



# NI myRIO 簡介

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# Outline

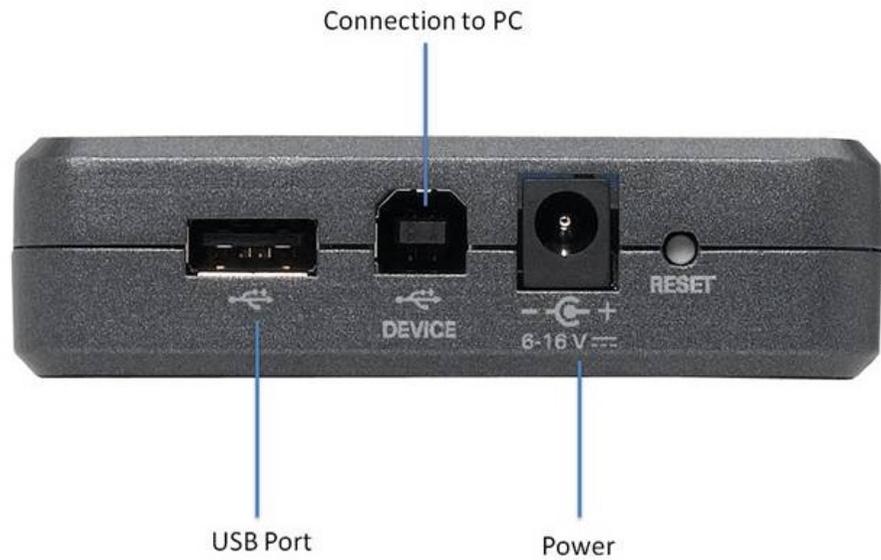
- NI myRIO 硬體概述
- Start myRIO project
- 實作一
- 實作二
- HW3

# NI myRIO 硬體概述

- 可搭配 LabVIEW 做開發測試的軟硬體平台
- 搭載高規格的 Zynq FPGA 及 3軸加速規
- 有40個數位I/O 通道、10個類比輸入通道、6個類比輸出  
通道，可連接感測器
- 建有 Wifi 與 USB埠

# Front View & Back View





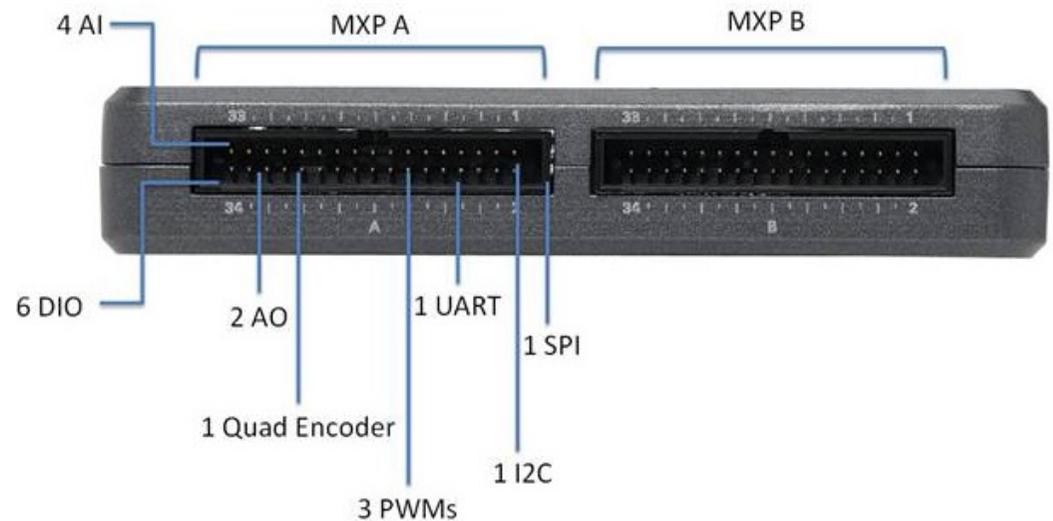
## MiniSystems Port (MSP)



