

**SUNIX**



Version 1.0

# *Powered USB Card User's Manual*

*Plug into A  
Brand-new World  
[www.sunix.com.tw](http://www.sunix.com.tw)*

First Edition, October 2008

# **Powered USB Card**

## **User's Manual**

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# 1.

## Introduction

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Thank you for purchasing the Powered USB PCI Card, which is designed to enable users accessing USB devices without additional external power supply connection. Powered USB provides the necessary power as well as the communication signals over a hot luggable cable. SUNIX Powered USB PCI Add-On card, carrying the latest power switching technology provides +5V, +12V and 24V, through the PC power supply directly to its 4 Powered USB ports. Powered USB PCI Add-On card is backward compatible to regular USB 1.1 and USB 2.0 devices.

The following topics are covered in this chapter:

- ◆ **Overview**
- ◆ **Package Checklist**
- ◆ **Product Features**
- ◆ **Product Specifications**

## Overview

USB allows peripheral devices to exchange data with a PC and also to receive power over the USB bus. Unfortunately, the bus supplied power is limit to 2.5 Watts (0.5A @ +5V) per port, sufficient to provide enough power to input devices, web cameras among other low power devices. Other devices like printer, displays, pin pads, external CD-ROM and hard drives still require an external power supply. Here comes Powered USB, it eliminates the need for additional power supplies. Powered USB provides the necessary power as well as the communication signals over a hot pluggable cable. In addition, the Powered USB solves the physical host side cable locking problem associated with the standard USB connector by providing a host cable locking mechanism.

The Powered USB PCI Add-On card provides a convenient and affordable way to add up to 4 Powered USB 2.0 ports to a PC. Devices which require more power than provided by the regular USB interface can be easily installed and used with no need for an additional power supply. SUNIX Powered USB PCI Add-On card, carrying the latest power switching technology provides +5V, +12V and +24V, through the PC power supply directly to its 4 Powered USB ports. Powered USB PCI Add-On card is backward compatible to regular USB 1.1 and USB 2.0 devices.

POS systems become more and more stylish now days, with limited space for the terminal and all peripherals inside. Save your valuable space and get rid of the peripherals' power supplies using the Powered USB PCI Add-On card. This Add-On card is the ideal solution for today's point of service systems.

## Package Checklist

Please check if the following items are present and in good condition upon opening your package. Contact your vendor if any item is damaged or missing.

1. Powered USB PCI Card
2. User's Manual (This document)
3. CD Driver

## Product Features

- Compliance with PCI 33MHz Version 2.2 & 2.1 specification.
- Compliant with the Universal Serial Bus (USB) Specification Revision 2.0
- High performance NEC USB2.0 PCI host controller on board.
- Support 4 external Powered USB ports and 1 internal standard USB port.
- Powered USB port supports +24, +12, and +5VDC power output with maximum current up to 3A.
- Each Powered USB ports built-in over current protection.
- Plug-n-Play, I/O address and IRQ assigned by operating system.
- Supports USB device Hot-Swapping and Plug-n-Play function.
- Certified by RoHS CE, FCC ClassB approval.
- Support Linux, Microsoft 9x, 2000, XP, 2003 Vista, and 2008 (X86/X64) operation system.

## Product Specifications

### ● USB Communication

<b>Interface</b>	Universal Serial Bus 2.0
<b>Controller</b>	NEC UPD720102
<b>BUS</b>	PCI 33MHz Ver2.1/2.2
<b>IRQ &amp; IO</b>	Assigned by System
<b>Speed</b>	Data Transfer rate of 1.5, 12, and 480Mbps
<b>External Powered USB Port</b>	+24VDC / 1-port / Maximum 3A +12VDC / 2-port / Maximum 3A +5VDC / 1-port / Maximum 2A
<b>Internal Powered USB Port</b>	+5VDC / 1-port / Maximum 0.5A (Pin Header Type)
<b>Protection</b>	3A PTC fuse for each USB port
<b>Board Connector</b>	Powered USB Connector

### ● Driver Support

<b>Microsoft Windows</b>	95/98/ME/2000/XP/Vista (X86/X64)
<b>Microsoft Embedded</b>	CE5.0/XP Embedded
<b>Microsoft Server</b>	NT/2003/2008 (X86/X64)
<b>Linux</b>	Linux 2.4.x / 2.6.x
<b>MAC</b>	Version 10.2 or later

