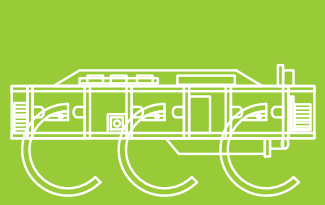
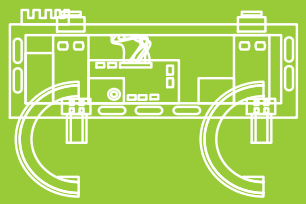
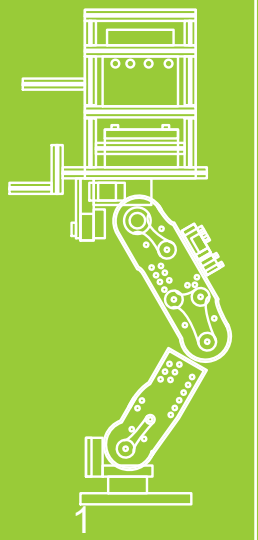
實驗二

Waveform Generation and Oscilloscope Data Read / Write

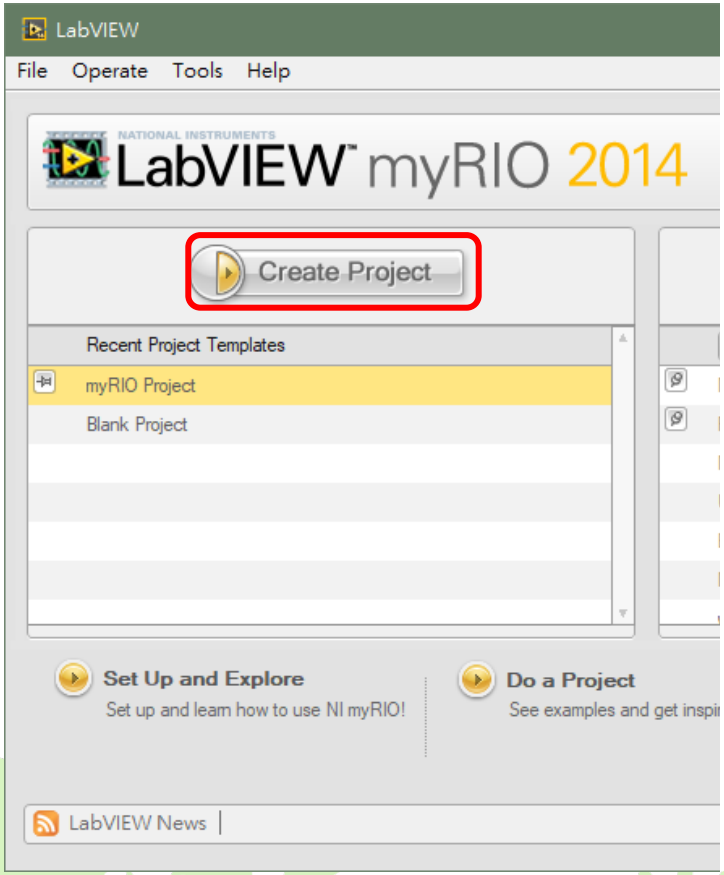
112-2 機電系統原理與實驗一

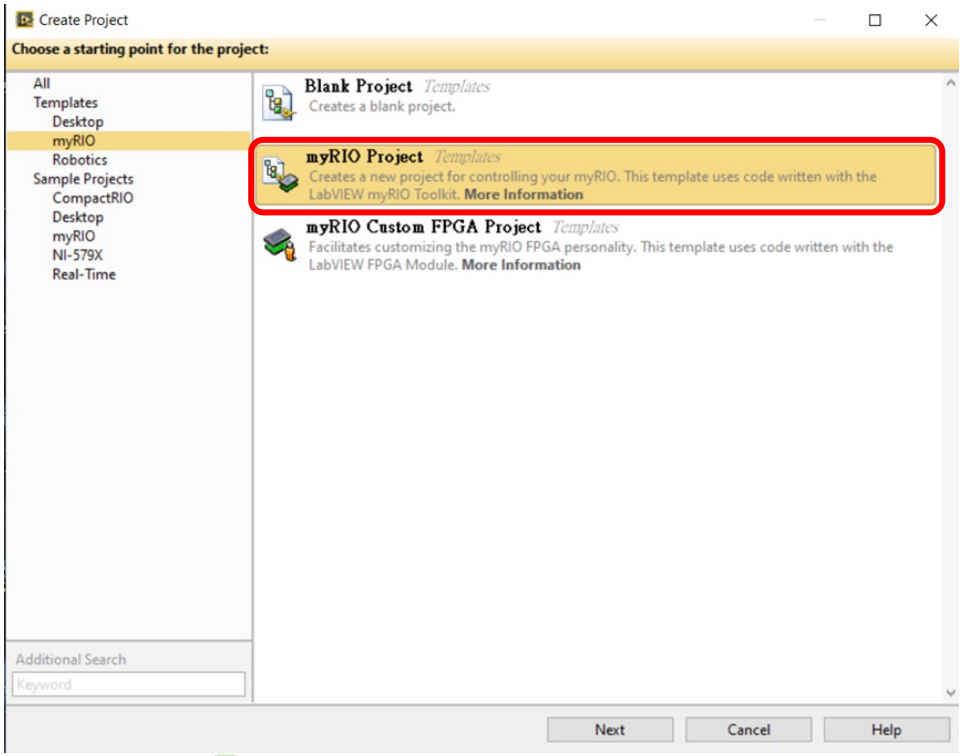




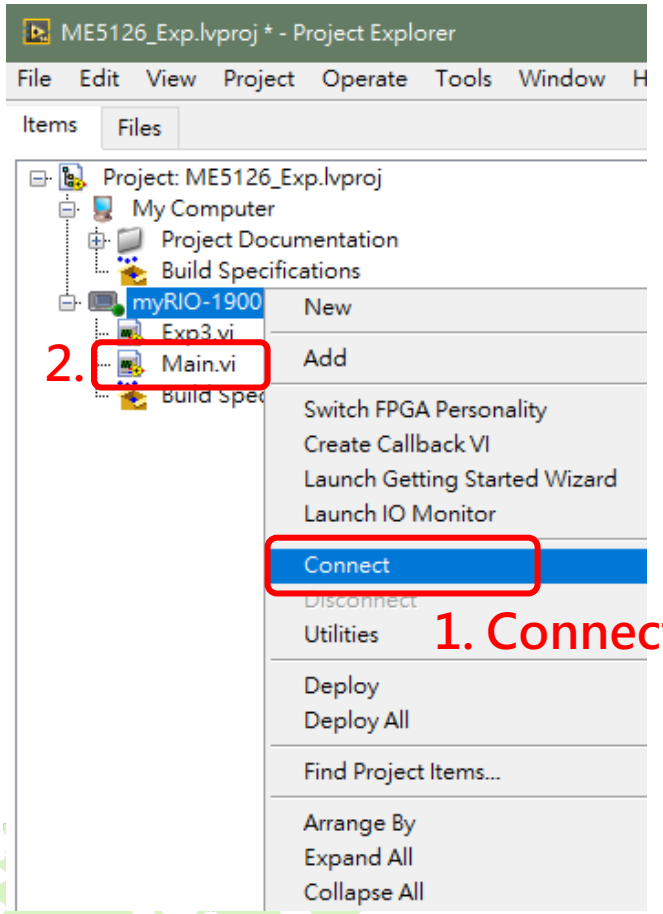


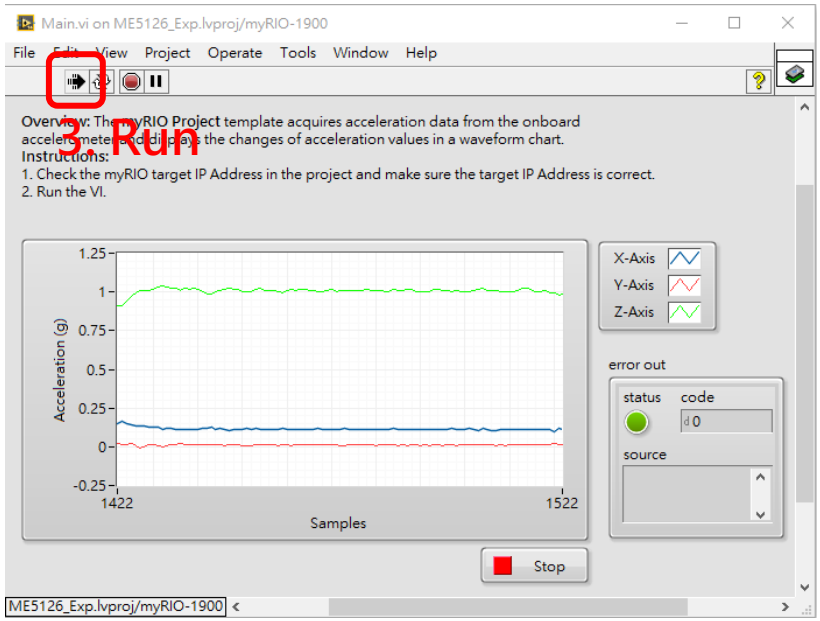
LabVIEW連接myRIO

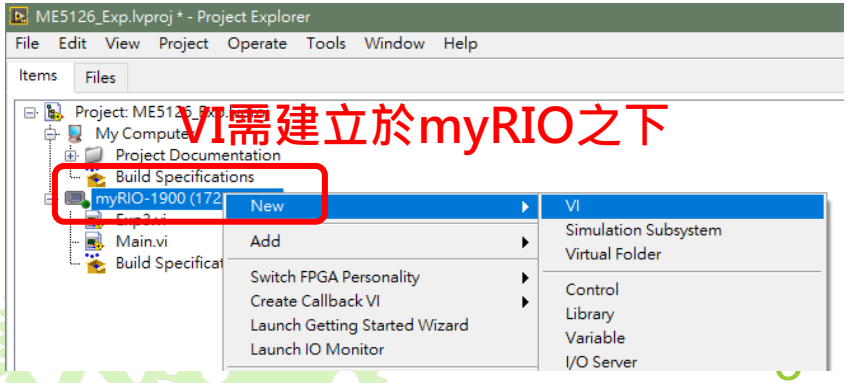




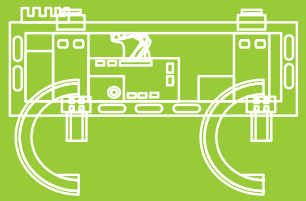
LabVIEW連接myRIO

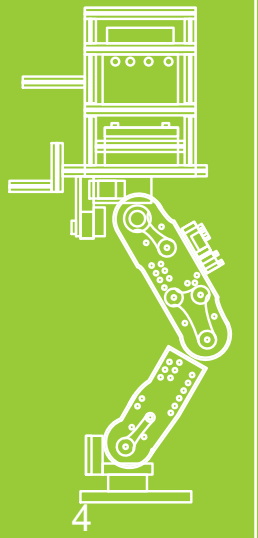






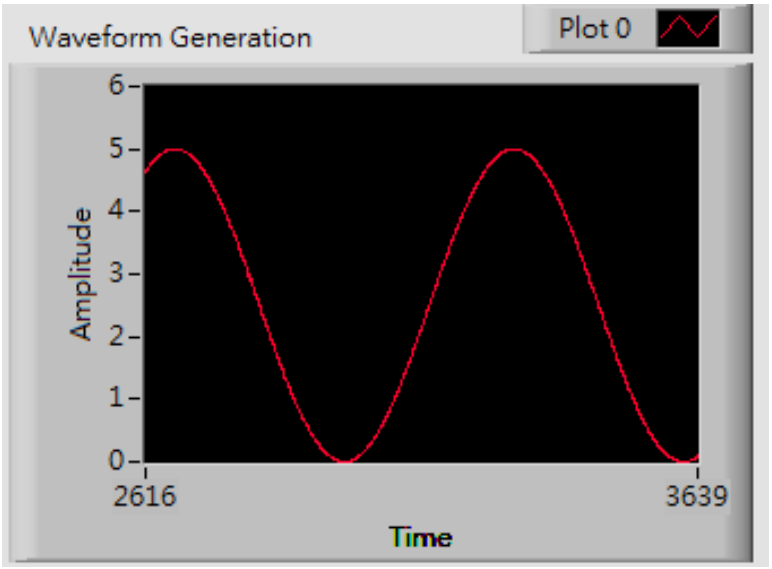
Waveform Generation and Oscilloscope



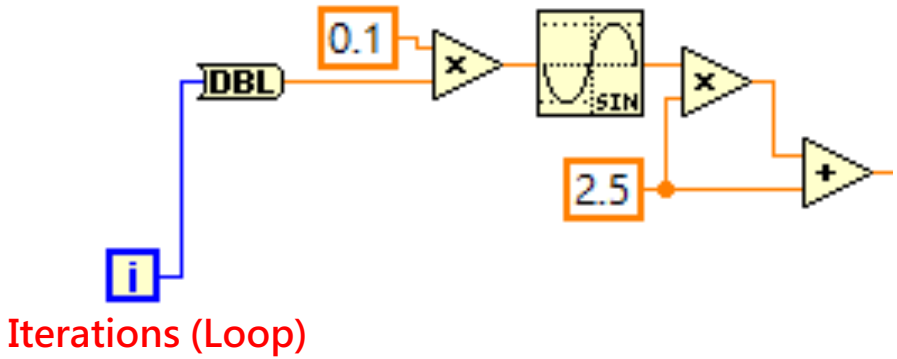
Waveform Generation

- 如何產正弦波