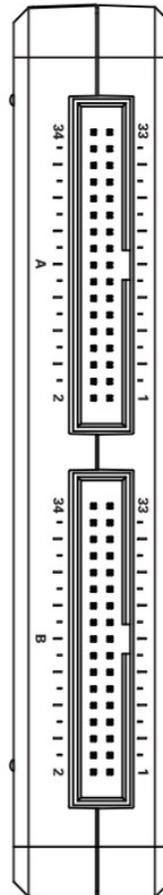
Identical to NI myDAQ

## NI myRIO Expansion Port(MXP)

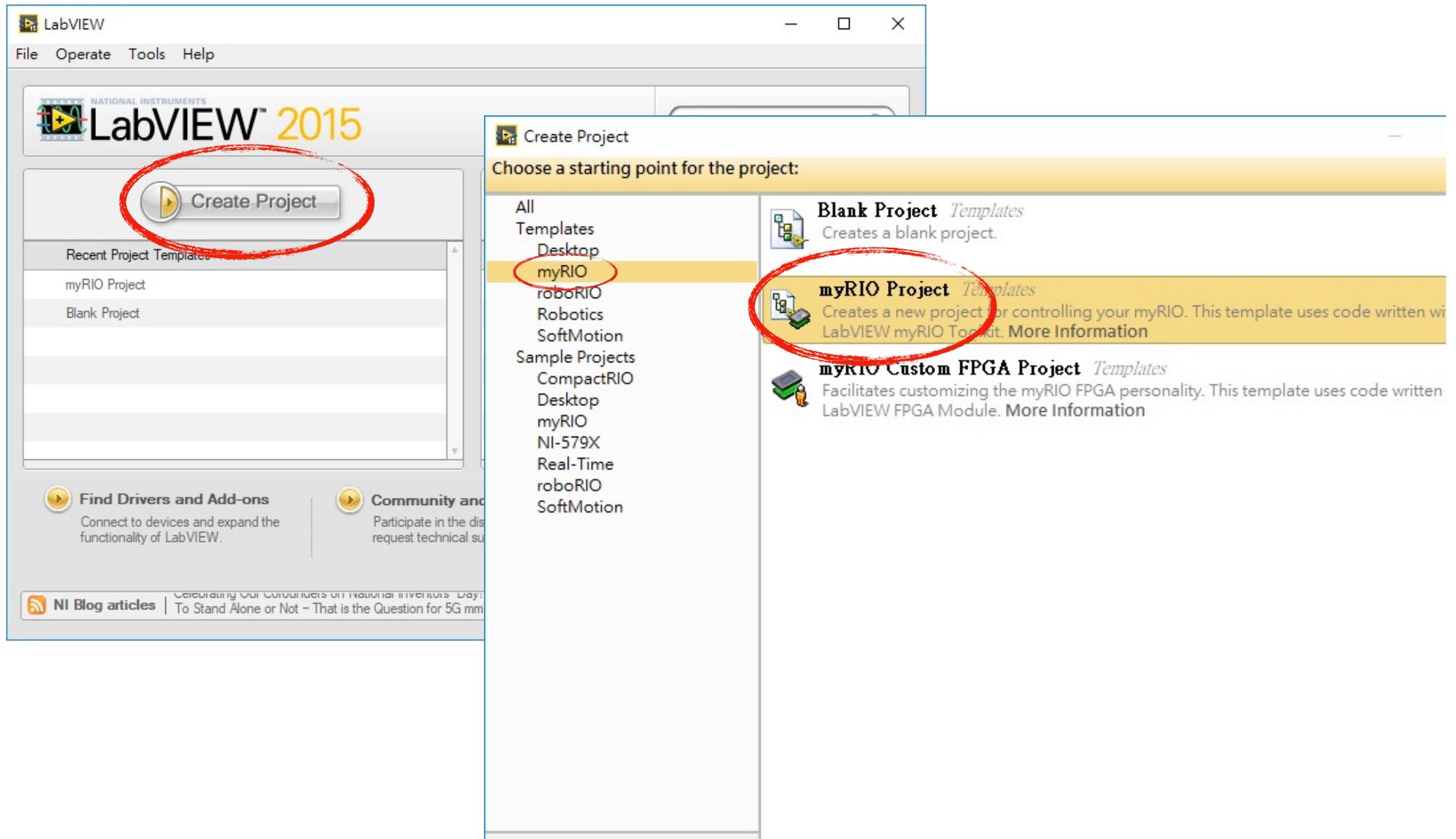
Identical Connectors



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



# Start myRIO project



Create Project

Configure the new project: myRIO Project

Project Name

HW2

Project Root

C:\Users\sp\Desktop\學號 \ HW2 \

File Name Prefix (Optional)

Target

- Plugged into USB
- Connected over WiFi
- Generic Target
- Specific IP Address or Hostname



NI-myRIO-1900-03039119 (172.22.11.2)



