
                        a=500000;//PPS/s。
                        int loop1;
                        int loop2;
                        float ratio;
                        i8092MF_SET_MAX_V(cardNo, AXIS_XY,160000L);
                        Print("RATIO_2D ratio ? \r\n");
                        Scanf("%f", &ratio);
                        Print("ratio= %f \r\n",ratio);
                        i8092MF_RATIO_INITIAL(cardNo, sv, v, a, ratio);
                        for (loop2 = 0; loop2 < 5; loop2++)
                        {
                              for (loop1 = 0; loop1 < 5; loop1++)
                              {
                                    i8092MF_RATIO_2D(cardNo, 0, 3600, 0);
                                    i8092MF_RATIO_2D(cardNo, 0, 3600, 1);
```

```
                }
                i8092MF_RATIO_2D(cardNo, 0, 7200, 0);
                i8092MF_RATIO_2D(cardNo, 0, 3600, 1);
            }
            i8092MF_RATIO_2D(cardNo, 1, 7200, 1);
            Delay(3000);
            Print("RATIO_2D OK ! \r\n");
            break;
//-------------------------------------------------------------
case '4':
            WORD wSA;
            WORD data;
            Print("FRnet wSA ? \r\n");
            Scanf("%d", &wSA);
            Print("FRnet 16 bits data ? \r\n");
            Scanf("%d", &data);
            i8092MF_FRNET_SA(cardNo, wSA, data);
            break;
//-------------------------------------------------------------
case '5':
            WORD wRA;
            Print("FRnet wRA ? \r\n");
            Scanf("%d", &wRA);
            long data1 = i8092MF_FRNET_RA(cardNo, wRA);
            Print("FRnet 16 bits data = %10ld \r\n", data1);
            break;
//-------------------------------------------------------------
case '6':
            i8092MF_SET_LP(cardNo, AXIS_XY, 0);
            i8092MF_SET_EP(cardNo, AXIS_XY, 0);
            Print("RESET Encoder ! \r\n");
            break;
//-------------------------------------------------------------
case '7':
            i8092MF_STOP_SLOWLY(cardNo, AXIS_XY);
            Print("STOP! \r\n");
            break;
//-------------------------------------------------------------
case '8':
```

```
                    i8092MF_CLEAR_ERROR(cardNo);
                    Print("CLEAR ERROR ! \r\n");
                    break;
            //-------------------------------------------------------------
            case 88:
            case 120:
                    BYTE m_Axis=AXIS_X;
                    i8092MF_SET_MAX_V(cardNo, m_Axis, 32000);
                    i8092MF_NORMAL_SPEED(cardNo, m_Axis, 0);    //set axis as
Symmetrical T curve mode
                    i8092MF_SET_A(cardNo, m_Axis, 50000);       //set Acc
=50000 PPS/S
                    i8092MF_SET_V(cardNo, m_Axis, 50000);
                    i8092MF_EXD_MP(cardNo, AXIS_X, 100);
                    i8092MF_EXD_DISABLE(cardNo, AXIS_Y);

                    break;
            //-------------------------------------------------------------
            case 89:
            case 121:
                    m_Axis=AXIS_Y;
                    i8092MF_SET_MAX_V(cardNo, m_Axis, 32000);
                    i8092MF_NORMAL_SPEED(cardNo, m_Axis, 0);    //set axis as
Symmetrical T curve mode
                    i8092MF_SET_A(cardNo, m_Axis, 50000);       //set Acc
=50000 PPS/S
                    i8092MF_SET_V(cardNo, m_Axis, 100000);
                    i8092MF_EXD_MP(cardNo, AXIS_Y, 100);
                    i8092MF_EXD_DISABLE(cardNo, AXIS_X);
                    break;
            //-------------------------------------------------------------
            case 90:
            case 115:
                    i8092MF_EXD_DISABLE(cardNo, AXIS_X);
                    i8092MF_EXD_DISABLE(cardNo, AXIS_Y);

                    break;
            //-------------------------------------------------------------
            default:
```

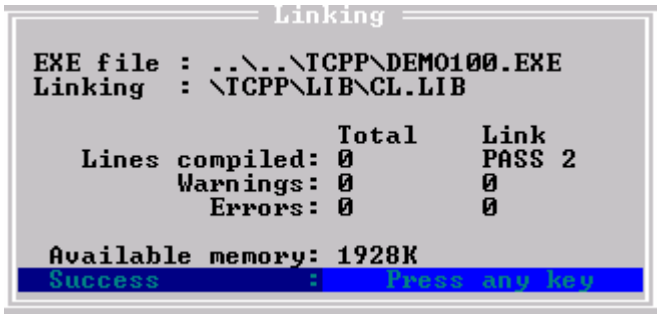
```
                    break;
            }
    } while (1);

    }
```

詳細請參考: demo100 範例

4.3.5 撰編譯連結程式

最後按下 F9 就會進行編譯，LINK 成 demo100.EXE。

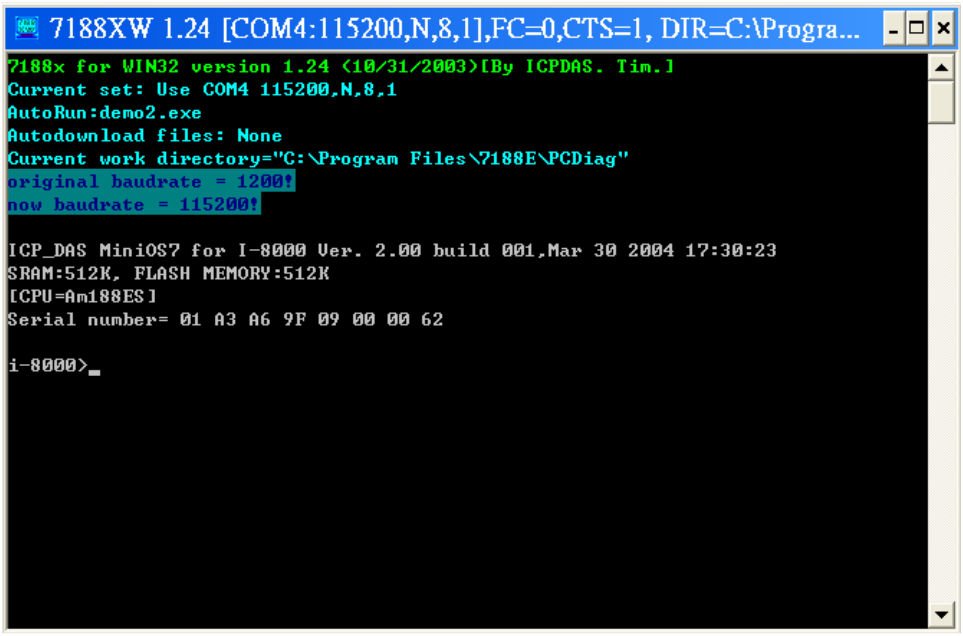


