PE-8004MX USER Manual

PCI Express x4/ 4-channel 10G LAN,IEEE 802.3at Compliant Intel® X710-AT2 M12 PoE+ PCIe Expansion Card

Vecow

1.0.0 Edition 20230323

Record of Revision

Version	Date	Page	Description	Remark
0.10	2023/03/09	All	Preliminary Release	
1.00	2023/03/23	All	Official 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 it is not installed and used in accordance with the instruction manual, it 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 products 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.

Copyright and Trademarks

Order Information

Part Number	Description
PE-8004MX	Intel® X710-AT2 4-port X-coded M12 10GigE IEEE 802.3at PoE+ Expansion Card

Table of Contents

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GENERAL INTRODUCTION

1.1 Overview

Vecow PE-8004MX is a 4-port 10GigE PCIe Express x4 Expansion Card, supporting IEEE 802.3at PoE+, rugged X-code connector, up to 25.5W power output at 48V DC per port. Based on Intel® X710-AT2 LAN chipset, the PE-8004MX supports a 4-port Independent 10GigE Ethernet controller, delivering up to 10Gbps data rate. Featuring Load Balancing, up to 9KB Jumbo Frame makes Vecow PE-8004MX an ideal PCIe expansion card for industrial applications in Scientific Research, real-streaming video, AI Surveillance, real-time inspection, and Edge AI applications.

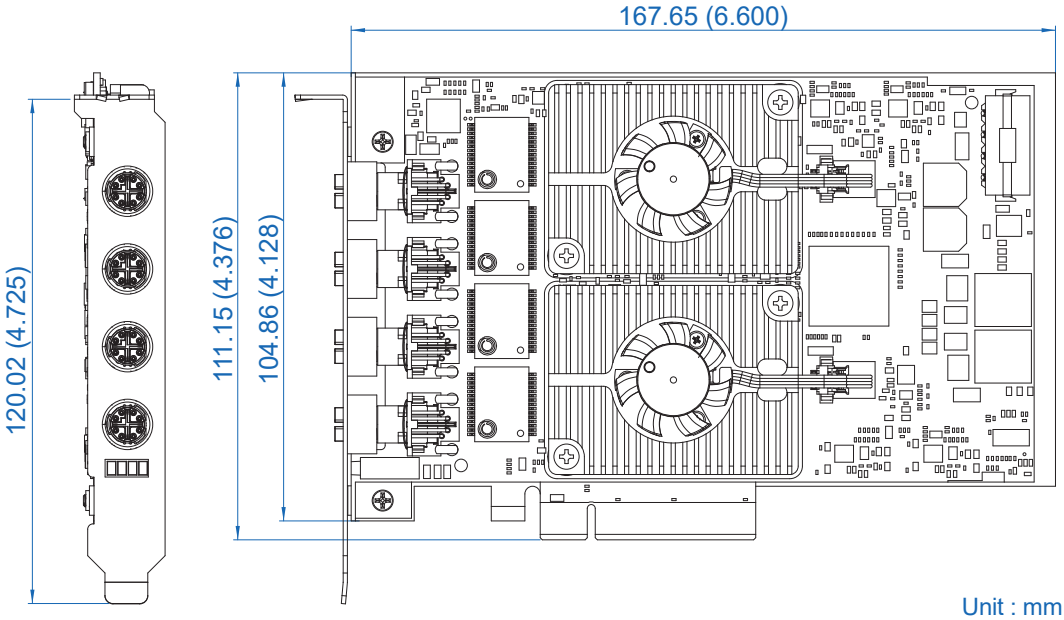
1.2 Features

- Meets the standard PCIe card width (14.5mm)
- Intel® X710-AT2 10GBASE-T Ethernet Controller support 4 independent 10GigE LAN, up to 10Gbps data rate
- PCI Express x8 interface, PCIe 3.0 supports up to 8.0 GT/s
- IEEE 802.3at Power over Ethernet (PoE+), rugged X-coded M12 connectors, up to 25.5W Power Output at 48V DC per port, with PoE+ On/Off Control
- Energy Efficient Ethernet (EEE) 802.3az enabled for reduced power consumption
- Up to 9728 bytes Jumbo Frame, Supports PXE
- Support Intel® Virtualization Technology (VT)
- 0°C to 50°C Operating Temperature

1.3 Product Specification

Ethernet	
Interface	PCI Express x8
Controller	Intel® Ethernet Controller X710-AT2
Data Rate	10Gbps/*5Gbps/*2.5Gbps/1Gbps/100Mbps (*Linux only)
Jumbo Frame	Up to 9728 bytes
Link Aggregation (LAG)	Present
Connector	8-pin X-coded M12 Connector
PoE Standard	IEEE 802.3at compliant
Power Requirements	
Output	• Up to 25.5W Power Output @48V DC per port • 4 LED for PoE On/Off Mode
Power Connector	1 4-pin 12V Power Connector
Environment	
Operating Temperature	0°C to 50°C with fan (32°F to 122°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% Humidity, non-condensing
Relative Humidity	95% @ 50°C
Certifications	CE, FCC
Mechanical	
Dimension (W x D x H)	168mm x 105mm (6.6" x 4.1")

1.4 Mechanical Dimension



Unit : mm (inch)

