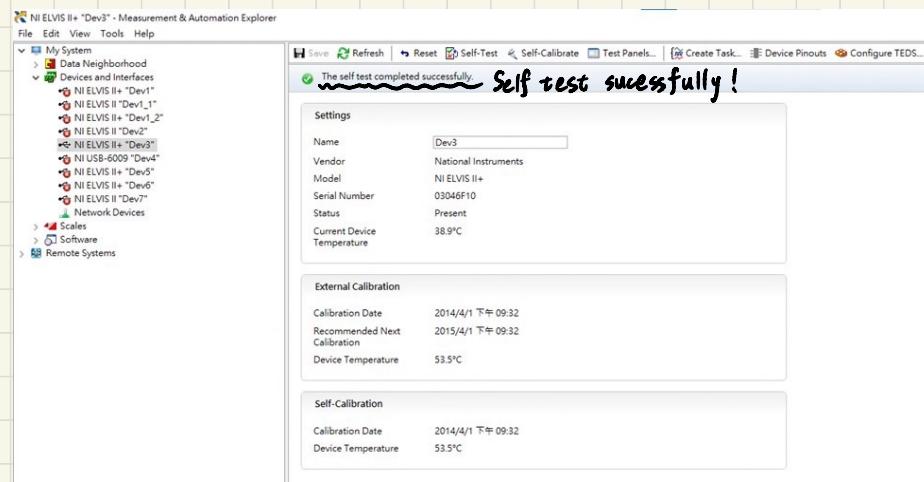


Lab2

NI LabVIEW Software Overview 08/15/62 何祚恩

Exercise 1: Test NI ELVIS II+

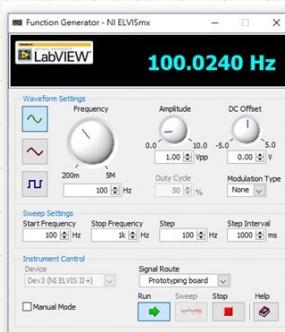
Step 1~4 Our hardware is recognized as "Dev3"



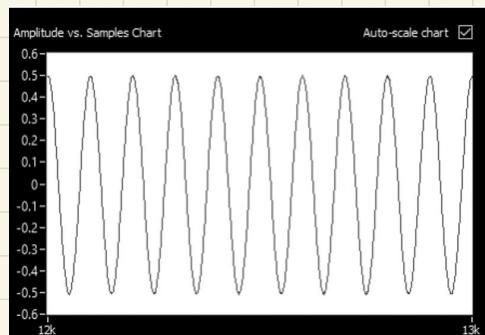
Step 5~7 Test for analog input & Digital I/O

(a) Analog input: { mode: continuous
Sampling rate: 10000 Hz
Signal from Function Generator: { sine wave
V_{pp} = 1 V
frequency = 100 Hz

