PCI-PWM02

User's Manual

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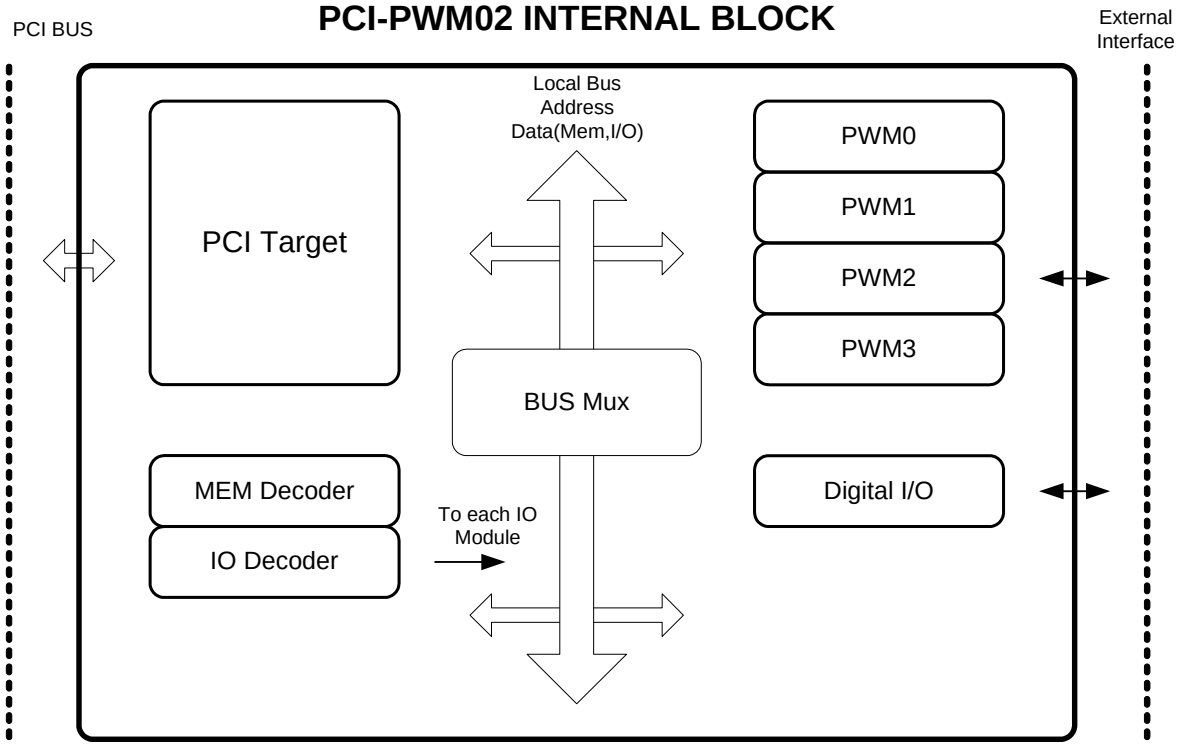
Contents

1. PCI-PWM02 Block Diagram

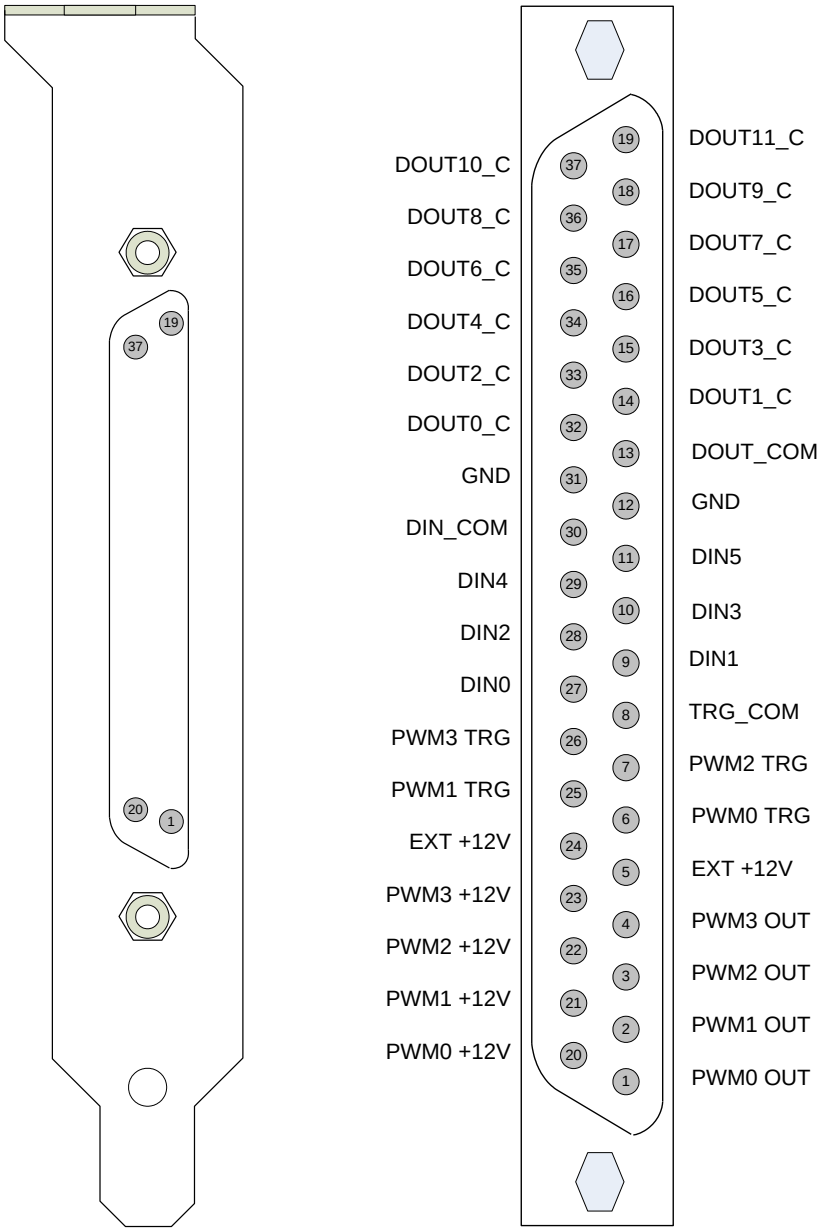


[Figure 1-1. PCI-PWM02 Internal block diagram]

The PCI-PWM02 is a board having the functions of external interface with the 4 PWM Control Blocks like a Figure 1-1.

