PFM-T096P

PCI-104 96-Channel DIO Module

XILINX XC3S200AN BGA 256 Chipset

5V/TTL Compatible

+5V through PCI-104 connector

PFM-T096P Manual 1st Ed

March 5th, 2014

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Packing List

Before you begin installing your card, please make sure that the following materials have been shipped:

- Product CD
- PFM-T096P
- Cable x 1 (for function test only)

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Chapter

1

General Information

1.1 Introduction

AAEON Technology, a leading company in embedded boards manufacturing with a full range of PC/104 CPU Modules, launches a brand new DIO Module-PFM-T096P.   Its compact size and rich functionality ensures the most cost effective and compatible module to coincide with your existing system planning devices.

The PFM-T096P features PCI-104 expansion interface.   It supports Windows XP, Win 7 and Linux operating systems. Moreover, it supports 96-Channel Digital I/O (Bi-Directional) with software configurable input and output. The PFM-T096P is designed to enhance benefit for the Subcompact and peripheral boards.

1.2 Features

- Support programmable input/output up to 96-bit I/O with 24ma driving capability
- ESD Protection circuit is built-in
- Less H/W Jump Setting/DIP SW to reduce malfunction, and most use S/W Define
- Rich flexibility in interrupt configuration
- Reserve the possibility to provide counter function
- Supports Window XP, Windows 7 and Linux
- PC/104 Interface

1.3 Specifications

- Form Factor   PC/104 (90mm x 96mm)
- Chipset   XILINX XC3S200AN BGA 256,

    SN74ALVC245
- Expansion Slot   PCI-104
- Power Requirement   +5V through PCI-104 connector
- Operating Temperature 32˚F~ 140˚F (0˚C ~ 60˚C)
- System Cooling   Fanless
- I/O Connector   4 x 50-pin box header
- Gross Weight   0.13 lb (0.06 Kg)
- Net Weight   0.66 lb (0.3 Kg)
- Certification   CE, FCC

Chapter

2

**Quick
Installation
Guide**

2.1 Safety Precautions

Warning! *Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.*

Caution! *Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis*

2.2 Location and Mechanical Drawing of Connectors and Jumpers

Component Side
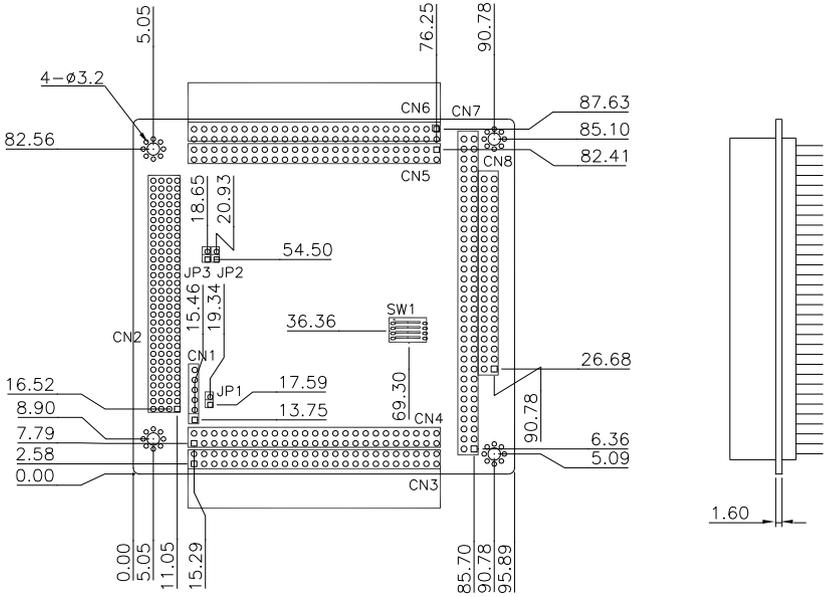
Component Side

Solder Side
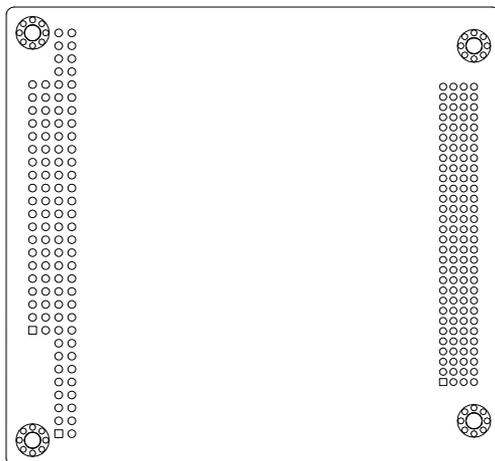
Solder Side

2.3 List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the board's jumpers:

Label	Function
JP1	Firmware Programming Selection
JP2	PCI Resource Selection-1
JP3	PCI Resource Selection-2
SW1	BoardID Selection

2.4 List of Connectors

The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

Label	Function
CN1	JTAG
CN2	PCI 104
CN3	DIO Port1
CN4	DIO Port2
CN5	DIO Port3
CN6	DIO Port4
CN7, CN8	PC/104 (Optional, Bypass PC/104 signal for customer's stack board request)

2.5 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper you connect the pins with the clip.