### ● Regulatory Approvals

<b>Hardware</b>	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B,
<b>Green</b>	RoHS

### ● Operation Environment

<b>Operation Temperature</b>	0 to 60°C (32 to 140°F)
<b>Operation Humidity</b>	5 to 95% RH
<b>Storage Temperature</b>	-20 to 85°C (-4 to 185°F)

### ● Dimension

<b>PCB Dimension</b>	130 x 100 mm
<b>Bracket</b>	Standard 121mm

# 2.

## Hardware Installation

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This chapter includes information about hardware installation and mechanical drawings for Powered USB Card. The following topics are covered:

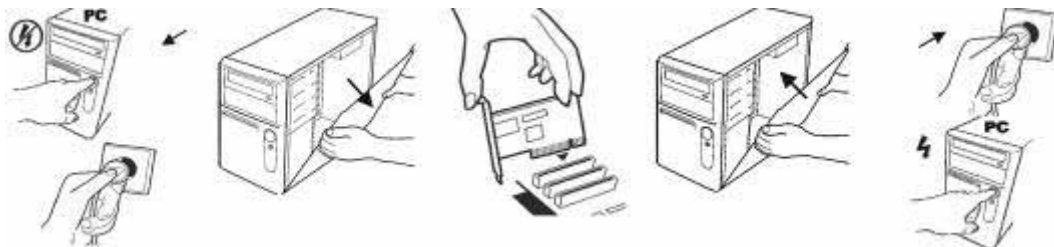
- ◆ **Hardware Installation**
- ◆ **Product Configuration Options**
- ◆ **Pin Assignments**



## Hardware Installation

Follow the instruction given below to install the Powered USB PCI Card.

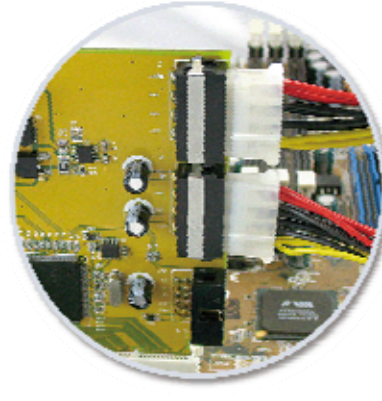
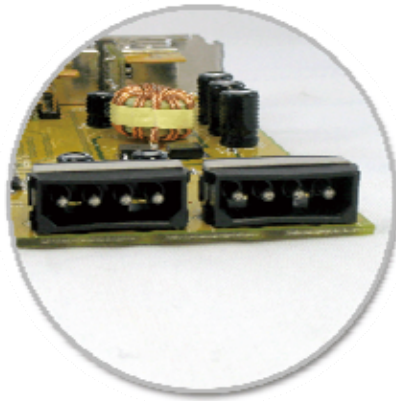
1. Turn your computer off
2. Remove the power plug from the plug socket.
3. Remove the cover from the computer case.
4. If fitted. Remove the metal cover plate on the rear of a free PCI slot (White).
5. Insert USB 2.0 PCI card into the free PCI slot and screw it firmly on the bracket side.
6. Plug the 4-pin power male connector from power supply into the 4-pin power female connector on board.
7. Place the cover back onto the computer.
8. Insert the plug into the plug socket.





### SAFTY FIRST

1. To avoid damaging, make sure to disconnect power connection before wiring or disposing the Powered USB card.
2. In order to output enough power to your device, we strongly recommend using 400W or above power supply in your system.
3. Two 4-pin power sets all should be plugged by power cable.
4. Does NOT use power Y-cable or sharing cable connect to 4-pin power set on board; we strongly recommend connecting two 4-pin power sets by **TWO separate power cables** directly from power supply.



Power for the USB Powered USB connectors are supplied from 4- pin connector located on the PCB. These connectors allows a PC hard disk drive power supply connector to provide the higher currents required by the power peripherals.

In order to get efficient intake current output, there are two sets 4-pin power connectors designed on the board. The first (upper) 4-pin power set draw +12VDC out and it is converted to 24VDC technically. The second (lower) one draw both +5 and +12VDC out for another Powered USB ports using.

The powered USB card supports +24VDC @ 3A, +12VDC @ 3A, and +5VDC @ 2A maximum total 118W using sustained with 400W system power supply.