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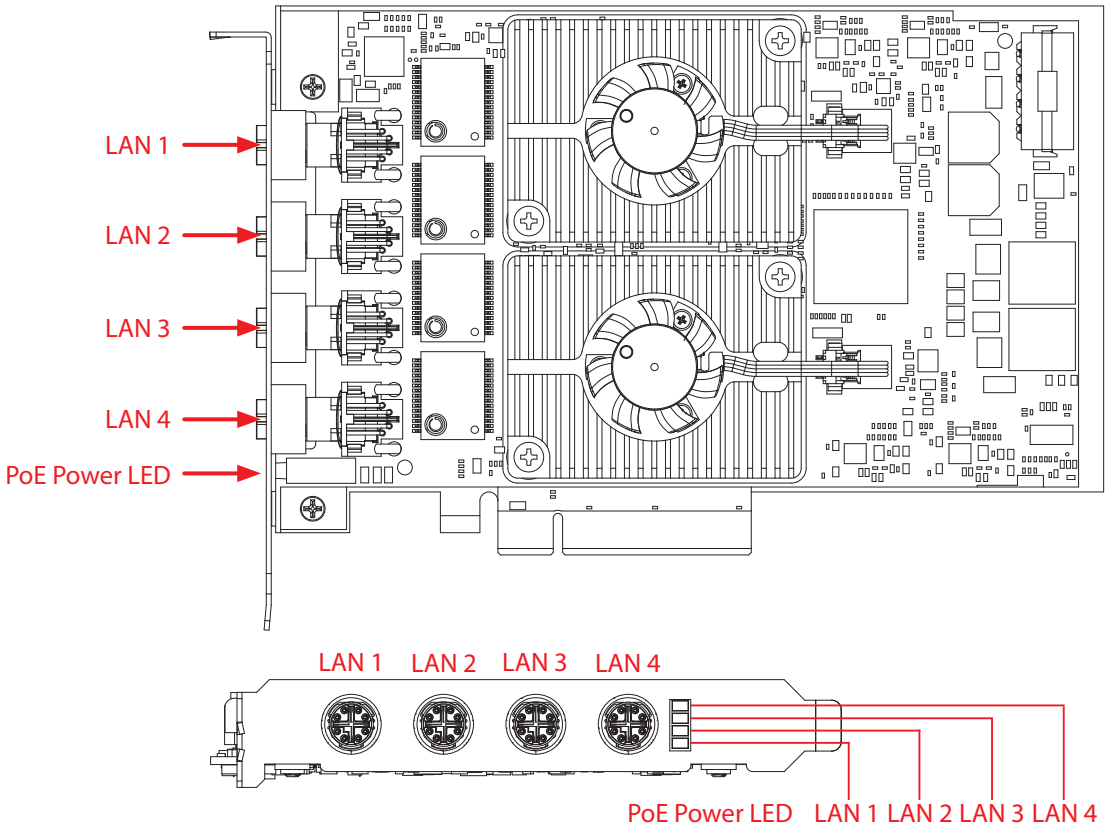
GETTING TO KNOW YOUR PE-8004MX

2.1 Packing List

Item	Description	Qty
1	PE-8004MX, Intel® X710-AT2 4-port X-coded M12 10GigE IEEE 802.3at PoE+ Expansion Card	1

2.2 PE-8004MX I/O and Indication

2.2.1 PoE (Power over Ethernet) Ports

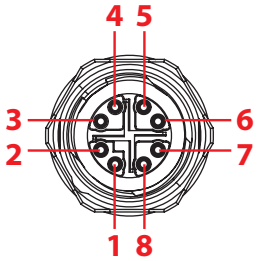


PE-8004MX is equipped with 4 IEEE 802.3at PoE+ ports for transmitting power as much as 25.5W / 48V per port and 1G/10GBASE-T gigabit data signals over standard Ethernet CAT-5/CAT-6 cable.

Each PoE connection is powered by Intel® X710-AT2 10GBASE-T Gigabit Ethernet.

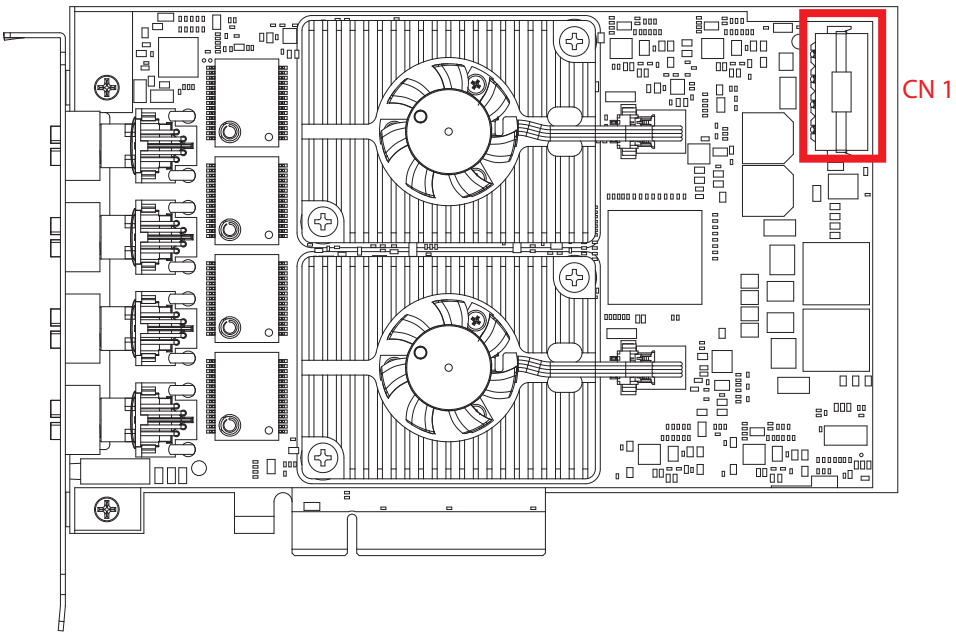
Controller and independent PCI express interface to connect with multi-core processor for networking and data transmit optimization. Only when PoE port starts to supply power to power devices, the dedicated LED will be lightened.