To "open" a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.

Open   **Closed**   **Closed 2-3**
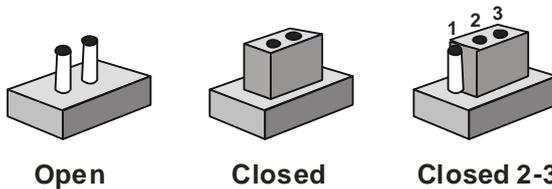
A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change.

Generally, you simply need a standard cable to make most connections.

2.6 Firmware Programming Selection (JP1)

Enable **Disable (default)**
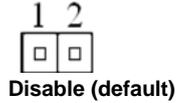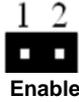
JP1	Function
SHORT	Enable
OPEN	Disable(default)

2.7 PCI Resource Selection (JP2/3)

JP2

JP3

JP2	JP3	Function
OPEN	OPEN	PCI Resource 1(IRQA,CLK0)
OPEN	SHORT	PCI Resource 2(IRQB,CLK1)
SHORT	OPEN	PCI Resource 3(IRQC,CLK2)
SHORT	SHORT	PCI Resource 4(IRQD,CLK3)

2.8 Board ID Selection (SW1) for Multi-Board Indicate in Utility

4 3 2 1
ON

SW1	Function
All Off	BoardID 0(default)
Other	BoardID1~15

2.9 JTAG (CN1) for Firmware Programming
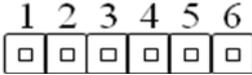
Pin	Pin Name	Signal Type	Signal Level
1	+3.3V	PWR	
2	GND	GND	
3	TCK	CLK	
4	TDO	OUT	+3.3V
5	TDI	IN	+3.3V
6	TMS	IN	

2.10 DIO Port 1/2/3/4 Connector (CN3/4/5/6)
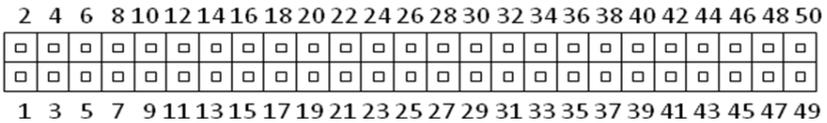
Pin	Pin Name	Signal Type	Signal Level
1	PnGrpC7	IN/OUT	+5V
2	EVENT	OUT	
3	PnGrpC6	IN/OUT	+5V
4	GND	GND	
5	PnGrpC5	IN/OUT	+5V
6	GND	GND	
7	PnGrpC4	IN/OUT	+5V
8	GND	GND	

DIO Module		PFM-T096P	
9	PnGrpC3	IN/OUT	+5V
10	GND	GND	
11	PnGrpC2	IN/OUT	+5V
12	GND	GND	
13	PnGrpC1	IN/OUT	+5V
14	GND	GND	
15	PnGrpC0	IN/OUT	+5V
16	GND	GND	
17	PnGrpB7	IN/OUT	+5V
18	GND	GND	
19	PnGrpB6	IN/OUT	+5V
20	GND	GND	
21	PnGrpB5	IN/OUT	+5V
22	GND	GND	
23	PnGrpB4	IN/OUT	+5V
24	GND	GND	
25	PnGrpB3	IN/OUT	+5V
26	GND	GND	
27	PnGrpB2	IN/OUT	+5V
28	GND	GND	
29	PnGrpB1	IN/OUT	+5V
30	GND	GND	
31	PnGrpB0	IN/OUT	+5V
32	GND	GND	

DIO Module		PFM-T096P	
33	PnGrpA7	IN/OUT	+5V
34	GND	GND	
35	PnGrpA6	IN/OUT	+5V
36	GND	GND	
37	PnGrpA5	IN/OUT	+5V
38	GND	GND	
39	PnGrpA4	IN/OUT	+5V
40	GND	GND	
41	PnGrpA3	IN/OUT	+5V
42	GND	GND	
43	PnGrpA2	IN/OUT	+5V
44	GND	GND	
45	PnGrpA1	IN/OUT	+5V
46	GND	GND	
47	PnGrpA0	IN/OUT	+5V
48	GND	GND	
49	+5V	PWR	
50	EXTTRG	IN	

※EVENT、EXTTRG for Counter

※PnGrp(A/B/C)(0~7) : DIO Port (1/2/3/4) Group (A/B/C) bit(0/1/2/3/4/5/6/7)

Below Table for China RoHS Requirements

产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	×	○	○	○	○	○
外部信号 连接器及线材	×	○	○	○	○	○

O：表示该有毒有害物质在该部件所有均质材料中的含量均在
　　SJ/T 11363-2006 标准规定的限量要求以下。

X：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出
　　SJ/T 11363-2006 标准规定的限量要求。

备注：此产品所标示之环保使用期限，系指在一般正常使用状况下。

Chapter

3

Driver Installation

Before using PFM-T096P utility, you need to install driver first.