**Note:**

*There is only one 4-pin power set on board, if your product does not equip any +24VDC Powered USB port.*

## Product Configuration Options

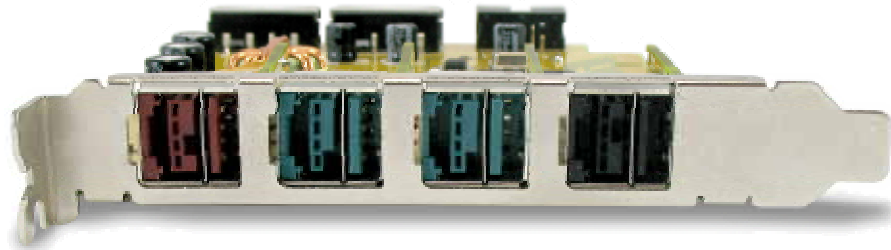
SUNIX provides several models with different power voltage output for customer options.

### **PUB1210P**

+24VDC / 1-port / Maximum 3A

+12VDC / 2-port / Maximum 3A

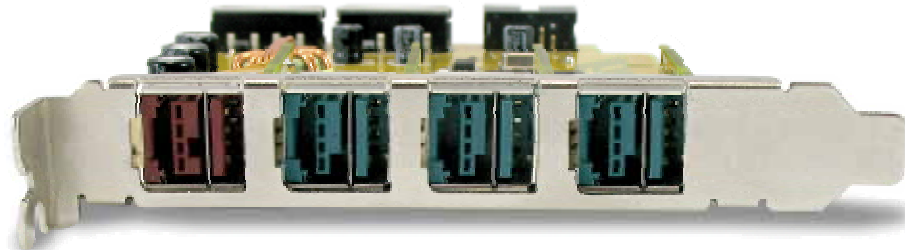
+5VDC / 1-port / Maximum 2A



### **PUB1300P**

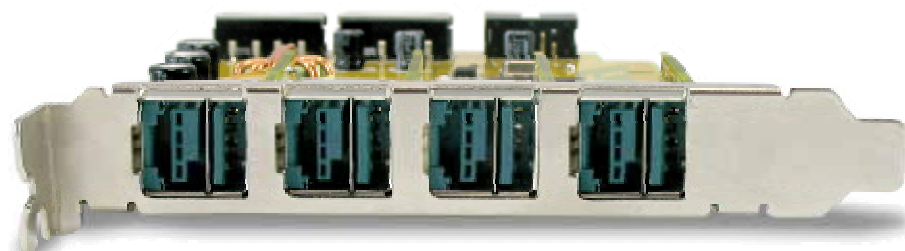
+24VDC / 1-port / Maximum 3A

+12VDC / 3-port / Maximum 6A



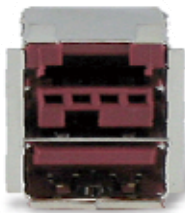
### **PUB0400P**

+12VDC / 4-port / Maximum 6A



## Pin Assignments

The Powered USB connectors are a standard USB “A” type connector with 4 extra pins designed to supply higher voltages. In order to differentiate varieties of power voltage level, Powered USB connector built-in different connect-key with different color coding to allow the correct voltage cable connection.



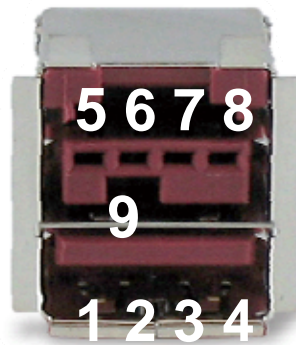
+24VDC Voltage Keyed  
with Red coding



+12VDC Voltage Keyed  
with Teal coding

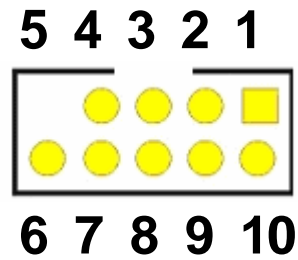
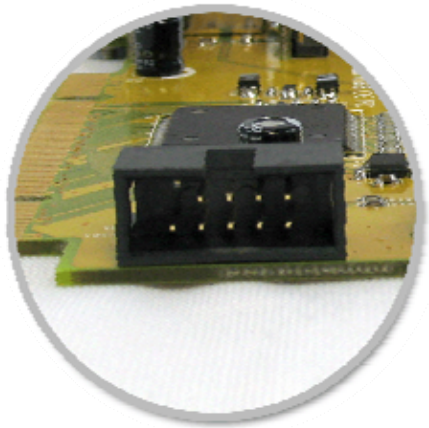