2. Connecter Pin map

2-1. Dsub-37 Pin Panel



[Figure 2-1. PCI-PWM02 Connecter Pin]

[Table 1. PCI-PWM02 37 pin Description]

Pin#	Name	Description	Remark
1	PWM0 OUT	PWM Channel 0 Output	
2	PWM1 OUT	PWM Channel 1 Output	
3	PWM2 OUT	PWM Channel 2 Output	
4	PWM3 OUT	PWM Channel 3 Output	

5	EXT +12V	External Power +12V Input	
6	PWM0 TRG	PWM Channel 0 Trigger Input	
7	PWM2 TRG	PWM Channel 2 Trigger Input	
8	TRG_COM	Trigger Input Common	
9	DIN1	Digital input 1 Input	
10	DIN3	Digital input 3 Input	
11	DIN5	Digital input 5 Input	
12	GND	Power GROUND	
13	DOUT_COM	Digital Output Common	
14	DOUT1_C	Digital Output 1 Collector Output	
15	DOUT3_C	Digital Output 3 Collector Output	
16	DOUT5_C	Digital Output 5 Collector Output	
17	DOUT7_C	Digital Output 7 Collector Output	
18	DOUT9_C	Digital Output 9 Collector Output	
19	DOUT11_C	Digital Output 11 Collector Output	
20	PWM0 +12V	PWM Channel 0 Output +12V	
21	PWM1 +12V	PWM Channel 1 Output +12V	
22	PWM2 +12V	PWM Channel 2 Output +12V	
23	PWM3 +12V	PWM Channel 3 Output +12V	
24	EXT +12V	External Power +12V Input	
25	PWM1 TRG	PWM Channel 1 Trigger Input	
26	PWM3 TRG	PWM Channel 3 Trigger Input	
27	DIN0	Digital input 0 Input	
28	DIN2	Digital input 2 Input	
29	DIN4	Digital input 4 Input	
30	DIN_COM	Digital input Common	
31	GND	Power GROUND	
32	DOUT0_C	Digital Output 0 Collector Output	
33	DOUT2_C	Digital Output 2 Collector Output	
34	DOUT4_C	Digital Output 4 Collector Output	
35	DOUT6_C	Digital Output 6 Collector Output	
36	DOUT8_C	Digital Output 8 Collector Output	
37	DOUT10_C	Digital Output 10 Collector Output	

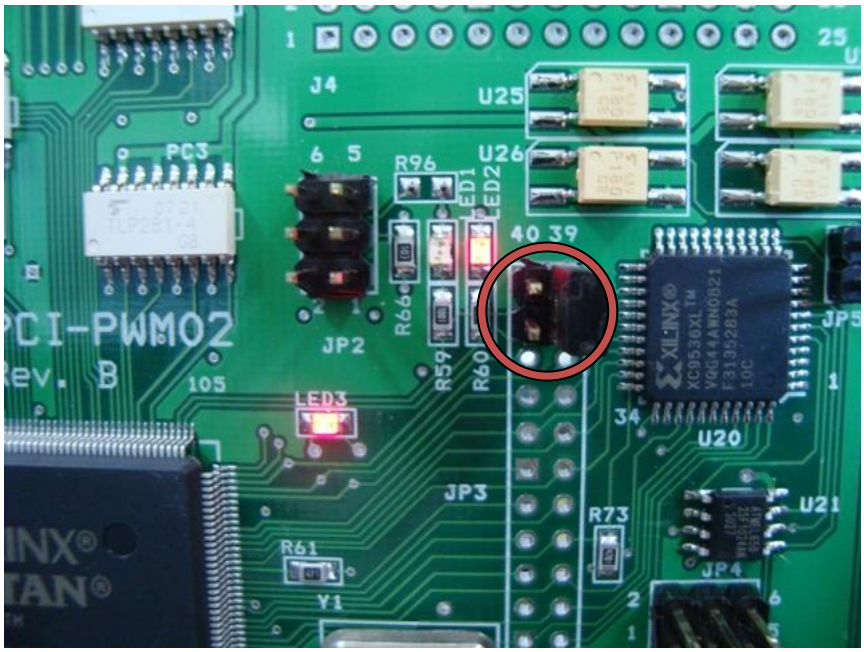
2-2. Multi Board Setup

If mounting works in one system that a lot of I/O ports are required, the PCI-PWM02 boards are classified according to each board address. Distribution of each board sets it up through 4 pin switch (JP3). A system is designed of maximum four boards at the same time so as usable.

Board No.	JP3 Setup	
	PIN38 <-> PIN40	PIN37 <-> PIN39
0	OPEN	OPEN
1	OPEN	SHORT
2	SHORT	OPEN
3	SHORT	SHORT

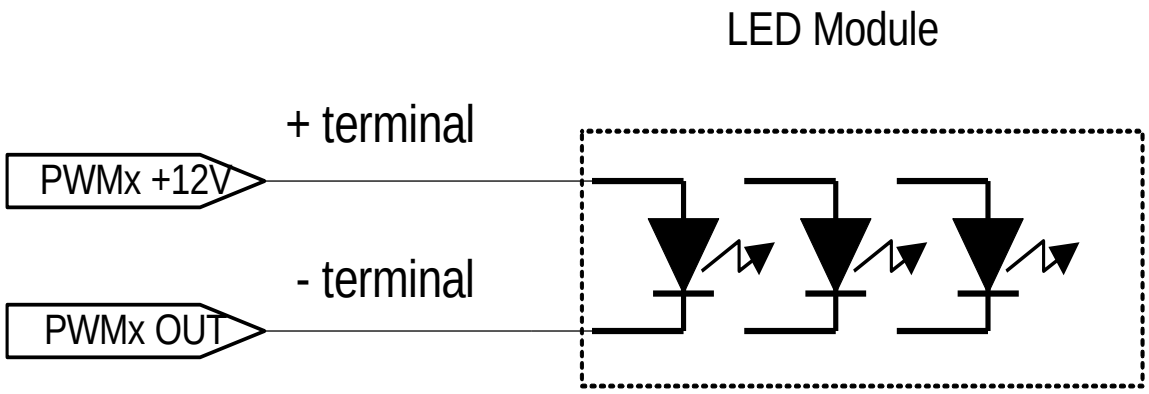
Follow picture shows that it set up the board number 1.