3.1 Supported Environment

OS: Windows 7, Windows Embedded Standard 7, Windows XP, Windows

Embedded Standard 2009

3.2 For Windows 7
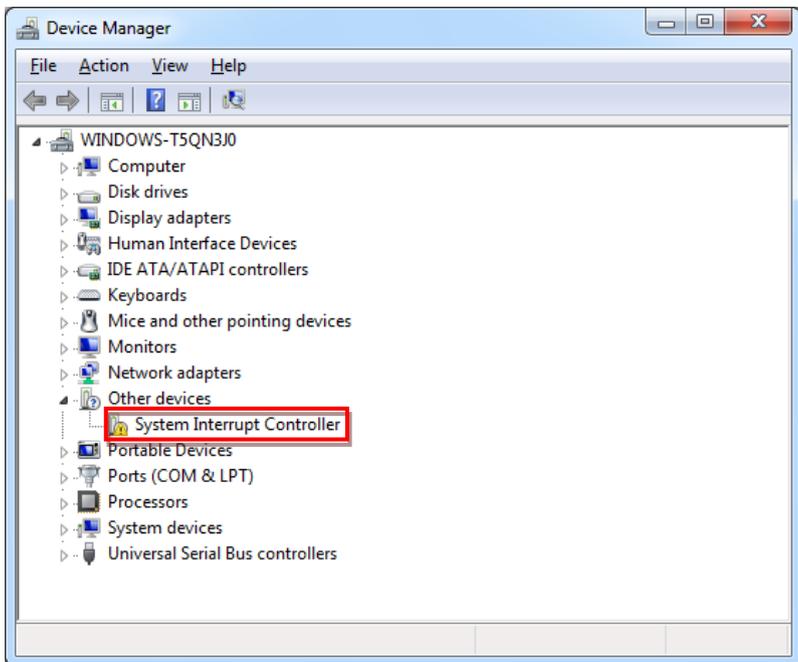
Step1: Click "Update Driver" as the following graphic shows.
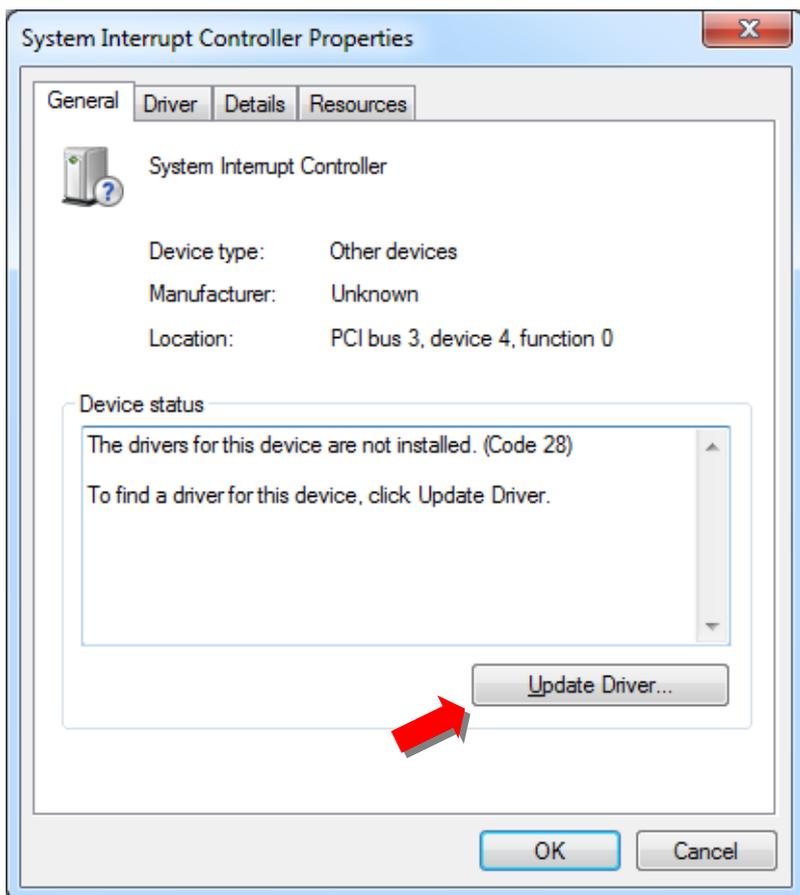
Step 2: Choose "Browse my computer for driver software" and click it.
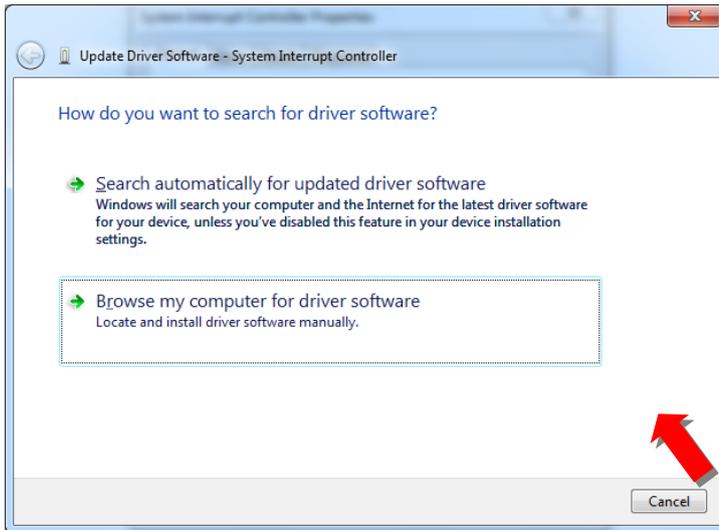
Step 3: Locate to Win7 driver folder.