正弦波

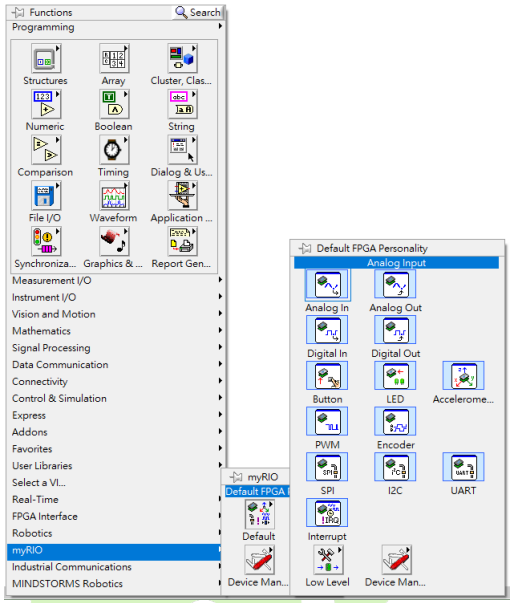
- 正弦波產生(需注意要offset)
  - 0V~5V

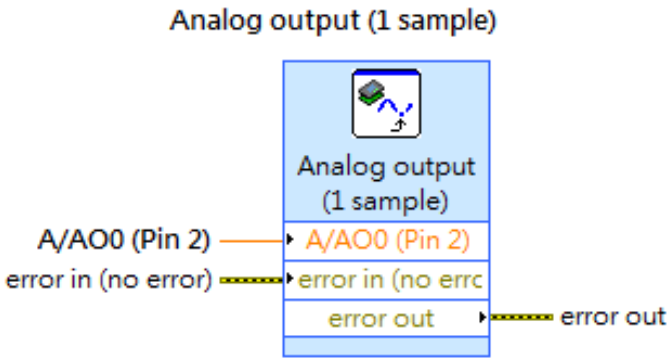


Ref:NI myRIO-1900 User Guide and Specification.pdf

類比輸出(AO)

- 類比輸出(AO)的範圍介在0V~5V之間
- **Way1** 使用Analog output



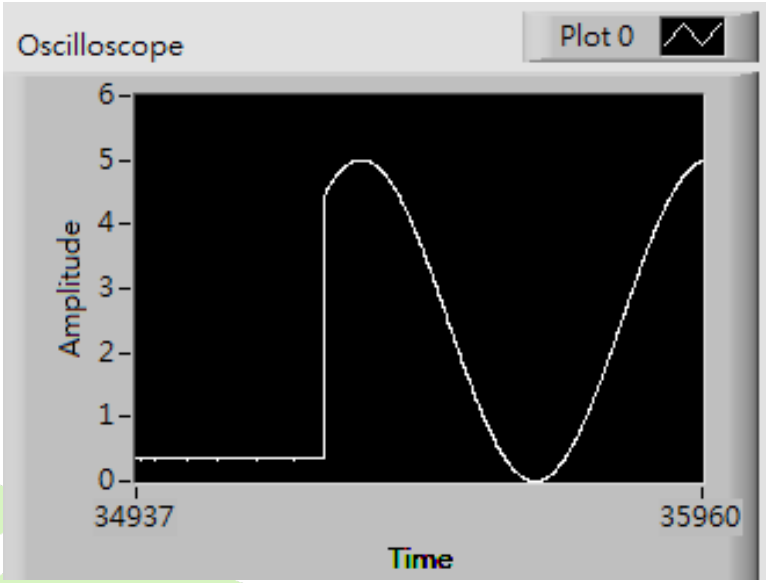


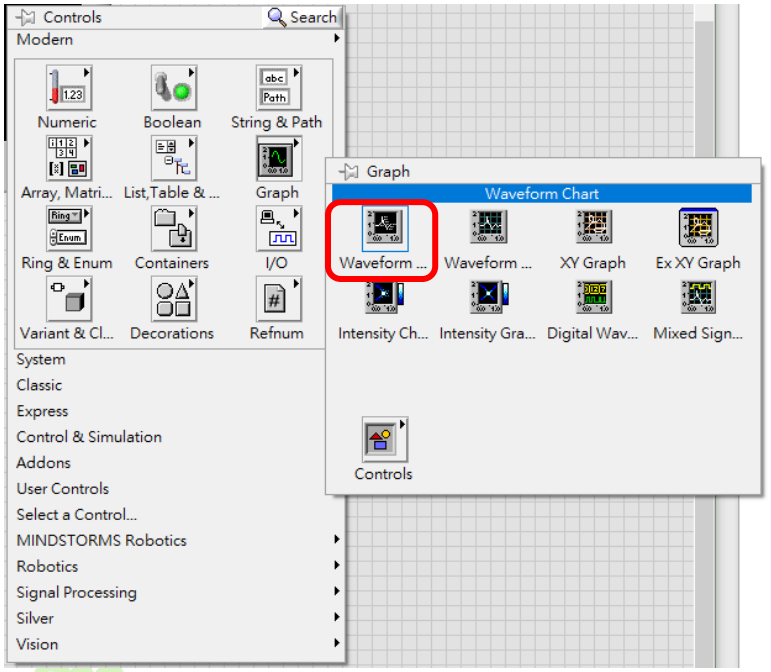
DIO15 / I2C.SDA	34	33	+3.3 V
DIO14 / I2C.SCL	32	31	DIO10 / PWM2
DGND	30	29	DIO9 / PWM1
DGND	28	27	DIO8 / PWM0
DIO13	26	25	DIO7 / SPI.MOSI
DGND	24	23	DIO6 / SPI.MISO
DIO12 / ENC.B	22	21	DIO5 / SPI.CLK
DGND	20	19	DIO4
白 DIO11 / ENC.A	18	17	DIO3
DGND	16	15	DIO2
UART.TX	14	13	DIO1
DGND	12	11	DIO0
UART.RX	10	9	AI3
DGND	8	7	AI2
AGND	6	5	AI1
AO1	4	3	AI0 白
AO0	2	1	+5V