The pin-outs of LAN 1 and LAN 4 are listed as follows :



Pin No.	10/100 Mbps	1000Mbps	PoE
1	E_TX+	MDI0_P	PoE+
2	E_TX-	MDI0_N	PoE+
3	E_RX+	MDI1_P	PoE-
4	----	MDI2_P	----
5	-----	MDI2_N	----
6	E_RX-	MDI1_N	PoE-
7	-----	MDI3_P	----
8	------	MDI3_N	----

2.2.2 Power Input



The PE-8004MX is 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.

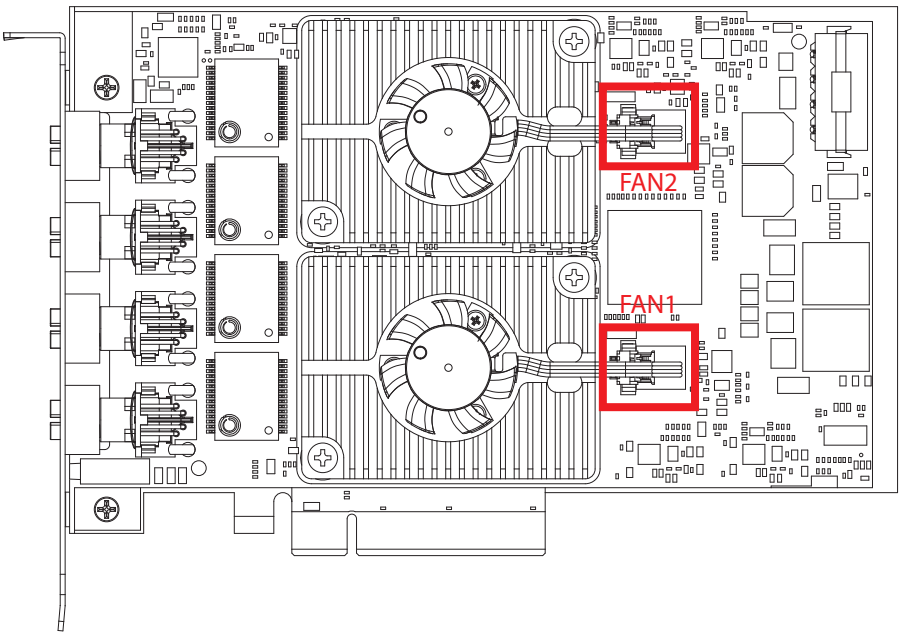
CN1 :

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

2.2.3 PoE Power On/Off

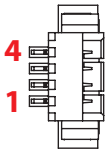
PE-8004MX controls PD69104B PoE Power ON/OFF via SMBUS. The address is 0x42.

2.2.4 Fan Connector



Fan power connector supports for additional thermal requirements. The pin assignments of FAN1/ FAN2 are listed in the following diagram :

Pin input :

