

PE-1000 USER

PCI Express x4, 2-channel/ 4-channel Gigabit LAN,
IEEE 802.3at Compliant PoE⁺ Expansion Card

Manual

Record of Revision

Version	Date	Page	Description	Remark
0.9	01/20/2015	All	Preliminary Release	
1.0	03/03/2015	All	Official Release	
1.1	07/13/2015	All	Update Release	

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Declaration of Conformity

FCC This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE The product (s) described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

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Order Information

Part Number	Description
PE-1002	PCI Express by 4, PoE ⁺ , 2-CH, Gigabit, IEEE 802.3at Compliant
PE-1004	PCI Express by 4, PoE ⁺ , 4-CH, Gigabit, IEEE 802.3at Compliant

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1

GENERAL INTRODUCTION

1.1 Overview

PE-1000 is a series of PoE⁺ expansion cards which is powered by independent gigabit LAN chips. With up to 25.5W at 48V DC power output on each 10/100/1000 Mbps IEEE 802.3at compliant connection, link aggregation (LAG) & 9KB Jumbo Frame supported, and wide range of operating temperature, PE-1000 series PoE⁺ expansion card is your cost effective choice for Intelligent Transportation System (ITS), IP Video Surveillance, Automation Optical Inspection, Industrial Automation and any PoE⁺ required applications.

1.2 Features

- PCI Express x4 Interface
- IEEE 802.3at compliant for PoE⁺
- Up to 4 Independent Gigabit LAN Ports
- Up to 25.5W Power Output at 48V DC per port
- -25°C to 70°C Operating Temperature
- 9KB Jumbo Frame
- Link Aggregation
- 16 Isolated DIO for 8 DI & 8 DO (Optional)

1.3 Product Specification

1.3.1 Specifications of Vecow PE-1002

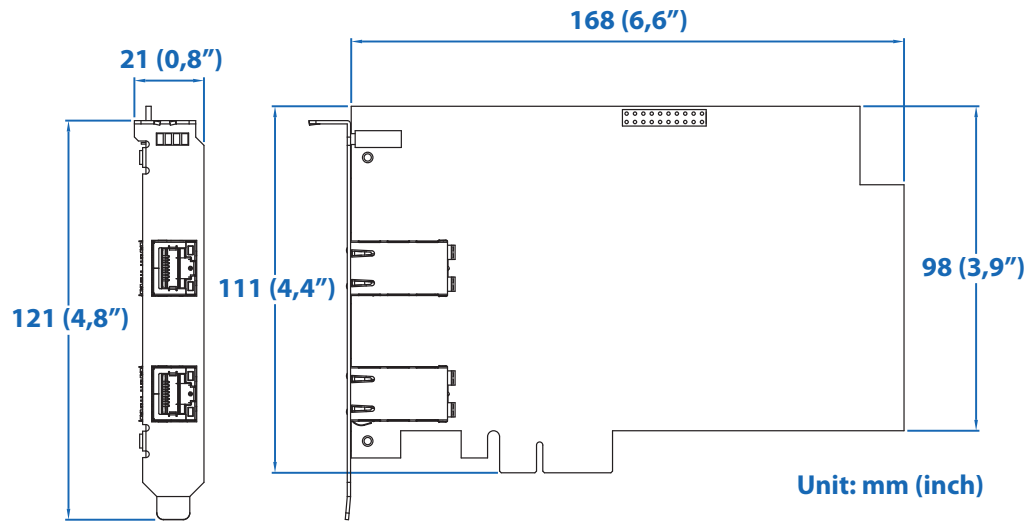
Ethernet	
Interface	PCI Express x4
Chipset	2 Intel® 82574L Gigabit LAN
Data Rate	10/ 100/ 1000 Mbps (Vary by attached Ethernet device)
Jumbo Frame	9KB
Link Aggregation (LAG)	Present
Connector	8-pin RJ45
PoE Standard	IEEE 802.3at compliant
Power Requirements	
Output	2 PoE Ports, up to 25.5W Power Output at 48V DC per port
Power Connector	1 4-pin ATX 12V Power Connector
DIO	16 Isolated DIO for 8 DI & 8 DO (Optional)
Environment	
Operating Temperature	-25°C to 70°C (-13°F to 158°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Certifications	FCC, CE, RoHS compliant
Mechanical	
Dimension (W x D x H)	168mm x 121mm x 21mm (6.6" x 4.8" x 0.8")

1.3.2 Specifications of Vecow PE-1004

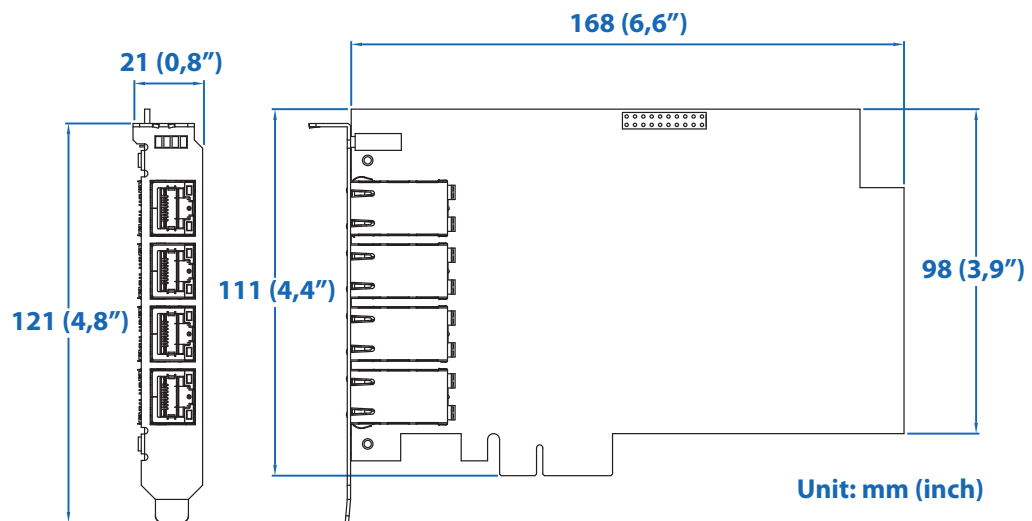
Ethernet	
Interface	PCI Express x4
Chipset	4 Intel® 82574L Gigabit LAN
Data Rate	10/ 100/ 1000 Mbps (Vary by attached Ethernet device)
Jumbo Frame	9KB
Link Aggregation (LAG)	Present
Connector	8-pin RJ45
PoE Standard	IEEE 802.3at compliant
Power Requirements	
Output	4 PoE Ports, up to 25.5W Power Output at 48V DC per port
Power Connector	1 4-pin ATX 12V Power Connector
DIO	16 Isolated DIO for 8 DI & 8 DO (Optional)
Environment	
Operating Temperature	-25°C to 70°C (-13°F to 158°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Certifications	FCC, CE, RoHS compliant
Mechanical	
Dimension (W x D x H)	168mm x 121mm x 21mm (6.6" x 4.8" x 0.8")