The LED1 is light on if short a circuit of PIN 38 and PIN40, the LED2 is light on if short a circuit PIN37 and PIN39. It display the board number which LED lightning works. (Refer to Red Circle)



3. Circuit Connection

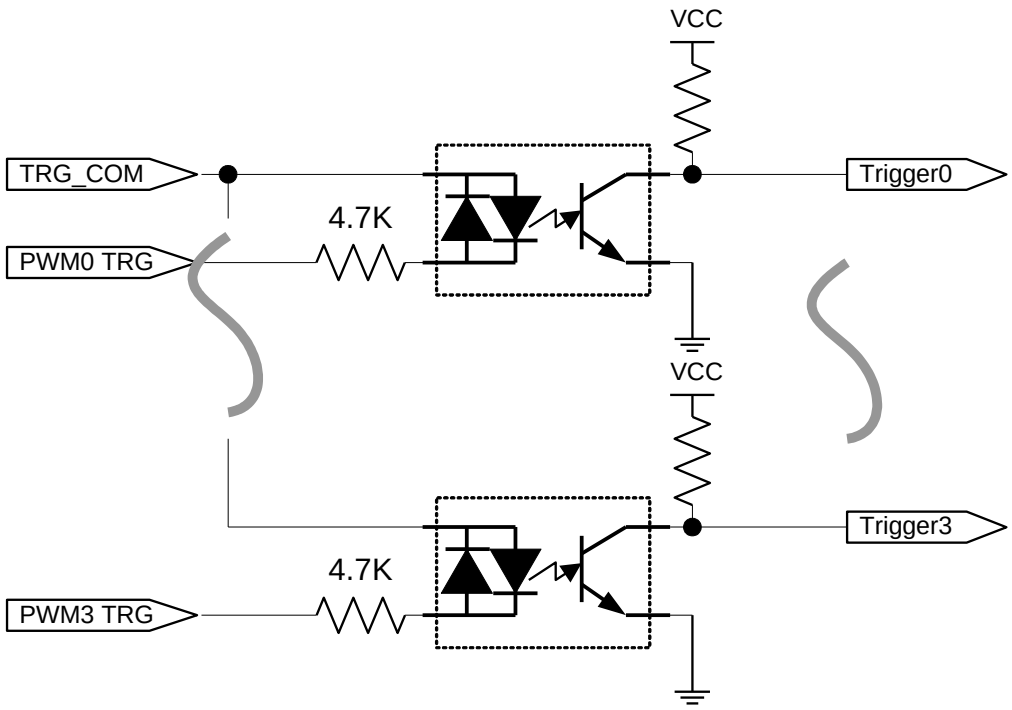
3-1. PWM Output Circuit



[Figure 3-1. PWM Output Connection Circuit]

Figure 3-1 shows that the PWM output connects to the LED modules. It is used to connect the +12V of PWM0-4 to the LED module “+”, PWM0-4 OUT to LED module “–” part.

3-2. Trigger Input Circuit

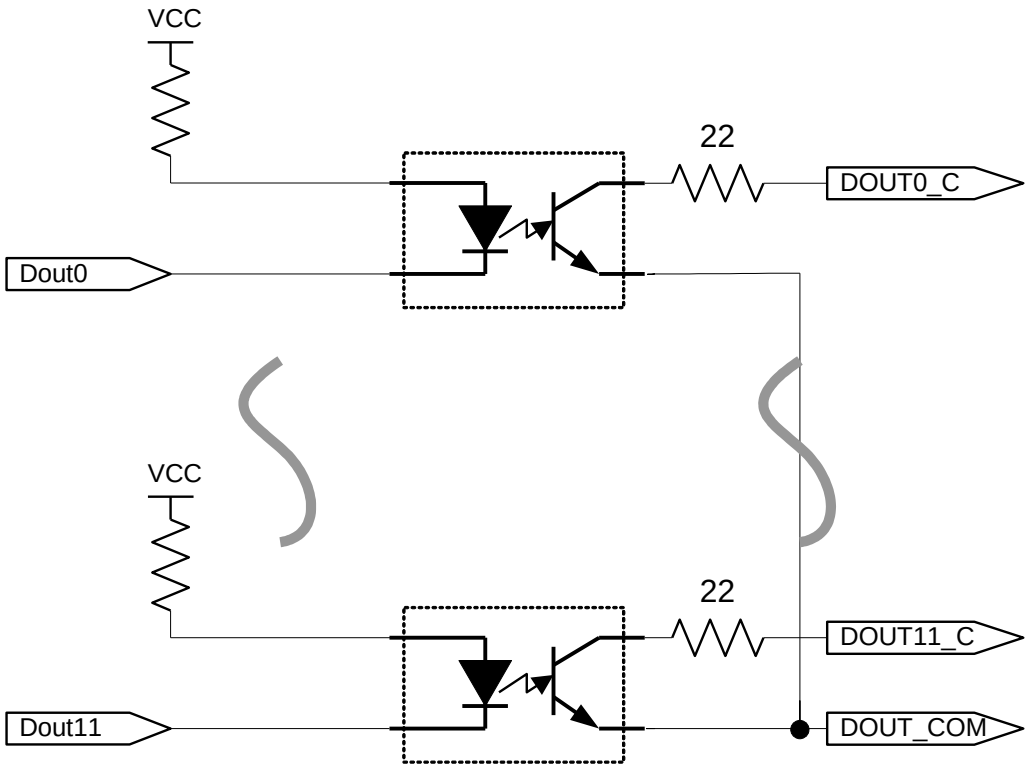


[Figure 3-2. Trigger Input Circuit]

Figure 3-2 shows that each PWM output get from trigger input if it let operate in trigger mode. There is A/B at the trigger input, it made a trigger actions if it supply to input 12 ~ 24V into each pin.

There isn't a need to distinguish plus and minus (+ / -) as there isn't power polarity of input.