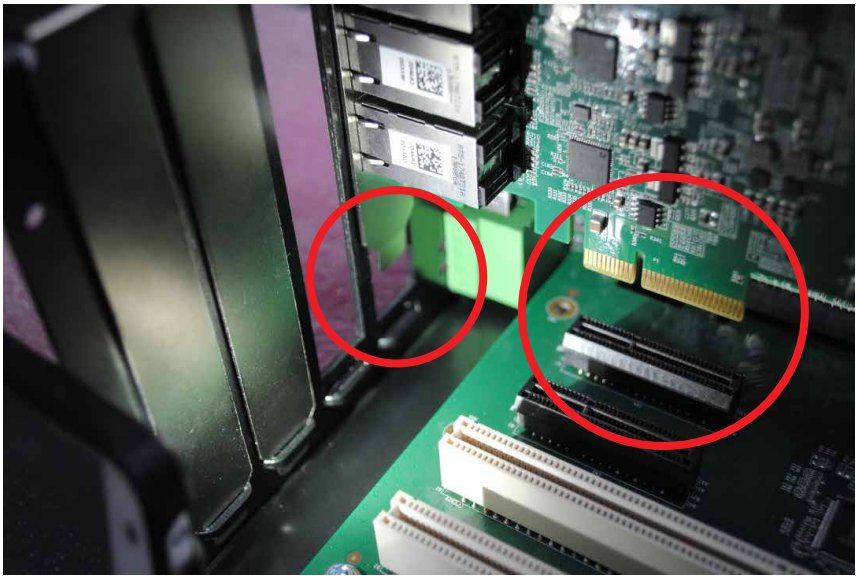


Pin No.	Definition	Pin No.	Definition
1	GND	2	+5V (0.5A max)
3	------	4	------

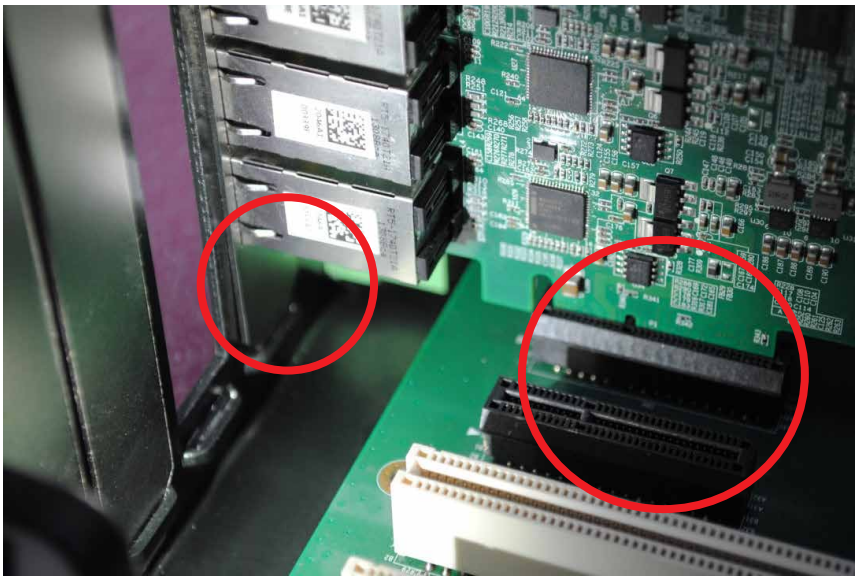
3

GETTING START

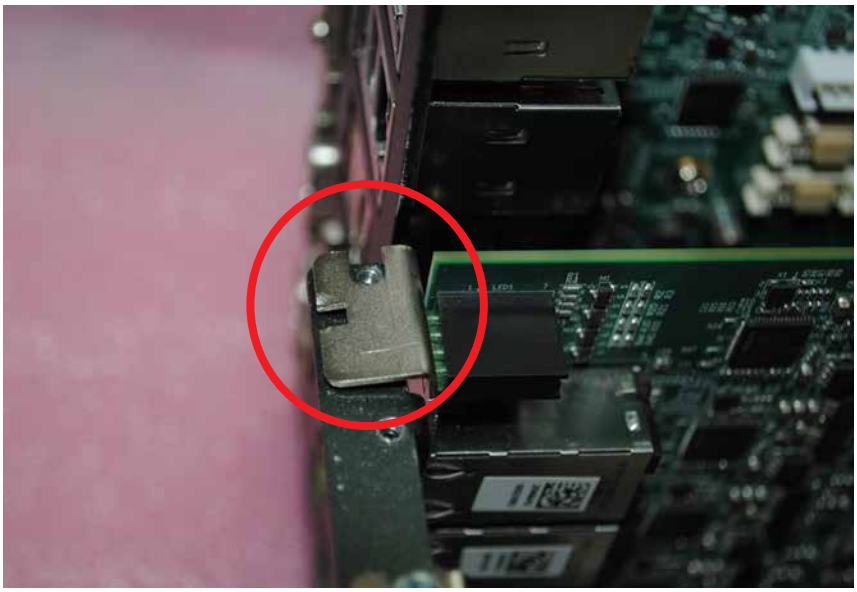
Step 1. Insert edge-finger and PCI Express I/O bracket into PCI Express vertical edge card connector carefully.



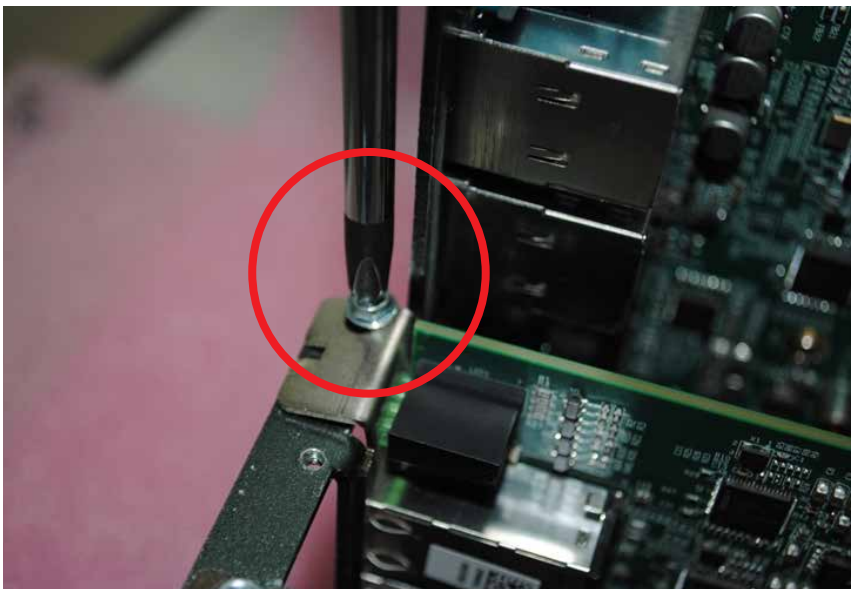
Step 2. Make sure edge-finger and PCI Express I/O bracket are inserted smoothly.



Step 3. Make sure PCI Express I/O bracket aligns screw hole.



Step 4. Fasten the M3 or #6-32 screw.



4

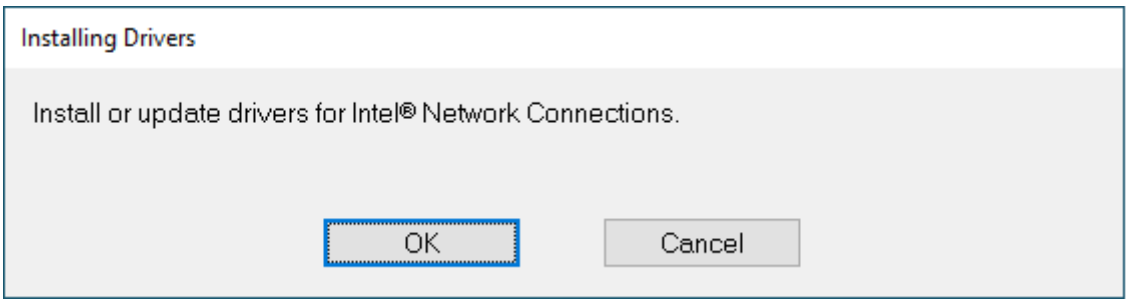
DRIVER INSTALLATION AND SETTING

4.1 PE-8004MX Install Driver

This section describes :
How to install drivers for PE-8004MX.