FPGA Personality

Default

Supports general I/O, protocols, and interrupt. [Learn more](#)



12  
AI



8  
AO



40  
DIO



1  
Button



4  
LED



3  
ACC



8  
PWM



4  
ENC



2  
SPI



2  
I2C



2  
UART



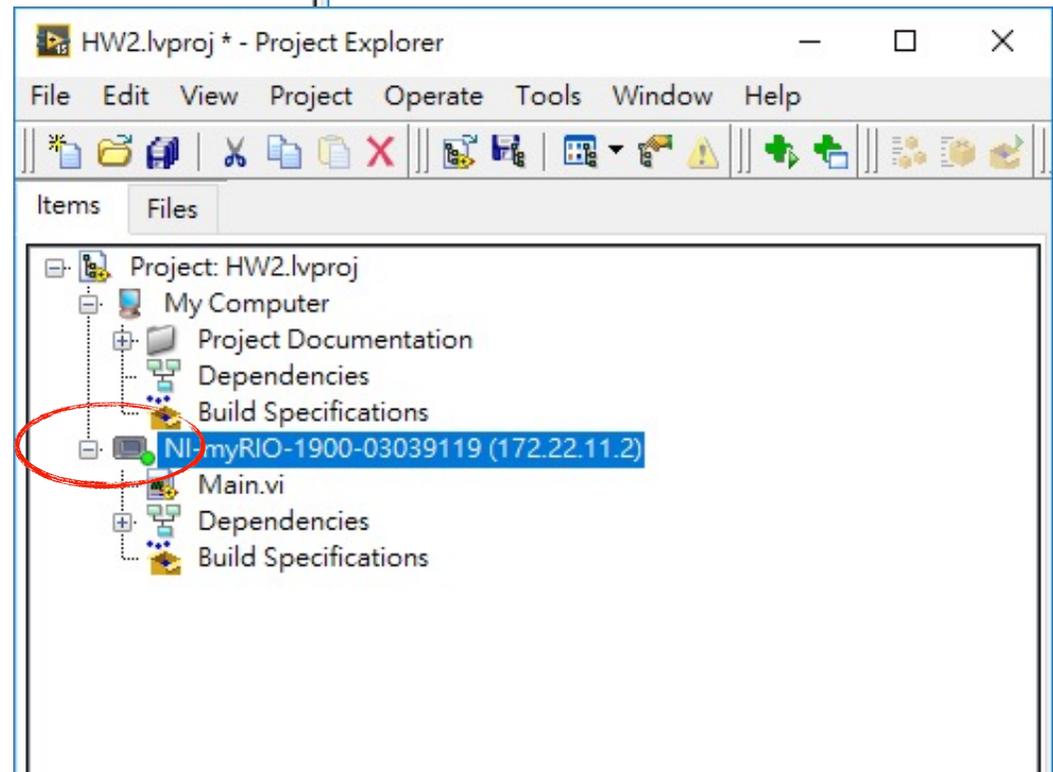
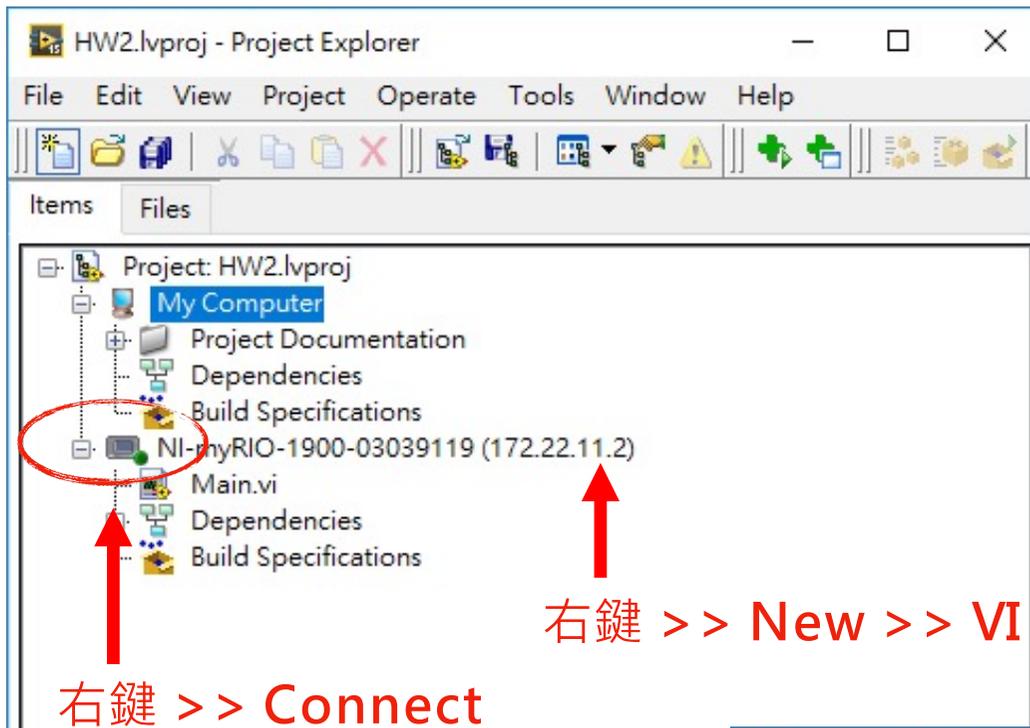
8  
IRQ