3-3. Digital Output Circuit

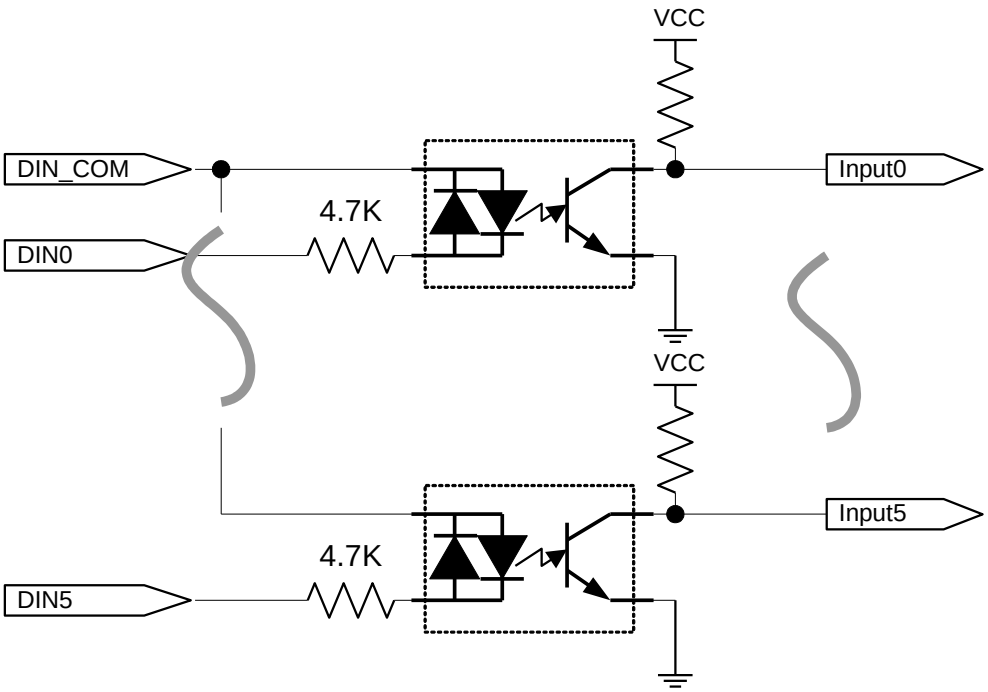


[Figure 3-3. Isolated Digital Output Circuit]

Figure 3-3 shows that each digital output makes output as isolated photo-coupler. Each output gets from over-current protection by resistance of 22 ohms, it use a common output terminal.

Generally, it uses output to open collector methods as it connects to external GROUND in case of a common output DOUT_COM.

3-4. Digital Input Circuit



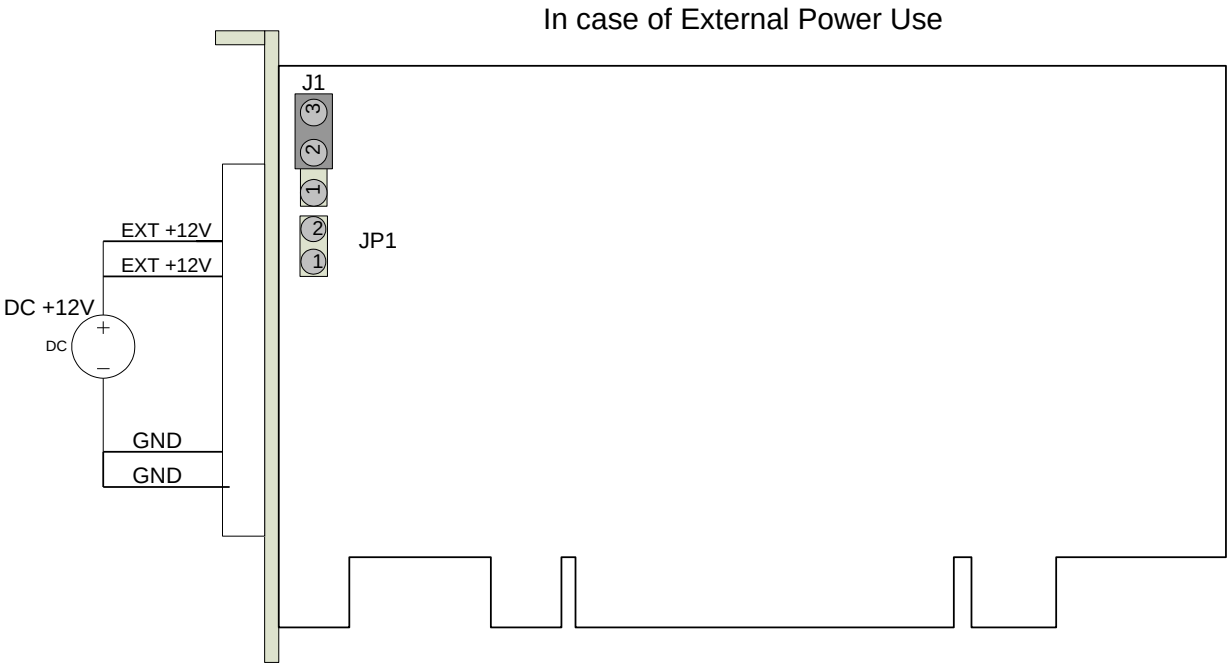
[Figure 3-4. Isolated Digital Input Circuit]

Figure 3-4 shows that each digital input is isolated by photo-coupler, input has a common input terminal and each input terminal. The resistor of 4.7K ohms is connected in a series, each input can get from 12 and 24V.

The common terminal can get from plus(“+”) or minus(“-”) voltage because of no polarity of input. Each input shall input opposite polarity to a common port.

4. External Connection

4-1. In case of external power use

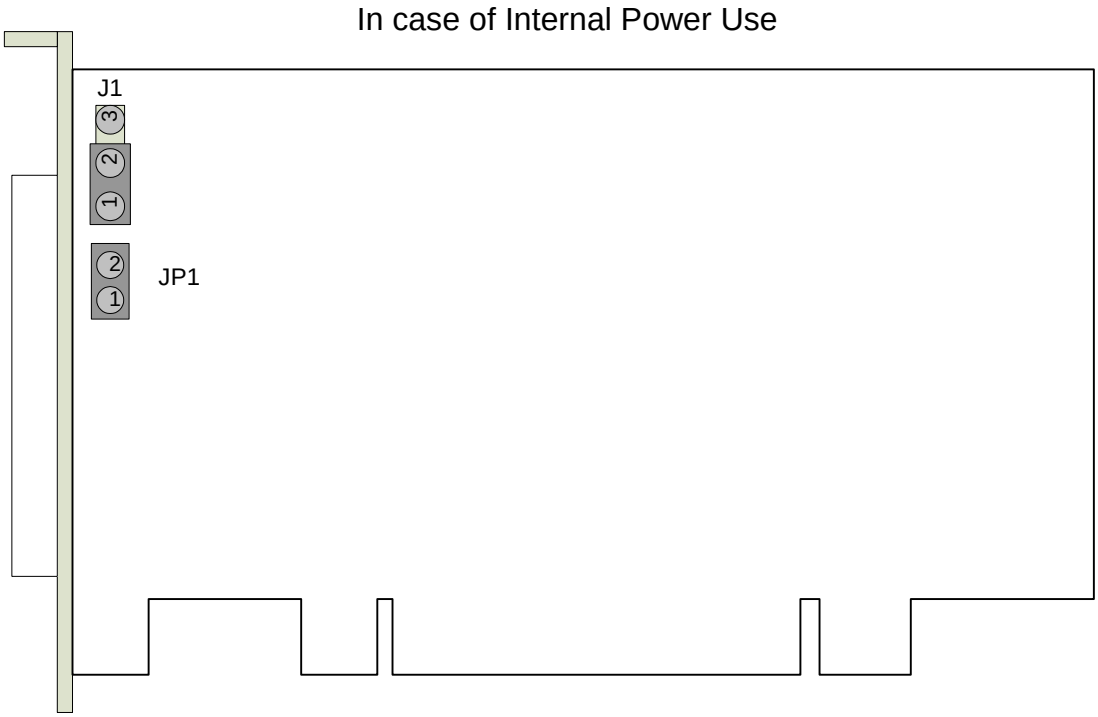


[Figure 4-1. External Connection (External Power Use)]

If +12V of PC power is lack of acting a LED module, it shall use external power. In case of using external power connection Figure 4-1 shows. The connecter pin “EXT +12” and “GND” pin are connect external power, the jumper (J1) on the board connects 2-3.