4.3.6 Download 程式到I-8000 系列PAC控制器

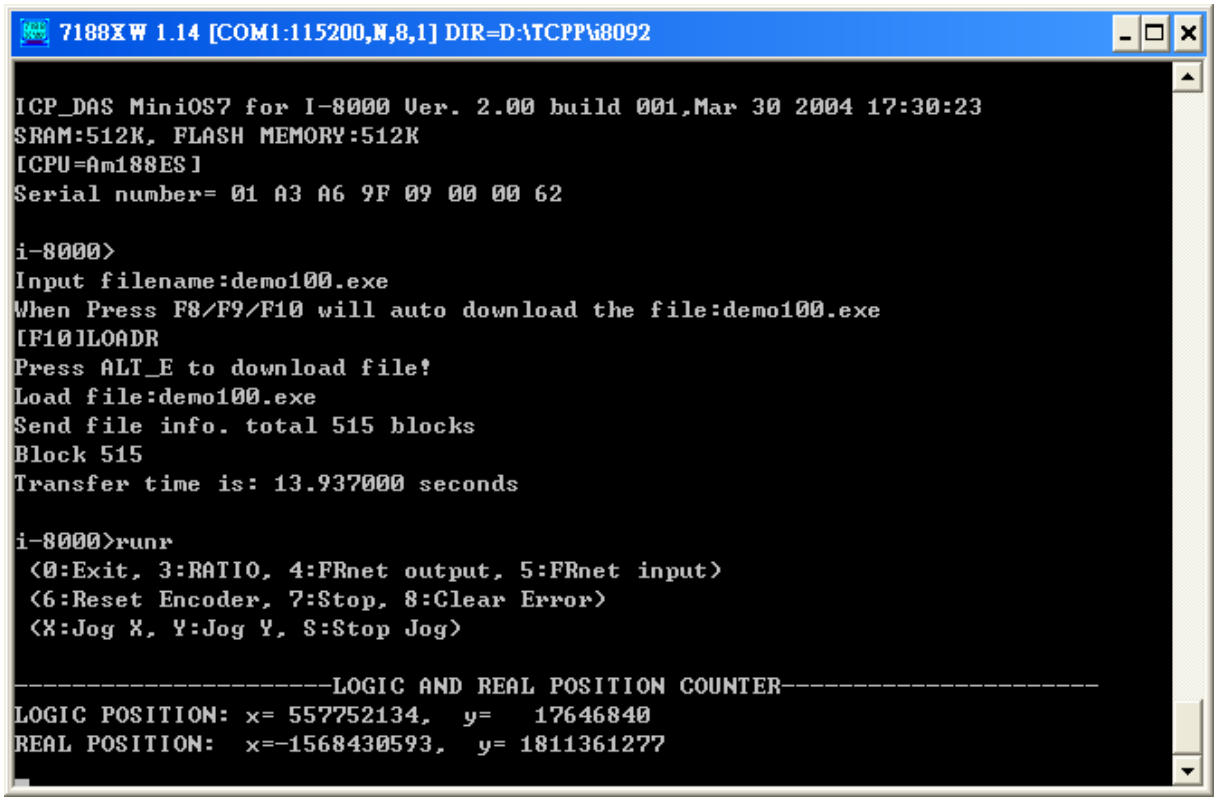
1. 請在 PC 端執行 7188x.EXE（這是一個 DOS 模式的執行檔，可以在純 DOS 下或 WIN9x 或 WIN-NT 或 WIN2K 的 DOS BOX 下執行）
   或是 7188xw.EXE（這是一個 win32 的執行檔，要在 WIN9x 或 WIN-NT 或 WIN2K 下執行）。
2. 請將依實際接線將 COM PORT 設成 COM1(ALT_1) 或 COM2(ALT_2)。傳輸速度設成 115200,N,8,1。
3. 打開 I-8000 的電源。此時有兩種可能的狀況：
   - 如果 INIT* 接腳有接到 INIT*COM 將會出現 MiniOs7 的版本訊息。然後出現 I-8000>。

- 如果 INIT* 接腳不接，I-8000 將會開始執行 AUTOEXEC.BAT 所設定的命令。執行完後一樣出現 I-8000>。

4. 當出現 I-8000> 後就可以下命令給 I-8000 了如下圖。



5. 按下 F2 鍵，輸入 demo100.exe，再按 F10 自動 download 並執行 demo100.exe 如下圖:



詳情請參考:I8000 CD 中 \Napdos\7188e\MiniOS7\doc\big5\index.htm 選左手邊 “7188E 入門手冊” 有詳盡說明。

A附錄

A.1 i-8092 開發環境安裝內容

A.1.1 eVC ++ 4.0

1. 微軟 eVC++ 4.0: 至少到 ServicPack2(目前已到 ServicPack4)
2. WinCon8000_EVC4_SP1: WinCon 在 eVC++ 開發環境(SA_IA)
3. WinConSDK:WinCon 軟體開發工具(inc,lib,dll,demo…)

A.1.2 Visual Studio .NET 2003(VB.NET，C#)

1. 微軟 Visual Studio.NET 2003 專業版以上, 須包含有 ”智慧型裝置應用程式” (SmartDeviceApplication)選項
2. 連線偵錯工具: Windows CE .NET Utilities v1.1 for Visual Studio .NET 2003
3. WinConSDK:WinCon 軟體開發工具(inc,lib,dll,demo…)

A.1.3 Turbo C(BC)

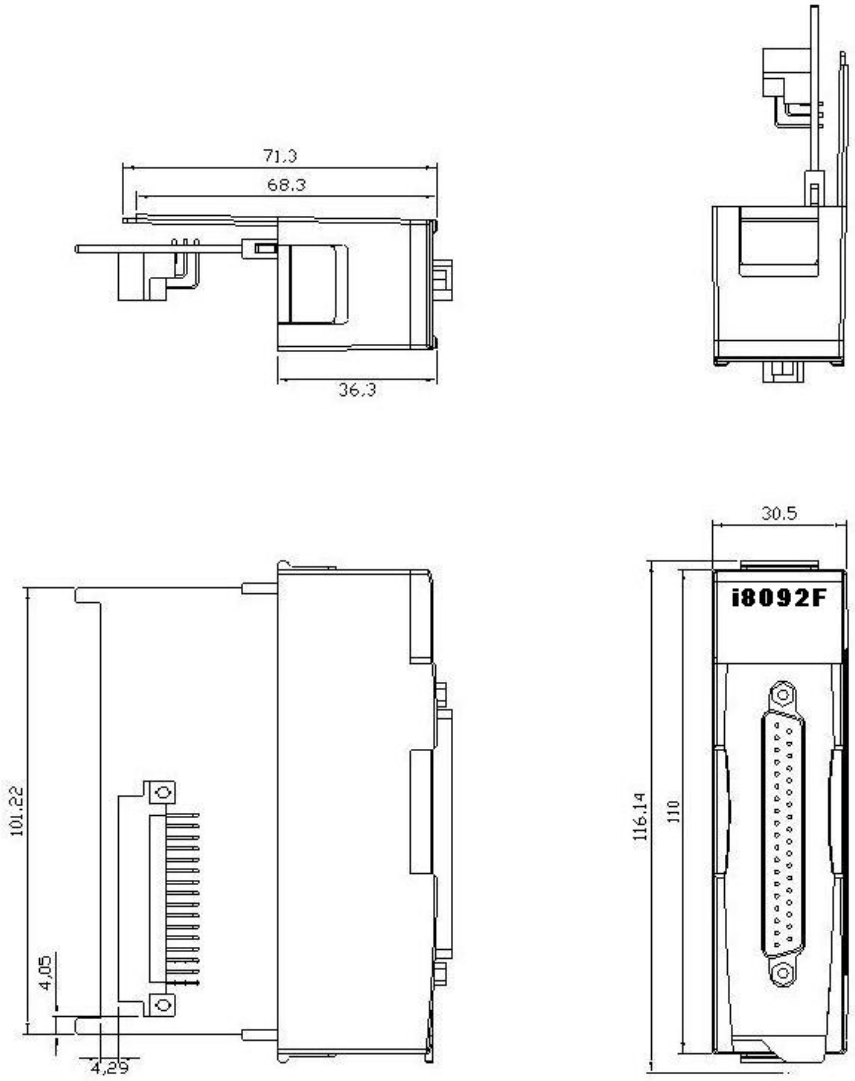
1. Turbo C 2.0 以上

A.2 i-8092 概觀

i-8092 運動控制模組圖片

WinCon W-8331 控制器，與 i-8092 運動控制模組，及 DN-8237 接線板圖片

A.3 外觀尺寸



A.4 版本更新內容註解

New i8092.DLL
New i8092.h
New i8092_NET.DLL

APPENDIX-B Others Terminal Boards

B.1 DN-8237-DB Daughter Board

The DN-8237DB is the daughter board for Delta ASDA-A Series Ampilifier. It has 2-axis I/O signals.

B.1.1 Board Layout for DN-8237-DB

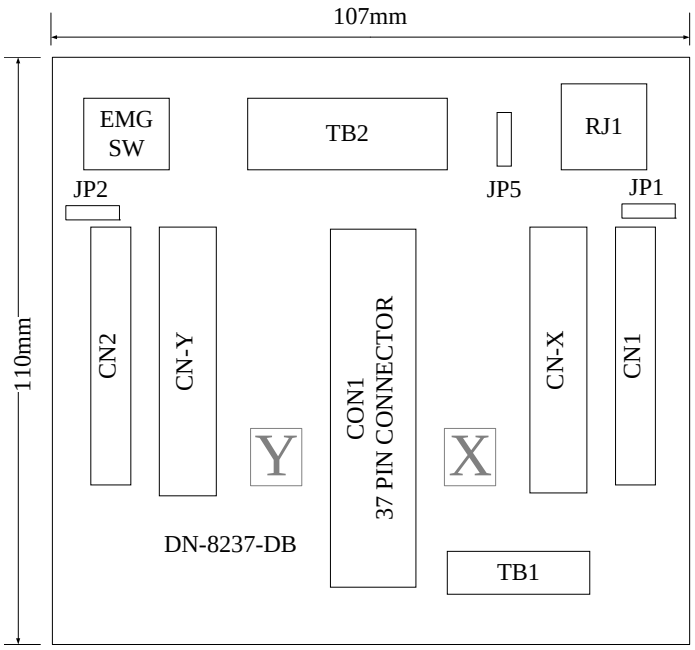


Fig. 1-1 Board layout for the DN-8237-DB

B.1.2 Signal Connections for DN-8237-DB

Maintaining signal connections is one of the most important factors in ensuring that your application system is sending and receiving data correctly.

■ Pin Assignment for CON1

The I/O connector on the DN-8237-DB is a 37-pin connector that enables you to connect to the PISO-PS200(or I-8092F) motion card. Fig. 1-2 shows the pin assignment for the 37-pin I/O connector on the DN-8237-DB (or on the motion card), and refer to Table 1-2 for description of each motion I/O signal.

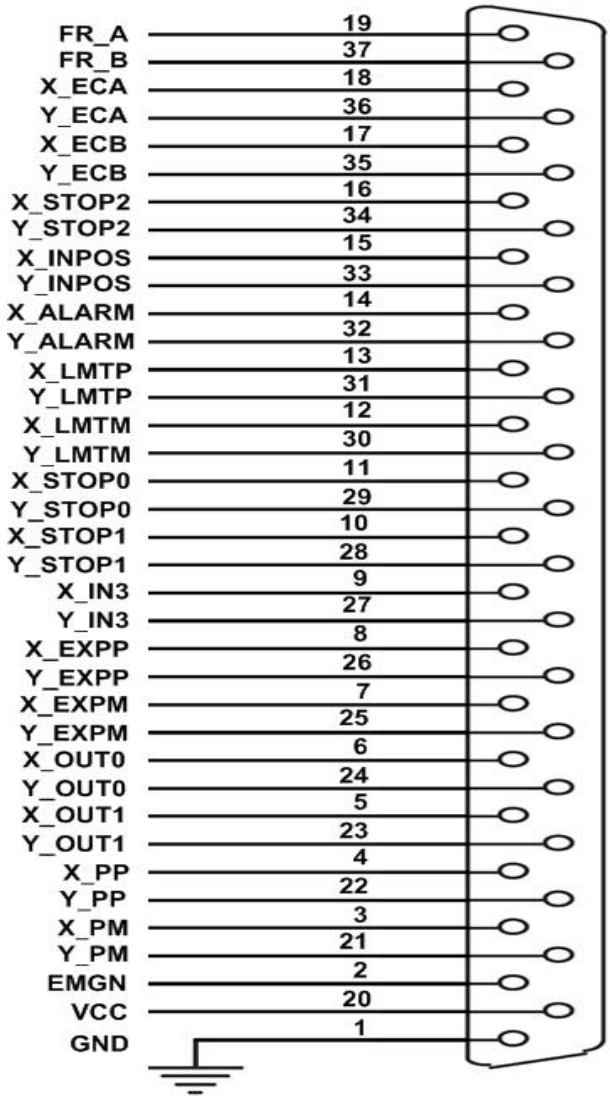


Fig. 1-2 I/O connector pin assignment for the CON1

Table 1-2 DN-8237-DB CON1 I/O connector signal description

Pin name	Pin number	Description
FR_A	19	FRnet A-phase signal
FR_B	37	FRnet B-phase signal
X_ECA	18	Encoder A-phase signal for the X axis
Y_ECA	36	Encoder A-phase signal for the Y axis
X_ECB	17	Encoder B-Phase signal for the X axis
Y_ECB	35	Encoder B-Phase signal for the Y axis
X_STOP2	16	Stop 2 signal for the X axis
Y_STOP2	34	Stop 2 signal for the Y axis
X_INPOS	15	In-position signal for the X axis
Y_INPOS	33	In-position signal for the Y axis
X_ALARM	14	Alarm signal for the X axis
Y_ALARM	32	Alarm signal for the Y axis
X_LMTP	13	Limit switch input signal (+) for the X axis
Y_LMTP	31	Limit switch input signal (+) for the Y axis
X_LMTM	12	Limit switch input signal (-) for the X axis
Y_LMTM	30	Limit switch input signal (-) for the Y axis
X_STOP0	11	Stop 0 signal for the X axis
Y_STOP0	29	Stop 0 signal for the Y axis
X_STOP1	10	Stop 1 signal for the X axis
Y_STOP1	28	Stop 1 signal for the Y axis
X_IN3	9	Input 3 signal for the X axis
Y_IN3	27	Input 3 signal for the Y axis
X_EXPP	8	EXT pulsar input signal (+) for the X axis
Y_EXPP	26	EXT pulsar input signal (+) for the Y axis
X_EXPM	7	EXT pulsar input signal (-) for the X axis
Y_EXPM	25	EXT pulsar input signal (-) for the Y axis
X_OUT0	6	Output 0 signal for the X axis
Y_OUT0	24	Output 0 signal for the Y axis
X_OUT1	5	Output 1 signal for the X axis
Y_OUT1	23	Output 1 signal for the Y axis
XPP	4	Driving pulsar signal (+) for the X axis
YPP	22	Driving pulsar signal (+) for the Y axis
XPM	3	Driving pulsar signal (+) for the X axis
YPM	21	Driving pulsar signal (+) for the Y axis
EMGN	2	Emergency stop input signal
VCC	20	Module power (+5V)
GND	1	Ground

■ TB1

The connector TB1 is 7-pin connector that enables you to connect to the signals of your motor drivers. Fig.1-3 shows the pin assignment for the 7-pin connector on the DN-8237-DB, and the Table 1-3 shows its I/O connector signal description.