1.4 Mechanical Dimension

1.4.1 PE-1002



1.4.2 PE-1004



2

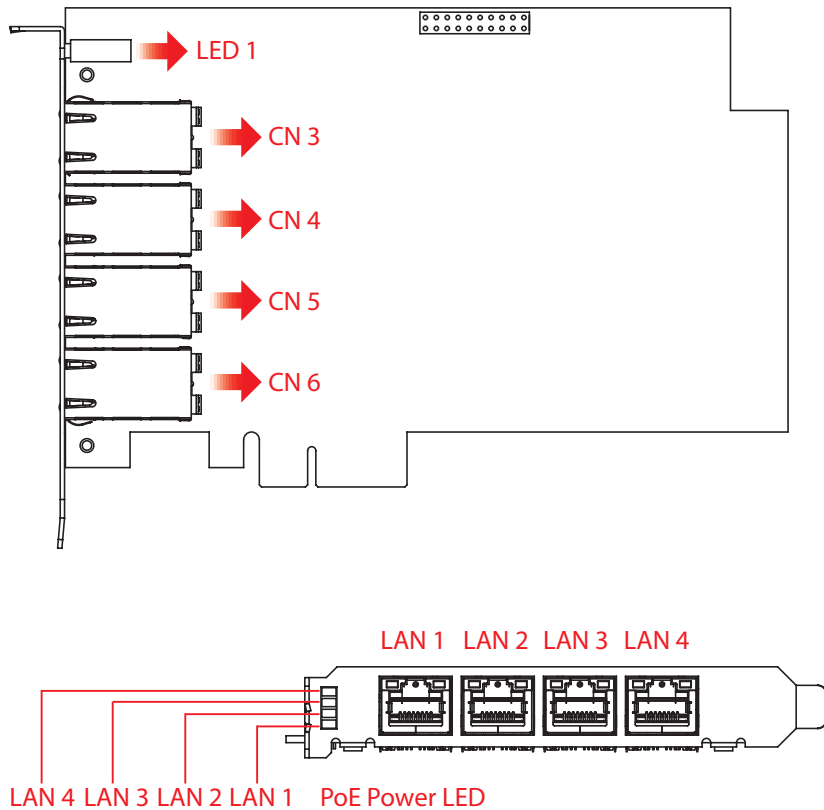
GETTING TO KNOW YOUR PE-1000

2.1 Packing List

Item	Description	Qty
1	PE-1000, PCI Express x4 PoE ⁺ , 2-Channel/ 4-Channel, Gigabit, IEEE 802.3at Compliant Expansion Card (According to the configuration you order.)	1
2	Accessory box, which contains Vecow Drivers & Utilities DVD	1

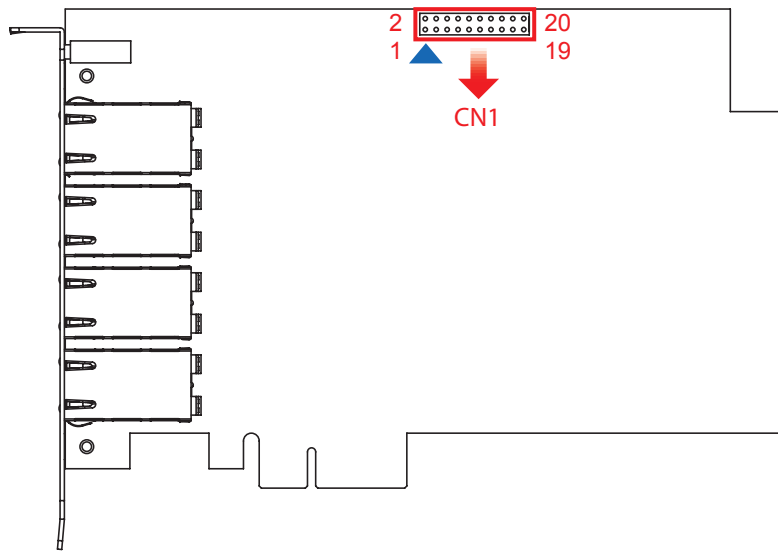
2.2 I/O and Indication

2.2.1 LED1 CN3 CN4 CN5 CN6



PE-1000 equipped with 4 IEEE 802.3at PoE⁺ ports for transmitting power as much as 25.5W / 48V per port and 1000BASE-T gigabit data signals over standard Ethernet CAT-5/CAT-6 cable. Every PoE port applies one Intel® 82574L Gigabit Ethernet controller and independent PCI express interface to connect with multi-core processor for network and data transmit optimization. Only when PoE port starts to supply power to power devices, the dedicated LED will be light on.

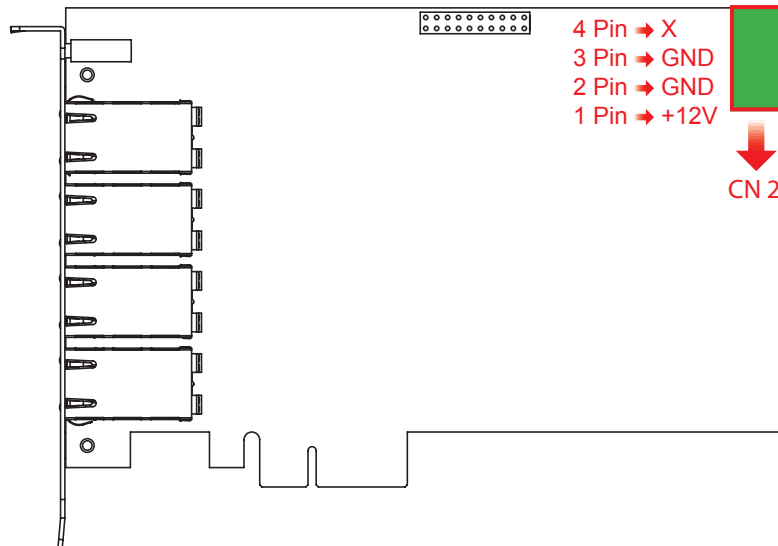
2.2.2 CN1



The PE-1000 offers a 16-bit Isolated DIO (8-DI / 8-DO) connector. Each bit of DI and DO equipped with a photo-coupler for protection. A power buffer device TPD2007F integrated in 8-DO circuit for industrial applications.

Pin No.	Definition	Pin No.	Definition
1	INPUT 0	11	OUTPUT 0
2	INPUT 1	12	OUTPUT 1
3	INPUT 2	13	OUTPUT 2
4	INPUT 3	14	OUTPUT 3
5	INPUT 4	15	OUTPUT 4
6	INPUT 5	16	OUTPUT 5
7	INPUT 6	17	OUTPUT 6
8	INPUT 7	18	OUTPUT 7
9	DI_COM	19	N.C.
10	GND	20	External 24VDC Input

2.2.3 CN2



The PE-1000 also equipped with one 4-pin power plug (12V, 6A max) for additional power supply. For most cases, the power obtained from PCIe bus is sufficient for the PoE devices, and you do not need to supply extra power to the card.

In case the external power is needed, you can use 4-pin ATX power connector (+5V/Red, GND/Black, GND/Black, +12V/Yellow) inside the host computer. Please always confirm the polarity before you plug into the onboard 4-pin power plug.