Function Generator Setting

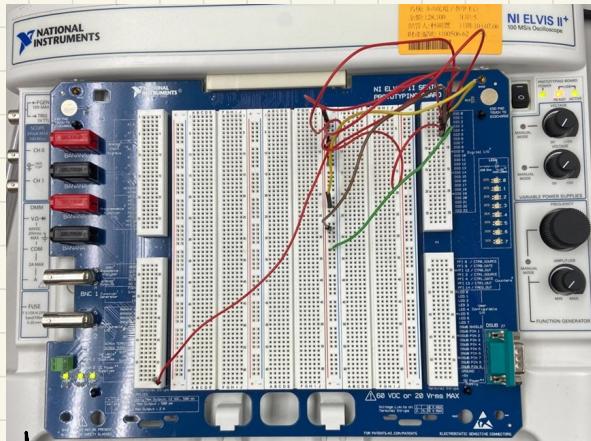


NI ELVIS II+ Test Panels on Analog Input

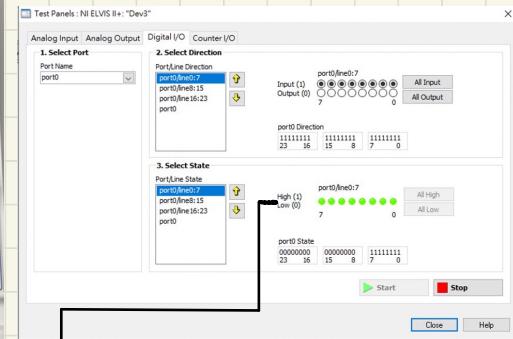


(b) Digital input

(i) Connect 5V to DIO 0:7

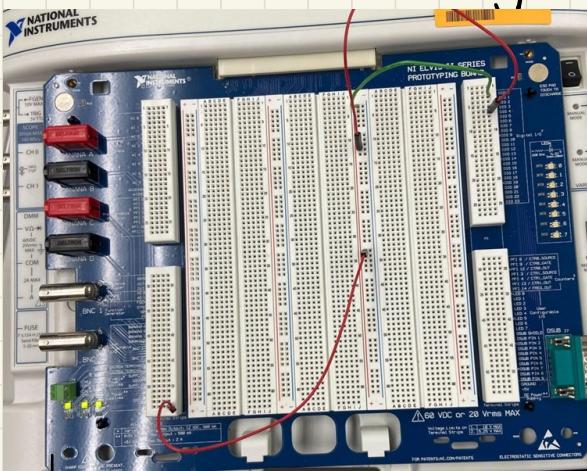


↳ Connect 5V to DIO 0:7

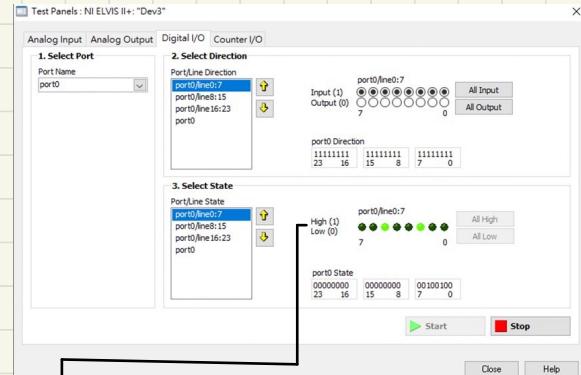


→ State of line 0:7 are all "1"

(ii) Connect 5V to only DIO2 & DIO5



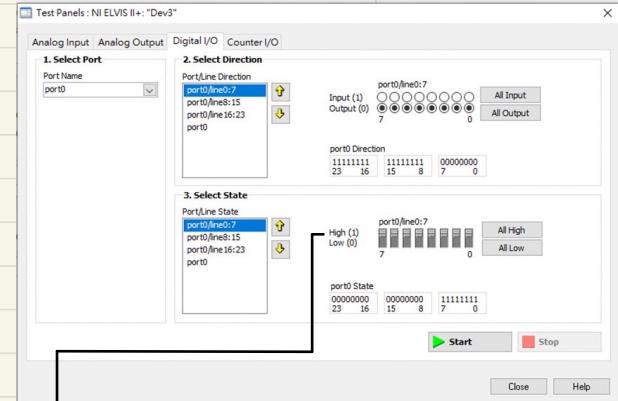
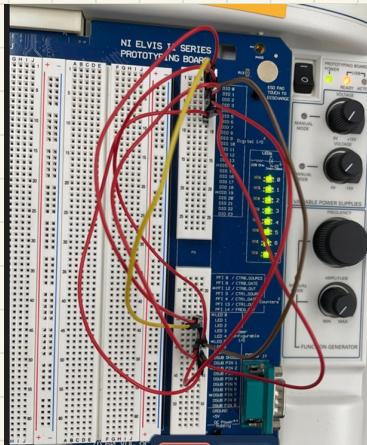
↳ Connect 5V to DIO2 & DIO5