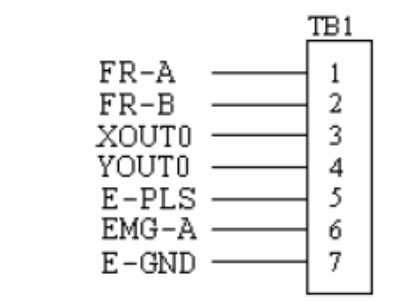


Fig. 1-3 Pin definition for TB1

Table 1-3 TB1 Signal Connection

Name	Description
FR-A	FRnet port A
FR-B	FRnet port B
XOUT0	General Output 0 for X axis
YOUT0	General Output 0 for Y axis
E-PLS	EXT pulse signal
EMG-A	EMG input signal for all axes
E-GND	EXT power ground

■ TB2

The connector TB2 is 5-pin connector that enables you to connect to the signals of your motor drivers. Fig.1-4 shows the pin assignment for the 5-pin connector on the DN-8237-DB, and the Table 1-4 shows its I/O connector signal description.

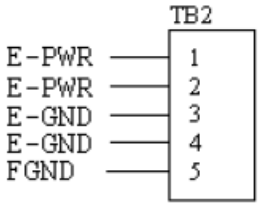


Fig. 1-4 Pin definition for TB2

Table 1-4 TB2 Signal Connection

Pin name	Description
E-PWR	EXT power supply +24V
E-GND	EXT power ground
FGND	Frame ground

► **Note:** Don't reverse connect signals with E_PWR and E_GND. Serious damage to your motion card and motion controller might be happened.

■ CN-X & CN-Y (CN1 connector for each AXIS in Driver)

The connectors CN-X and CN-Y are 50-pin connectors that enable you to connect to the CN1 connector of Delta ASDA-A series motor drivers. Fig.1-5 shows the pin assignment for the 50-pin connector on the DN-8237-DB, and the Table 1-5 shows its I/O connector signal description.

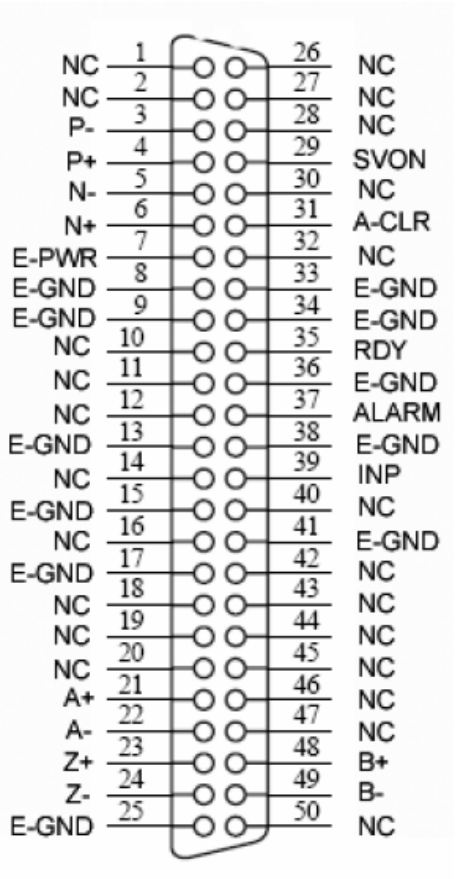


Fig. 1-5 Pin definition for CNX and CNY

Table 1-5 CN1 Signal Connection

Name	Number	Description
A+	21	Encoder A-Phase (+)
A-	22	Encoder A-Phase (-)
B+	48	Encoder B-Phase (+)
B-	49	Encoder B-Phase (-)
Z+	23	Encoder Z-Phase (+)
Z-	24	Encoder Z-Phase (-)
P+	4	Positive Direction Pulse Output(+)
P-	3	Positive Direction Pulse Output(-)
N+	6	Negative Direction Pulse
N-	5	Negative Direction Pulse Output(-)
INP	39	Servo In Position
RDY	35	Servo Ready
SVON	29	Servo On
A-CLR	31	Alarm Clear
ALARM	37	Servo Alarm
E-PWR	7	EXT power +24V
E-GND	8, 9, 13, 15,17, 25, 33,34, 36, 38,41	EXT power ground
NC	1,2,10,11, 12,14,16, 18,19,20, 26,27,28, 30,32,40, 42,43,44, 45,46,47, 50	No connection

Note 1: Don't connect NC (not connected) signals. Connecting these signals could cause permanent damage to your motion controller.

■ CN1 & CN2 (The I/O signals of the X and Y AXIS)

The connectors CN1 and CN2 are 11-pin connectors that enable you to connect to the signals of your motor drivers. Fig.1-6 shows the pin assignment for the 20-pin connector on the DN-8237-DB, and the Table 1-6 shows its I/O connector signal description.

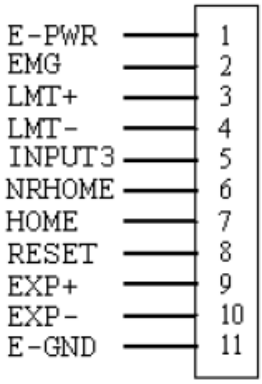


Fig. 1-6 Pin definition for CN1 & CN2

Table 1-6 CN1 & CN2 Signal Connection

Pin name	Description
E-PWR	EXT power supply +24V
EMG	EMG input signal
LMT+	Limit Switch Input Signal (+)
LMT-	Limit Switch Input Signal (-)
INPUT3	Input Signal (IN3)
NRHOME	Near Home Sensor Input Signal
HOME	Home Sensor Input Signal
RESET	Reset input signal
EXP+	EXT Positive Direction Pulse (+)
EXP-	EXT Negative Direction Pulse (-)
E-GND	EXT power ground

■ RJ1 (The I/O signals of the FRnet)

The connectors RJ1 is an 8-pin RJ45 connector that enable you to connect to the signals of FRnet. Fig.1-7 shows the pin assignment for the 8-pin connector on the DN-8237-DB, and the Table 1-7 shows its I/O connector signal description.

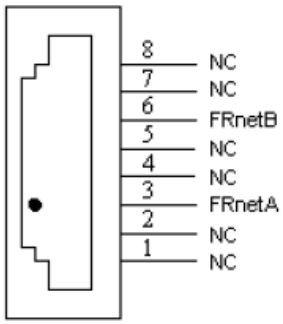


Fig. 1-7 Pin definition for RJ1

Table 1-7 RJ1

Pin name	Description
FRnetA	FRnet port A
FRnetB	FRnet port B
NC	No connection

▶ **Note:** Don't connect NC (not connected) signals. Connecting these signals could cause permanent damage to your motion controller.

B.1.3 Jumper and Switch Settings

■ JP5

Jumper 5 controls the EMG-A signal of the TB1 connector. The following diagram is shown the selection condition of the jumper 5.

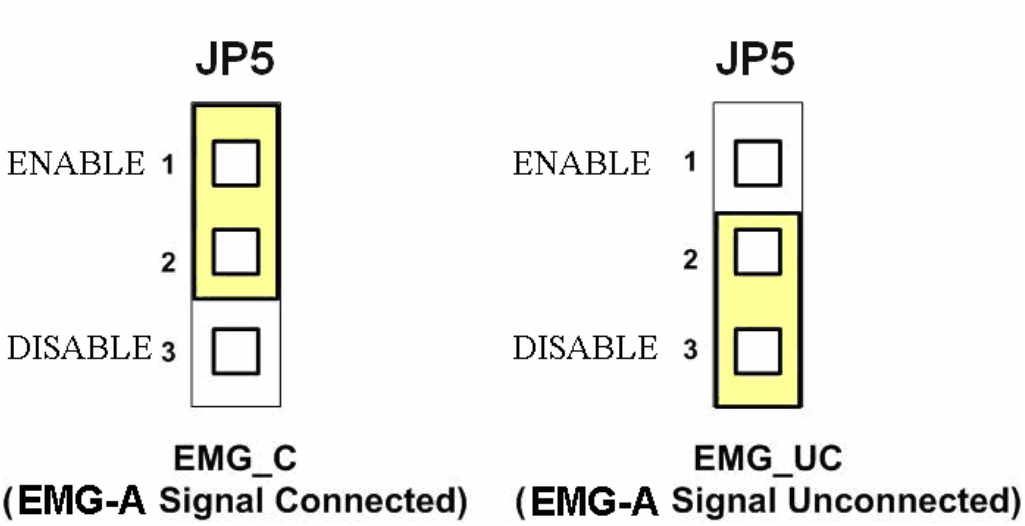


Fig. 1-8 Jumper 5 setting

■ SW 1

The emergency stop signal for each servo ampilfier can be selected from SW1. The number 1 and 2 on SW1 are denoted as axis X and Y, respectively. The number 3 and 4 on SW1 are reserved for future work. Fig. 1-9 is the default setting to connect the EMG singals to GND. The EMG signals from CN1 and CN2 will not take effect. If the switch is disconnected as shown in Fig. 1-10, the emergency stop signals can be controlled from EMG signals in CN1 and CN2.

Fig. 1-9 SW1 setting for normally GND (Default setting)

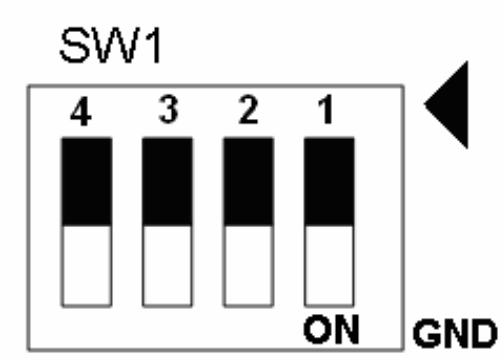


Fig. 1-10 SW1 setting for user controlled signals.