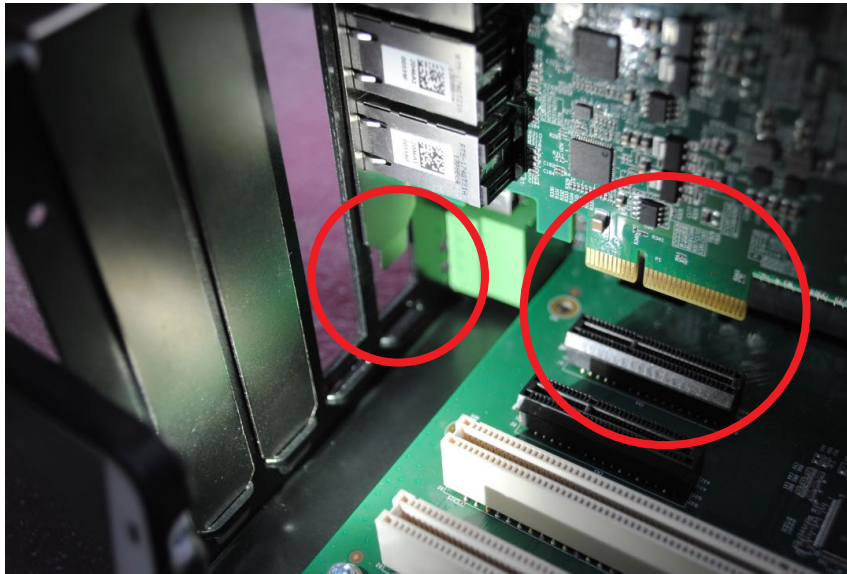
Pin No.	Definition
1	+12V
2	GND
3	GND
4	X

3

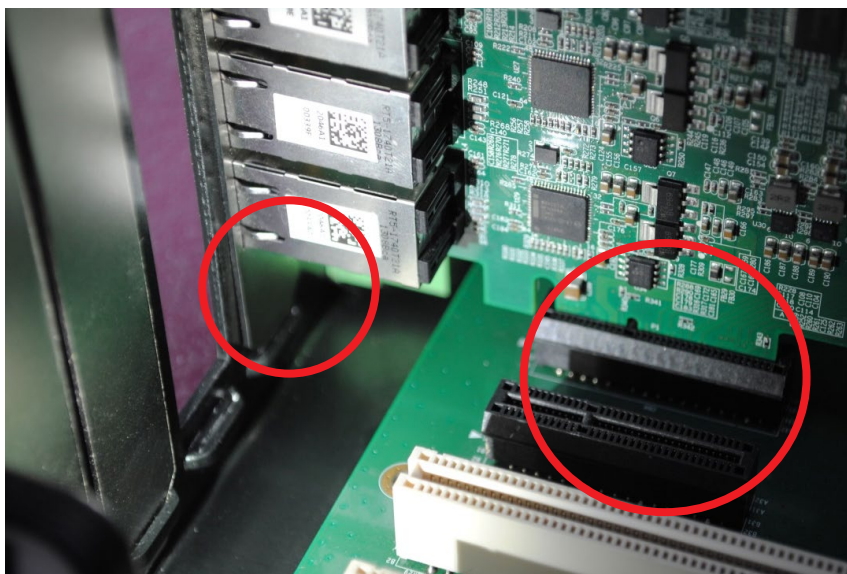
GETTING START

3.1 Installing PE-1002/ PE-1004

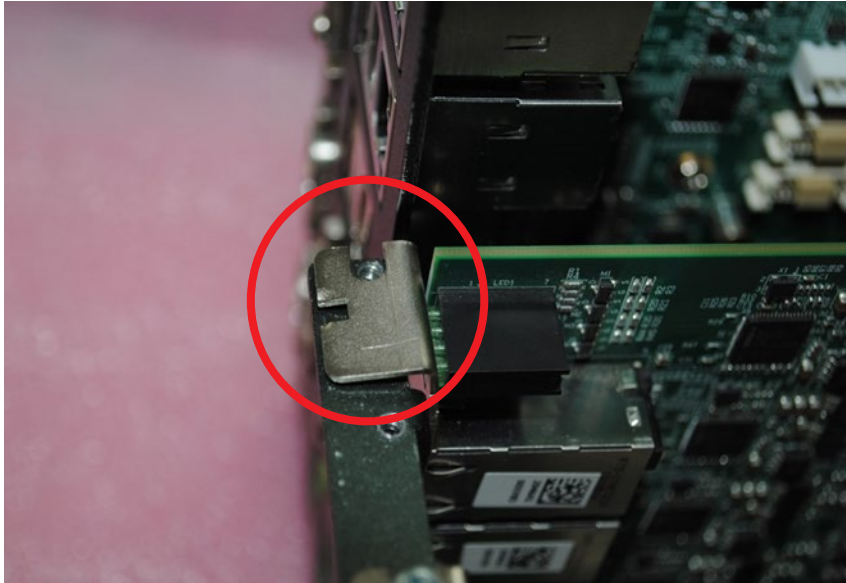
Step 1. Insert PE-1000 golden finger and PCI bracket into PCIe socket carefully.



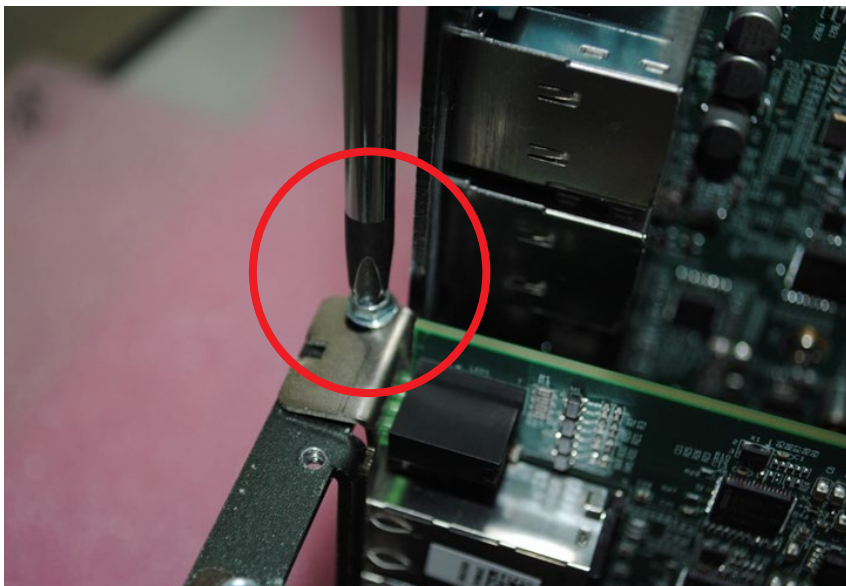
Step 2. Make sure golden finger and PCI bracket was inserted smoothly.



Step 3. Make sure the bracket aligns screw hole.



Step 4. Fasten the M3 screw.