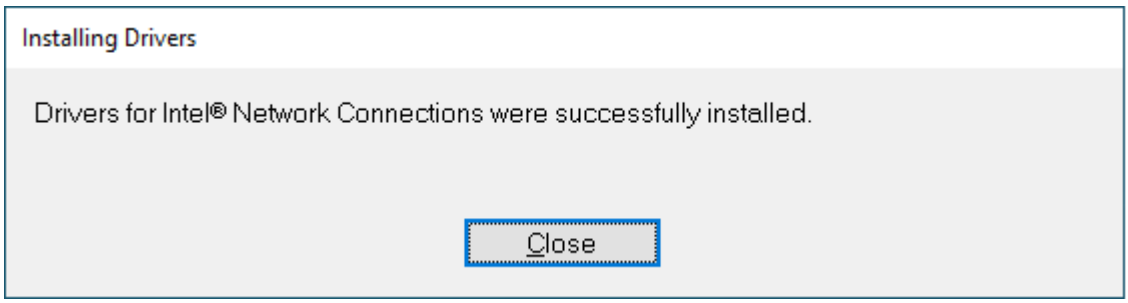
System OS :
Windows 10-64bit

Step 1. Execute "Wired_driver_28.0_x64.exe" and then go "OK" step.

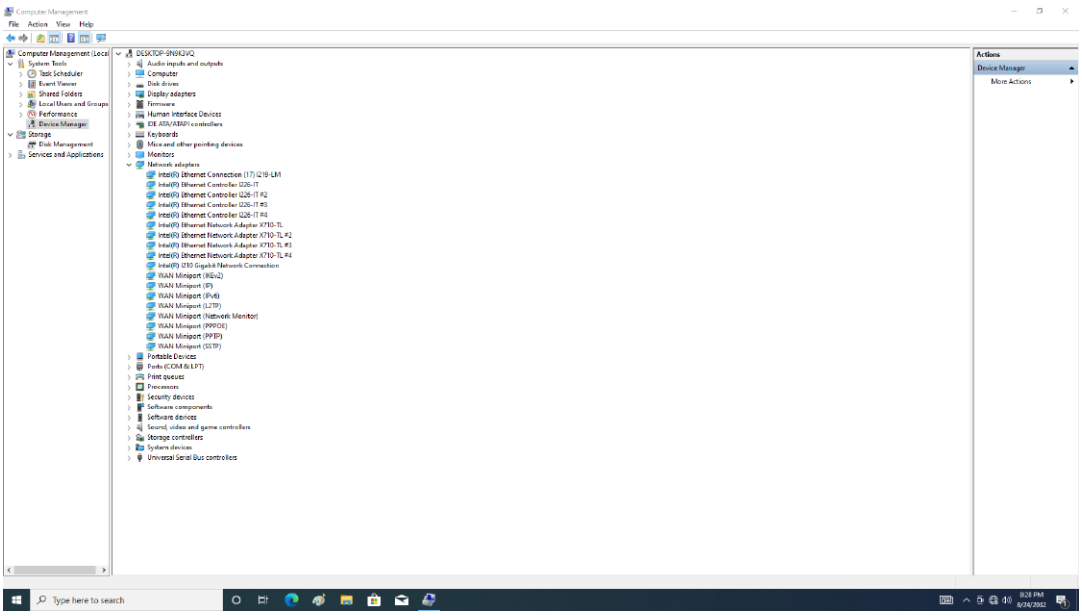


Step 2. Installing Drivers.

Step 3. Select "Close" step.



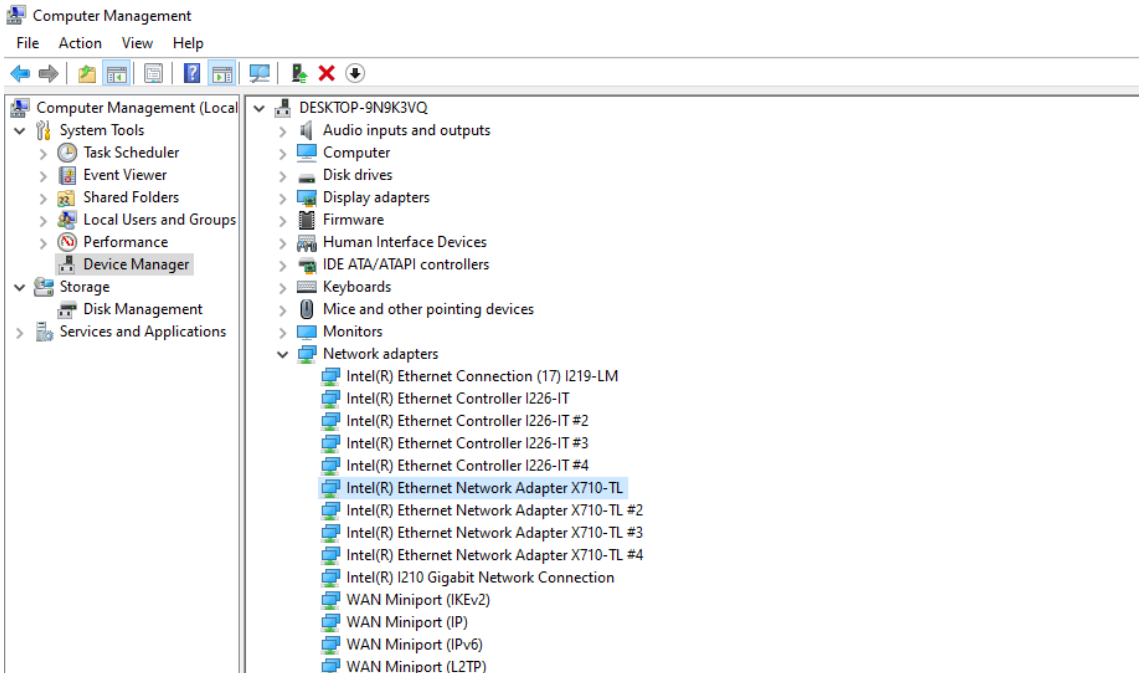
Step 4. Auto Detect in "four Intel Ethernet Converged Network Adapter X710-TL#xx".