Back

Finish

Cancel

Help



Functions

Programming

- Structures
- Array
- Cluster, Clas...
- Numeric
- Boolean
- String
- Comparison
- Timing
- Dialog & Us...
- File I/O
- Waveform
- Application ...
- Synchroniza...
- Graphics & ...
- Report Gen...
- VI Analyzer
- Unit Test Fra...

Measurement I/O

Instrument I/O

Vision and Motion

Mathematics

Signal Processing

Data Communication

Connectivity

Control & Simulation

SignalExpress

Express

Addons

Favorites

User Libraries

Select a V...

Real-Time

FPGA Interface

Robotics

**myRIO**

Industrial Communications

DSC Module

LabVIEW >> Block Diagram >> Function >> myRIO

myRIO

Search Customize

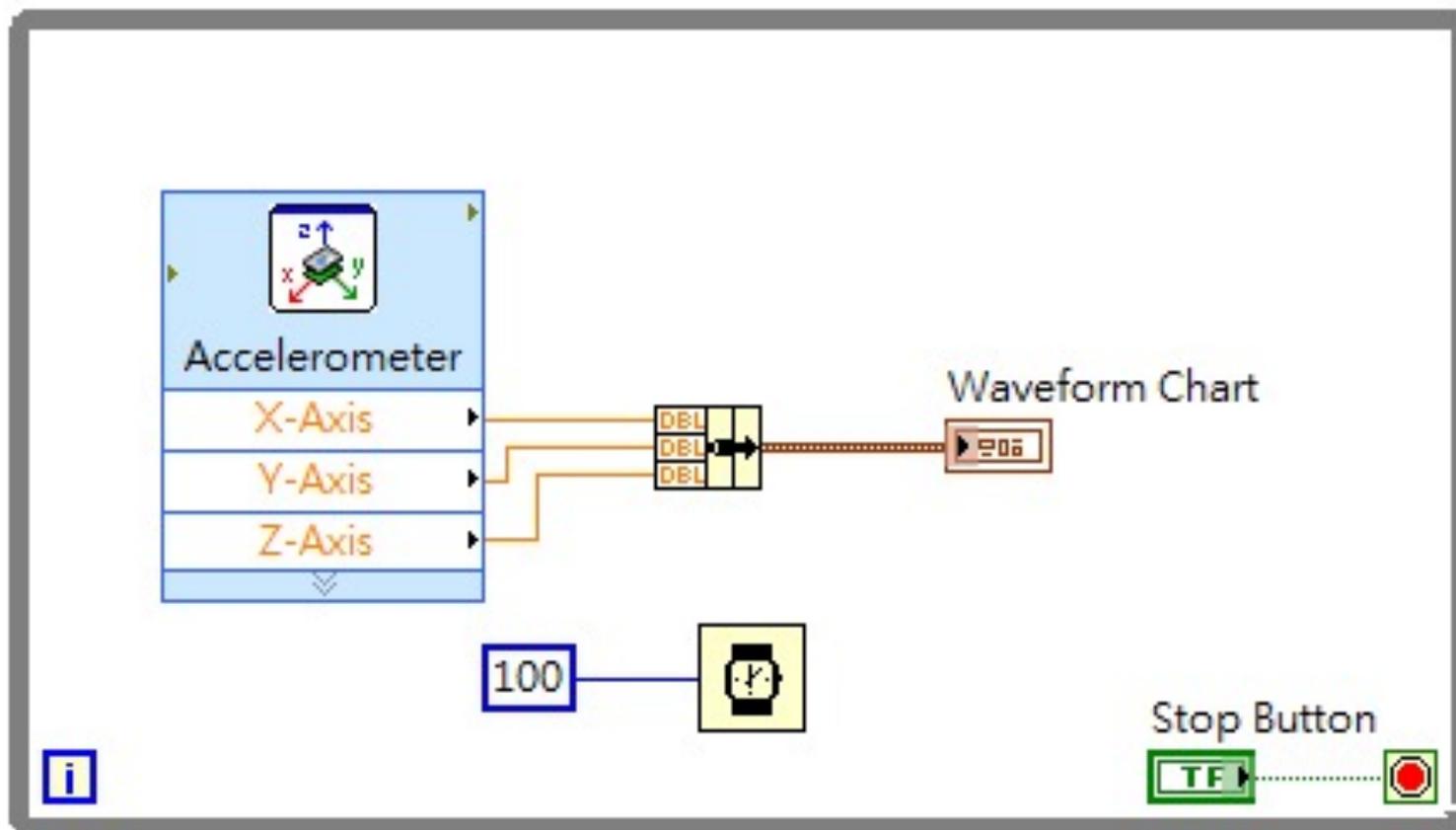
- Analog In
- Analog Out
- Digital In
- Digital Out
- Button
- LED
- Accelerome...
- PWM
- Encoder
- SPI
- I2C
- UART
- Interrupt
- Low Level
- Device Man...