4

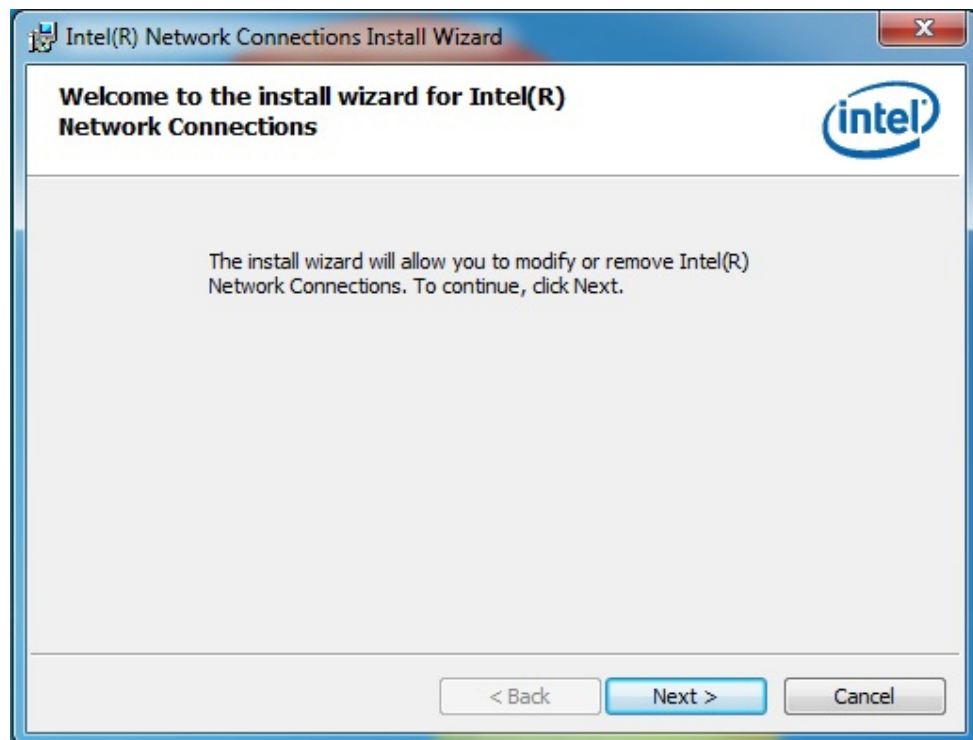
DRIVER INSTALLATION AND SETTING

4.1 Driver Installation

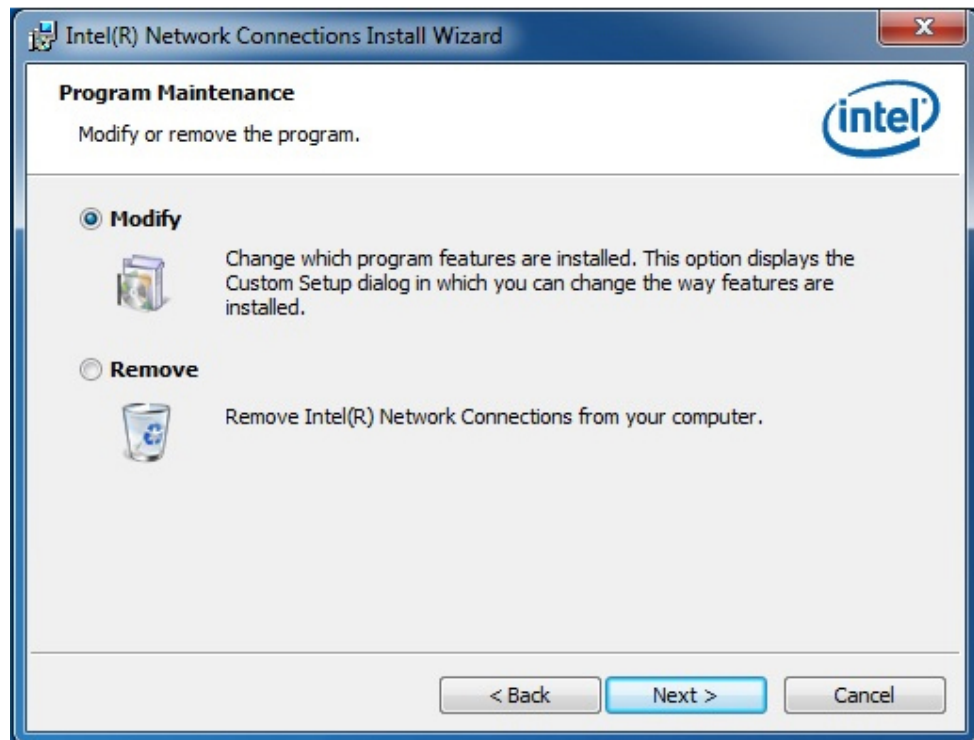
This section describes:
How to install drivers for PE-1002/ PE-1004 PoE Card.

System OS:
Windows XP, Windows 7 32-bit, Windows 7 64-bit, Windows 8.

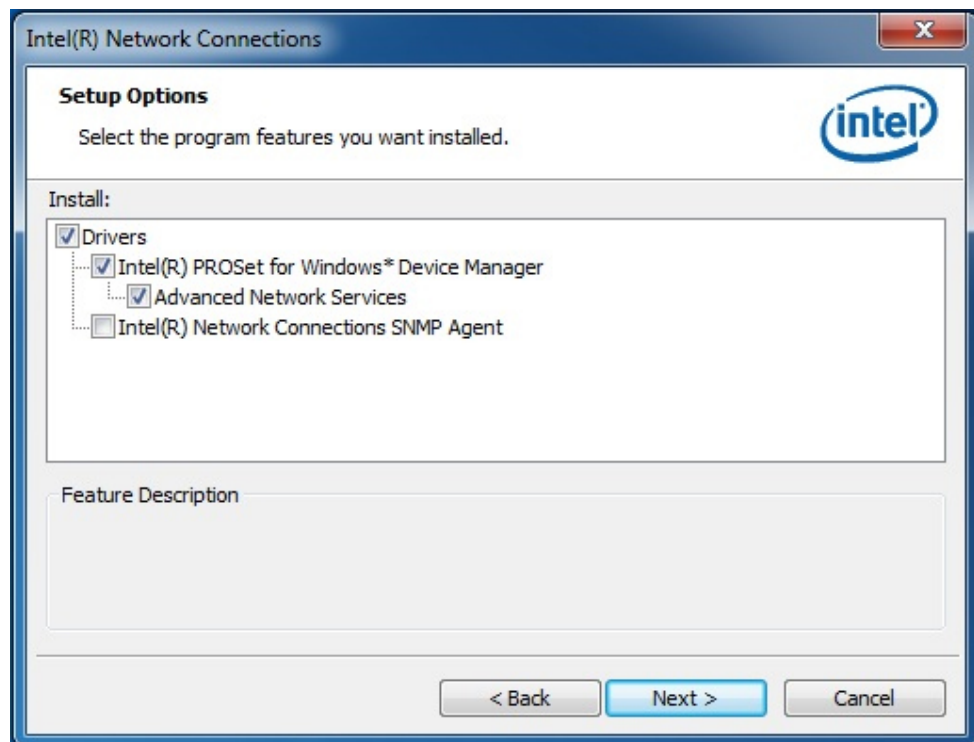
Step 1. Execute [LAN82574L_PROWinx64.exe](#) and then go "Next" step.



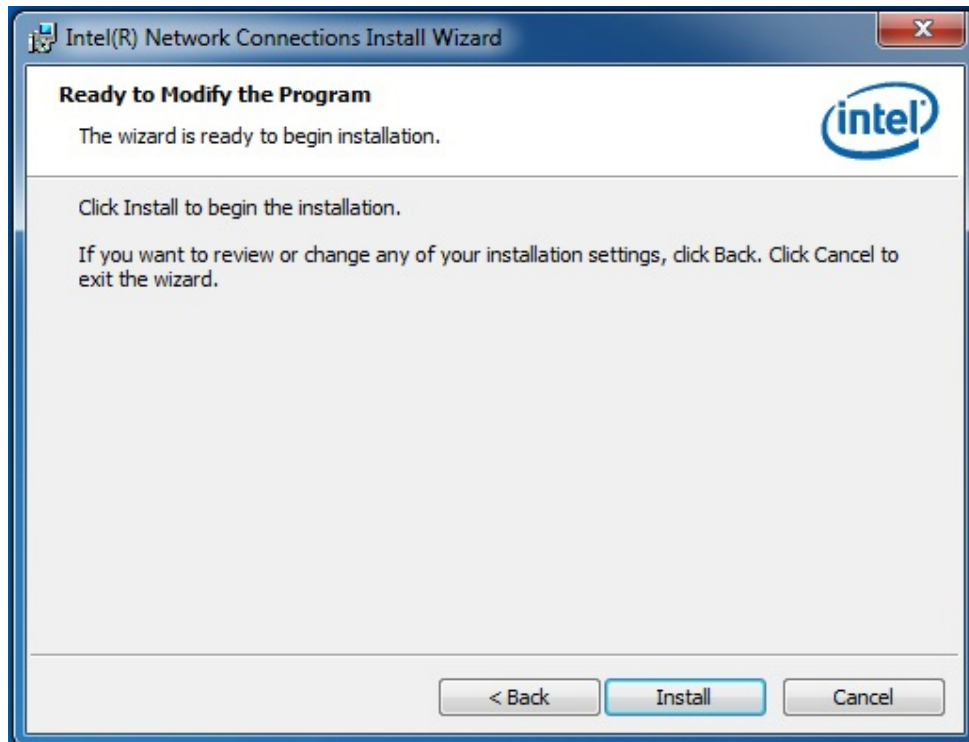
Step 2. Select "Modify" and then go to "Next" step.