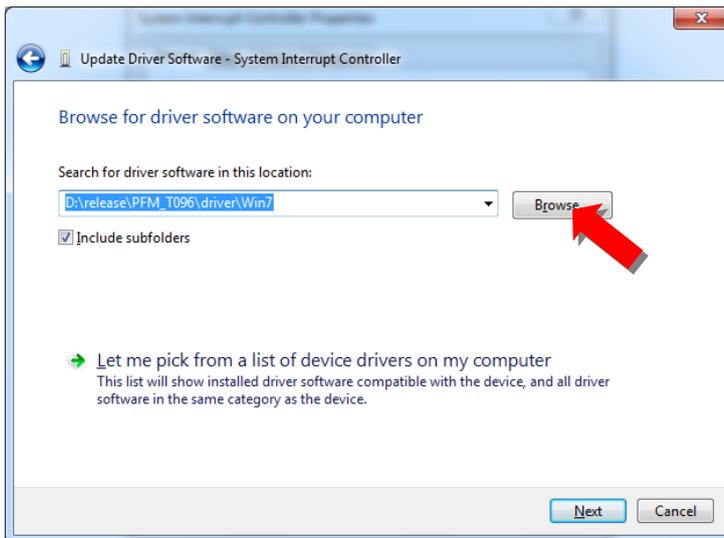
Step 4: Choose "Install this driver software anyway" and click it.
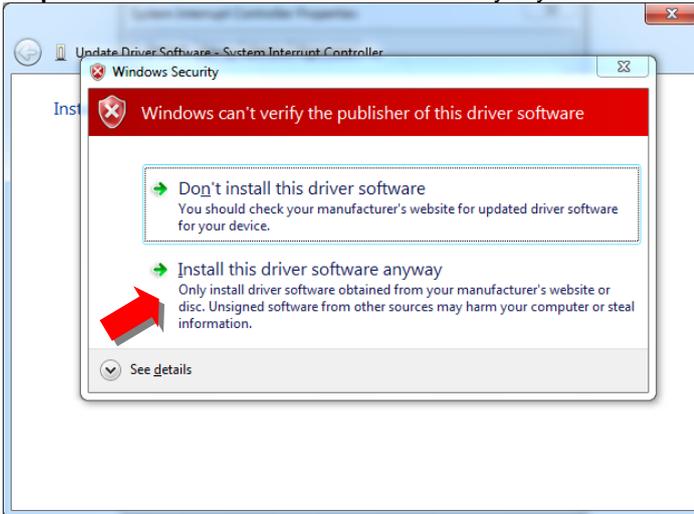
Step 5: The following dialog box pops up and the driver installation is finished.
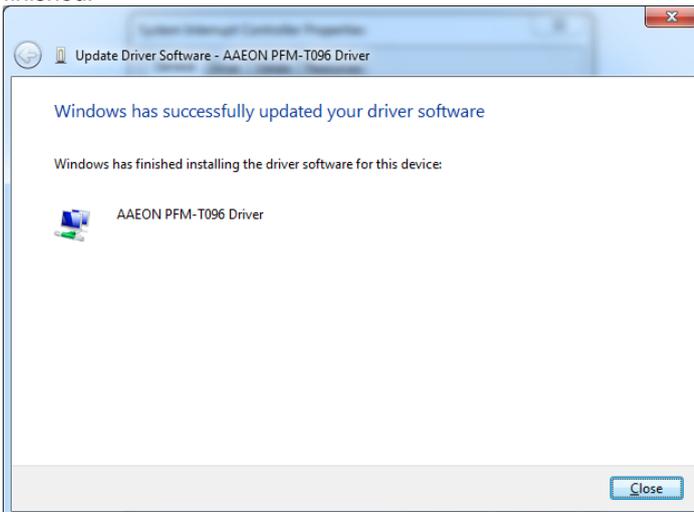
Step 6: You will see the driver is properly installed.
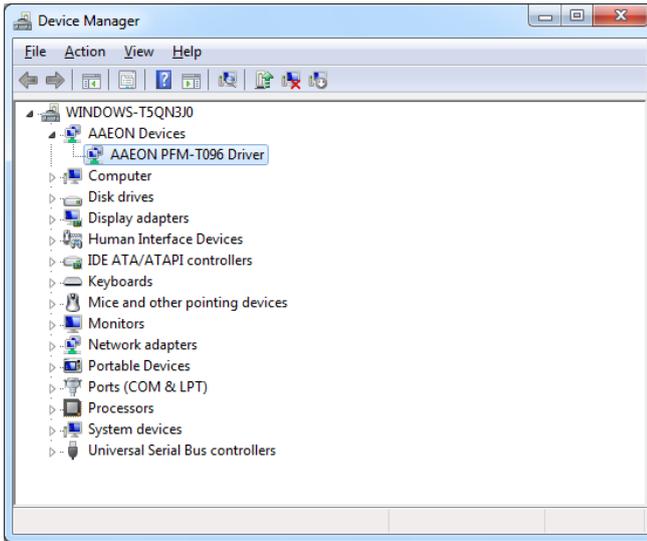
3.3 For Windows XP:

In Windows XP, you need to install Kernel-Mode Driver Framework first.