# 實作一

使用 myRIO 三軸加速規，用 Waveform Chart 作圖



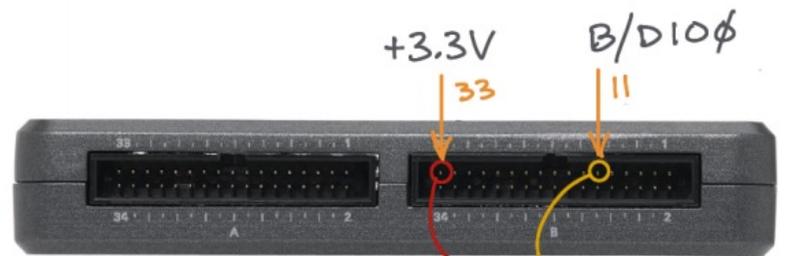
# 實作一 解答



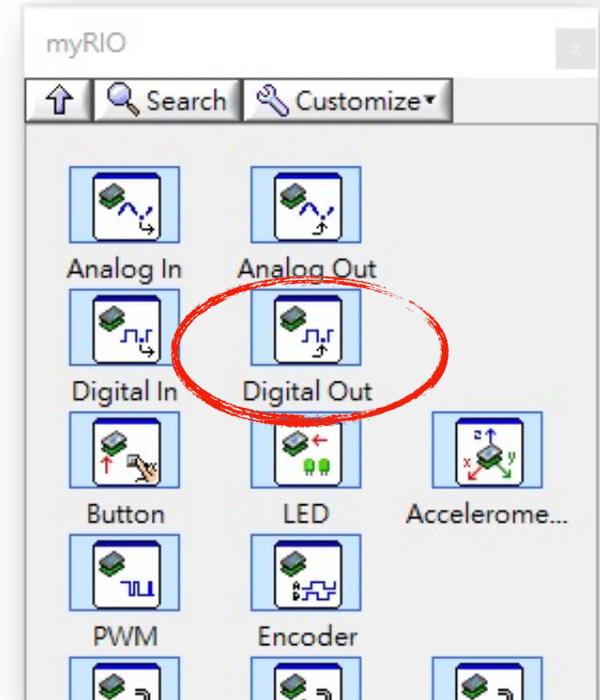
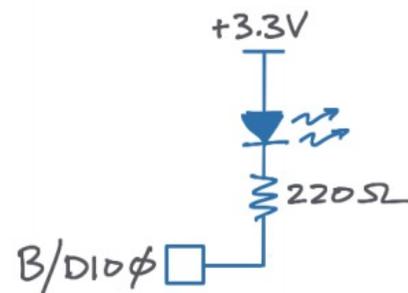
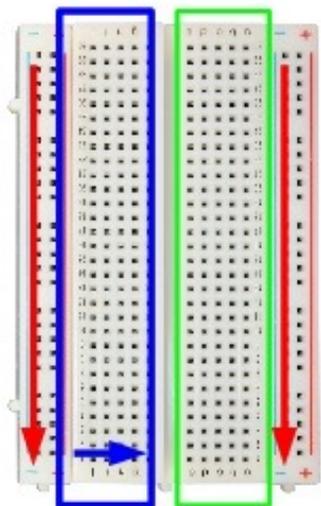
# 實作二