Ref:NI myRIO-1900 User Guide and Specification.pdf

Oscilloscope

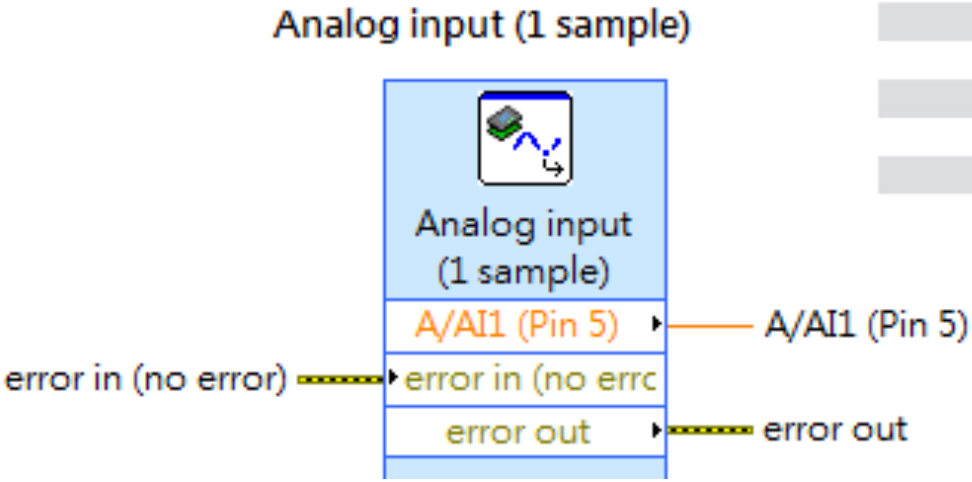
- 讀取輸入波形





類比輸入(AI)

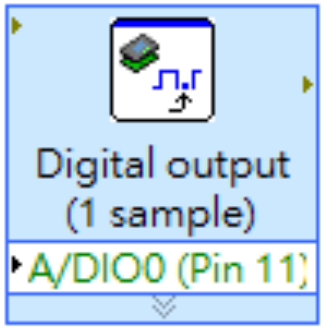
- 類比輸入(AI)
- **Way1** 使用Analog input



DIO15 / I2C.SDA	34	33	+3.3 V
DIO14 / I2C.SCL	32	31	DIO10 / PWM2
DGND	30	29	DIO9 / PWM1
DGND	28	27	DIO8 / PWM0
DIO13	26	25	DIO7 / SPI.MOSI
DGND	24	23	DIO6 / SPI.MISO
DIO12 / ENC.B	22	21	DIO5 / SPI.CLK
DGND	20	19	DIO4
DIO11 / ENC.A	18	17	DIO3
DGND	16	15	DIO2
UART.TX	14	13	DIO1
DGND	12	11	DIO0
UART.RX	10	9	AI3
DGND	8	7	AI2
AGND	6	5	AI1
AO1	4	3	AI0
AO0	2	1	+5V

數位輸出(DO)

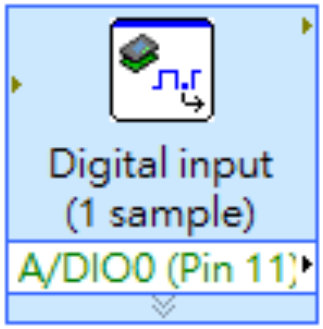
- 數位輸出(DO)
- **Way1** 使用Digital output



DIO15 / I2C.SDA	34	33	+3.3 V
DIO14 / I2C.SCL	32	31	DIO10 / PWM2
DGND	30	29	DIO9 / PWM1
DGND	28	27	DIO8 / PWM0
DIO13	26	25	DIO7 / SPI.MOSI
DGND	24	23	DIO6 / SPI.MISO
DIO12 / ENC.B	22	21	DIO5 / SPI.CLK
DGND	20	19	DIO4
白 DIO11 / ENC.A	18	17	DIO3
DGND	16	15	DIO2
UART.TX	14	13	DIO1
DGND	12	11	DIO0
UART.RX	10	9	AI3
DGND	8	7	AI2
AGND	6	5	AI1
AO1	4	3	AI0 白
AO0	2	1	+5V

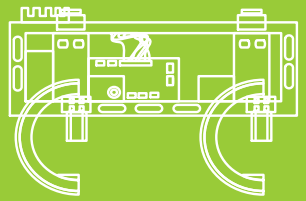
數位輸入(DI)

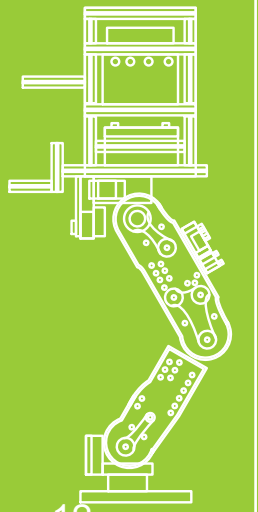
- 數位輸入(DI)
- **Way1** 使用Digital input



DIO15 / I2C.SDA	34	33	+3.3 V
DIO14 / I2C.SCL	32	31	DIO10 / PWM2
DGND	30	29	DIO9 / PWM1
DGND	28	27	DIO8 / PWM0
DIO13	26	25	DIO7 / SPI.MOSI
DGND	24	23	DIO6 / SPI.MISO
DIO12 / ENC.B	22	21	DIO5 / SPI.CLK
DGND	20	19	DIO4
DIO11 / ENC.A	18	17	DIO3
DGND	16	15	DIO2
UART.TX	14	13	DIO1
DGND	12	11	DIO0
UART.RX	10	9	AI3
DGND	8	7	AI2
AGND	6	5	AI1
AO1	4	3	AI0
AO0	2	1	+5V