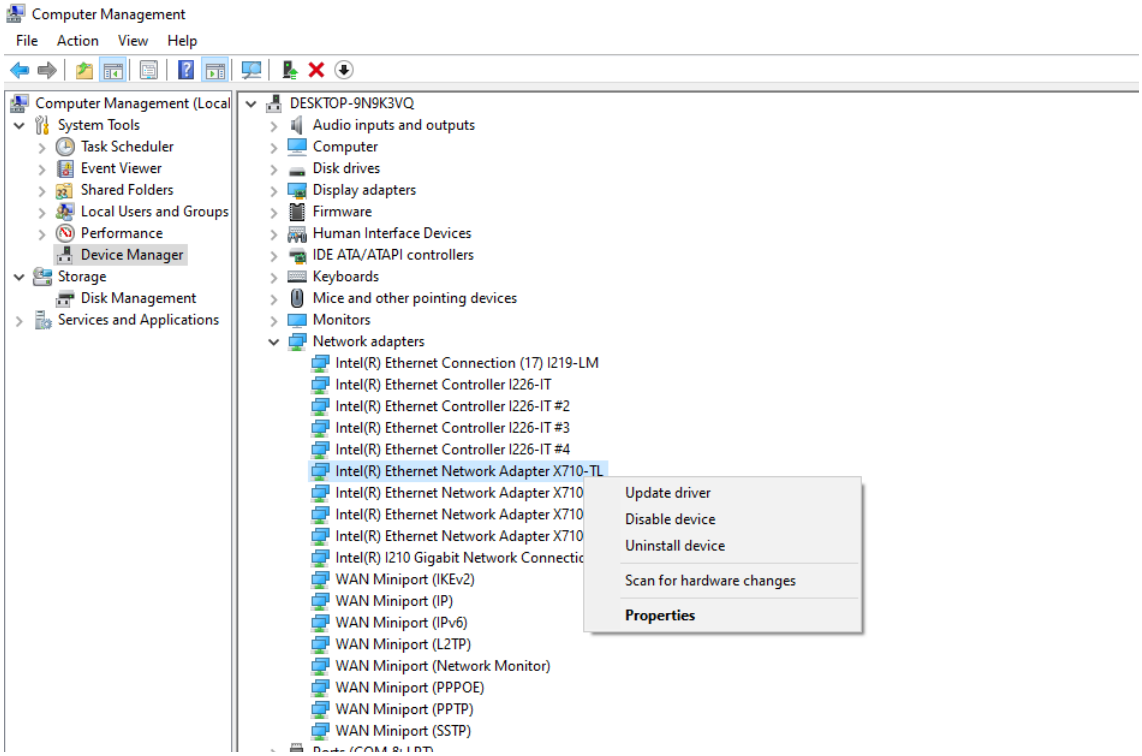
4.2 Jumbo Frame

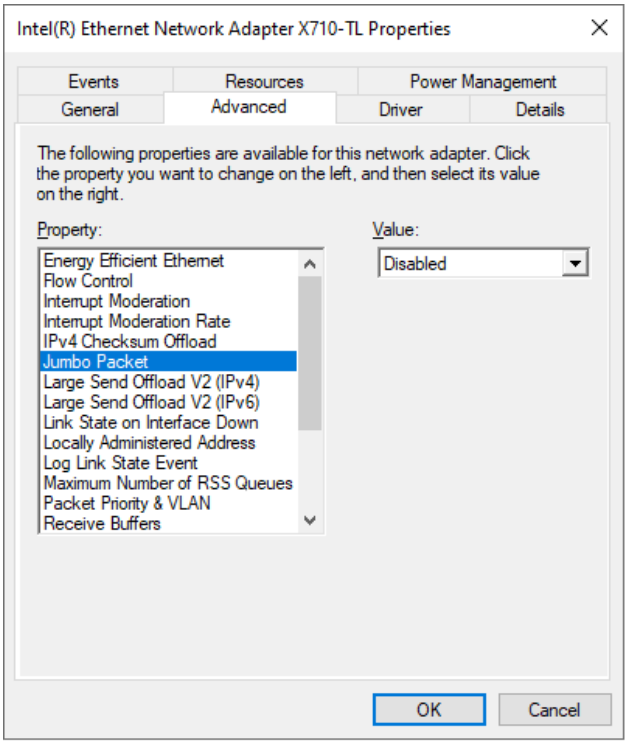
After installing the driver for Intel® X710-TL controller, you can get the enhance function that called jumbo frame, please find more instruction as below.

Step 1. "Right-click → Device Manager → Network adapters".