參考 NI myRIO Project Essentials Guide

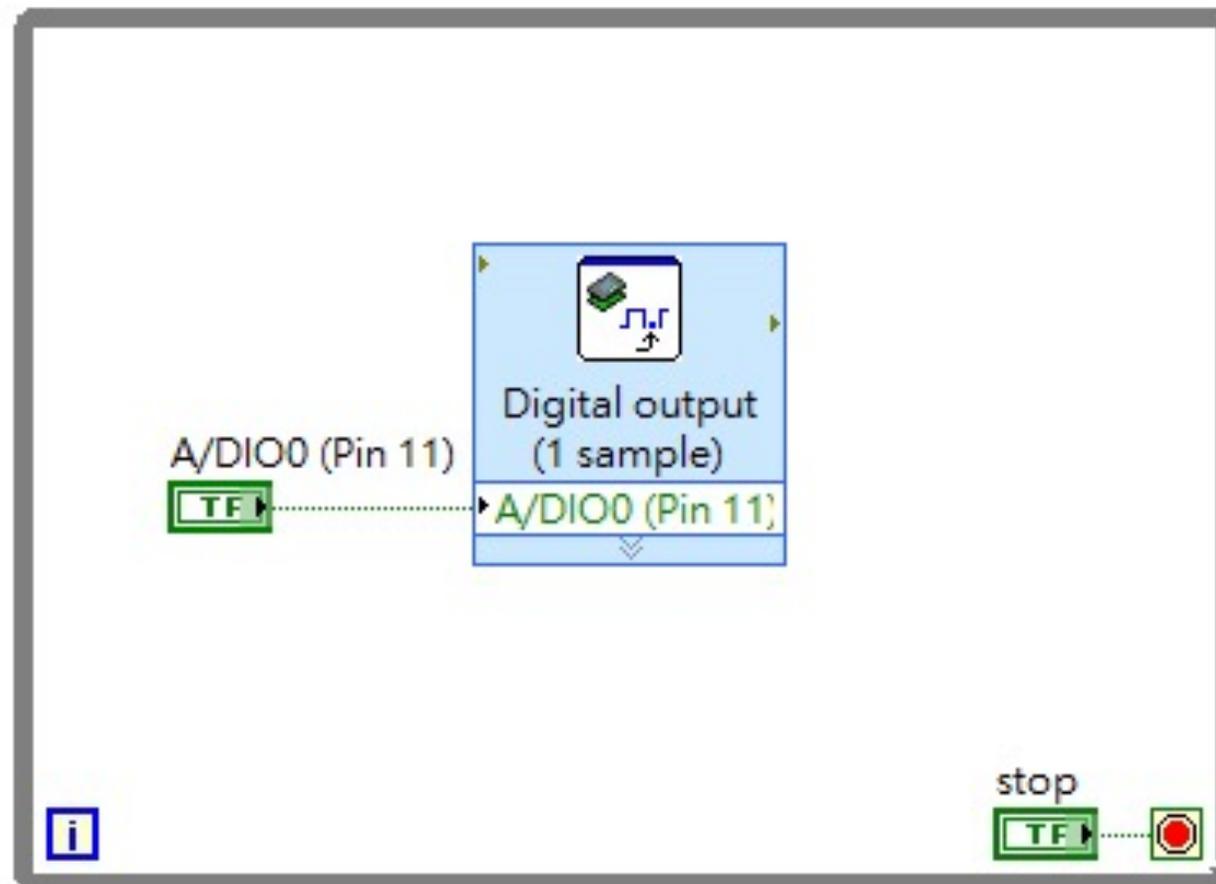
在myRIO擴充板上接LED燈並確保可以控制output訊號



藍區綠區水平相通  
藍綠區互不相通  
紅區垂直相通



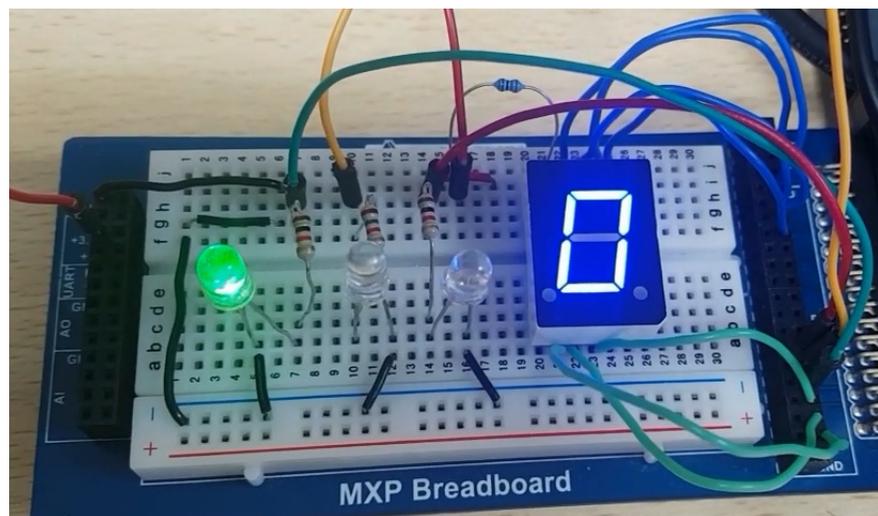
# 實作二 解答



# HW3

請參考實際紅綠燈設計，用 LabVIEW 編寫  
再透過 MyRIO 外接面包板顯示十字路口雙向號誌燈。