In case of using internal power use, connection shall work 1-2 jumper (J1).

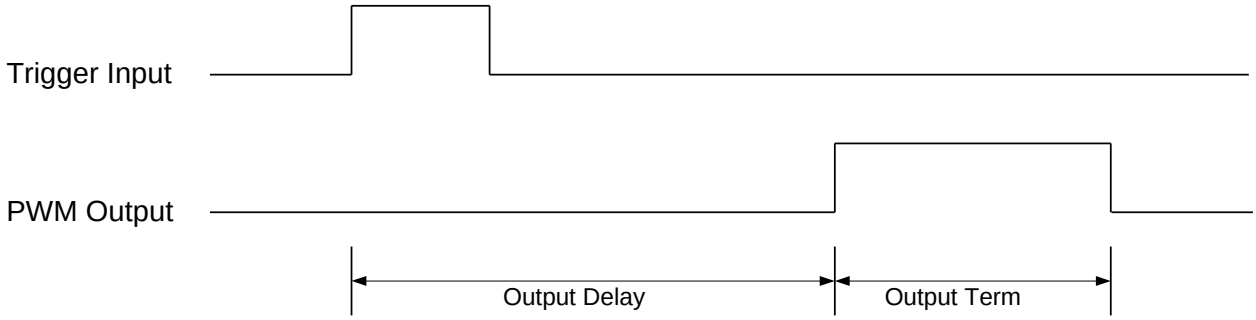
4-2. In case of internal power use



[Figure 4-2. Internal Power Use]

In case of using internal PC power (+12) use, connection shall work 1-2 jumper (J1) like Figure 4-2. At this time +12V gets from supply in PCI slot.

5. Trigger Motion mode



[Figure 5-1. Trigger Mode Motion]

Figure 5-1 shows trigger motion mode to control PWM output by external trigger. It can be set up output delay and output time in trigger mode, setting is possible until the maximum 4,194,303usec in each 1usec until in time as use a 22bit timer.

6. Installation

After unpacking, inspect the board carton to make sure there are no damages on the board.

6-1. Package Content

Product Contents

1. PCI-PWM02 Board
2. CD (Driver/Manual/API/Sample Source etc.)

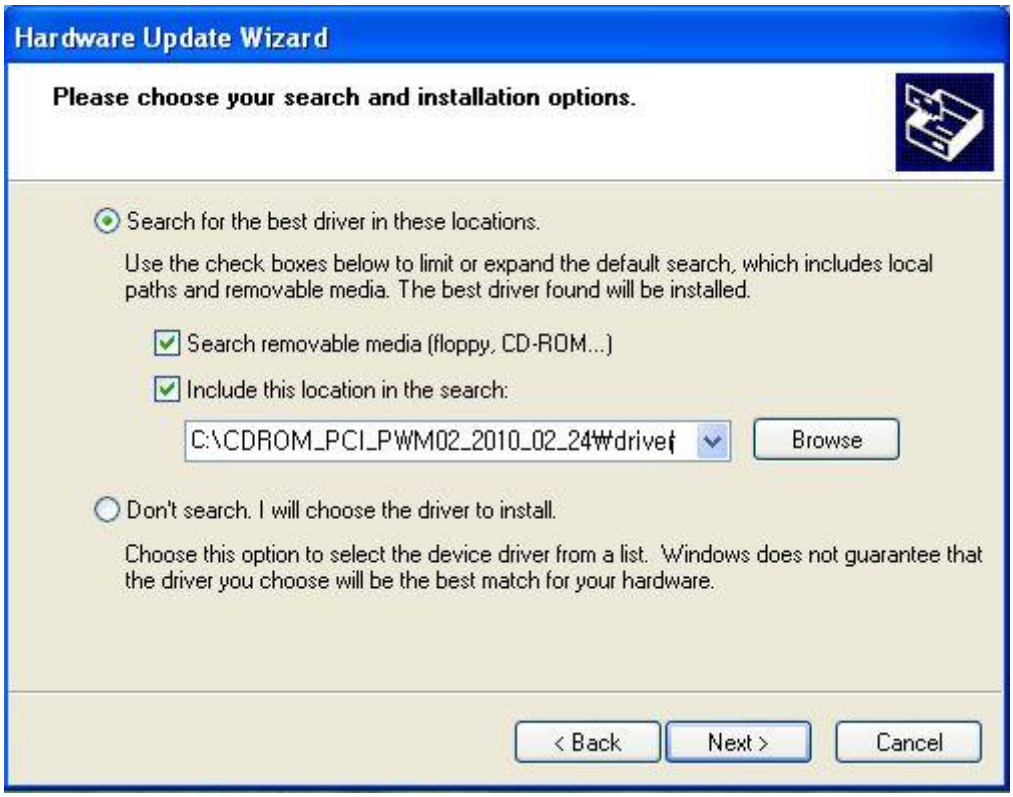
6-2. Installation Sequence

To install your PCI-PWM02 board in your PC, follow the steps described in the document “How to install PCI DAQ Board” provided by DAQ System. If the document is missing, you can get it from www.daqsystem.com. The PCI-PWM02 board is completely Plug & Play. There are no switches or jumpers to set. Therefore you can install it easily.