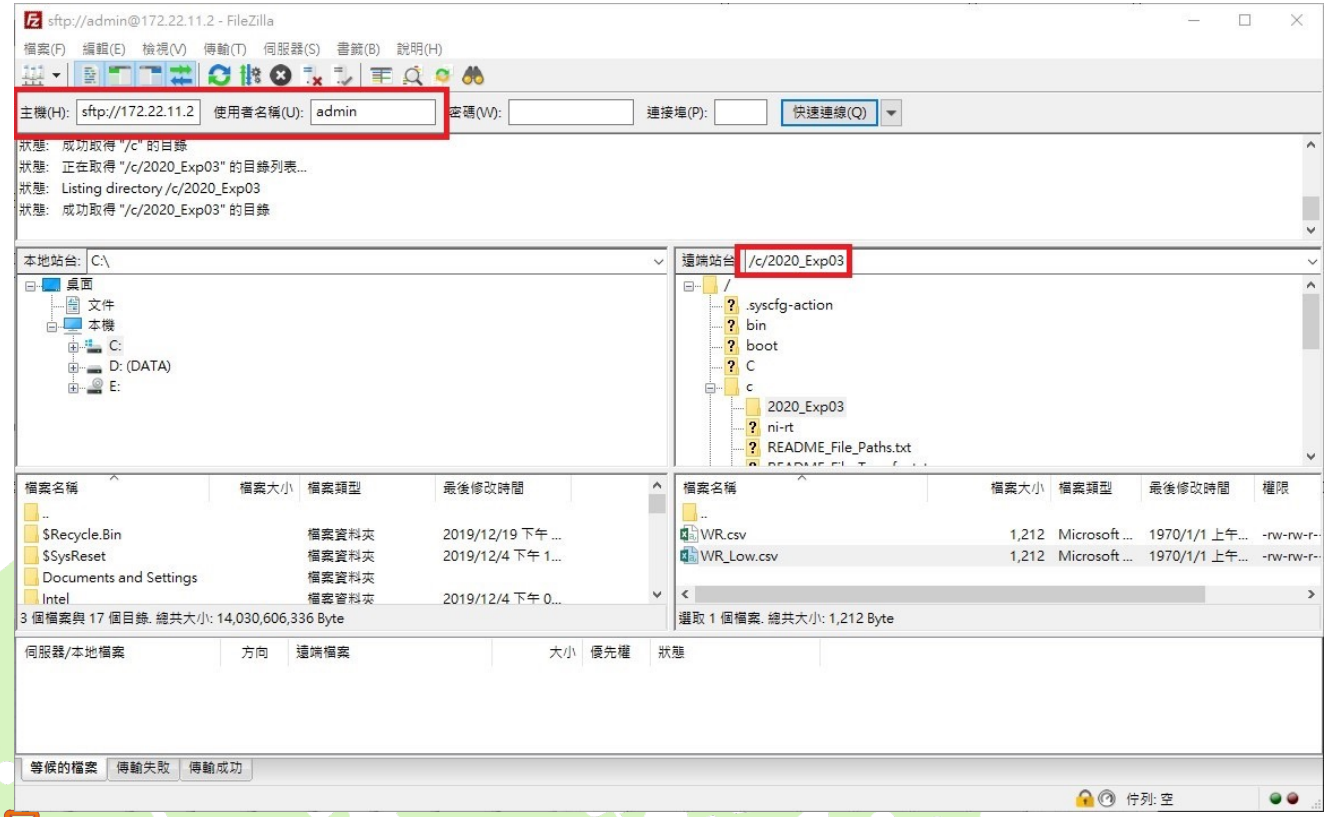
Data Read / Write





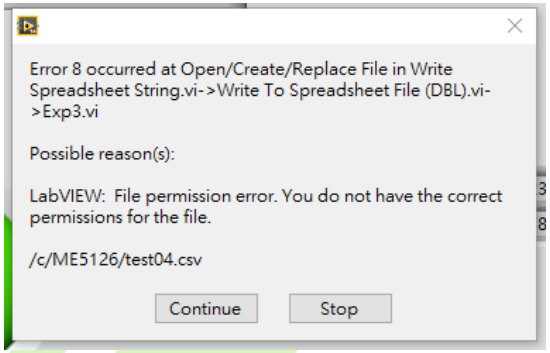
myRIO的存讀路徑

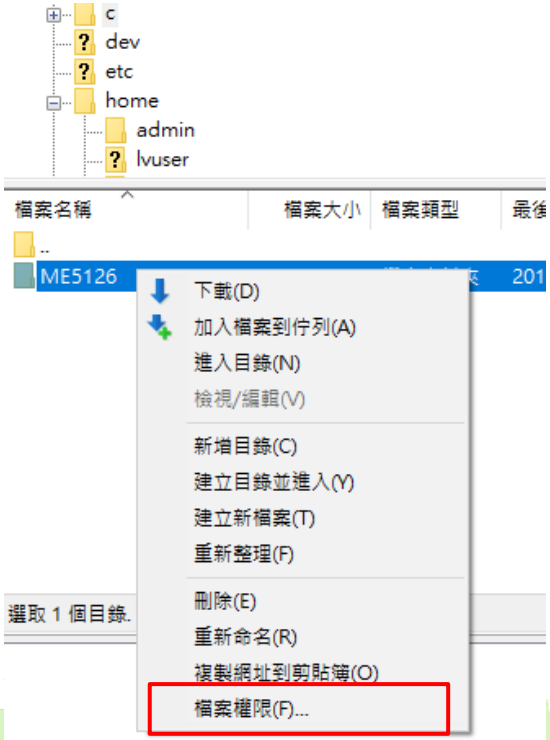
- 主機 **sftp://172.22.11.2** 使用者名稱 **admin**
- 路徑由FileZilla可以看到 /c/ExpXX <自創資料夾
- 所以存取時路徑/c/ExpXX/檔名.副檔名 <自動建立檔案

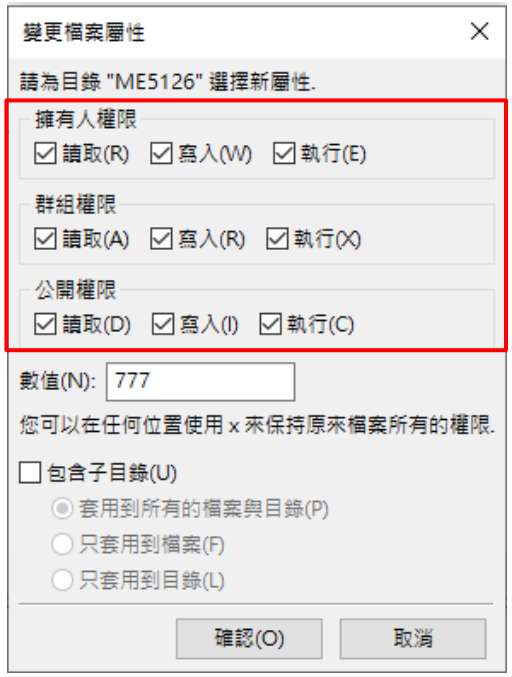


存取權限異常

- 執行Labview程式後出現權限不足
- 使用Filezilla對欲存取的資料夾進行檔案權限修改
- 勾選所有權限後按確認

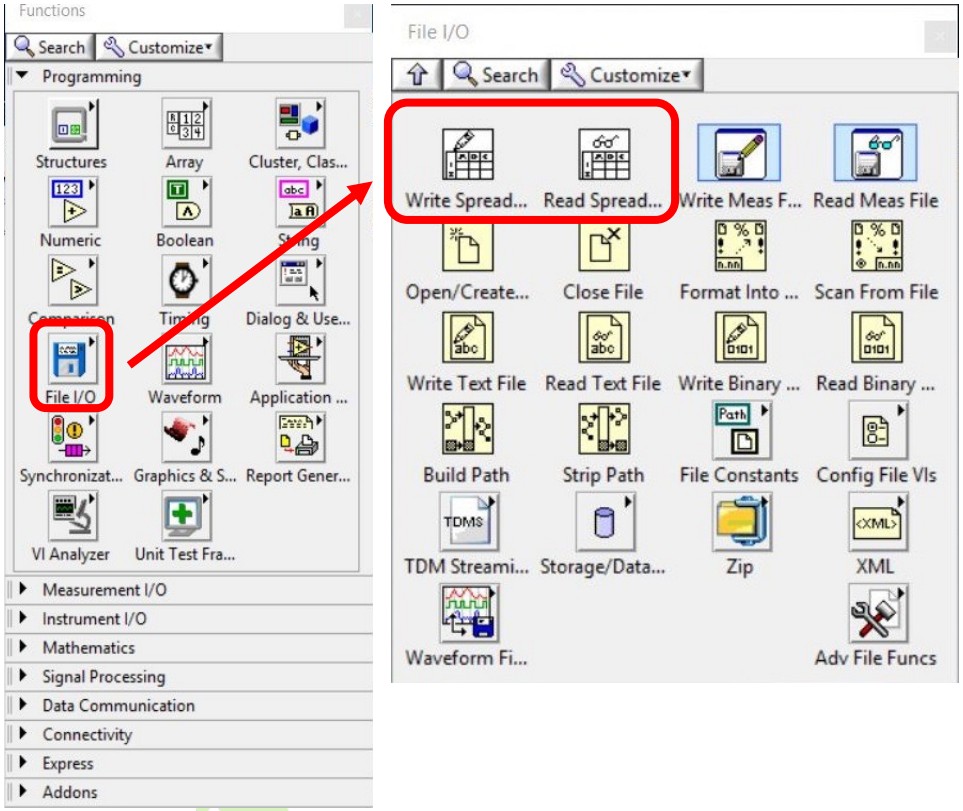




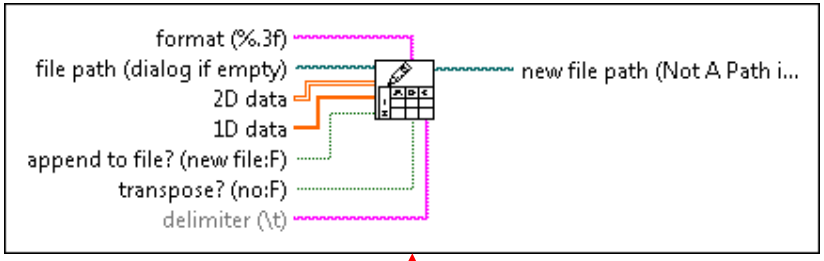


Read/Write 元件

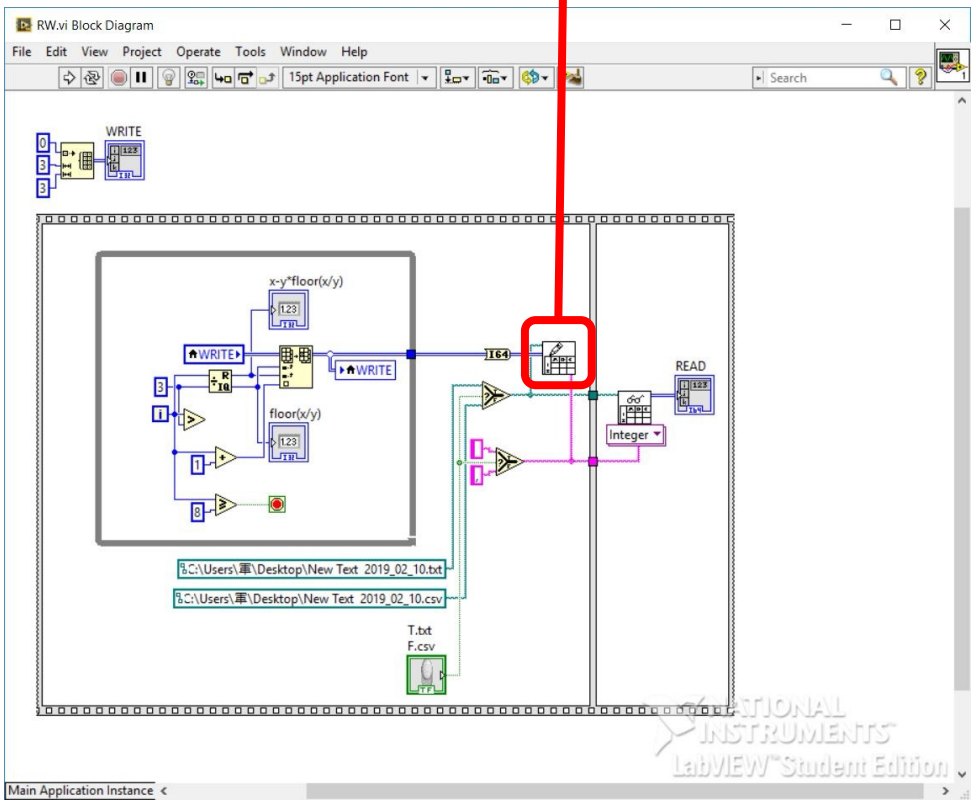
- File I/O
  - Write Spreadsheet
  - Read Spreadsheet