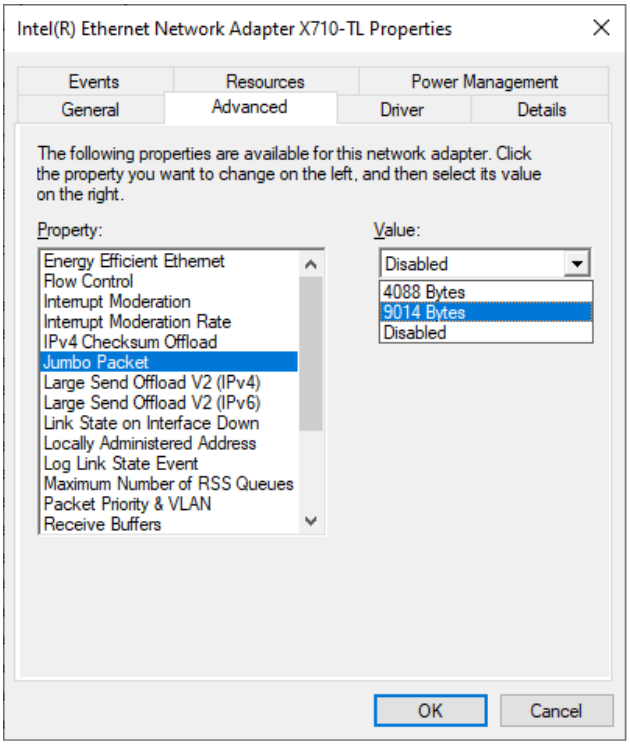


Step 2. Select anyone "Intel Ethernet Converged Network Adapter X710-TL #xx", right Click and select "Properties", a property dialog appears and Click on the Advanced page.





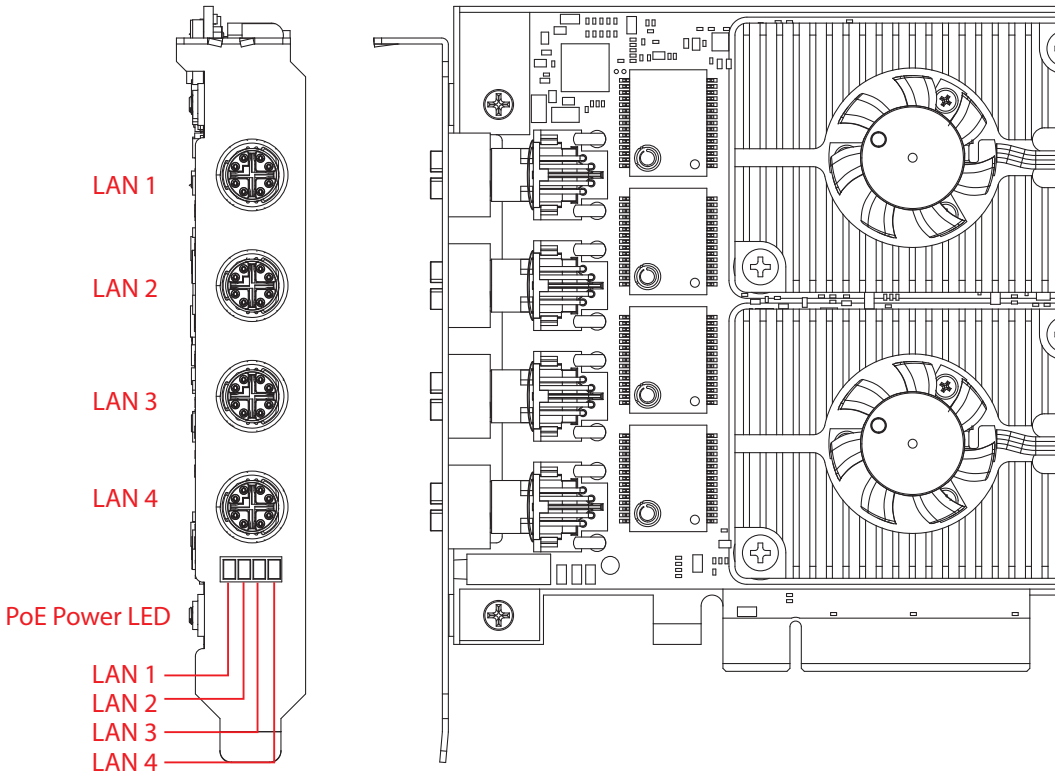
Step 3. Select the "Jumbo Packet", settings, and select the expected jumbo frame size and then go "OK" Finish.



APPENDIX A : PoE Guide

A.1 Function Description

The PE-8004MX series offers a 4-port PoE+.



Pin No.	Definition	Pin No.	Definition
LAN 1	POE 0	LAN 3	POE 2
LAN 2	POE 1	LAN 4	POE 3

Do NOT use these functions in below :
1. ECS-4000 : DIO1 (ID = 2), POE (ID = 0)
2. ECS-4500, ECS-9000, ECS-9200, ECS-9700, IVH-7700, IVH-9000, IVH-9200 : POE (ID = 0)
3. RCS-7000 : GPIO (ID = 0)
4. PE-2000 : DIO1 (ID is the same, ID = 0 ~ 7), POE (ID = 0)
5. UE-1000 : USB (IDUE-1000 = IDPE-3000 >> 1 & 3 | IDPE-3000 << 2 & 4)

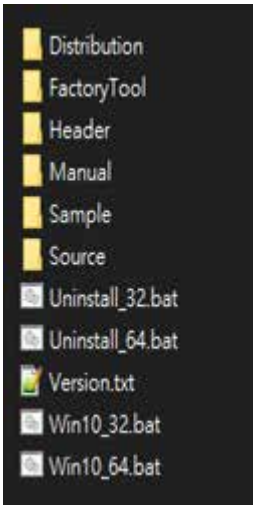
Default Address:0x42(1)

PE-8004MX controls PD69104B PoE Power ON/OFF via SMBUS

A.2 Software Package Contain

Distribution folder include x32 and x64 versions, use batch file for installation.
There are included as fallowed :

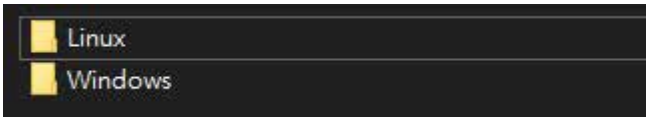
Win10_32.bat, and Win10_64.bat :
Installation for driver, and
Uninstall_32.bat, and Uninstall_64.bat :
Uninstallation for driver Run
Make sure Windows version before installation.