■ JP1 ~ JP2

Jumper 1 ~ Jumper 2 can select the reset function in CN1 and CN2 for each axis. The following diagram is shown the selection condition of the JP1.

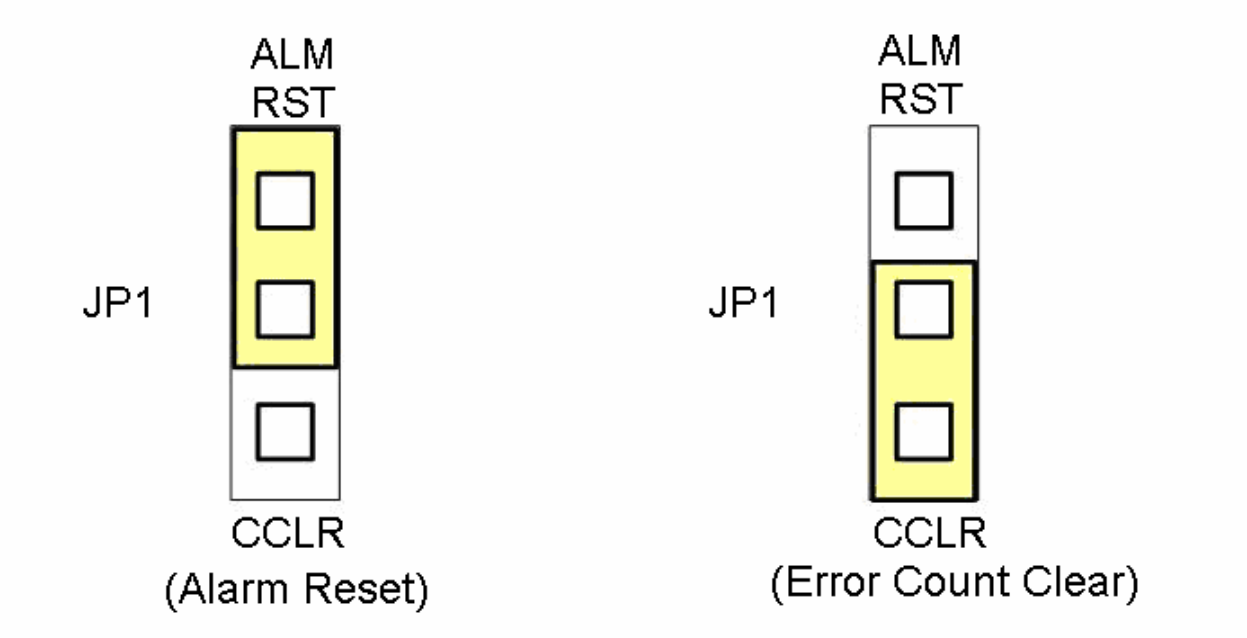


Fig. 1-15 JP 1 and 2 setting

B.2 DN-8237-MB Daughter Board

The DN-8237MB is the daughter board for Mitsubishi J2 Series Ampilifier. It has 2-axis I/O signals.

B.2.1 Board Layout for DN-8237-MB

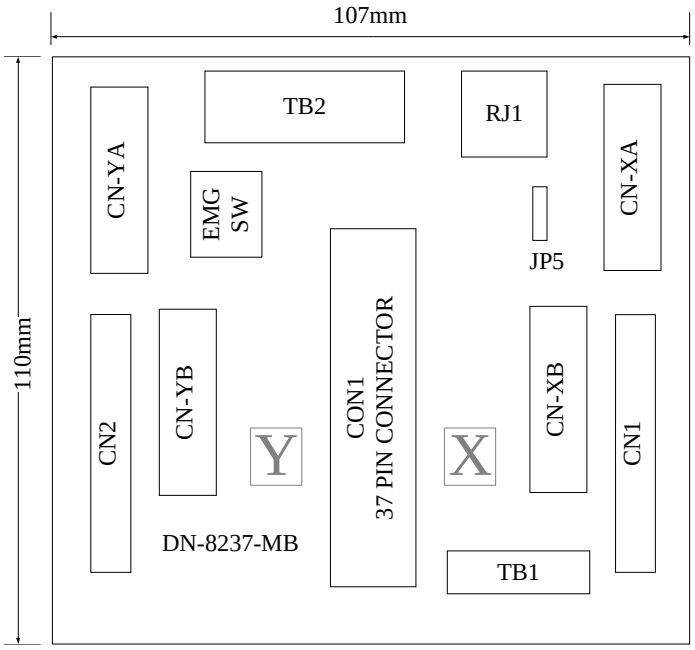


Fig. 3-1 Board layout for the DN-8237-MB

B.2.2 Signal Connections for DN-8237-MB

Maintaining signal connections is one of the most important factors in ensuring that your application system is sending and receiving data correctly.

■ Pin Assignment for CON1

The I/O connector on the DN-8237-MB is a 37-pin connector that enables you to connect to the PISO-PS200(or I-8092F) motion card. Fig. 3-2 shows the pin assignment for the 37-pin I/O connector on the DN-8237-MB (or on the motion card), and refer to Table 3-2 for description of each motion I/O signal.

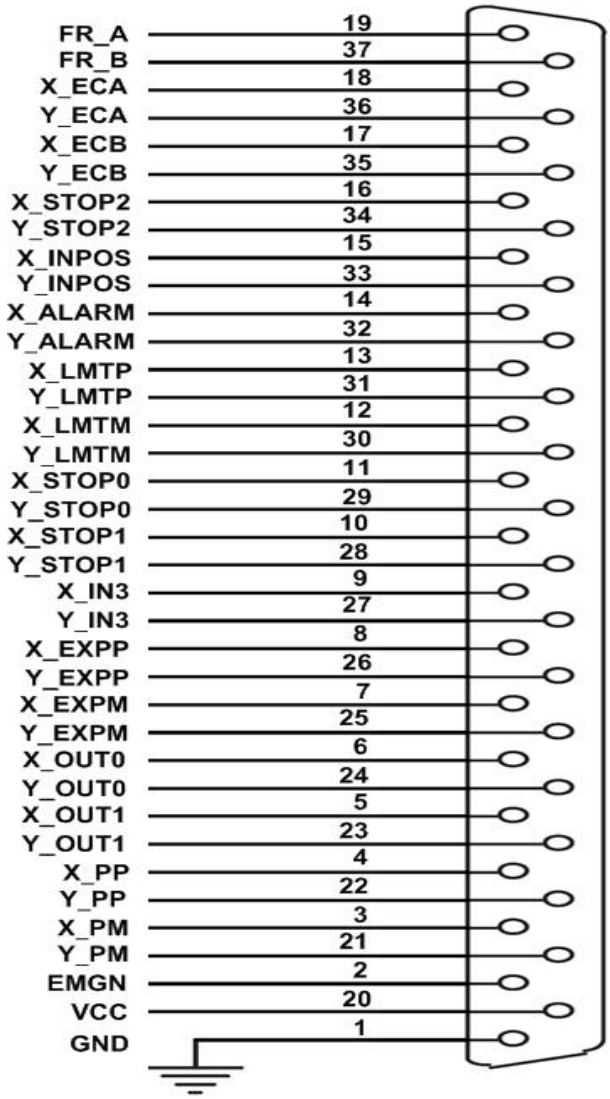


Fig. 3-2 I/O connector pin assignment for the CON1

Table 3-2 DN-8237-MB CON1 I/O connector signal description

Pin name	Pin number	Description
FR_A	19	FRnet A-phase signal
FR_B	37	FRnet B-phase signal
X_ECA	18	Encoder A-phase signal for the X axis
Y_ECA	36	Encoder A-phase signal for the Y axis
X_ECB	17	Encoder B-Phase signal for the X axis
Y_ECB	35	Encoder B-Phase signal for the Y axis
X_STOP2	16	Stop 2 signal for the X axis
Y_STOP2	34	Stop 2 signal for the Y axis
X_INPOS	15	In-position signal for the X axis
Y_INPOS	33	In-position signal for the Y axis
X_ALARM	14	Alarm signal for the X axis
Y_ALARM	32	Alarm signal for the Y axis
X_LMTP	13	Limit switch input signal (+) for the X axis
Y_LMTP	31	Limit switch input signal (+) for the Y axis
X_LMTM	12	Limit switch input signal (-) for the X axis
Y_LMTM	30	Limit switch input signal (-) for the Y axis
X_STOP0	11	Stop 0 signal for the X axis
Y_STOP0	29	Stop 0 signal for the Y axis
X_STOP1	10	Stop 1 signal for the X axis
Y_STOP1	28	Stop 1 signal for the Y axis
X_IN3	9	Input 3 signal for the X axis
Y_IN3	27	Input 3 signal for the Y axis
X_EXPP	8	EXT pulsar input signal (+) for the X axis
Y_EXPP	26	EXT pulsar input signal (+) for the Y axis
X_EXPM	7	EXT pulsar input signal (-) for the X axis
Y_EXPM	25	EXT pulsar input signal (-) for the Y axis
X_OUT0	6	Output 0 signal for the X axis
Y_OUT0	24	Output 0 signal for the Y axis
X_OUT1	5	Output 1 signal for the X axis
Y_OUT1	23	Output 1 signal for the Y axis
XPP	4	Driving pulsar signal (+) for the X axis
YPP	22	Driving pulsar signal (+) for the Y axis
XPM	3	Driving pulsar signal (+) for the X axis
YPM	21	Driving pulsar signal (+) for the Y axis
EMGN	2	Emergency stop input signal
VCC	20	Module power (+5V)
GND	1	Ground

■ TB1

The connector TB1 is 7-pin connector that enables you to connect to the signals of your motor drivers. Fig.3-3 shows the pin assignment for the 7-pin connector on the DN-8237-MB, and the Table 3-3 shows its I/O connector signal description.

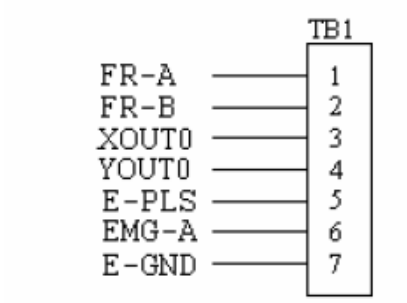


Fig. 3-3 Pin definition for TB1

Table 3-3 TB1 Signal Connection

Name	Description
FR-A	FRnet port A
FR-B	FRnet port B
XOUT0	General Output 0 for X axis
YOUT0	General Output 0 for Y axis
E-PLS	EXT pulse signal
EMG-A	EMG input signal for all axes
E-GND	EXT power ground

■ TB2

The connector TB2 is 5-pin connector that enables you to connect to the signals of your motor drivers. Fig.3-4 shows the pin assignment for the 5-pin connector on the DN-8237-MB, and the Table 3-4 shows its I/O connector signal description.