Write Spreadsheet



1. File Path 右鍵 create constant
2. 輸入想要存取的位置、檔名與副檔名(副檔名會決定檔案類型)
3. 或先創好文件,使用select path

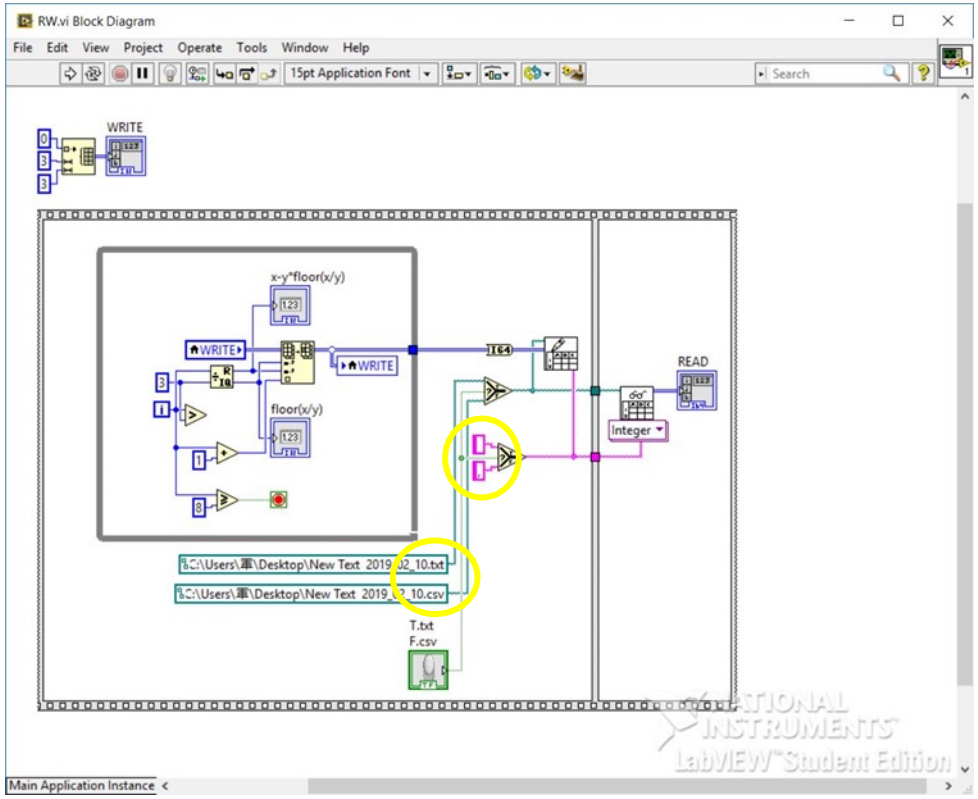


對著元件點滑鼠右鍵,選擇help就有詳細內容

File format

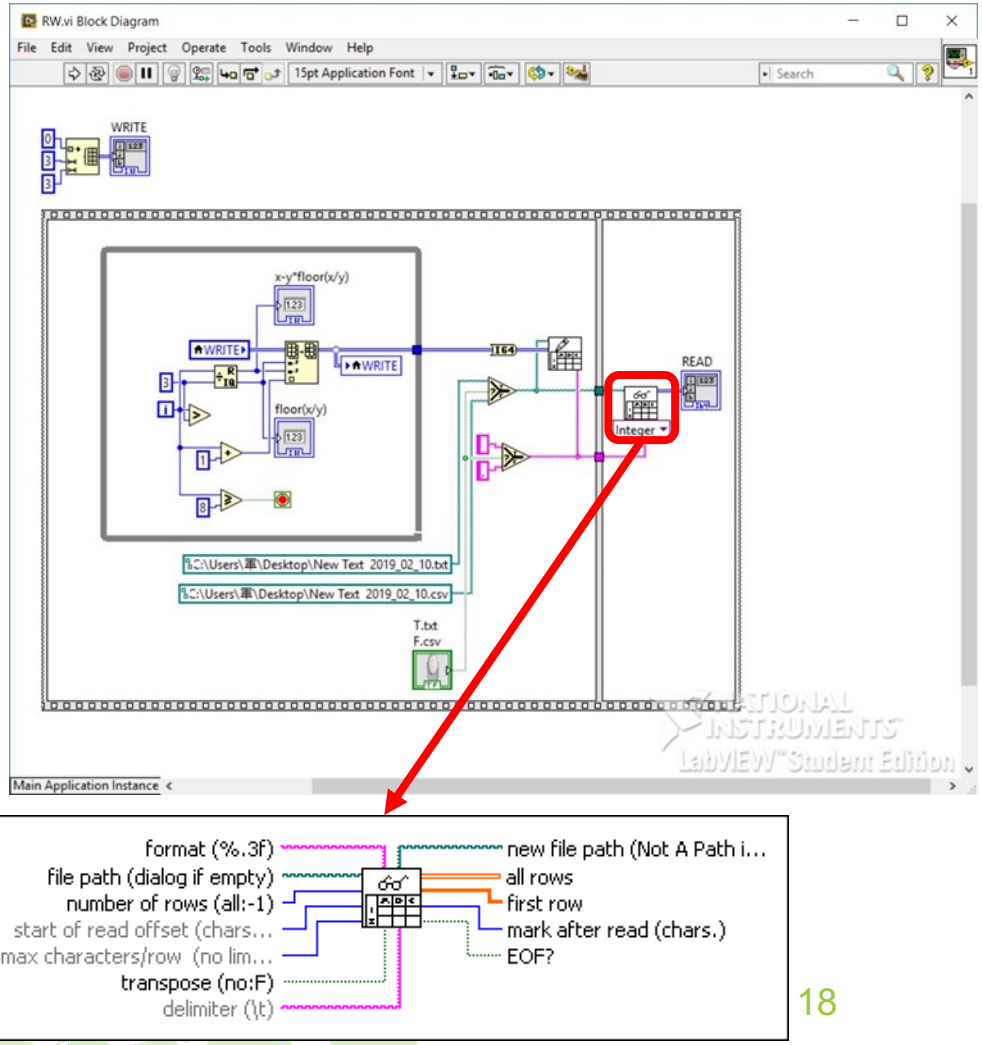
- Txt檔
  - 副檔名.txt
  - Delimiter [\t] 空格
- **Excel檔**
  - 副檔名.csv
  - Delimiter [,] 在excel中換行