- 紅燈需維持20秒，黃燈需閃爍3次/秒共維持五秒，綠燈維持20秒。
- 綠燈維持時間到數9秒時，七節管須配合顯示倒數。

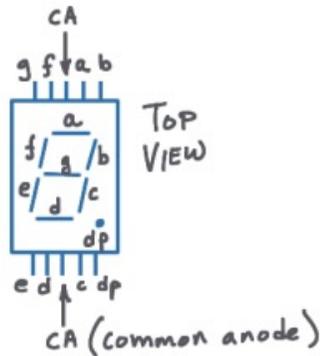


# 作業繳交方式

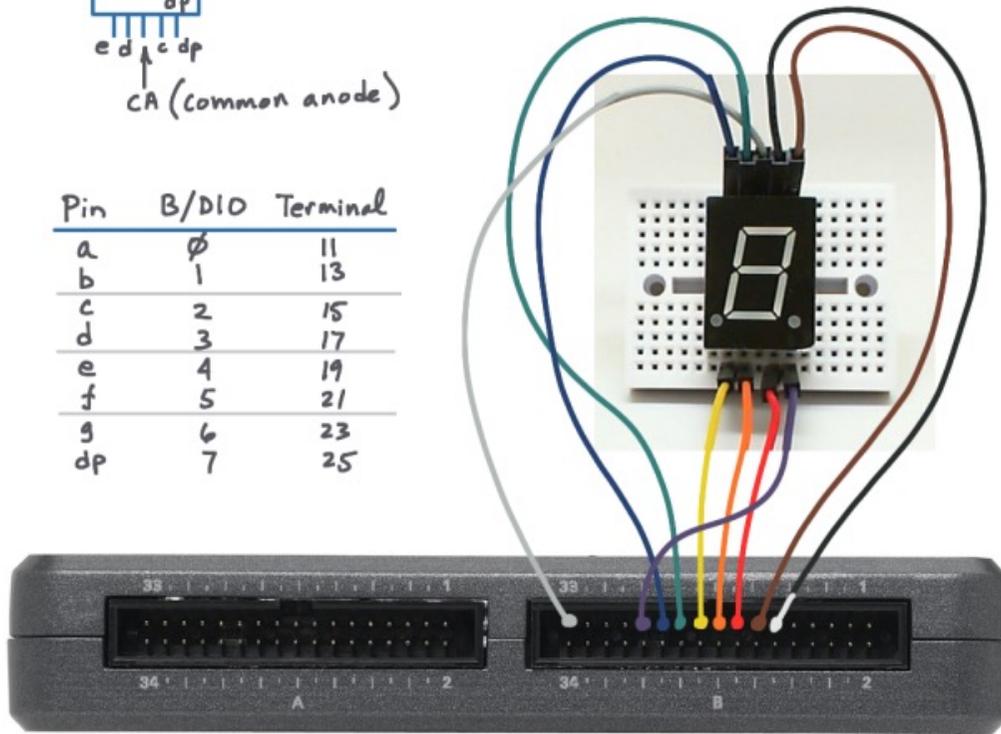
- 繳交時間: 3/26 12:00 助教課
- 繳交方式: 整個Project跟所有的vi都放在資料夾下，資料夾取名為學號。
- 遲交扣分方式: 一天分數\*90%、2天80%、3天70%、超過4天0分
  