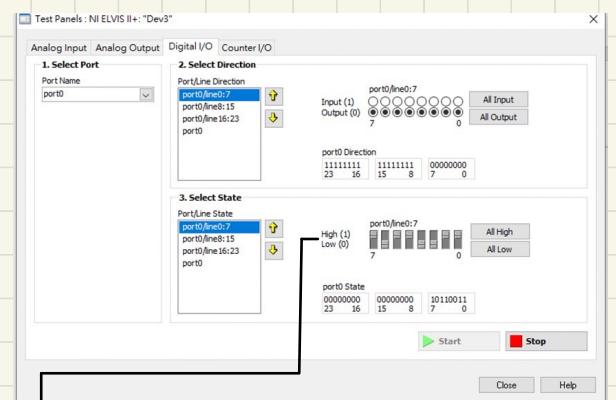
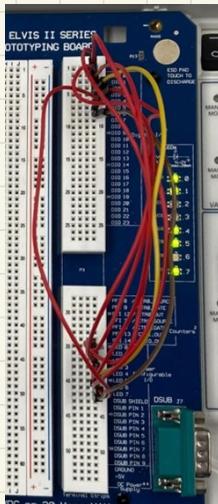
→ Only line 2 and 5 are "1"

(c) Digital Output : Connect DIO 0:7 with LED 0:7

(i) DIO 0:7 are all set to state "1", therefore, the state of LED 0:7 are all "1".



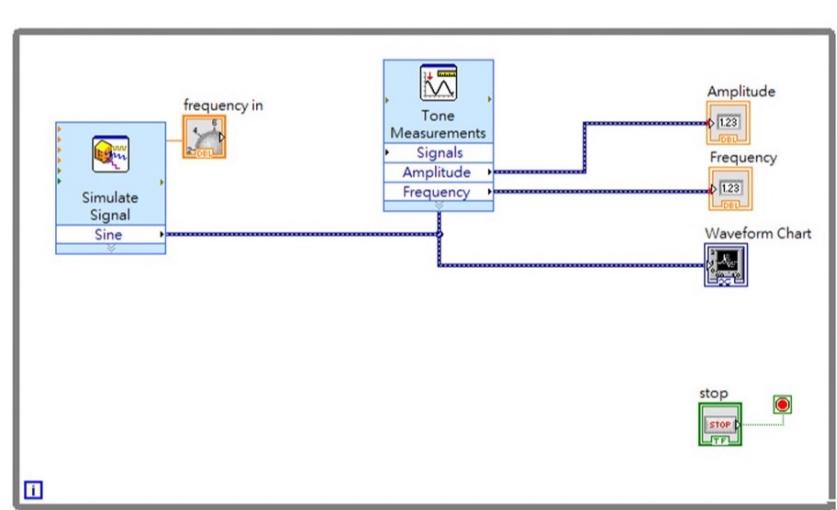
(ii) Only DIO 0, DIO1, DIO4, DIO5, DIO7 are set to output state "1", the rest output state "0"