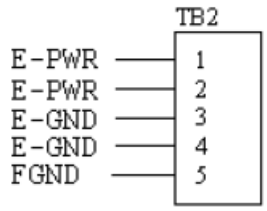


Fig. 3-4 Pin definition for TB2

Table 3-4 TB2 Signal Connection

Pin name	Description
E-PWR	EXT power supply +24V
E-GND	EXT power ground
FGND	Frame ground

► **Note:** Don't reverse connect signals with E_PWR and E_GND. Serious damage to your motion card and motion controller might be happened.

■ CN-XA & CN-YA (CNA connector for each AXIS)

The connectors CN-XA and CN-YA are 20-pin connectors that enable you to connect to the CNA connector of Mitsubishi motor drivers. Fig.3-5 shows the pin assignment for the 20-pin connector on the DN-8237-MB, and the Table 3-5 shows its I/O connector signal description.

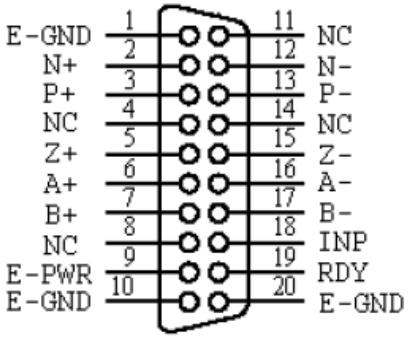


Fig. 3-5 Pin definition for CN-XA and CN-YA

Table 3-5 CNA Signal Connection

Name	Number	Description
A+	6	Encoder A-Phase (+)
A-	16	Encoder A-Phase (-)
B+	7	Encoder B-Phase (+)
B-	17	Encoder B-Phase (-)
Z+	5	Encoder Z-Phase (+)
Z-	15	Encoder Z-Phase (-)
P+	3	Positive Direction Pulse Output(+)
P-	13	Positive Direction Pulse Output(-)
N+	2	Negative Direction Pulse Output(+)
N-	12	Negative Direction Pulse Output(-)
INP	18	Servo In Position
RDY	19	Servo Ready
E-PWR	9	EXT power +24V
E-GND	1, 10, 20	EXT power ground
NC	4,8,11,14	No connection

▶ **Note 1:** Don't connect NC (not connected) signals. Connecting these signals could cause permanent damage to your motion controller.

■ CN-XB & CN-YB (CNB connector for each AXIS)

The connectors CN-XB and CN-YB are 20-pin connectors that enable you to connect to the CNB connector of your motor drivers. Fig.3-6 shows the pin assignment for the 20-pin connector on the DN-8237-MB, and the Table 3-6 shows its I/O connector signal description.

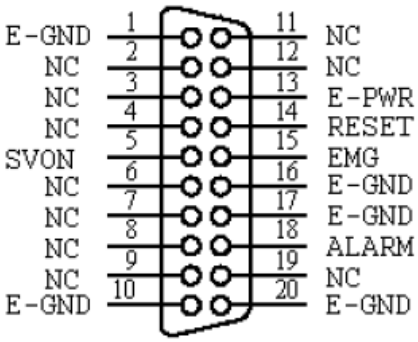


Fig. 3-6 Pin definition for CN-XB and CN-YB

Table 3-6 CNB Signal Connection

Pin	Pin	Description
SVON	5	Servo On
RESET	14	Servo Reset
EMG	15	Emergent Stop
ALARM	18	Servo Alarm
E-PWR	13	EXT power +24V
E-GND	1, 10, 16,17, 20	EXT power ground
NC	2, 3, 4, 6, 7, 8, 9, 11, 12, 19	No connection

Note: Don't connect NC (not connected) signals. Connecting these signals could cause permanent damage to your motion controller.

■ CN1 & CN2 (The I/O signals of the X and Y AXIS)

The connectors CN1 and CN2 are 11-pin connectors that enable you to connect to the signals of your motor drivers. Fig.3-7 shows the pin assignment for the 20-pin connector on the DN-8237-MB, and the Table 3-7 shows its I/O connector signal description.

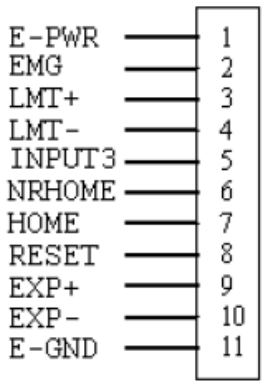


Fig. 3-7 Pin definition for CN1 & CN2

Table 3-7 CN1 & CN2 Signal Connection

Pin name	Description
E-PWR	EXT power supply +24V
EMG	EMG input signal
LMT+	Limit Switch Input Signal (+)
LMT-	Limit Switch Input Signal (-)
INPUT3	Input Signal (IN3)
NRHOME	Near Home Sensor Input Signal
HOME	Home Sensor Input Signal
RESET	Reset input signal
EXP+	EXT Positive Direction Pulse (+)
EXP-	EXT Negative Direction Pulse (-)
E-GND	EXT power ground

■ RJ1 (The I/O signals of the FRnet)

The connectors RJ1 is an 8-pin RJ45 connector that enable you to connect to the signals of

FRnet. Fig.3-8 shows the pin assignment for the 8-pin connector on the DN-8237-MB, and the Table 3-8 shows its I/O connector signal description.

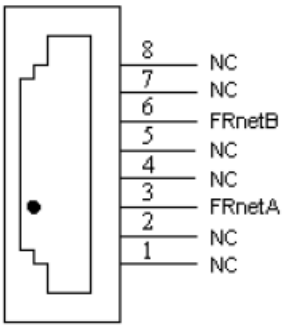


Fig. 3-8 Pin definition for RJ1

Table 3-8 RJ1

Pin name	Description
FRnetA	FRnet port A
FRnetB	FRnet port B
NC	No connection

> **Note:** Don't connect NC (not connected) signals. Connecting these signals could cause permanent damage to your motion controller.

B.2..3 Jumper and Switch Settings

■ JP5

Jumper 5 controls the EMG-A signal of the TB1 connector. The following diagram is shown the selection condition of the jumper 5.

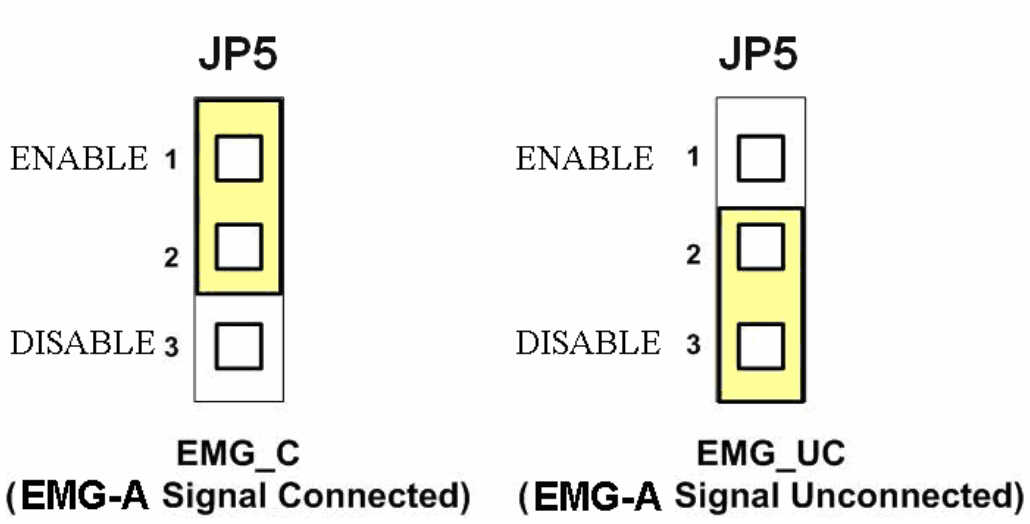


Fig. 3-9 Jumper 5 setting

■ SW 1

The emergency stop signal for each servo ampilfier can be selected from SW1. The number 1 and 2 on SW1 are denoted as axis X and Y, respectively. The number 3 and 4 on SW1

are reserved for future work. Fig. 3-10 is the default setting to connect the EMG singals to GND. The EMG signals from CN1 and CN2 will not take effect. If the switch is disconnected as shown in Fig. 3-11, the emergency stop signals can be controlled from EMG signals in CN1 and CN2.

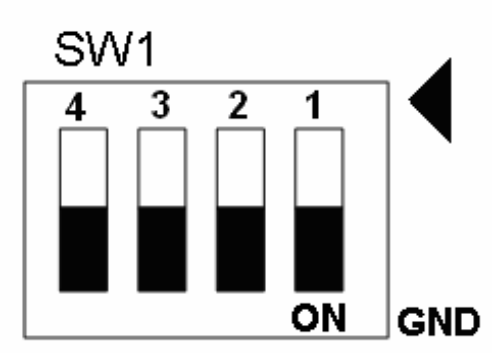


Fig. 3-10 SW1 setting for normally GND (Default setting)

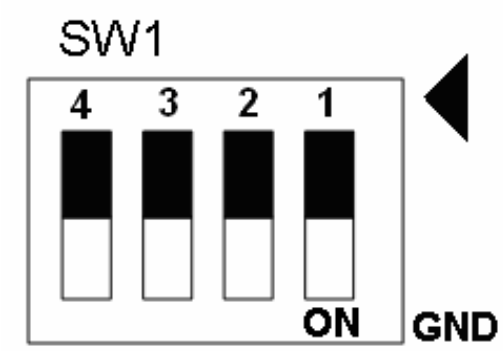


Fig. 3-11 SW1 setting for user controlled signals.

B.3 DN-8237-PB Daughter Board

The DN-8237PB is the daughter board for Panasonic A4 Series Ampilifier. It has 2-axis I/O signals.