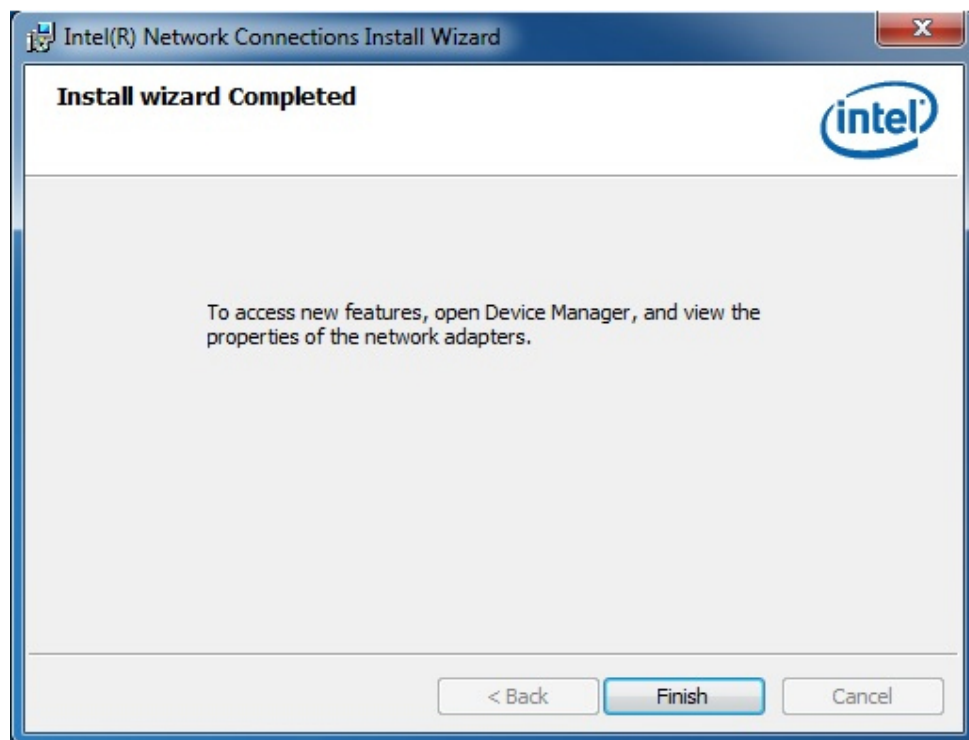
Step 3. Select program features.



Step 4. Click the "Install" icon to begin the installation.



Step 5. Install wizard completed.



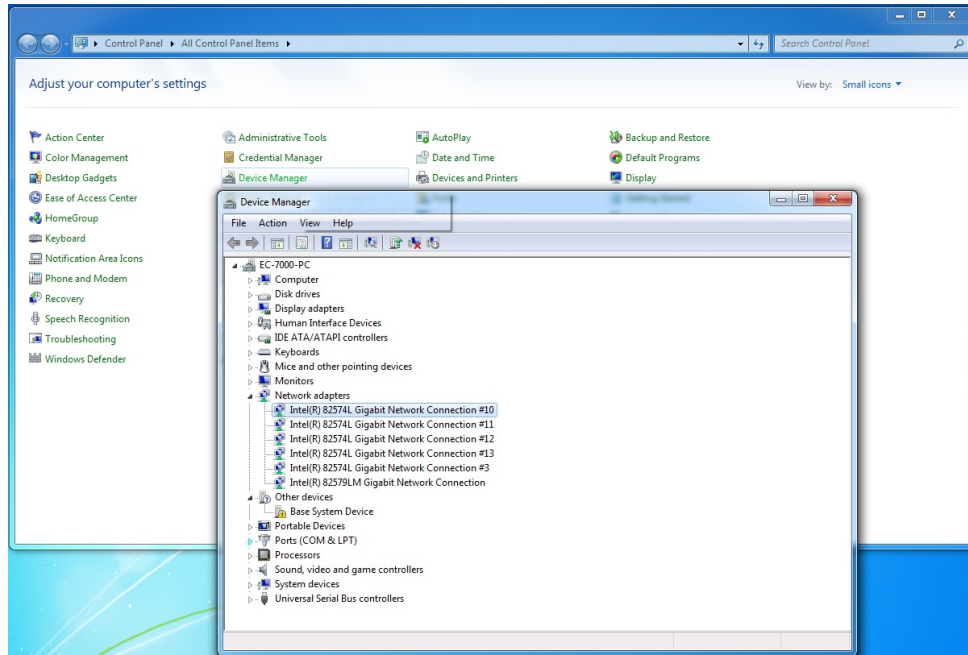
Once you need this network driver , you could remove this program on Control panel directly.

4.2 Jumbo Frame

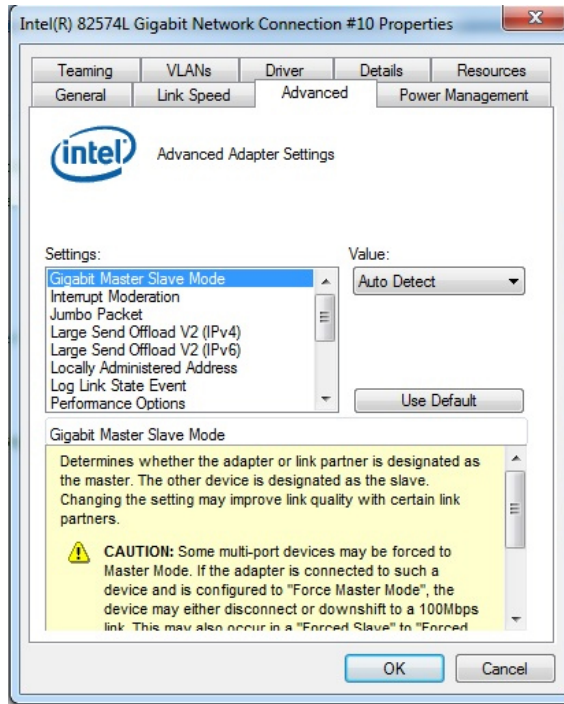
After installing the driver for Intel® 82574L GbE controller, you can get the enhance function that called jumbo frame, please find more instruction as below.

Step 1.