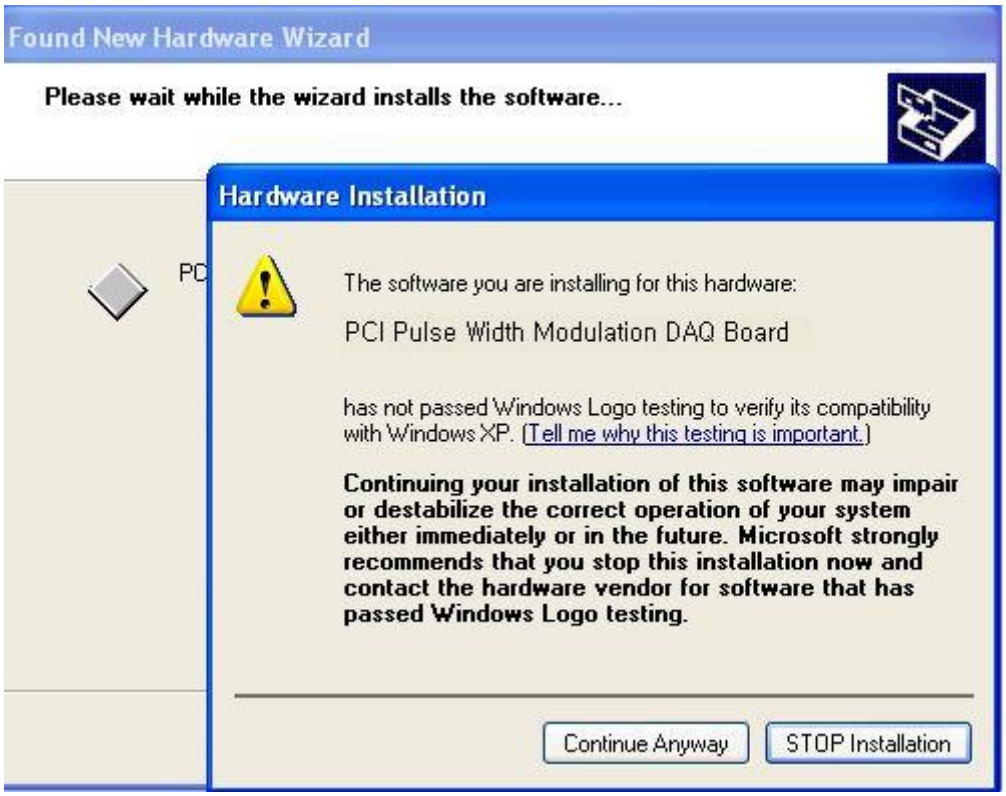
- Your OS requirement : Windows 2000 SP4 or Windows XP SP1 above

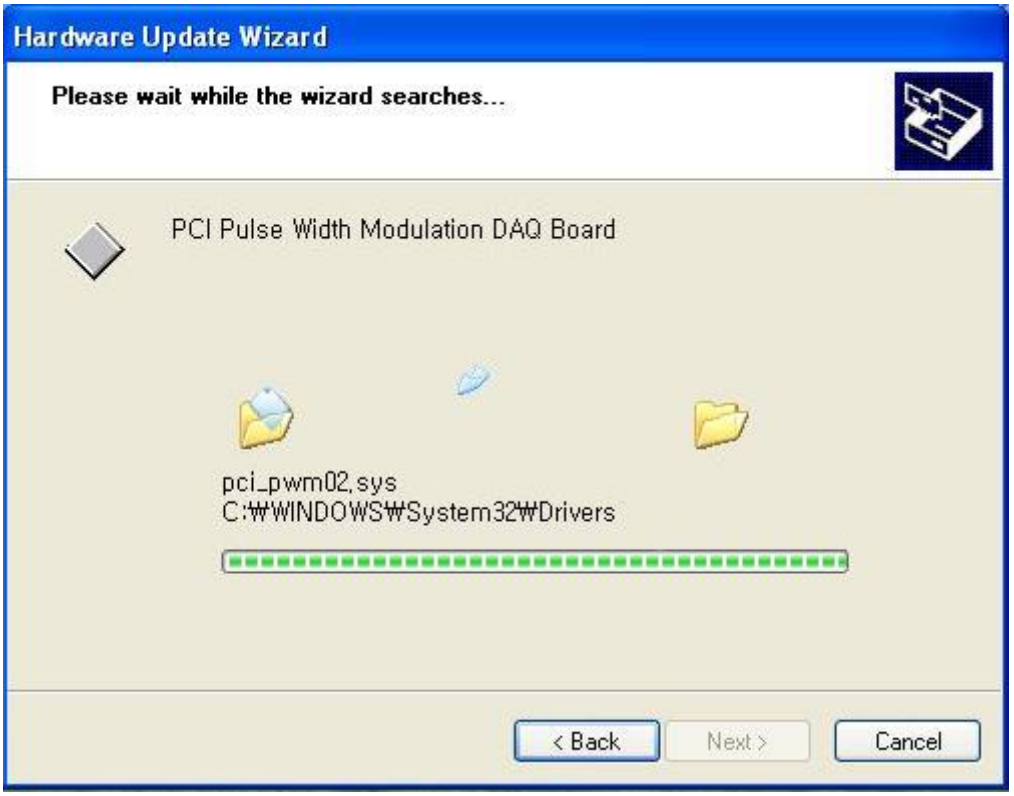
The PCI-PWM02 connects to PCI Card Port. After that you can show the below picture of “Found New Hardware Wizard” window.

If new hardware is found, Wizard will ask you to install the corresponding driver. For installation of the driver, select the item “Install from a list or specific location (Advanced)” and click “Next” as in the figure.