B.3.1 Board Layout for DN-8237-PB

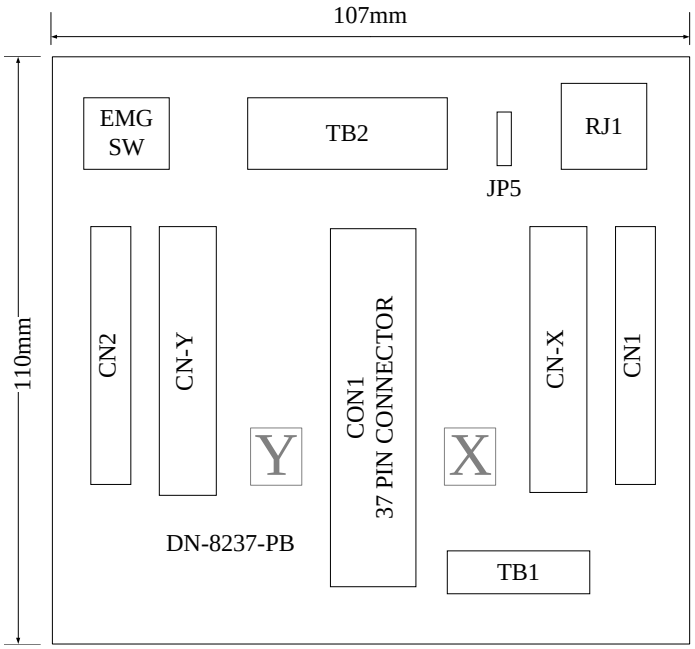


Fig. 3-1 Board layout for the DN-8237-PB

B.3.2 Signal Connections for DN-8237-PB

Maintaining signal connections is one of the most important factors in ensuring that your application system is sending and receiving data correctly.

■ Pin Assignment for CON1

The I/O connector on the DN-8237-PB is a 37-pin connector that enables you to connect to the PISO-PS200(or I-8092F) motion card. Fig. 3-2 shows the pin assignment for the 37-pin I/O connector on the DN-8237-PB (or on the motion card), and refer to Table 3-2 for description of each motion I/O signal.

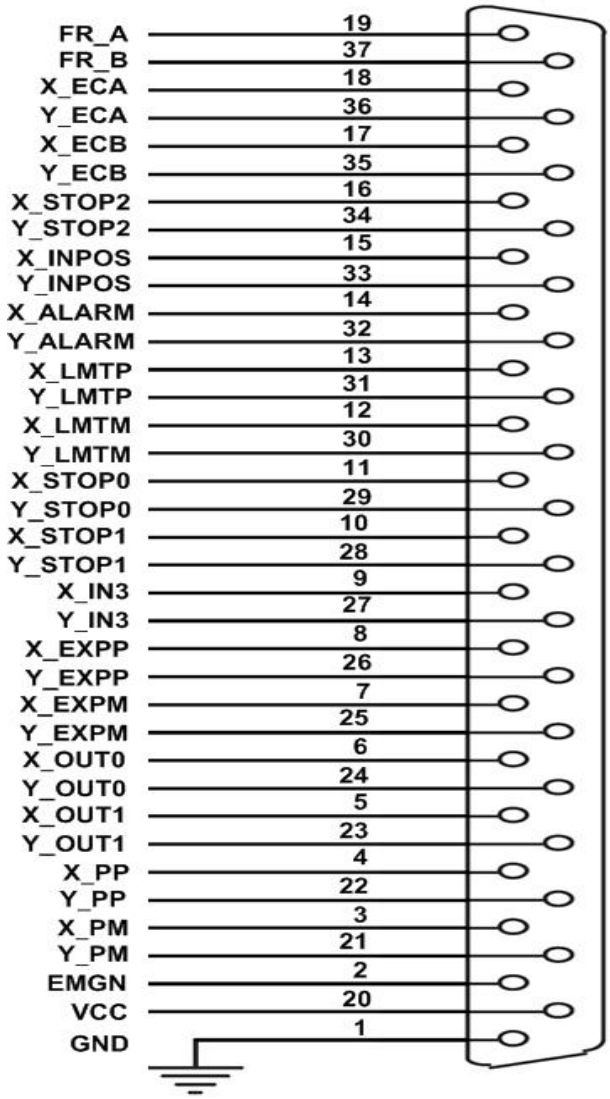


Fig. 3-2 I/O connector pin assignment for the CON1

Table 3-2 DN-8237-PB CON1 I/O connector signal description

Pin name	Pin number	Description
FR_A	19	FRnet A-phase signal
FR_B	37	FRnet B-phase signal
X_ECA	18	Encoder A-phase signal for the X axis
Y_ECA	36	Encoder A-phase signal for the Y axis
X_ECB	17	Encoder B-Phase signal for the X axis
Y_ECB	35	Encoder B-Phase signal for the Y axis
X_STOP2	16	Stop 2 signal for the X axis
Y_STOP2	34	Stop 2 signal for the Y axis
X_INPOS	15	In-position signal for the X axis
Y_INPOS	33	In-position signal for the Y axis
X_ALARM	14	Alarm signal for the X axis
Y_ALARM	32	Alarm signal for the Y axis
X_LMTP	13	Limit switch input signal (+) for the X axis
Y_LMTP	31	Limit switch input signal (+) for the Y axis
X_LMTM	12	Limit switch input signal (-) for the X axis
Y_LMTM	30	Limit switch input signal (-) for the Y axis
X_STOP0	11	Stop 0 signal for the X axis
Y_STOP0	29	Stop 0 signal for the Y axis
X_STOP1	10	Stop 1 signal for the X axis
Y_STOP1	28	Stop 1 signal for the Y axis
X_IN3	9	Input 3 signal for the X axis
Y_IN3	27	Input 3 signal for the Y axis
X_EXPP	8	EXT pulsar input signal (+) for the X axis
Y_EXPP	26	EXT pulsar input signal (+) for the Y axis
X_EXPM	7	EXT pulsar input signal (-) for the X axis
Y_EXPM	25	EXT pulsar input signal (-) for the Y axis
X_OUT0	6	Output 0 signal for the X axis
Y_OUT0	24	Output 0 signal for the Y axis
X_OUT1	5	Output 1 signal for the X axis
Y_OUT1	23	Output 1 signal for the Y axis
XPP	4	Driving pulsar signal (+) for the X axis
YPP	22	Driving pulsar signal (+) for the Y axis
XPM	3	Driving pulsar signal (+) for the X axis
YPM	21	Driving pulsar signal (+) for the Y axis
EMGN	2	Emergency stop input signal
VCC	20	Module power (+5V)
GND	1	Ground

■ TB1

The connector TB1 is 7-pin connector that enables you to connect to the signals of your motor drivers. Fig.3-3 shows the pin assignment for the 7-pin connector on the DN-8237-PB, and the Table 3-3 shows its I/O connector signal description.

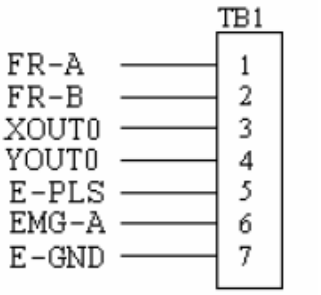


Fig. 3-3 Pin definition for TB1

Table 3-3 TB1 Signal Connection

Name	Description
FR-A	FRnet port A
FR-B	FRnet port B
XOUT0	General Output 0 for X axis
YOUT0	General Output 0 for Y axis
E-PLS	EXT pulse signal
EMG-A	EMG input signal for all axes
E-GND	EXT power ground

■ TB2

The connector TB2 is 5-pin connector that enables you to connect to the signals of your motor drivers. Fig.3-4 shows the pin assignment for the 5-pin connector on the DN-8237-PB, and the Table 3-4 shows its I/O connector signal description.

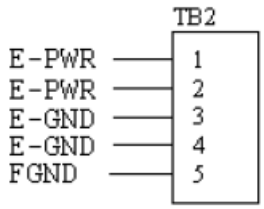


Fig. 3-4 Pin definition for TB2

Table 3-4 TB2 Signal Connection

Pin name	Description
E-PWR	EXT power supply +24V
E-GND	EXT power ground
FGND	Frame ground

► **Note:** Don't reverse connect signals with E_PWR and E_GND. Serious damage to your motion card and motion controller might be happened.

■ CN-X &CN-Y(CN X5 connector for each Axis in Driver)

The connectors CN-X and CN-Y are 50-pin connectors that enable you to connect to the CN X5 connector of Panasonic motor drivers. Fig.3-5 shows the pin assignment for the 50-pin connector on the DN-8237-PB, and the Table 3-5 shows its I/O connector signal description.

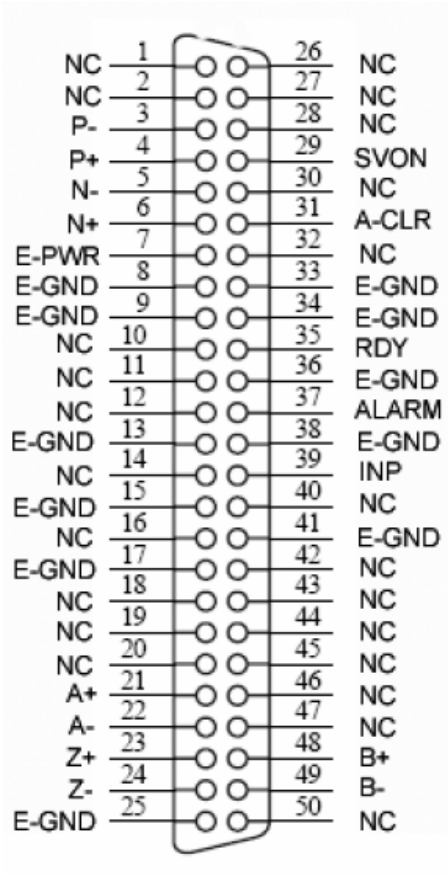


Fig. 3-5 Pin definition for CNX and CNY

Table 3-5 CN X5 Signal Connection

Name	Number	Description
A+	21	Encoder A-Phase (+)
A-	22	Encoder A-Phase (-)
B+	48	Encoder B-Phase (+)
B-	49	Encoder B-Phase (-)
Z+	23	Encoder Z-Phase (+)
Z-	24	Encoder Z-Phase (-)
P+	4	Positive Direction Pulse Output(+)
P-	3	Positive Direction Pulse Output(-)
N+	6	Negative Direction Pulse
N-	5	Negative Direction Pulse Output(-)
INP	39	Servo In Position
RDY	35	Servo Ready
SVON	29	Servo On
A-CLR	31	Alarm Clear
ALARM	37	Servo Alarm
E-PWR	7	EXT power +24V
E-GND	8, 9, 13, 15,17, 25, 33,34, 36, 38,41	EXT power ground
NC	1,2,10,11, 12,14,16, 18,19,20, 26,27,28, 30,32,40, 42,43,44, 45,46,47, 50	No connection

▶ **Note 1:** Don't connect NC (not connected) signals. Connecting these signals could cause permanent damage to your motion controller.

■ CN1& CN2 (The I/O signals of the X and Y axis)

The connectors CN1 and CN2 are 11-pin connectors that enable you to connect to the signals of your motor drivers. Fig.3-6 shows the pin assignment for the 20-pin connector on the DN-8237-PB, and the Table 3-6 shows its I/O connector signal description.