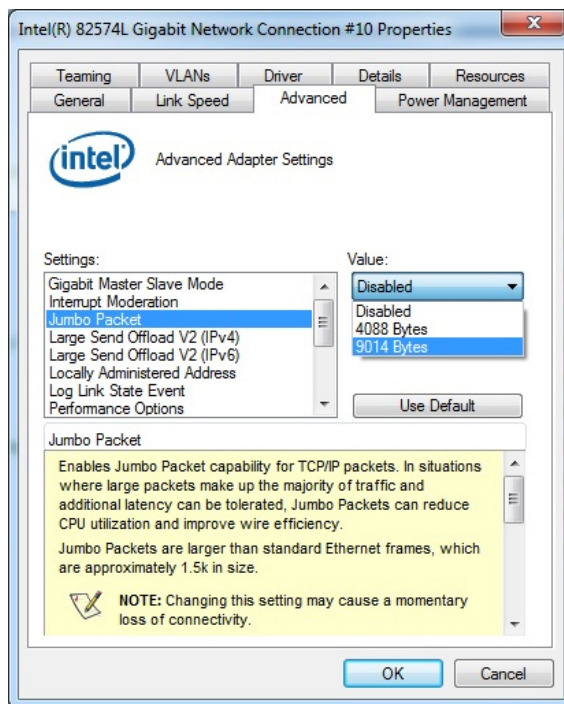
Open the "[Control Panel](#) → [Device Manager](#) → [Network adapters](#)".



Step 2. Select anyone "Intel® 82574L Gigabit Network Connection #xx", right Click and select "Properties", a property dialog appears and Click on the Advanced page.



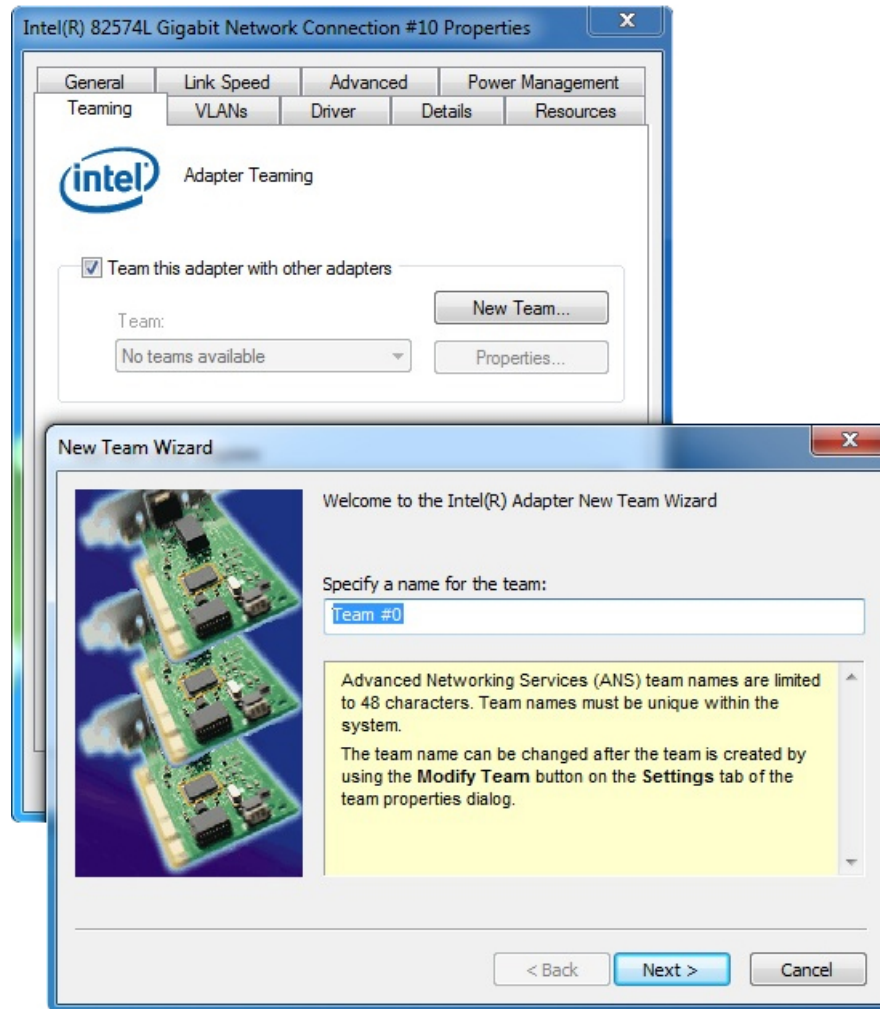
Step 3. Select the "Jumbo Packet", settings, and select the expected jumbo frame size.



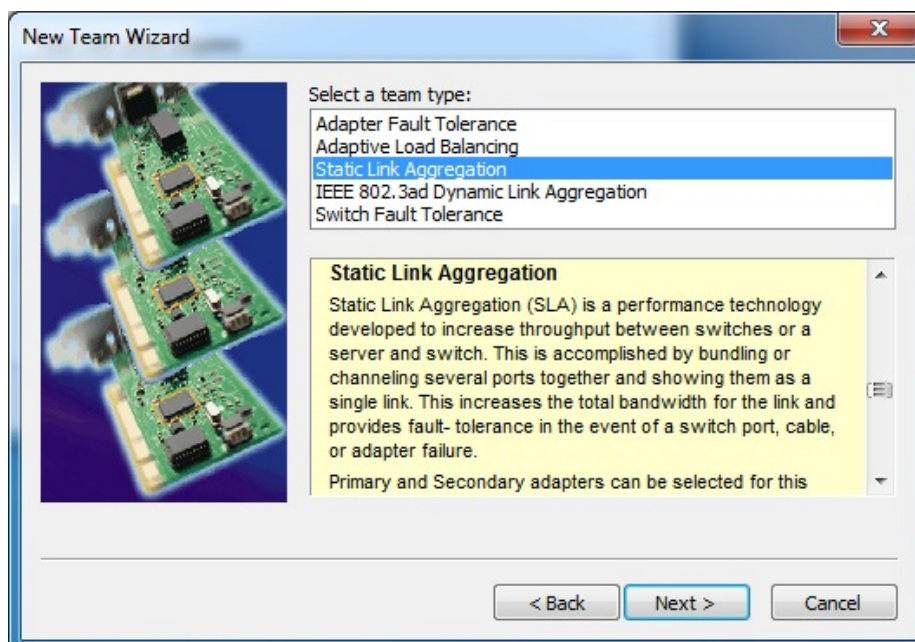
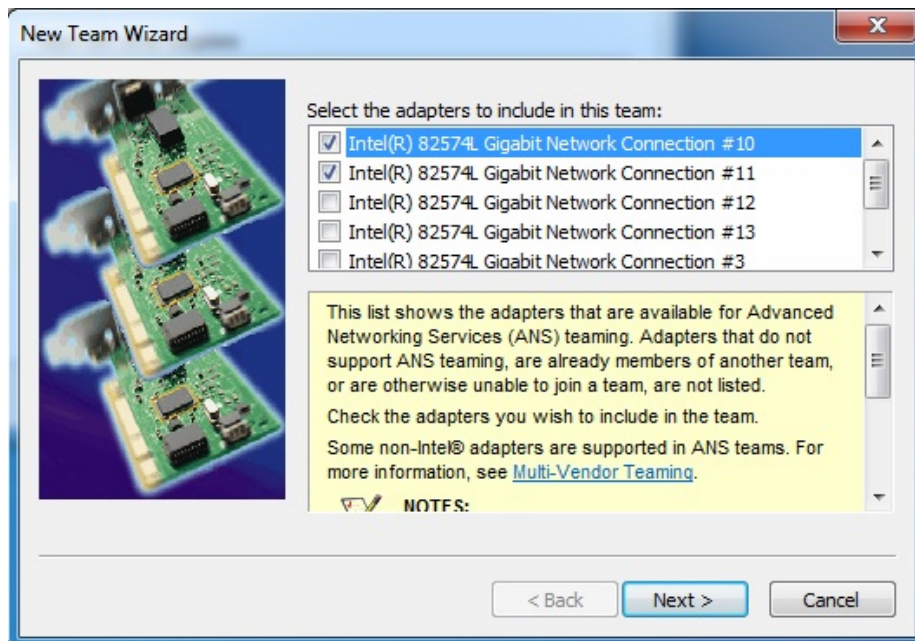
4.3 Link Aggregation

Step 1.