Step 1: Click **Microsoft Kernel-Mode Driver Framework**

Install-v1.9-Win2k-WinXP-Win2k3.exe.
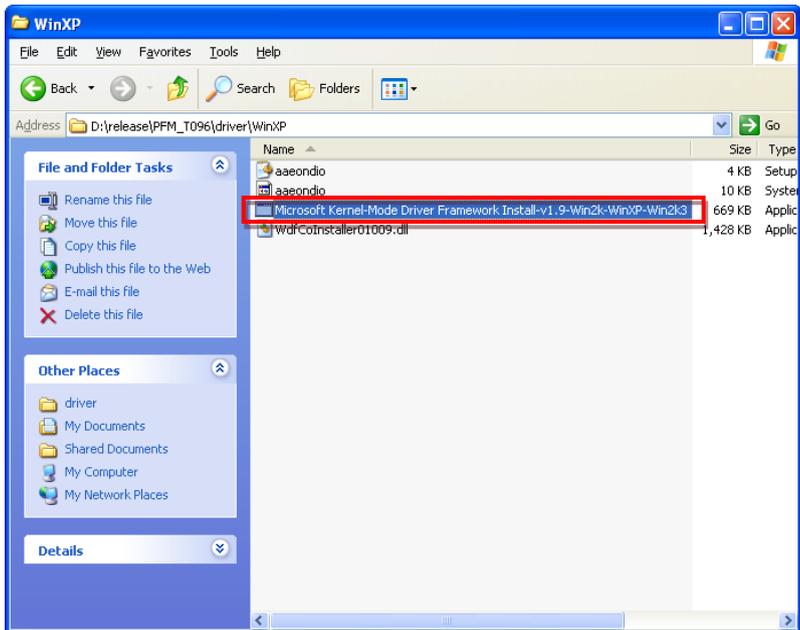
Step 2: Click "Next" and it will update your system automatically.
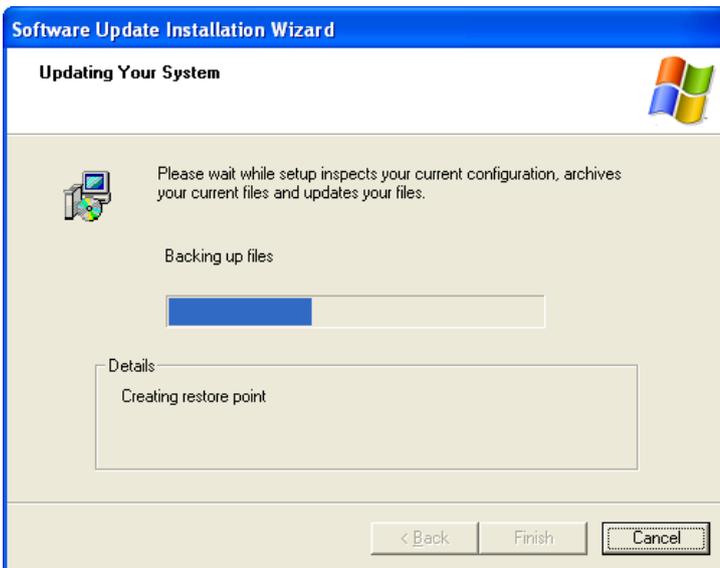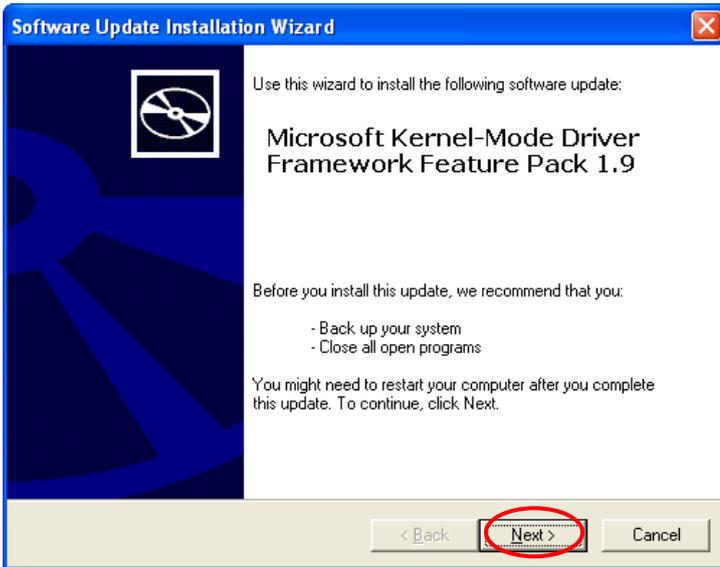
Step 3: Click "Finish" to complete the updating.