- 有任何問題至820詢問或直接Email我:
- Email: f105601043@g.ncu.edu.tw

# Seven-Segment LED Display

参考 NI myRIO Project Essentials Guide



Pin	B/DIO Terminal
a	11
b	13
c	15
d	17
e	19
f	21
g	23
dp	25

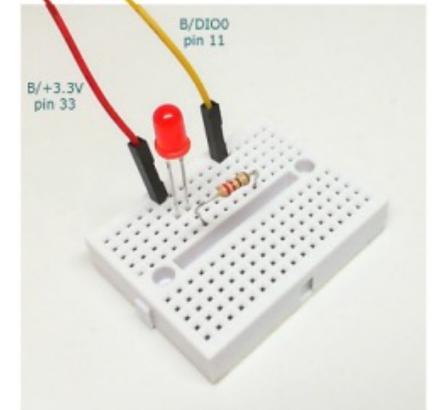
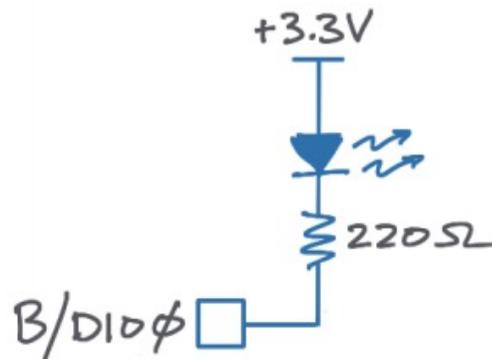
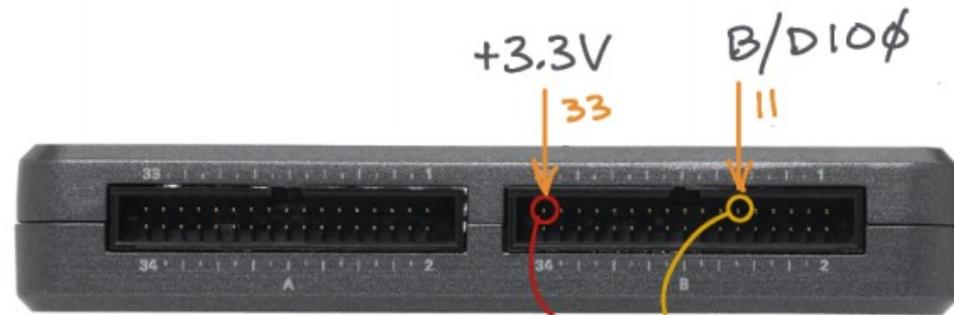
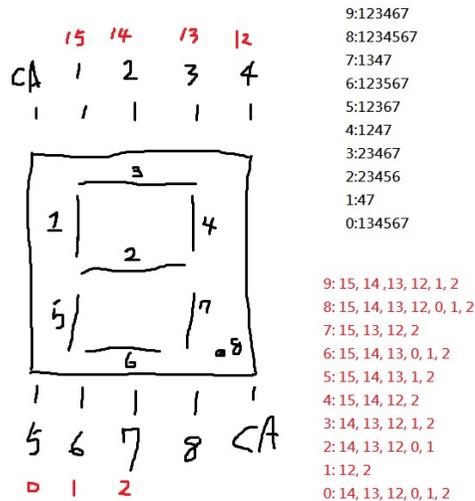


## Run the demonstration VI:

- Download <http://www.ni.com/academic/myrio/project-guide-vis.zip> if you have not done so previously and unpack the contents to a convenient location,
- Open the project Seven-Segment LED demo.lvproj contained in the subfolder Seven-Segment LED demo,
- Expand the hierarchy button (a plus sign) for the myRIO item and then open Main.vi by double-clicking,
- Confirm that NI myRIO is connected to your computer, and
- Run the VI either by clicking the Run button on the toolbar or by pressing Ctrl+R.

# Discrete LED

參考 NI myRIO Project Essentials Guide



## Run the demonstration VI:

- Download <http://www.ni.com/academic/myrio/project-guide-vis.zip> if you have not done so previously and unpack the contents to a convenient location,
- Open the project Discrete LED demo.lvproj contained in the subfolder Discrete LED demo,

- Expand the hierarchy button (a plus sign) for the myRIO item and then open Main.vi by double-clicking,
- Confirm that NI myRIO is connected to your computer, and
- Run the VI either by clicking the Run button on the toolbar or by pressing Ctrl+R.