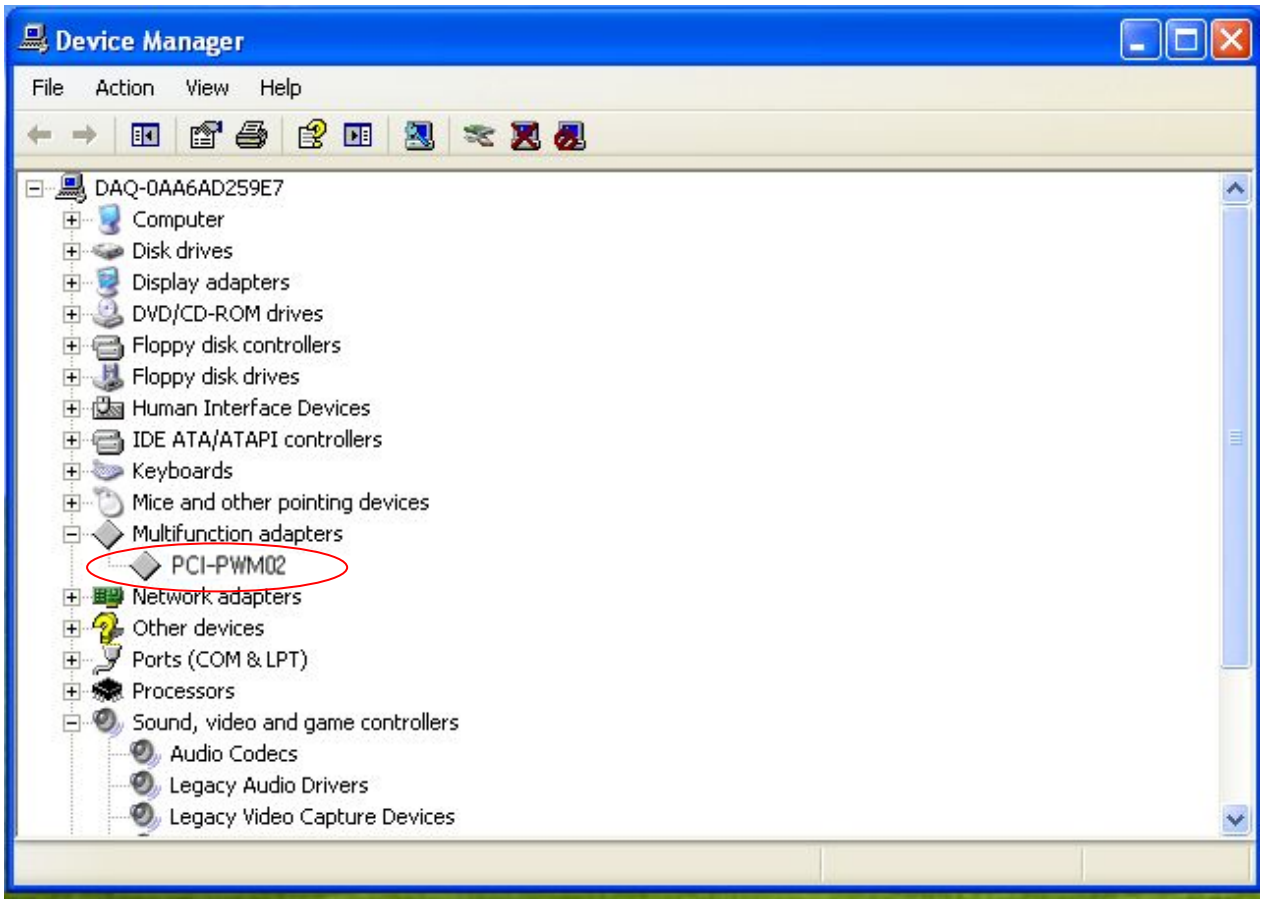
The driver folder includes a file of **"pci_pwm02.inf"** and **"pci_pwm02.sys"** that it is necessary for driver installation. A warning message appears during installation here, press "Continue Anyway" button. You can show below message window. The process progress as follows.





If the installation is completely finished, you can show below message window.

If the installation is completely finished, you confirm it in the following ways. Do the following steps to show up the “Device Manager” window. [My Computer -> properties -> Hardware -> Device Manager -> **Multifunction Adaptors -> PCI-PWM02**]



If you can see the “PCI-PWM02”, the driver installation is to have been over.

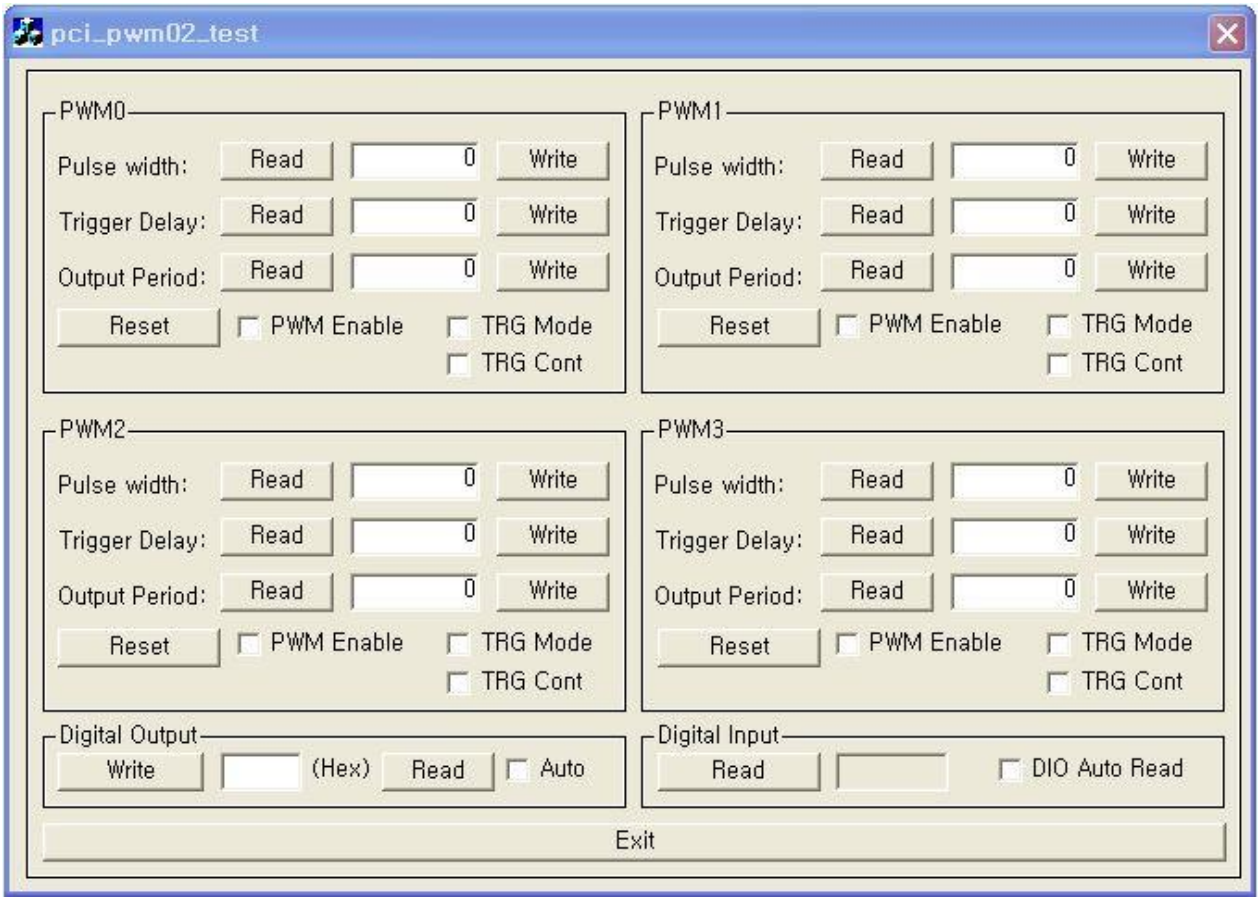
(Check the red circle)

Notice : After installation, you should re-boot the system for the proper operation.