Here shows another enhance network function "Teaming".



Step 2. You could multi-select network device to get a high performance net



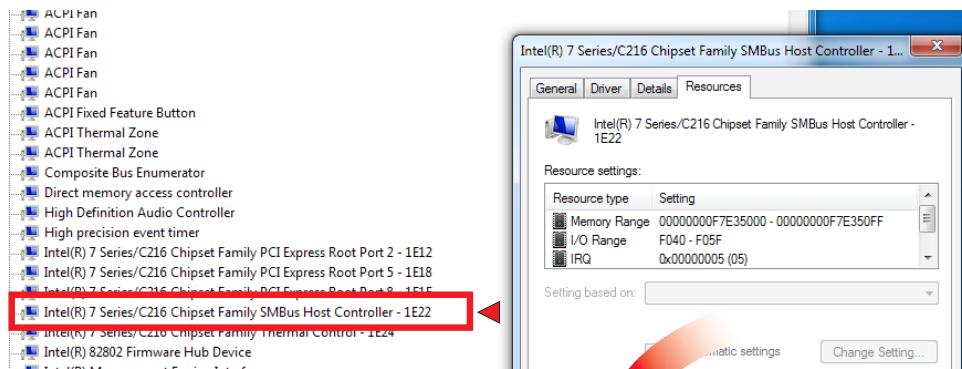
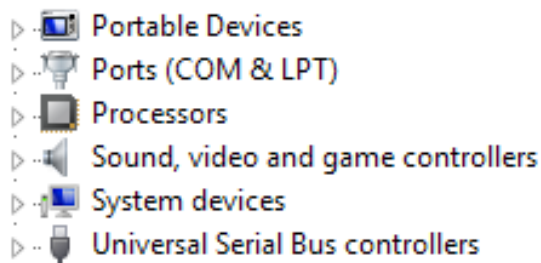
A

APPENDIX : DIO FUNCTION

PE-1000 series include 16 Isolated Digital I/O extension function.

Step 1. Pin assignment: Please refer to section 2.2.1 for pin assign.

Step 2. SMBus base address :



Resource settings:

Resource type	Setting
Memory Range	0000000F7E35000 - 0000000F7E350FF
I/O Range	F040 - F05F
IRQ	0x00000005 (05)

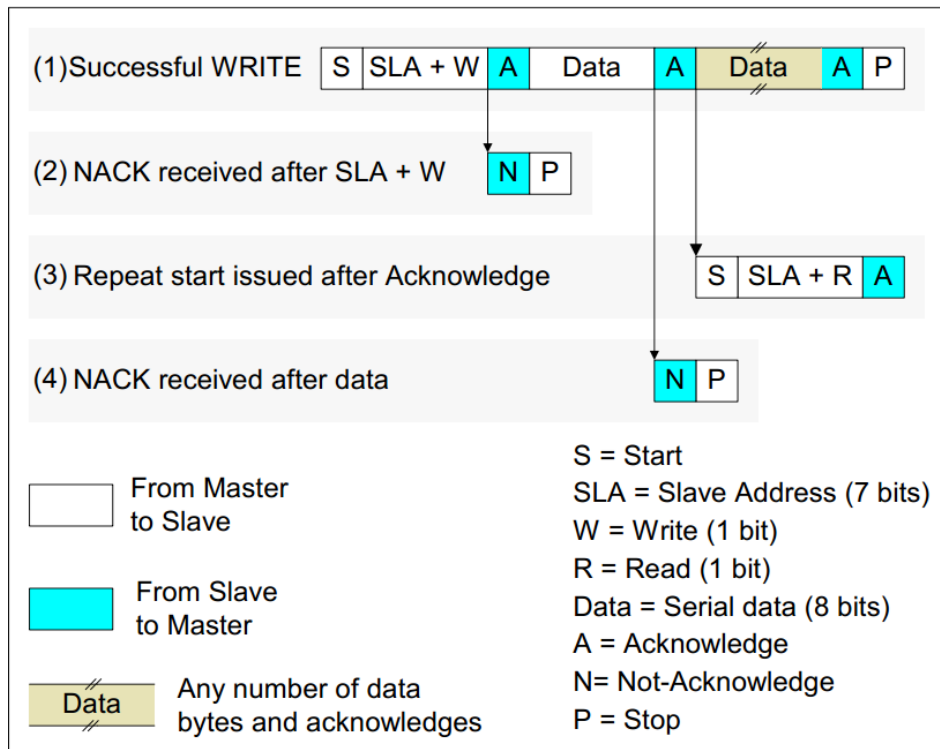
* Here you could find the I/O Range **F040-F05F**,
IRQ is **0x00000005(05)**.

* The **0xF040** is start address(SMB_BASE) of SMBus function

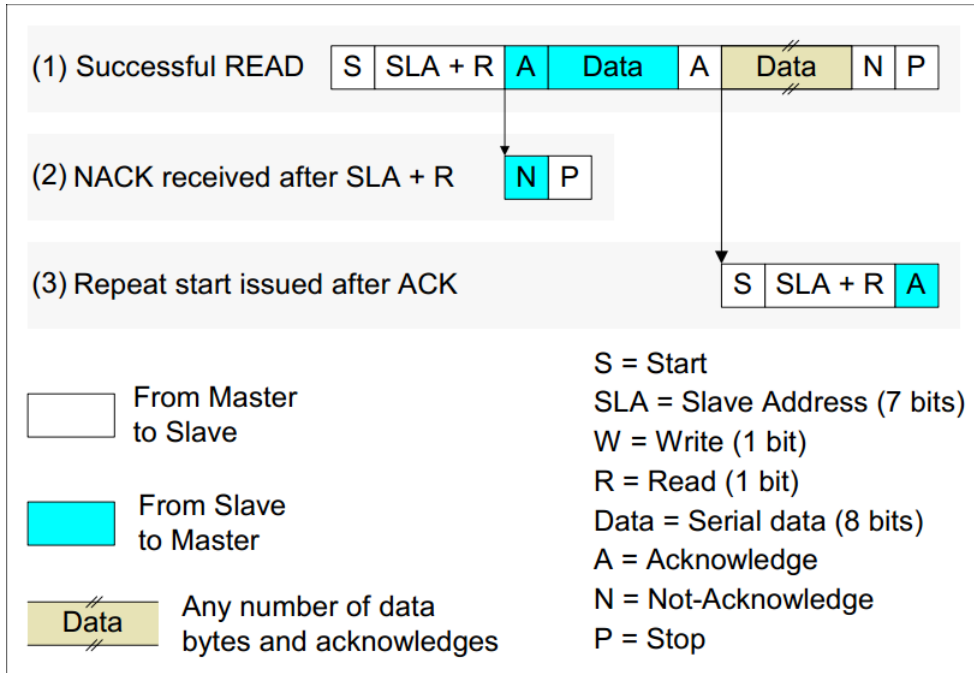
Step 3. SMBus IO Address Mapping table

SMB_BASE + Offset	Mnemonic	Register Name	Default	Type
00h	HST_STS	Host Status	00h	R/WC, RO, R/WC (special)
02h	HST_CNT	Host Control	00h	R/W, WO
03h	HST_CMD	Host Command	00h	R/W
04h	XMIT_SLVA	Transmit Slave Address	00h	R/W
05h	HST_D0	Host Data 0	00h	R/W
06h	HST_D1	Host Data 1	00h	R/W
07h	HOST_BLOCK_DB	Host Block Data Byte	00h	R/W
08h	PEC	Packet Error Check	00h	R/W
09h	RCV_SLVA	Receive Slave Address	44h	R/W
0Ah-0Bh	SLV_DATA	Receive Slave Data	0000h	RO
0Ch	AUX_STS	Auxiliary Status	00h	R/WC, RO
0Dh	AUX_CTL	Auxiliary Control	00h	R/W
0Eh	SMLINK_PIN_CTL	SMLink Pin Control (TCO Compatible Mode)	See register description	R/W, RO