Step 4: After installing the KDF, please install PFM-T096P driver.
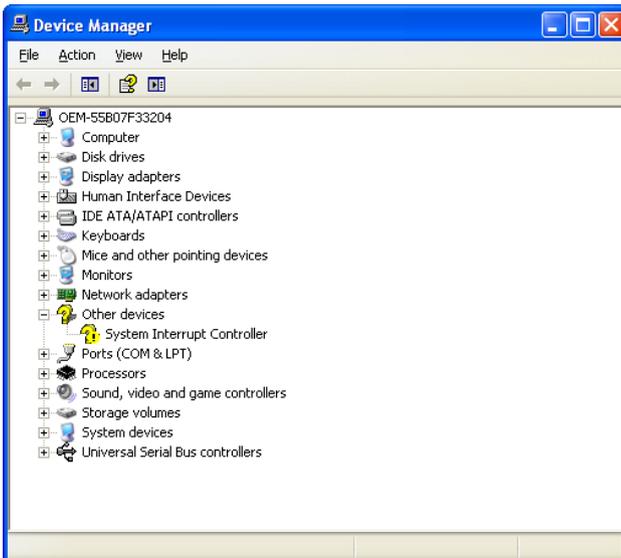
Step 5: Click "Update Driver".
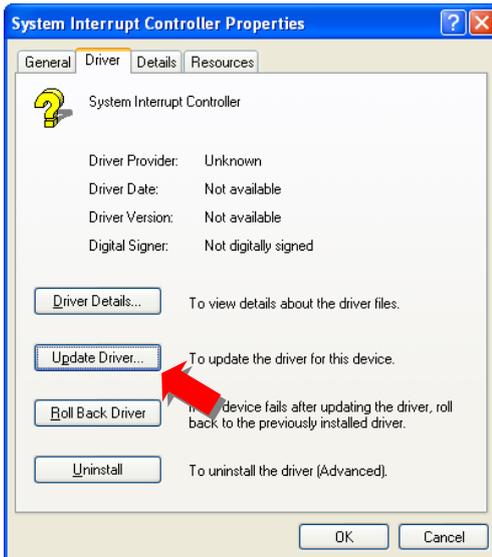
Step 6: Choose "Yes, this time only" and click "Next" to continue.

Step 7: Choose "Install from a list or specific location (Advanced)" and click "Next" to continue.
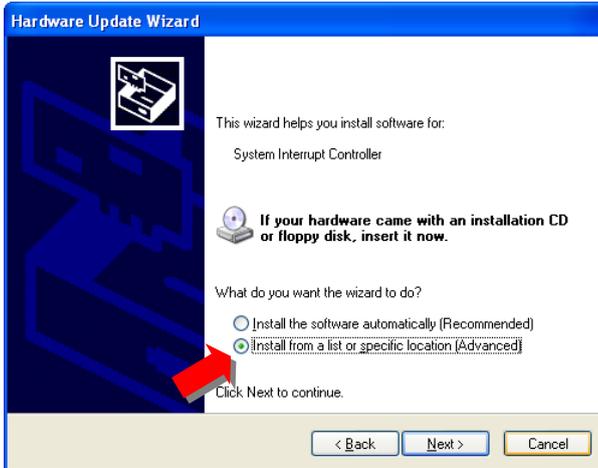
Step 8: Click "Browse" to locate to the Win XP driver folder. Then click "Next".
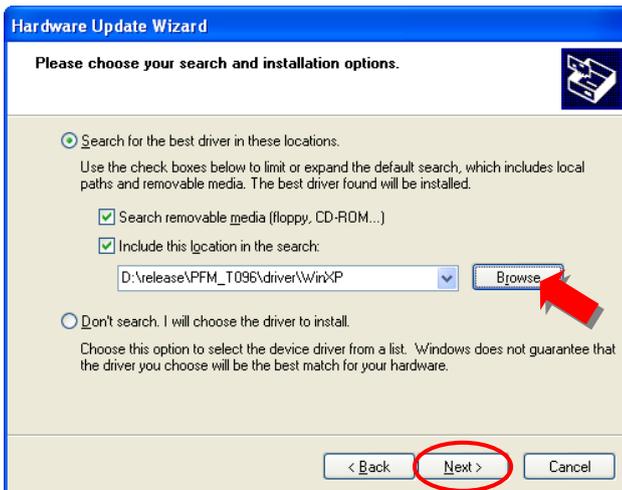
Step 9: The driver installation starts.
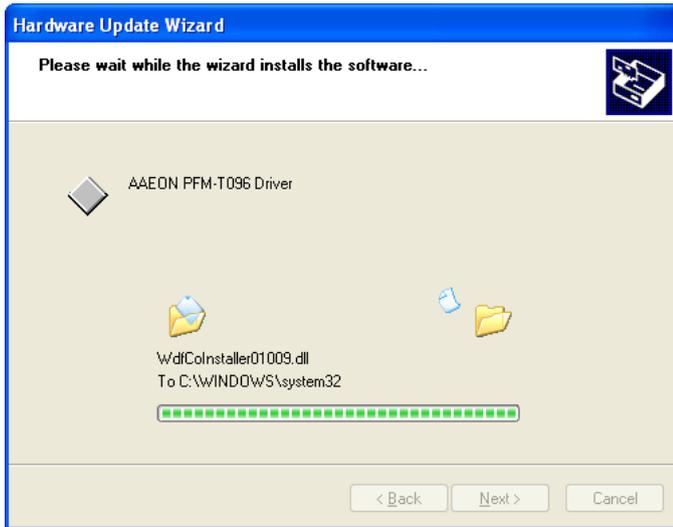
Step 10: The following dialog box pops up and the driver installation is