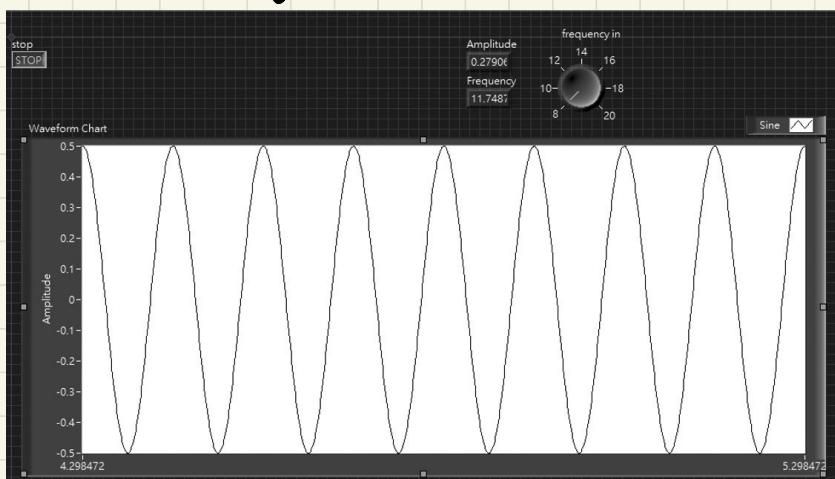
Only LED [0,1,4,5,7] are on

Exercise 2: Tone measurement

Block Diagram



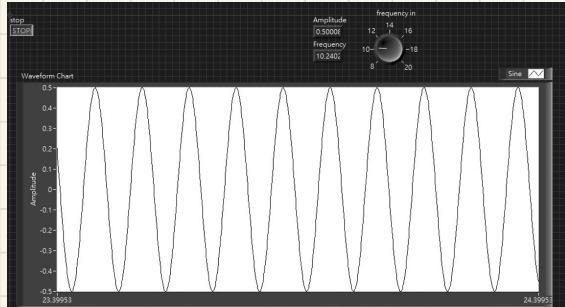
* In Simulate Signal, we set the amplitude of the wave as 0.5V
Front Panel (frequency in = 8Hz)



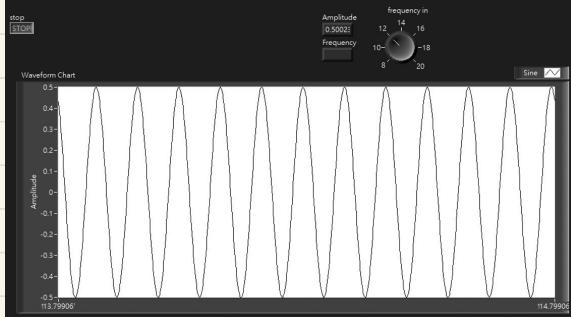
* Amplitude and frequency indicator can't give the correct result in this case.
Note that indicator can't be used when frequency is less than 10 Hz

↑ This is what we learned in this case!

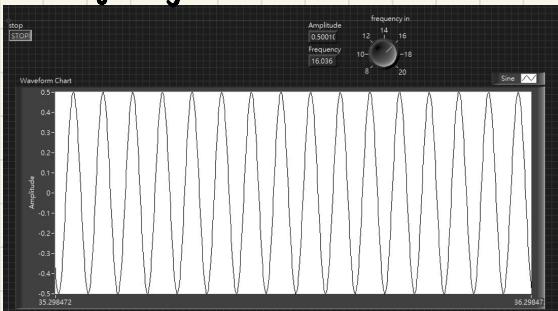
frequency in = 10Hz



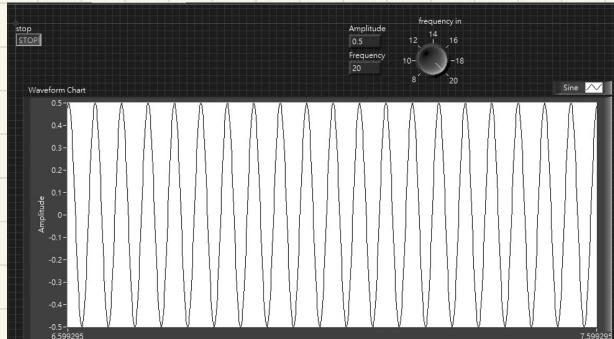
frequency in = 12Hz



frequency in = 16Hz



frequency in = 20Hz



Question & Discussion :

* When frequency in is greater than 10Hz, the amplitude and frequency indicator is good, which is almost same value as our setting in Simulate Signal (sine, $V_{pp} = 1V$), the value shown by frequency indicator is also same as the value we set on frequency in. However, in frequency less than 10Hz, the value on amplitude/frequency indicator doesn't match our setting. To correct the result, we can simply observe the value in waveform we display on front panel. In frequency in = 8Hz case, it's apparently that the amplitude is 0.5V, and as for the frequency, we can calculate by # of full wave / passing time on screen, which can be calculated by $8 / (5.298 - 4.298) = 8 \text{ Hz}$ (same as frequency in)