Step 4. To Access SMBus register, below shows standard Read/Write scenarios. You refer to demo code that follow SMBus protocol to complete the process.



```
void smbwrite(Data_BYTE device_id, Data_BYTE reg_no,
unsigned char data)
{
    Data_BYTE err_no;
    WriteAByte(SMBus_Host_Status, 0xFF);
    Delay_T(1);
    err_no = Check_SMBus_Ready();
    if (err_no != 0) return;
    WriteAByte(SMBus_Trans_Addr, device_id);
    WriteAByte(SMBus_Host_Command, reg_no);
    WriteAByte(SMBus_Host_Data0, data);
    WriteAByte(SMBus_Host_Control, 0x48);
    Delay_T(200);
    Check_SMBus_Ready();
}
```

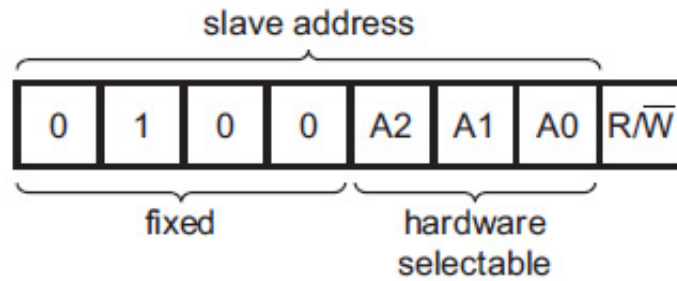


```
Data_BYTE smbread(Data_BYTE device_id, Data_BYTE reg_no,
unsigned char *dat)
```

```
{
    Data_BYTE err_no;
    WriteAByte(SMBus_Host_Status, 0xff);
    WriteAByte(SMBus_Host_Data0, 0x00);
    err_no = Check_SMBus_Ready();
    if (err_no != 0) return err_no;
    WriteAByte(SMBus_Trans_Addr, device_id+1);
    WriteAByte(SMBus_Host_Command, reg_no);
    WriteAByte(SMBus_Host_Control, 0x48);
    Delay_T(20);
    err_no = Check_SMBus_Ready();
    if (err_no != 0) return err_no;
    *dat = ReadAByte(SMBus_Host_Data0);
    return (err_no);    //Data 0
}
```

Step 5. Control DIO port

- a. DIO port device slave address :
As SMBus protocol, you need slave address to identify your target device on runtime control. The default value is "0x40", at the lower three bit, you can adjust the address through "J1".



- b. DIO port device configuration

I/O Pin	Direction	Command
GPIO Port 0	Output	0x06
GPIO Port 1	Input	0x07

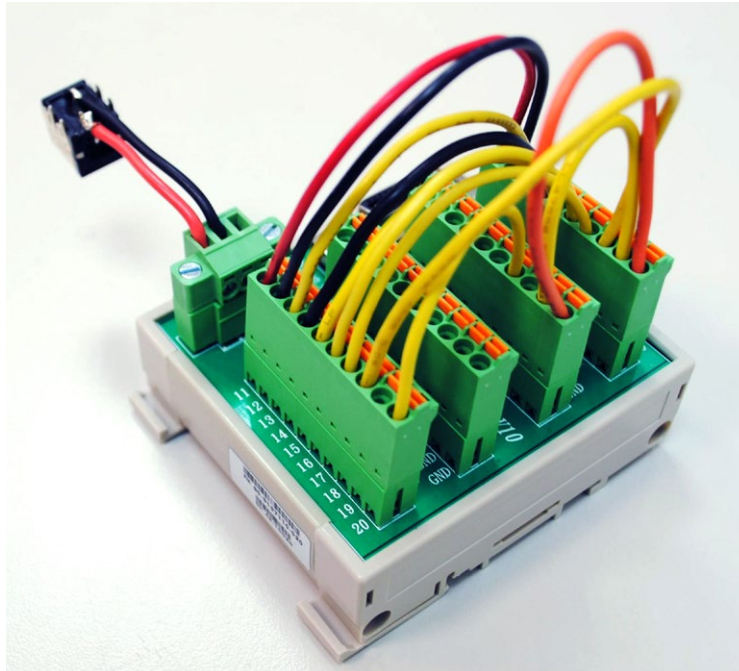
Output Mode : 1 , Input Mode : 0

- c. Access Output port / Input port :
Input port register = 0x00
Output port register = 0x03

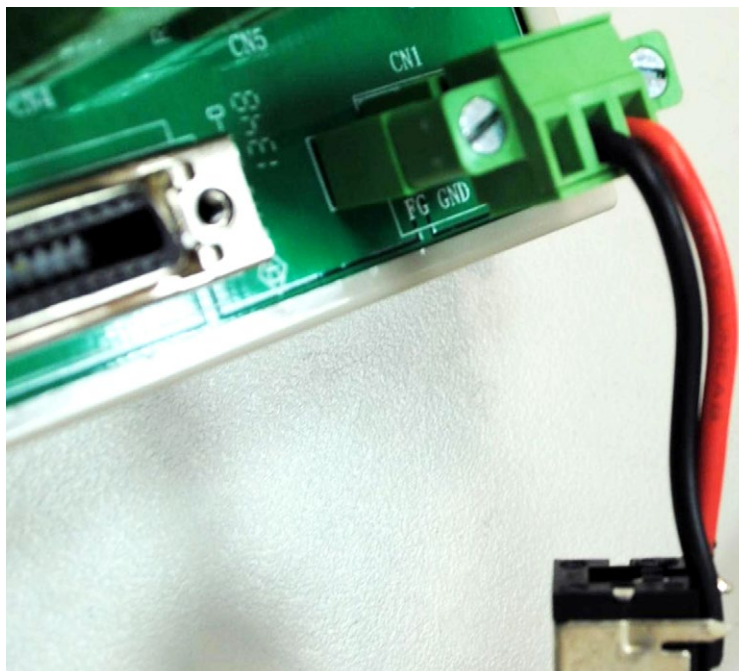
Step 6. Connect DIO demo tool

Make DI to DO loopback wire connection

- a. Data line : CN3[01~08] wire to CN6[01~08]
- b. Powerline : CN6[10] wire to CN4[07], CN3[09] wire to CN4[09]
- c. Grounding : CN3[10] wire to CN4[10]



- d. Connect 24V to Terminal board



* If more help is needed, please contact Vecow Technical Support



For further support information, please visit www.vecow.com

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