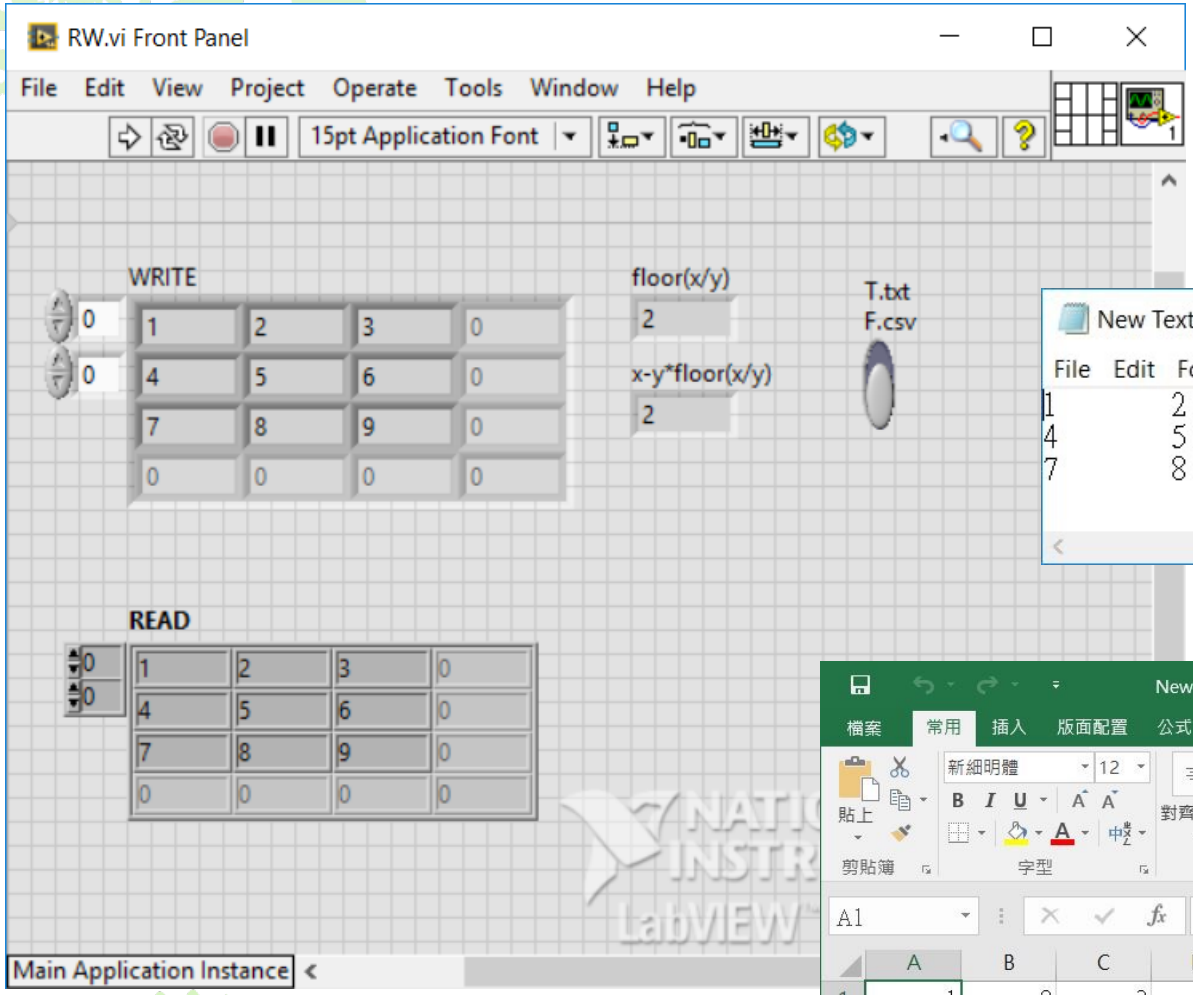
Read Write 統一

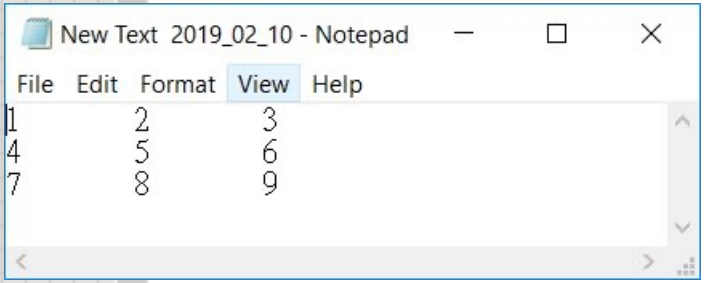


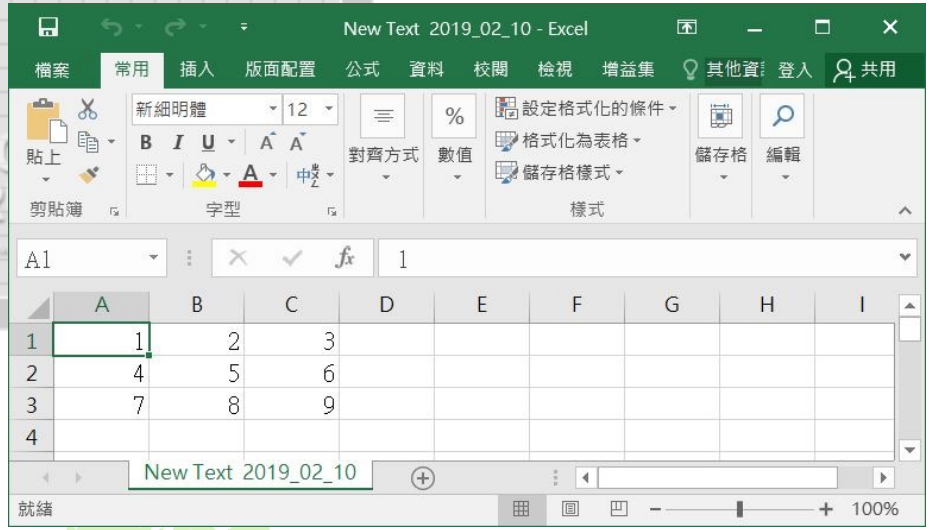
Read Spreadsheet

1. File Path 右鍵 create constant
2. 輸入想要讀取的位置與檔名
3. 或使用select path,點選要讀取的文件

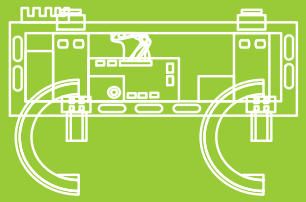


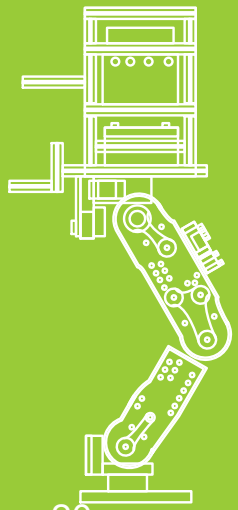

RW.vi Front Panel
File Edit View Project Operate Tools Window Help
15pt Application Font
WRITE
0 1 2 3 0
0 4 5 6 0
7 8 9 0
0 0 0 0 0
floor(x/y)
2
x-y*floor(x/y)
2
T.txt
F.csv
READ
0 1 2 3 0
0 4 5 6 0
7 8 9 0
0 0 0 0 0
Main Application Instance


New Text 2019_02_10 - Notepad
File Edit Format View Help
1 2 3
4 5 6
7 8 9


New Text 2019_02_10 - Excel
檔案 常用 插入 版面配置 公式 資料 校閱 檢視 增益集 其他資訊 登入 共用
新細明體 12
貼上
剪貼簿
字型
對齊方式
數值
設定格式化的條件
格式化為表格
儲存格樣式
樣式
儲存格
編輯
A1
1
A B C D E F G H I
1 1 2 3
2 4 5 6
3 7 8 9
4
New Text 2019_02_10
就緒
100%