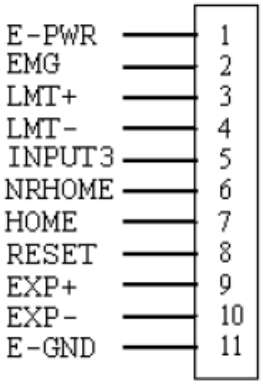


Fig. 3-6 Pin definition for CN1 & CN2

Table 3-6 CN1 & CN2 Signal Connection

Pin name	Description
E-PWR	EXT power supply +24V
EMG	EMG input signal
LMT+	Limit Switch Input Signal (+)
LMT-	Limit Switch Input Signal (-)
INPUT3	Input Signal (IN3)
NRHOME	Near Home Sensor Input Signal
HOME	Home Sensor Input Signal
RESET	Reset input signal
EXP+	EXT Positive Direction Pulse (+)
EXP-	EXT Negative Direction Pulse (-)
E-GND	EXT power ground

■ RJ1 (The I/O signals of the FRnet)

The connectors RJ1 is an 8-pin RJ45 connector that enable you to connect to the signals of FRnet. Fig.3-7 shows the pin assignment for the 8-pin connector on the DN-8237-PB, and the Table 3-7 shows its I/O connector signal description.

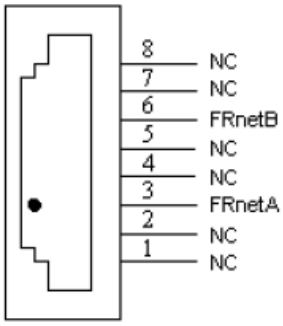


Fig. 3-7 Pin definition for RJ1

Table 3-7 RJ1

Pin name	Description
FRnetA	FRnet port A
FRnetB	FRnet port B
NC	No connection

> **Note:** Don't connect NC (not connected) signals. Connecting these signals could cause permanent damage to your motion controller.

B.3.3 Jumper and Switch Settings

■ JP5

Jumper 5 controls the EMG-A signal of the TB1 connector. The following diagram is shown the selection condition of the jumper 5.

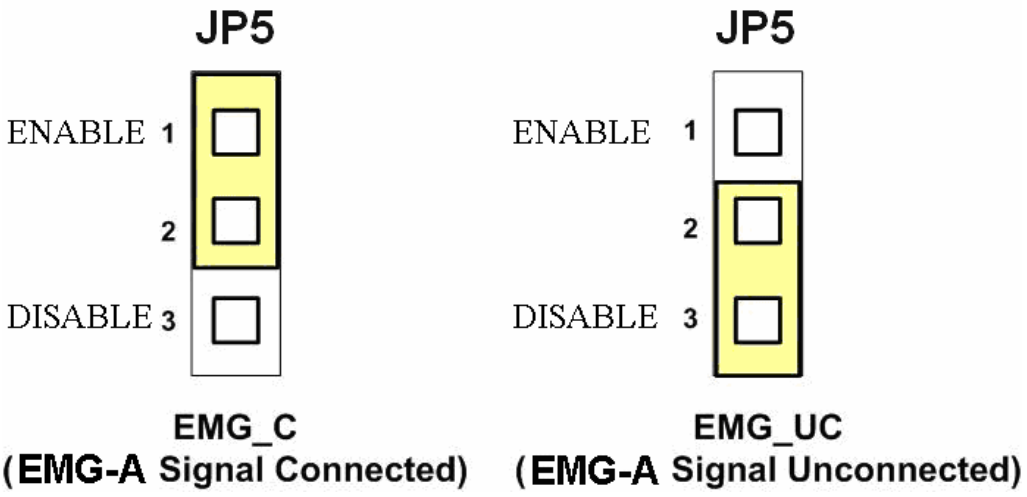


Fig. 3-8 Jumper 5 setting

■ SW 1

The emergency stop signal for each servo ampilfier can be selected from SW1. The number 1 and 2 on SW1 are denoted as axis X and Y, respectively. The number 3 and 4 on SW1 are reserved for future work. Fig. 3-9 is the default setting to connect the EMG singals to GND. The EMG signals from CN1 and CN2 will not take effect. If the switch is disconnected as shown in Fig. 3-10, the emergency stop signals can be controlled from EMG signals in CN1 and CN2.

Fig. 3-9 SW1 setting for normally GND (Default setting)

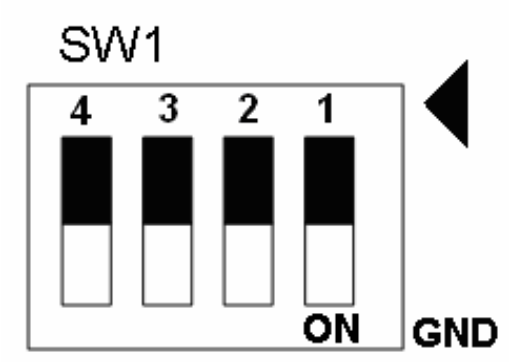


Fig. 3-10　SW1 setting for user

B.4 DN-8237-YB Daughter Board

The DN-8237YB is the daughter board for Yaskawa Series Ampilifier.　It has 2-axis I/O signals.

B.4.1 Board Layout for DN-8237-YB

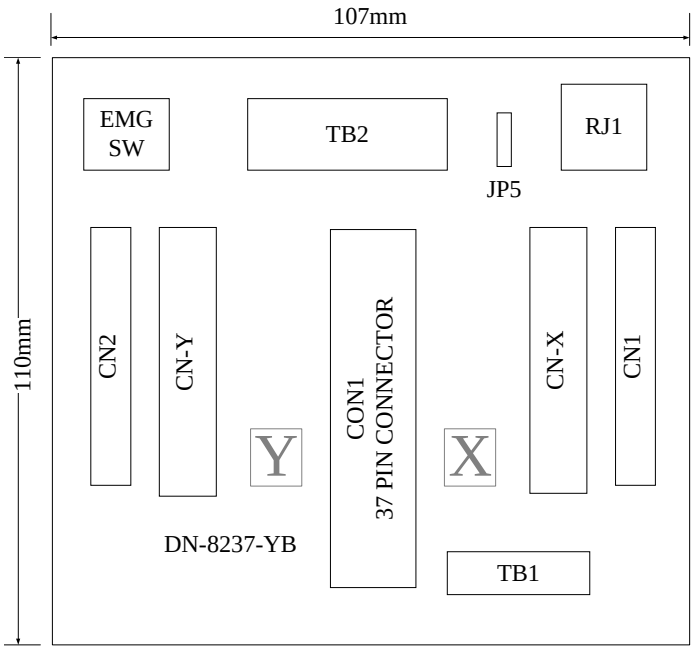


Fig. 1-1 Board layout for the DN-8237-YB

B.4.2 Signal Connections for DN-8237-YB

Maintaining signal connections is one of the most important factors in ensuring that your application system is sending and receiving data correctly.

■ Pin Assignment for CON1

The I/O connector on the DN-8237-YB is a 37-pin connector that enables you to connect to the PISO-PS200(or I-8092F) motion card. Fig. 1-2 shows the pin assignment for the 37-pin I/O connector on the DN-8237-YB (or on the motion card), and refer to Table 1-2 for description of each motion I/O signal.

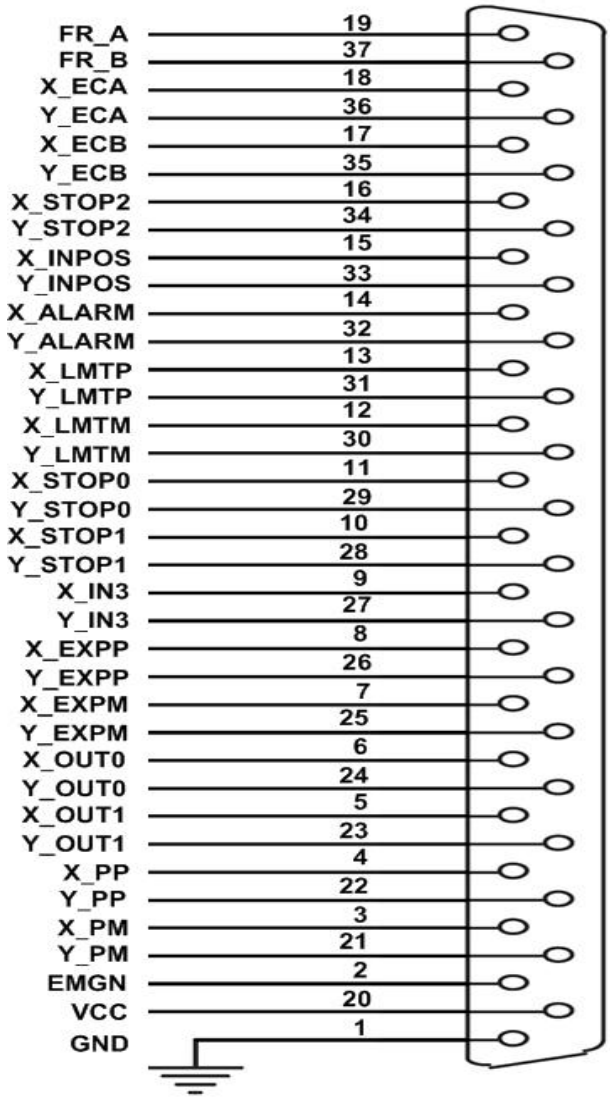


Fig. 1-2 I/O connector pin assignment for the CON1

Table 1-2 DN-8237-YB CON1 I/O connector signal description

Pin name	Pin number	Description
FR_A	19	FRnet A-phase signal
FR_B	37	FRnet B-phase signal
X_ECA	18	Encoder A-phase signal for the X axis
Y_ECA	36	Encoder A-phase signal for the Y axis
X_ECB	17	Encoder B-Phase signal for the X axis
Y_ECB	35	Encoder B-Phase signal for the Y axis
X_STOP2	16	Stop 2 signal for the X axis
Y_STOP2	34	Stop 2 signal for the Y axis
X_INPOS	15	In-position signal for the X axis
Y_INPOS	33	In-position signal for the Y axis
X_ALARM	14	Alarm signal for the X axis
Y_ALARM	32	Alarm signal for the Y axis
X_LMTP	13	Limit switch input signal (+) for the X axis
Y_LMTP	31	Limit switch input signal (+) for the Y axis
X_LMTM	12	Limit switch input signal (-) for the X axis
Y_LMTM	30	Limit switch input signal (-) for the Y axis
X_STOP0	11	Stop 0 signal for the X axis
Y_STOP0	29	Stop 0 signal for the Y axis
X_STOP1	10	Stop 1 signal for the X axis
Y_STOP1	28	Stop 1 signal for the Y axis
X_IN3	9	Input 3 signal for the X axis
Y_IN3	27	Input 3 signal for the Y axis
X_EXPP	8	EXT pulsar input signal (+) for the X axis
Y_EXPP	26	EXT pulsar input signal (+) for the Y axis
X_EXPM	7	EXT pulsar input signal (-) for the X axis
Y_EXPM	25	EXT pulsar input signal (-) for the Y axis
X_OUT0	6	Output 0 signal for the X axis
Y_OUT0	24	Output 0 signal for the Y axis
X_OUT1	5	Output 1 signal for the X axis
Y_OUT1	23	Output 1 signal for the Y axis
XPP	4	Driving pulsar signal (+) for the X axis
YPP	22	Driving pulsar signal (+) for the Y axis
XPM	3	Driving pulsar signal (+) for the X axis
YPM	21	Driving pulsar signal (+) for the Y axis
EMGN	2	Emergency stop input signal
VCC	20	Module power (+5V)
GND	1	Ground

■ TB1

The connector TB1 is 7-pin connector that enables you to connect to the signals of your motor drivers. Fig.1-3 shows the pin assignment for the 7-pin connector on the DN-8237-YB, and the Table 1-3 shows its I/O connector signal description.