finished. Click "Finish".

Chapter 3 Driver Installation 3 - 12

Step 11: You will see the driver is properly installed.
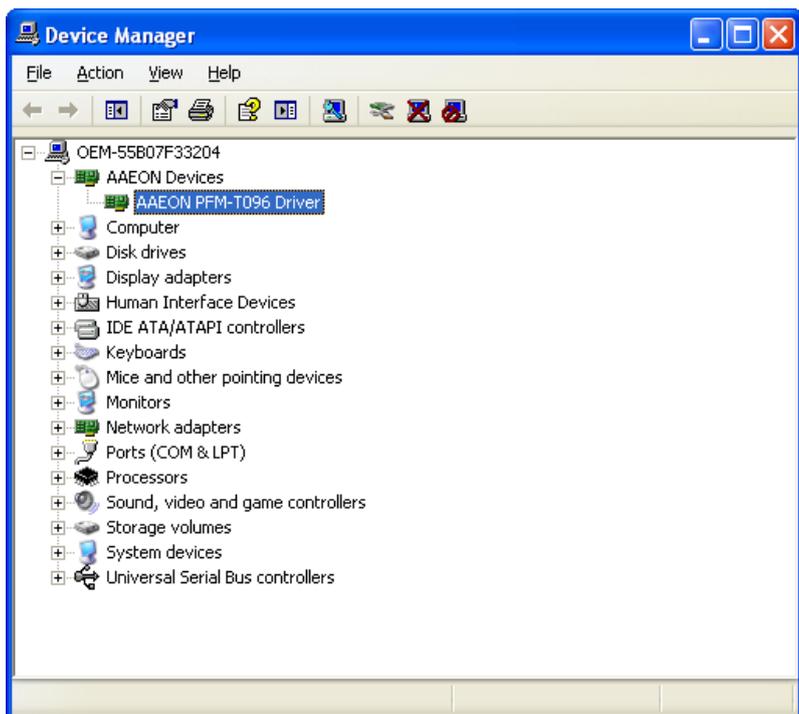
3.4 Utilization of the Utility