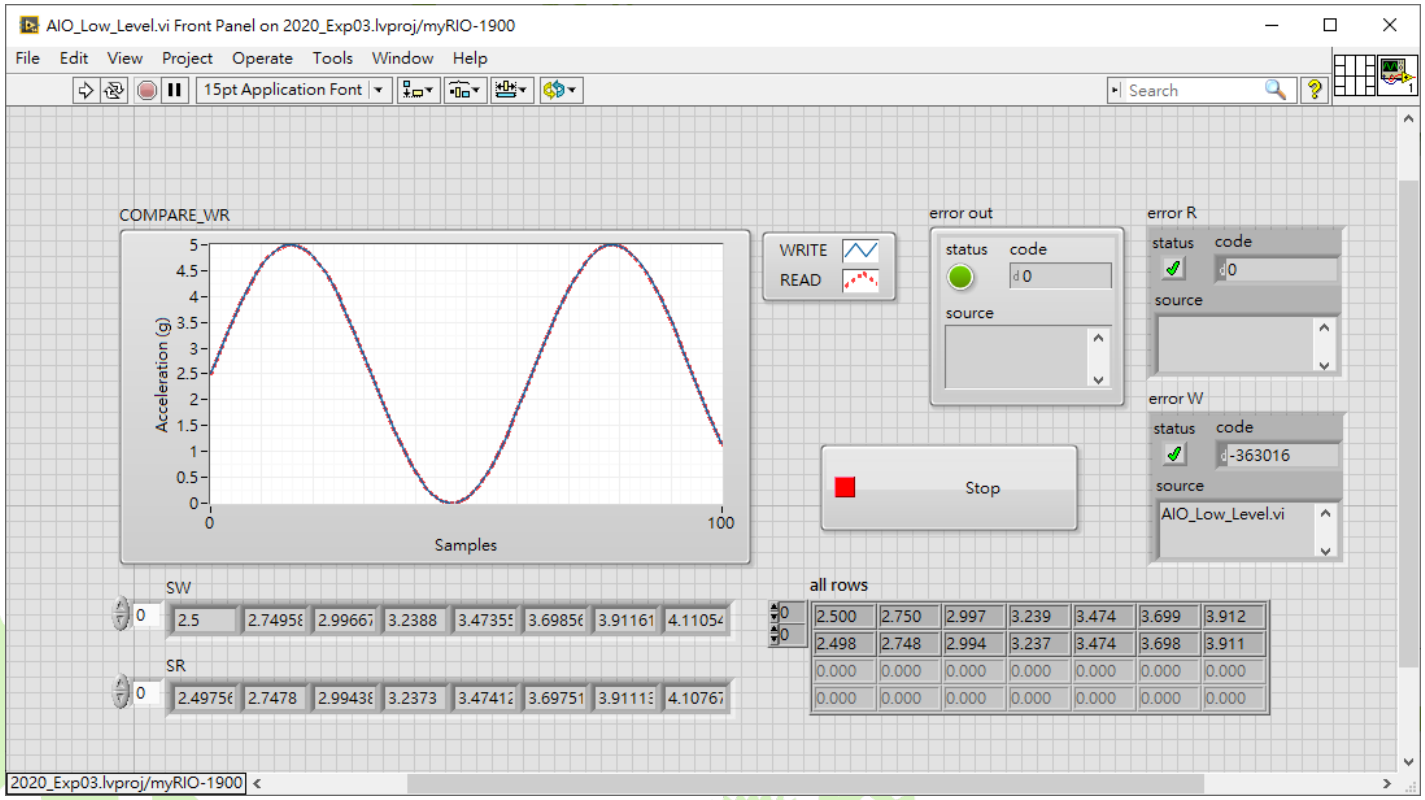
驗收



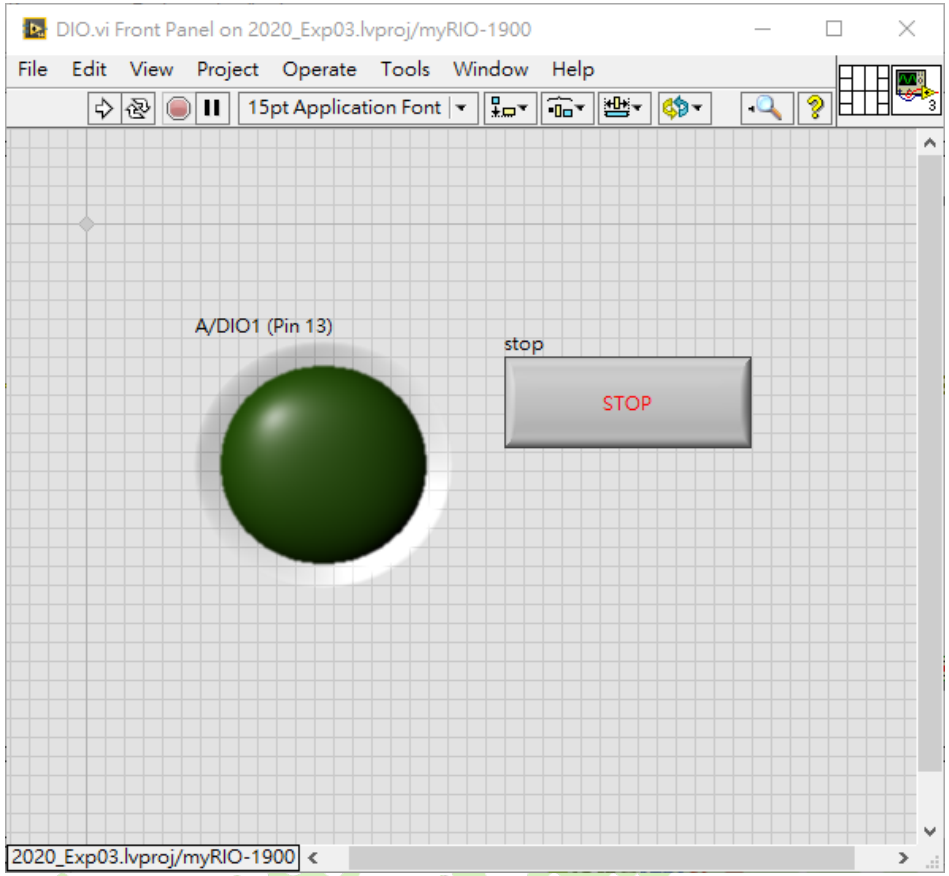


配分

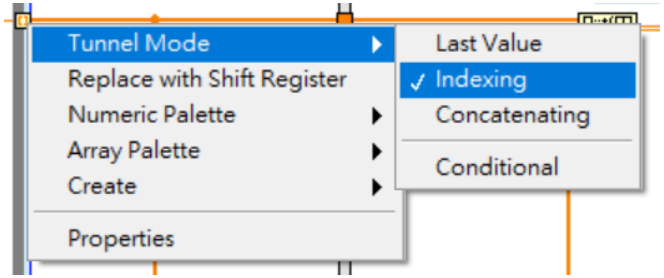
- 基本題:
  - AIO 30% 附加 Data RW 30%
    - 產生正弦波,用類比輸出再讀入,並記錄一段時間,用**Waveform Chart**驗收



- DIO 40%
  - 產生間歇閃爍(需經過腳位輸出輸入)



Sample Code



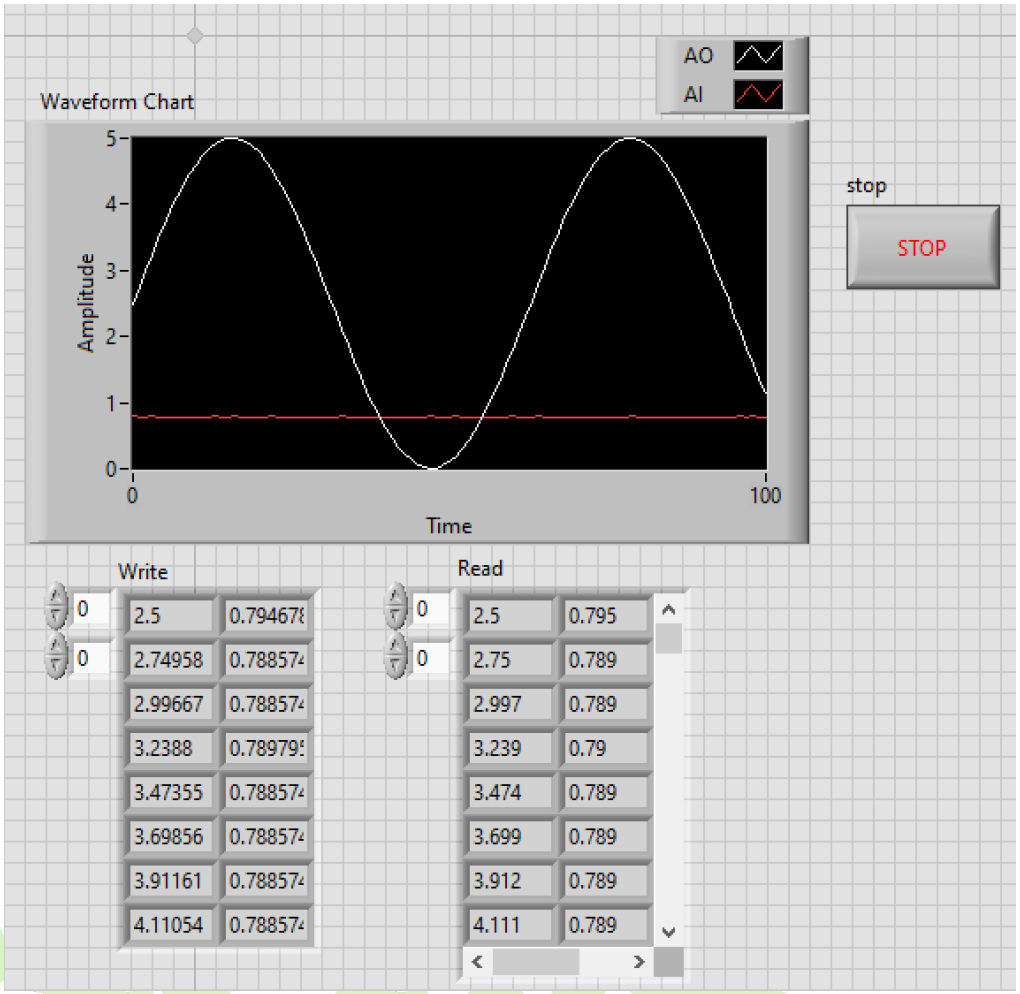
Tunnel Mode->Indexing

Flat Sequence Structure

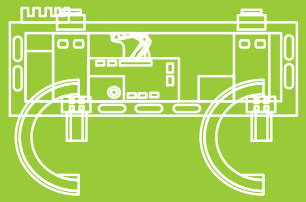
While Loop

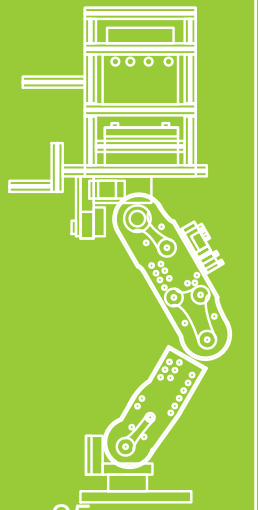
milliseconds to wait
10
Wait (ms)
2.5
Multiply
Analog output (1 sample)
Analog output (1 sample)
A/AO0 (Pin 2)
0.1
Multiply
Sine
Add
DBL
To Double Precision Float
Bundle
Waveform Chart
Analog input (1 sample)
Analog input (1 sample)
A/AI0 (Pin 3)
i
stop
STOP
TF
Build Array
Greater Or Equal?
100
Or
Write Delimited Spreadsheet.vi
delimiter (\t)
Write
file path (dialog if empty)
/c/ta_test/01.txt
Read Delimited Spreadsheet.vi
Double
Read