+5VDC Voltage Keyed  
with Black coding



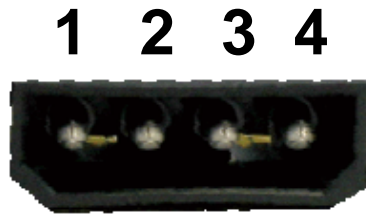
Pin No.	Signal Name	Port Type	Description
1	<b>VBus Power</b>	USB Type A Port	Bus power (connected to +5V)
2	<b>D -</b>	USB Type A Port	Twisted pair differential data line
3	<b>D +</b>	USB Type A Port	
4	<b>Ground</b>	USB Type A Port	Signal ground
5	<b>Ground</b>	Powered USB Port	
6	<b>VBus-Plus Power</b>	Powered USB Port	Bus power ( connected to +24V, +12V, or +5V)
7	<b>VBus-Plus Power</b>	Powered USB Port	
8	<b>Ground</b>	Powered USB Port	Signal ground
9	<b>Connect Key</b>	Powered USB Port	Key to prevent incorrect connection
<b>Shell</b>	<b>Shield</b>	Powered USB Port	Cable (shield) ground

SUNIX Powered USB card built-in one right-angle internal USB2.0 expanded port. The fifth independent USB2.0 port is an internal pin header type form factor that is convenient for user connecting front bay or chassis internal expansion using.



Pin No.	Signal Name	Description
1	+5V	connected to +5V Parallel connect to Pin 10
2	N.A.	N.A.
3		
4	Ground	Signal ground
5	Connect Key	Key to prevent incorrect connection
6	Ground	Signal ground
7	Ground	Signal ground
8	D +	Twisted pair differential data line
9	D -	
10	VBus Power	Bus power (connected to +5V)
Shell	Shield	Cable (shield) ground

The power connector is a right-angle four pin “hard-disk style” keyed header.



Pin No.	Signal Name	Description
<b>1</b>	<b>+12V</b>	12V power supply
<b>2</b>	<b>Ground</b>	Ground
<b>3</b>	<b>Ground</b>	Ground
<b>4</b>	<b>+5V</b>	5V power supply

# 3.

## Powered USB Card Operation

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After Powered USB card hardware installs properly in your system, the first thing you should do is that check operation system detect the card or not. This chapter introduces the method to confirm the Powered USB card installation.

The following topics covered in this chapter:

- ◆ **Driver Installation**
- ◆ **Verify Powered USB Card in System**
- ◆ **Powered USB Card Operation**

## Driver Installation

Once the Windows 98, 2000, XP, 2003, Vista or 2008 startup; Powered USB PCI card will be installed automatically without driver installing. In order to ensure the better performance, please install driver as below steps:

1. Please insert the CD driver into your CD/DVD ROM.
2. Click the Setup.exe from your CD/DVD device

: ***\\USB\\USB2.0-NEC\\Windows\\setup.exe***



3. The driver will install automatically. Please do not break off installation.



4. System will install driver automatically. Please reset your system after driver installation finish.

### **NOTE:**

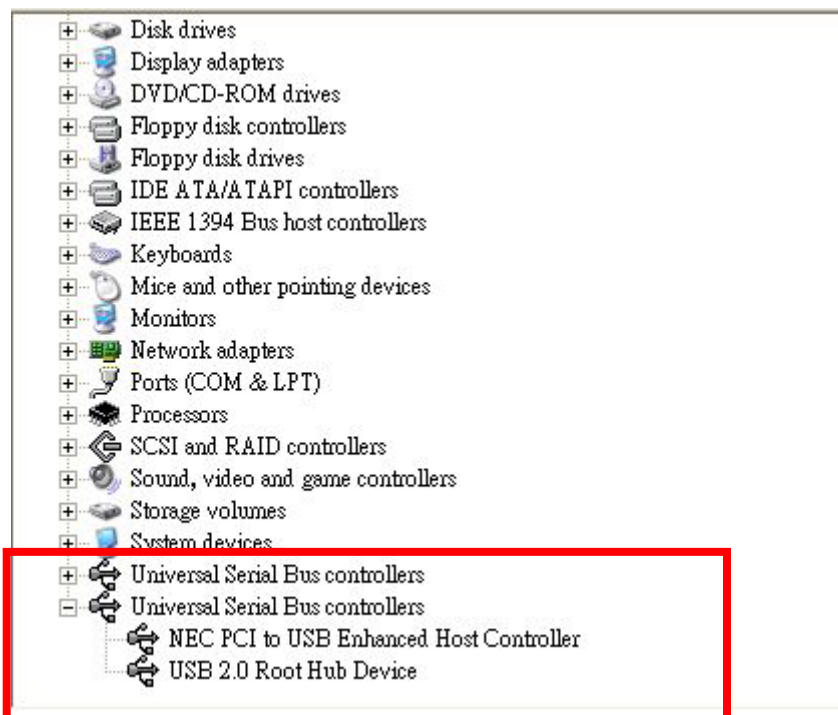
In order to get better USB2.0 high speed data transmission performance, we strongly recommend upgrade your operation system to Microsoft **Windows 2000 service pack 4**, **Windows XP service pack 2**, and **Windows Sever2003 service pack1** or later version. Please visit Microsoft web site (<http://www.microsoft.com>) or use update function on your system to upgrade the latest version service pack of operation system.



## Verify Powered USB Card in System

Please check click on the “**Device Manager**” tab in System Properties, which you access from the Windows Control Panel. You should see an entry for the driver you installed under the Universal Serial Bus Controllers item.

**Start > Controller Panel > System > Device Manager**



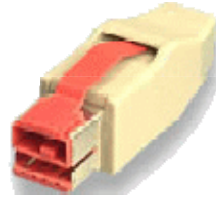
You can find out both “**NEC PCI to USB Enhanced Host Controller**” and “**USB2.0 Root Hub Device**” under Universal Serial Bus Controllers item.

## Powered USB Card Operation

User can plug standard USB Type A male or Powered USB male cable into the Powered USB connector on board.



Standard USB Type A Male



Powered USB Male Type

Please press the key on the Powered USB male connector, then you can eject the cable from the card.



### SAFTY FIRST

Unplugging or ejecting a device without first stopping them can often cause your computer to crash and lose valuable data. To safely unplug or eject any of the USB devices, firstly use the hardware wizard in the control panel to stop the devices. Or you can use the **“Safety Remove”** icon on the taskbar to quickly unplug or eject your devices.



# 4.

## Troubleshooting

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This chapter shows some problems that user came with usually. Also you can check it if the Powered USB Card can not work properly in your system after following hardware and software installation steps.

## Troubleshooting

**1. If the card and devices connected to the computer do not seem to be working properly, please perform following basic troubleshooting steps:**

1. Check that all cables are correct and securely connected.
2. Make sure the devices are turned on.
3. Make sure the devices are getting the power they require.
4. Make sure there is no problem with the card installation.

**2. I can NOT install USB2.0 PCI Express card driver properly.**

USB2.0 driver bounds with Microsoft Windows system, please upgrade the latest "Service Packs" on your software vendor website, for example <http://www.microsoft.com> . We suggest updating your operation system to Windows 2000 service pack 4, Windows XP service pack 2, and Windows Sever2003 service pack1 or later version.

Right click your mouse on "My Computer" and select "Properties" to check your operation system service pack version as below pictures shown.



### **3. Computer failed to start after inserting the Powered USB PCI card.**

Turn off the computer, remove the Powered USB PCI card, and try to restart the computer. If the computer starts successfully, it means that the card has not been inserted into the PCI slot correctly. Please insert the card firmly into the PCI slot or try another slot.

### **4. How to deal with there is a yellow exclamation point on NEC PCI to USB Enhanced Host controller.**



1. Please shutdown your computer and move the card to another available PCI slot then re-install Powered USB PCI card driver.
2. Please point on this device then right-check on the mouse. Selecting "Update Driver" to renew USB driver.
3. This exclamation point usually means there is a resource conflict between the Powered USB PCI card and another card in your system. Please move the card to another available slot. Restart your computer. Windows will then re-configure itself and re-assign resources. Check your device manager again. If the exclamation point is still there then repeat the process until it no longer appears.

### **5. The USB cable has been extended and the device no longer works.**

The length of the USB cable must not exceed 3.5 meters. Please do not extend the cable or a USB repeater must be used if the cable is longer than 3.5 meters.