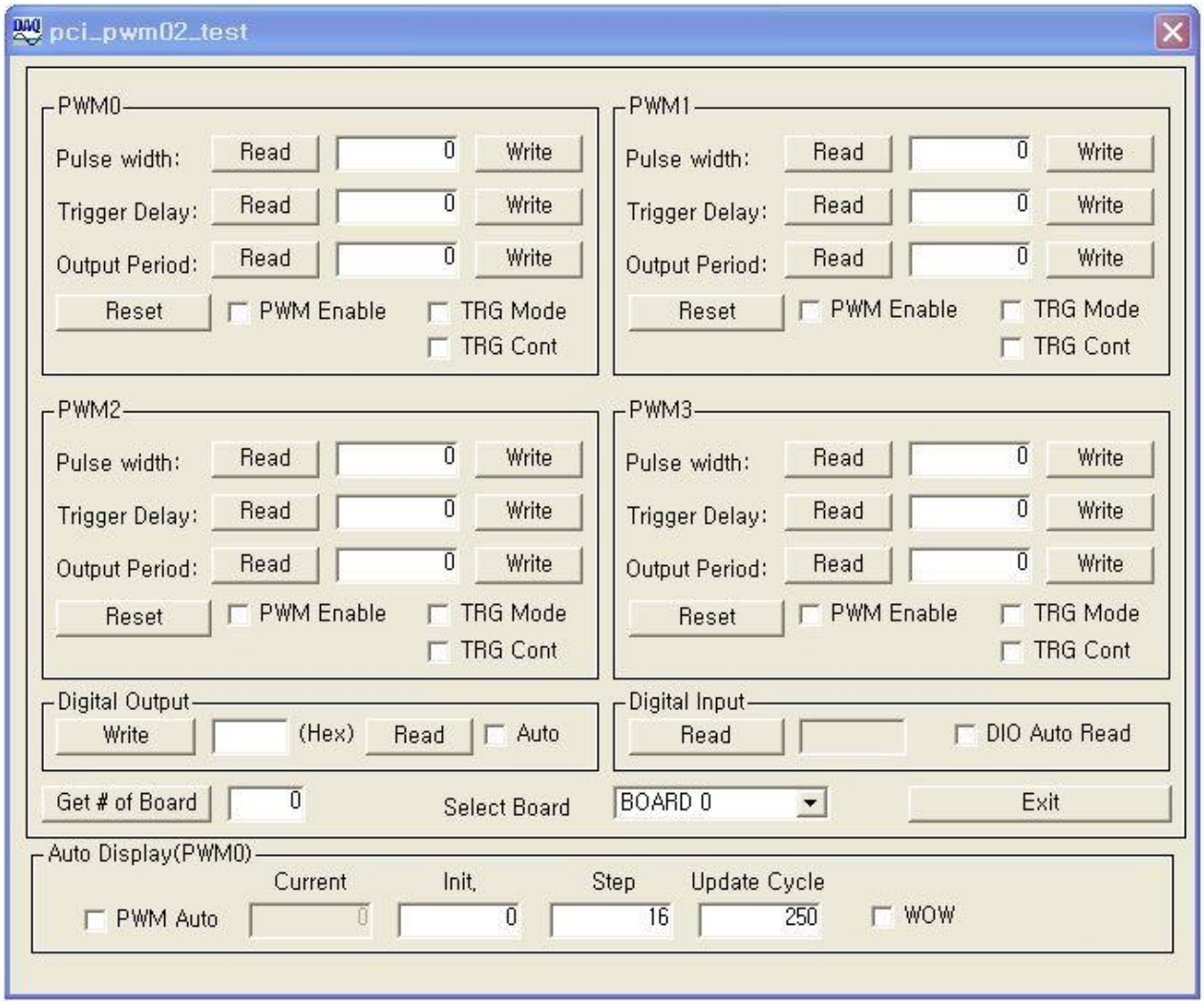
7. Sample Program

DAQ system provides a sample program to make the user be familiar with the board operation and to make the program development easier. You can find the sample program in the CDROM accompanying with the board. One of the execution file is **"PCI_PWM02_SINGLE.exe"** and **"PCI_PWM02_MULTI.exe"**.

Sample program is provided in source form in order to show the usage of API(Application Programming Interface) of the board and may be modified for customer's own usage.



[Figure 7-1. When Sample program "PCI_PWM02_SINGLE.exe' is executed]



[Figure 7-2. When Sample program “PCI_PWM02_MULTI.exe’ is executed]

To run the sample application program, you need to use API, it is a form of client DLL. To compile the sample source to make its executable file, you have to use Import Library files and header files. You can find them in the CDROM. To run the .exe file, the API DLL file **(PCI_PWM02.DLL)** must be in the same directory with the .exe file or Windows system folder. Another method is to add the directory of API DLL file to PATH environmental variable.

As a “PCI_PWM02_MULTI.exe” application program includes a “PCI_PWM02_SINGLE.exe” application program, we explain it around multi-board application program.

7-1. PWM0 ~ PWM03 Function

(1) **Pulse width 'Read' Button**

Read current setup PWM value.

(2) **Pulse width 'Write' Button**

Control each PWM output. The setup value range is 0 ~ 255.

(3) **Trigger Delay 'Read' Button**

Read current setup PWM output delay.

(4) **Trigger Delay 'Write' Button**

Control each PWM output delay. The setup value range is 0 ~ 4194303.

The unit is 1usec for resolution, the maximum value is 4194303uSEC.

(5) **Output Period 'Read' Button**

Read current setup PWM output delay.

(6) **Output Period 'Write' Button**

Control each PWM output time period. The setup value range is 0 ~ 4194303.

The unit is 1usec for resolution, the maximum value is 4194303uSEC.

(7) **'Reset' Button**

Initialize each PWM. After initialization, PWM will be 0 and PWM Disable, Normal Mode, Delay time will be 0, Period time will be 1000mSEC.

7-2. Digital Output Function

(1) **'Write' Button**

Set up the Digital output. If each bit is '1', output will be 'ON' state.

Total output bit is nit 0~ bit.

(2) **'Read' Button**

Read current setup Digital output.

(3) **'Auto' Button**

Auto read current setup Digital output.

7-3. Digital Input Function

(1) **'Read Time' Button**

Read current setup Digital input. The digital input have 6 inputs.

7-4. System Function

(1) **'Get # of Board' Button**

Confirm the how many PCI-PWM02 board install in the PC.

(2) **Select Board**

Select the board number. (0 ~3)

(3) **'Exit' Button**

Close the device of all PCI-PWM02.

7-5. Auto Display (PWM0) Function

(1) **'Read Time' Button**

Control the PWM0 output. The setup value range is 0 ~ 255.

References

1. PCI System Architecture

-- MindShare Inc.

2. PCI Local Bus Specification

-- PCI-SIG

3. General information on PCI board API

-- DAQ system

4. AN201 How to build application using APIs

-- DAQ system

5. AN242 PCI-PWM02 API Programming

-- DAQ system