Sample Code - UI



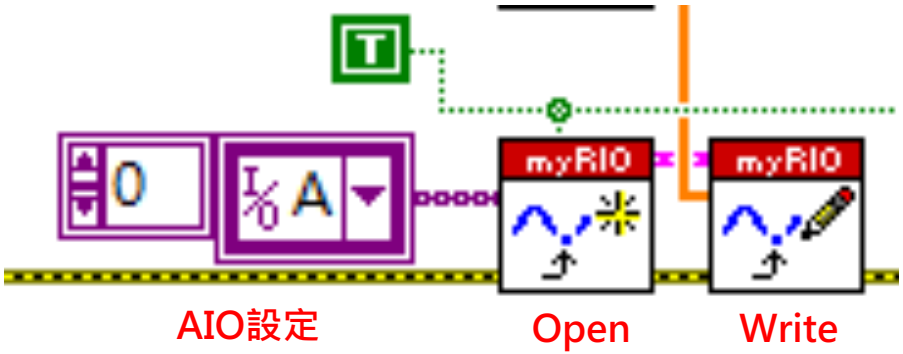
附錄





類比輸出(AO)

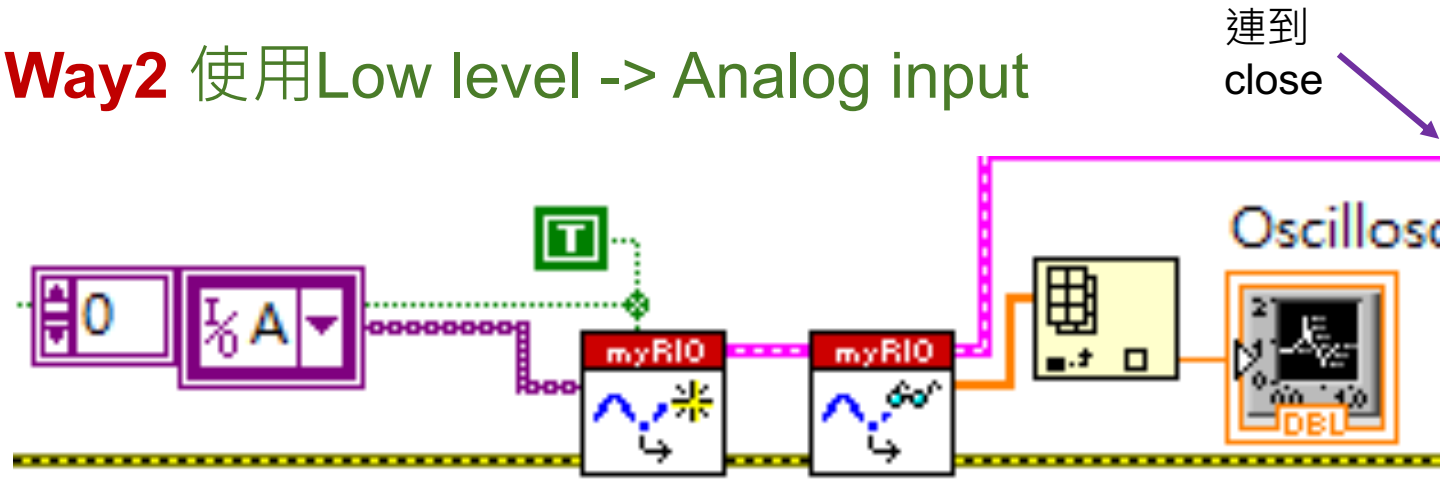
- **Way2** 使用Low level -> Analog output



Ref:NI myRIO-1900 User Guide and Specification.pdf

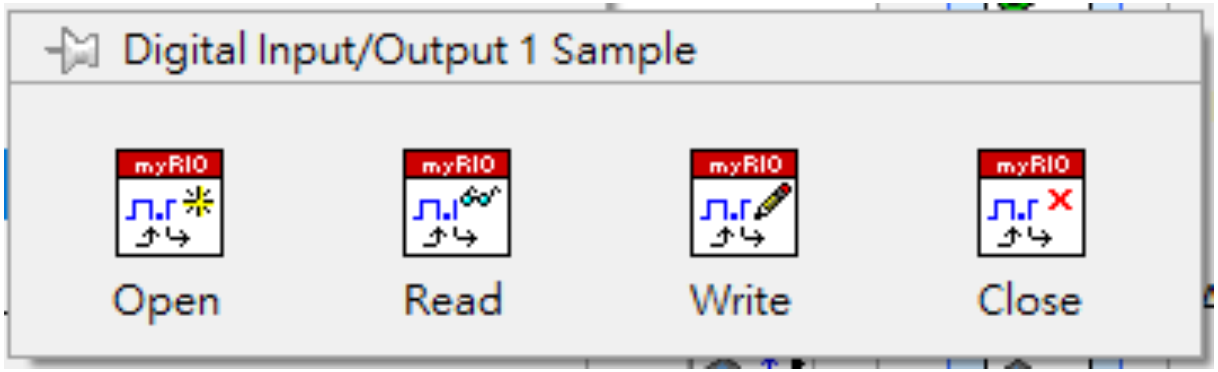
類比輸入(AI)

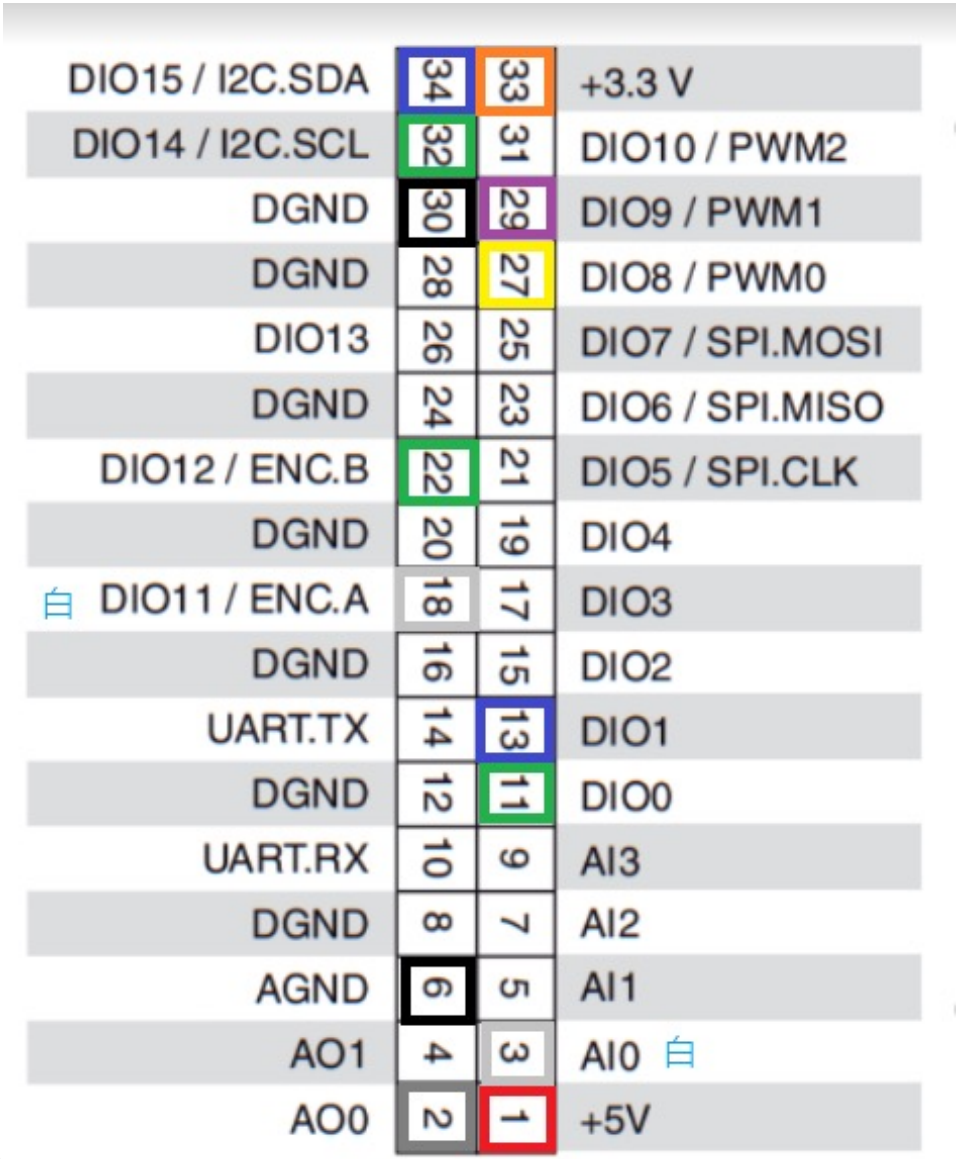
- **Way2** 使用Low level -> Analog input



Ref:NI myRIO-1900 User Guide and Specification.pdf

- **Way2** 使用Low level -> Digital input/output




DIO15 / I2C.SDA
34
33
+3.3 V
DIO14 / I2C.SCL
32
31
DIO10 / PWM2
DGND
30
29
DIO9 / PWM1
DGND
28
27
DIO8 / PWM0
DIO13
26
25
DIO7 / SPI.MOSI
DGND
24
23
DIO6 / SPI.MISO
DIO12 / ENC.B
22
21
DIO5 / SPI.CLK
DGND
20
19
DIO4
白
DIO11 / ENC.A
18
17
DIO3
DGND
16
15
DIO2
UART.TX
14
13
DIO1
DGND
12
11
DIO0
UART.RX
10
9
AI3
DGND
8
7
AI2
AGND
6
5
AI1
AO1
4
3
AI0 白
AO0
2
1
+5V