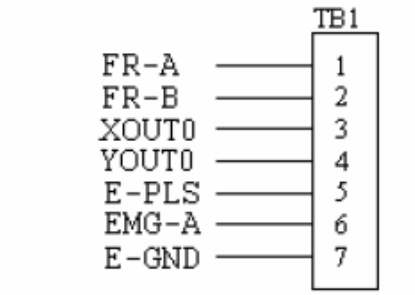


Fig. 1-3 Pin definition for TB1

Table 1-3 TB1 Signal Connection

Name	Description
FR-A	FRnet port A
FR-B	FRnet port B
XOUT0	General Output 0 for X axis
YOUT0	General Output 0 for Y axis
E-PLS	EXT pulse signal
EMG-A	EMG input signal for all axes
E-GND	EXT power ground

■ TB2

The connector TB2 is 5-pin connector that enables you to connect to the signals of your motor drivers. Fig.1-4 shows the pin assignment for the 5-pin connector on the DN-8237-YB, and the Table 1-4 shows its I/O connector signal description.

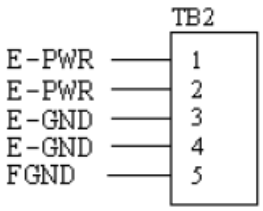


Fig. 1-4 Pin definition for TB2

Table 1-4 TB2 Signal Connection

Pin name	Description
E-PWR	EXT power supply +24V
E-GND	EXT power ground
FGND	Frame ground

► **Note:** Don't reverse connect signals with E_PWR and E_GND. Serious damage to your motion card and motion controller might be happened.

■ CN-X & CN-Y (CN1 connector for each AXIS in Driver)

The connectors CN-X and CN-Y are 50-pin connectors that enable you to connect to the CN1 connector of Yaskawa motor drivers. Fig.1-5 shows the pin assignment for the 50-pin connector on the DN-8237-YB, and the Table 1-5 shows its I/O connector signal description.

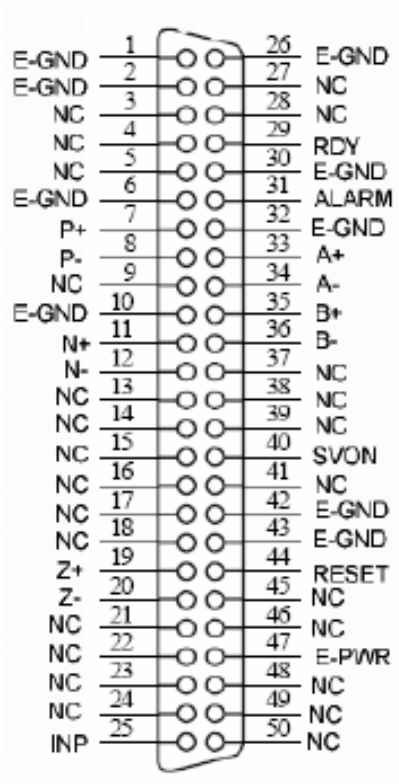


Fig. 3-5 Pin definition for CNX, CNY, CNZ, CNU

Table 3-6 CN1 Signal Connection

Name	Number	Description
A+	33	Encoder A-Phase (+)
A-	34	Encoder A-Phase (-)
B+	35	Encoder B-Phase (+)
B-	36	Encoder B-Phase (-)
Z+	19	Encoder Z-Phase (+)
Z-	20	Encoder Z-Phase (-)
P+	7	Positive Direction Pulse Output(+)
P-	8	Positive Direction Pulse Output(-)
N+	11	Negative Direction Pulse
N-	12	Negative Direction Pulse Output(-)
INP	25	Servo In Position
RDY	29	Servo Ready
SVON	40	Servo On
RESET	44	Parameter Reset
ALARM	31	Servo Alarm
E-PWR	47	EXT power +24V
E-GND	1,2,6,10, 26, 30,32, 42,43	EXT power ground
NC	3,4,5,9, 13,14,15, 16,17,18, 21,22,23, 24,27,28, 37,38,39, 41,45,46, 48,49,50,	No connection

■ CN1 & CN2 (The I/O signals of the X and Y AXIS)

The connectors CN1 and CN2 are 11-pin connectors that enable you to connect to the signals of your motor drivers. Fig.1-6 shows the pin assignment for the 20-pin connector on the DN-8237-YB, and the Table 1-6 shows its I/O connector signal description.

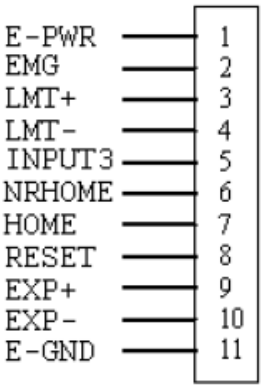


Fig. 1-6 Pin definition for CN1 & CN2

Table 1-6 CN1 & CN2 Signal Connection

Pin name	Description
E-PWR	EXT power supply +24V
EMG	EMG input signal
LMT+	Limit Switch Input Signal (+)
LMT-	Limit Switch Input Signal (-)
INPUT3	Input Signal (IN3)
NRHOME	Near Home Sensor Input Signal
HOME	Home Sensor Input Signal
RESET	Reset input signal
EXP+	EXT Positive Direction Pulse (+)
EXP-	EXT Negative Direction Pulse (-)
E-GND	EXT power ground

■ RJ1 (The I/O signals of the FRnet)

The connectors RJ1 is an 8-pin RJ45 connector that enable you to connect to the signals of FRnet. Fig.1-7 shows the pin assignment for the 8-pin connector on the DN-8237-YB, and the Table 1-7 shows its I/O connector signal description.

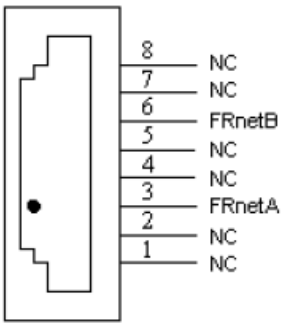


Fig. 1-7 Pin definition for RJ1

Table 1-7 RJ1

Pin name	Description
FRnetA	FRnet port A
FRnetB	FRnet port B
NC	No connection

Note: Don't connect NC (not connected) signals. Connecting these signals could cause permanent damage to your motion controller.

B.4.3 Jumper and Switch Settings

■ JP5

Jumper 5 controls the EMG-A signal of the TB1 connector. The following diagram is shown the selection condition of the jumper 5.

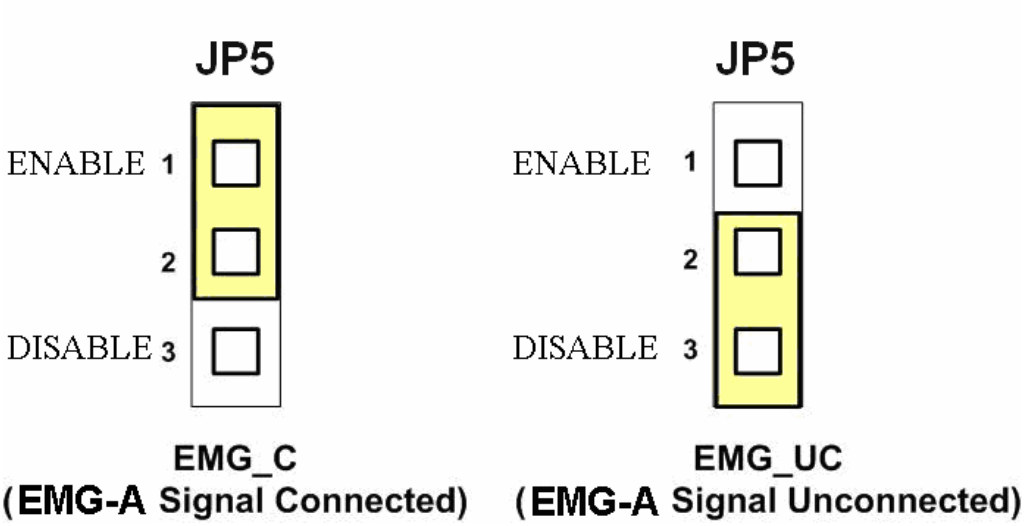


Fig. 1-8 Jumper 5 setting

■ SW 1

The emergency stop signal for each servo ampilfier can be selected from SW1. The number 1 and 2 on SW1 are denoted as axis X and Y, respectively. The number 3 and 4 on SW1 are reserved for future work. Fig. 1-9 is the default setting to connect the EMG singals to GND. The EMG signals from CN1 and CN2 will not take effect. If the switch is disconnected as shown in Fig. 1-10, the emergency stop signals can be controlled from EMG signals in CN1 and CN2.

Fig. 1-9 SW1 setting for normally GND (Default setting)

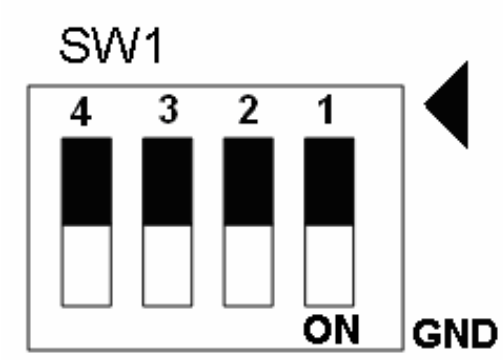


Fig. 1-10 SW1 setting for user controlled signals.