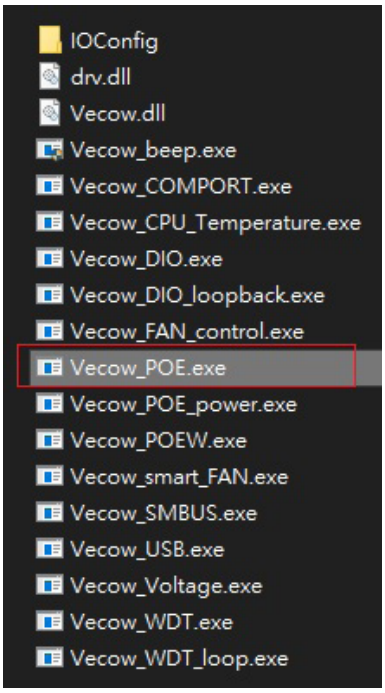


Runtime folder include head file for software developer or System Integration. Sample folder include sample program, driver library, and API library. Source folder include sample program source code that compile on Visual Studio 2008.

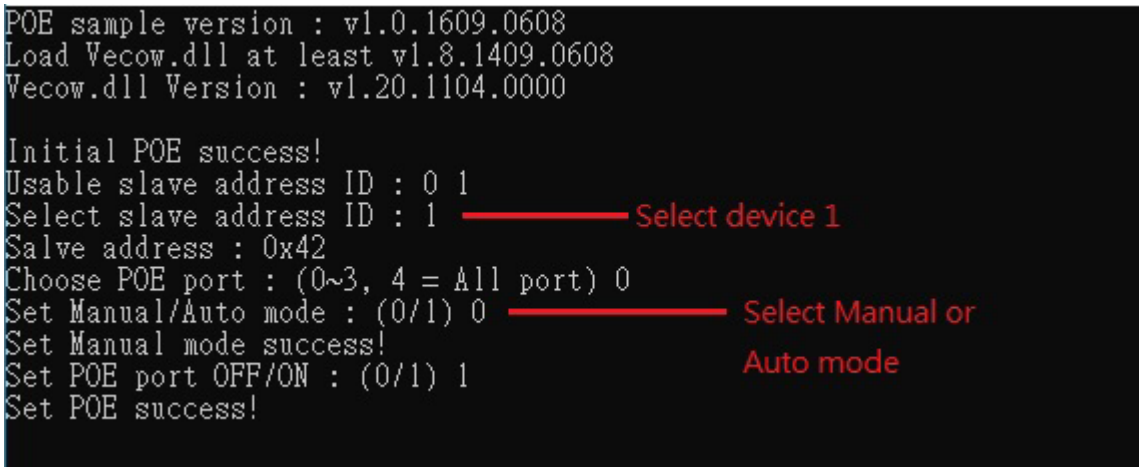
A.3 Sample

Sample folder include Windows and linux, x32 and x64 versions, as shown below :





PE-8004MX default is Auto power detect mode, you can use the following software control to switch to manual mode.



B

APPENDIX B : Software Functions

B.1 Driver API Guide

In Header folder, Vecow.h and VecowLinux.h contain usabled API for Windows/Linux.

BOOL Initial_POE(BYTE Scan, BYTE ID)
Initial card for POE
A. **Scan** : POE ID scan type
2: Auto scan; 1: Manual setup.
B. **ID** ([3:0]): POE ID by manual setting
Return :
TRUE (1): Success;
FALSE (0): Fail (Driver not exists, or version is too old, or out of range error)

BOOL Get_POE_Config(BYTE ID, BYTE *Auto, BYTE *Mask)
Get POE configuration (by variable)
A. **ID** : POE ID.
Range:0~15.
B. **Auto** ([3:0]): Auto mode, pin setting by hexadecimal bitmask
1: Auto; 0: Manual
C. **Mask** ([3:0]): DC Enable / Disable, pin setting by hexadecimal bitmask
1: Enable; 0: Disable
Return :
TRUE (1) : Success;
FALSE (0) : Fail (Initial error, or call by pointer error, or hardware problem)

BOOL Set_POE_Config(BYTE ID, BYTE Auto, BYTE Mask)
Set POE configuration
(by variable).
A. **ID** ([3:0]): POE ID
Range: 0~15.
B. **Auto** ([3:0]): Auto mode, pin setting by hexadecimal
1: Auto; 0: Manual
C. **Mask** ([3:0]): DC Enable / Disable, pin setting by hexadecimal bitmask 1: Enable; 0: Disable
Return :
TRUE (1) : Success;
FALSE (0) : Fail (Initial error, or out of range error, or hardware problem)

BOOL Get_POE(BYTE ID, BYTE *POE)

Get POE state.

A. **ID** : POE ID
   Range: 0~15

B. **POE** ([3:0]): POE state, pin setting by hexadecimal bitmask.
   1: On; 0: Off

Return :
TRUE (1) : Success;
FALSE (0) : Fail (Initial error, or call by pointer error, or hardware problem)

BOOL Set_POE(BYTE ID, BYTE POE)

Set POE state

A. **ID** : POE ID
   Range: 0~15

B. **POE** ([3:0]): POE state, pin setting by hexadecimal bitmask
   1: On; 0: Off

Return :
TRUE (1) : Success;
FALSE (0) : Fail (Initial error, or out of range error, or hardware problem)

Vecow

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