Utility Screenshot
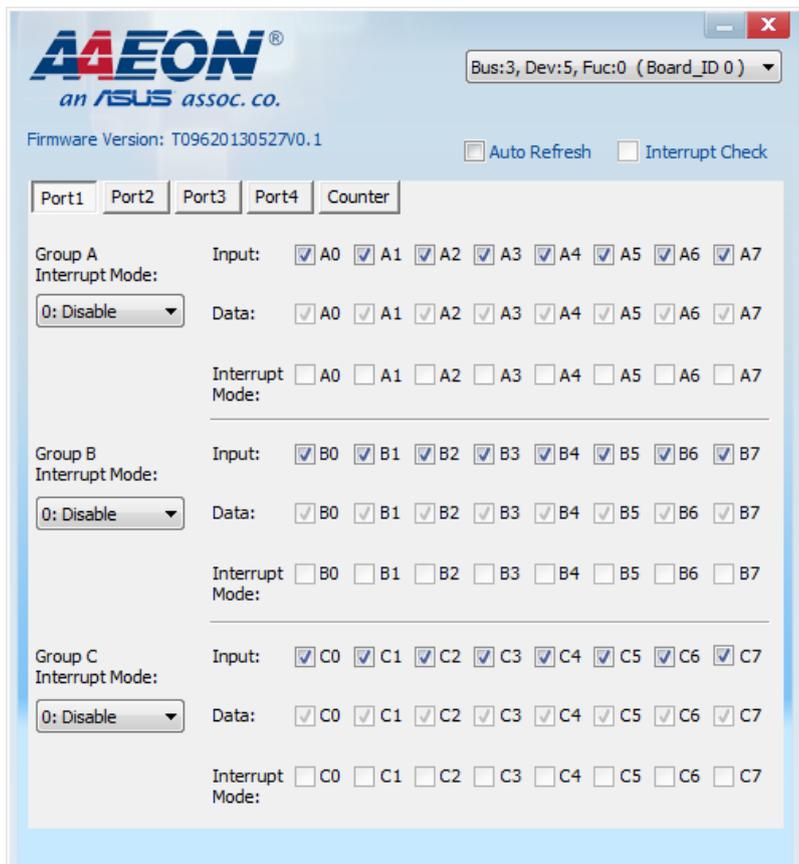
Function Explanation
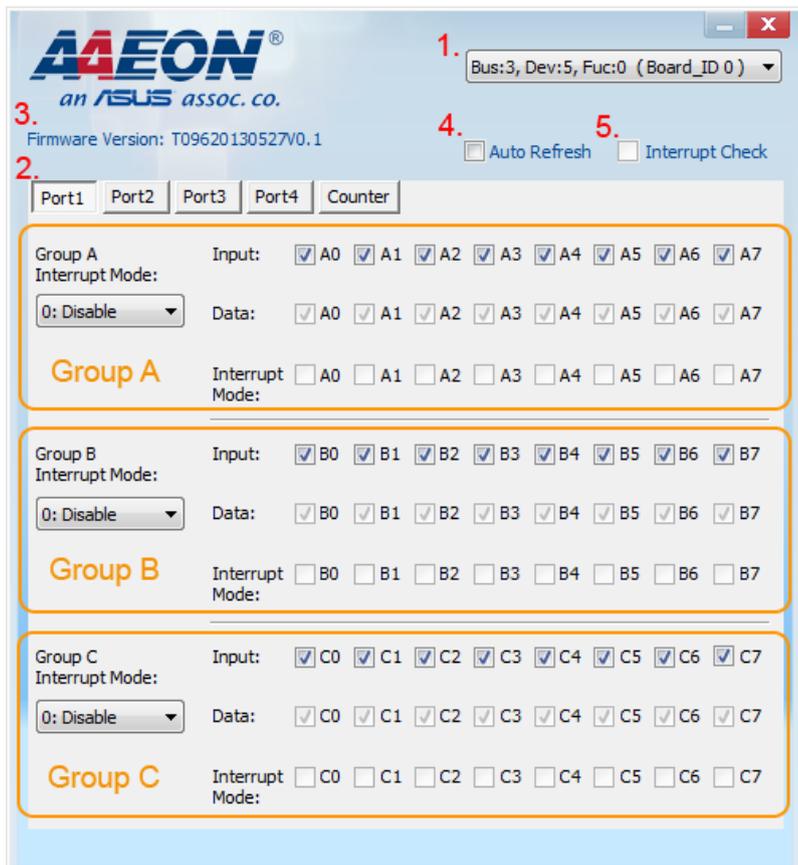
1. All PFM-T096P devices will list here
2. There are 4 ports in PFM-T096P (1~4)
3. Shows firmware version
4. Check this box will auto refresh DIO data and counter status
5. This box changed if there is an interrupt occurred

.

DIO Module	PFM-T096P

1. Digital IO input settings (Checked means set in input mode)

2. Digital IO data status (Checked means **High**, otherwise **Low**)

3. There are five interrupt mode:

    a. Disable: No interrupt

    b. Edge: When encounter **Falling** or **Rising** edge, an interrupt occurs

    c. Level: When encounter **Low** or **High** level, interrupt occurs repeatly

    d. Change State: When DIO data status changed, an interrupt occurs

    e. Pattern Match: When pattern matching, interrupt occurs.

According these mode, here will present different function:

Edge

    0: Falling, 1: Rising

Level

    0: Low, 1: High

Change State

    0: Enable, 1: Disable

Pattern Match

    EX: Set pin interrupt mode bit7~bit0 = 0b00111000. When getting

Data = 0b00111000, then interrupt occurs.

Counter value is 0~65535. When overflowing, interrupt occurs.

1. There are two mode:

   a.　Up count: counter will increase

   b.　Down count: counter will decrease

2. Read current counter number

3. Set count value

4. When interrupt occurring, this value decides pulse interval.

   Ex. 10 = 100ms x 10 = 1000ms = 1s

Appendix

A

Mating Connector

A.1 List of Mating Connectors and Cables

The table notes mating connectors and available cables.

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model number		
CN3	Digital I/O	Molex	22-55-2501	AAEON DIO Extension Cable	1701500401
CN4					
CN5					
CN6					

Appendix

B

Support Matrix

DIO Module	PFM-T096P

B.1 List of Support Matrix

For customer implement PFM-T096P with difference main board some time meet resource issues.

Below support matrix for reference.

	M/B	XP Platform setting	Win 7 Platform setting	Remark:
1	PFM-CVS Rev.B	INT_B/C/D PASS	INT_A/B/C/D PASS	PFM-CVSB R1.0 BIOS
2	EPIC-HD07	INT_A/B/C PASS	INT_A/B/C PASS	EPIC-HD07 R1.3 BIOS
3	EPIC-QM77	INT_A/C/D PASS	INT_A/B/C/D PASS	EPIC-QM77 R1.2 BIOS

Real situation depend on difference MB setting & add card to occupy the MB resource. So above support matrix for reference only.

The jumper setting of INT for reference.

INT type	JP2	JP3	Remark:
INT_A	Open	Open	
INT_B	Open	Short	
INT_C	Short	Open	
INT_D	Short	short	