**6. Is it possible to connect current USB 1.1 devices to the Powered USB PCI card?**

Yes.

The device will not, however, obtain the USB 2.0 speed (480 Mbits/sec) but the USB 1.1 speed (12 Mbits/sec).

**7. Is it possible to connect a USB2.0 hub to the Powered USB PCI card?**

Yes. You will then be able to connect a number of devices (max. 127) to one USB port.

**8. Why not I can get enough power current to my Powered USB device?**

Our Powered USB card PCB design can tolerance up to 3Amp power current per port, so please use sufficient 400W or above power supply. Of course, if your system connect many devices which cost lots of power current, such as VGA graphic card, DVD ROM, or hard disk, we recommend using more than 500W power supply in your system.

**9. There is no +24, +12 , or 5VDC power output to Powered USB device.**

Please confirm TWO 4-pin power sets are all connection ready. Make sure using two separate power cables directly from power supply. Please refer to the chapter2 hardware installation for detail.

**10. May I have different power voltage combination of Powered USB port mode or LOW PROFILE bracket support?**

Yes, we provide several models with different power voltage output for customer options. If our current model can not satisfy your request, please contact us for the detail service.

# 5.

## Appendix

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This chapter shows Powered USB card's core technologies and shows you how to contact with us for information about this and other products.

In this appendix, we cover the following topics.

- ◆ **Core Technologies**
- ◆ **Safety Guide**
- ◆ **Contract Information**

## Core Technologies

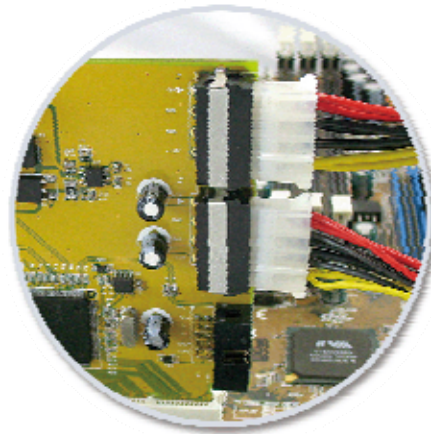
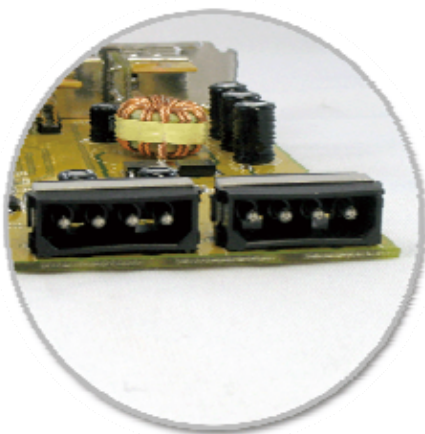
SUNIX R&D team is experienced and expert at many advanced technologies needed for manufacturing highly- reliable data communication products. This Powered USB card equips many hardware and software features for users easily equipping in kinds of environment. It's also the best solution for all of commercial communication and automation application.

### ◆ Reliable Circuit Protection

Power for the USB Powered USB connectors are supplied from 4- pin connector located on the PCB. These connectors allows a PC disk drive power supply connector to provide the higher currents required by the power peripherals.

In order to get efficient intake current output, there are two sets 4-pin power connectors designed on the board. The first 4-pin power set draw +12VDC out and it is converted to 24VDC technically. The second one draw both +5 and +12VDC out for another Powered USB ports using.

The powered USB card supports +24VDC @ 3A , +12VDC @ 3A, and +5VDC @ 2A maximum total 118W using sustained with 400W system power supply.





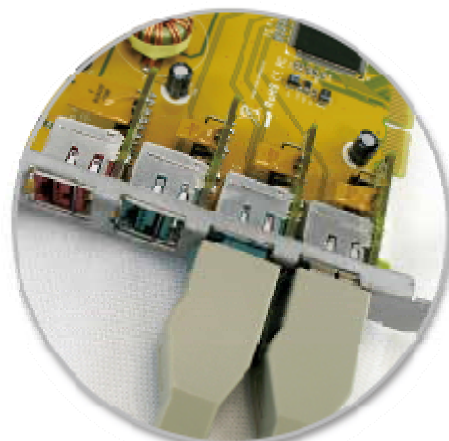
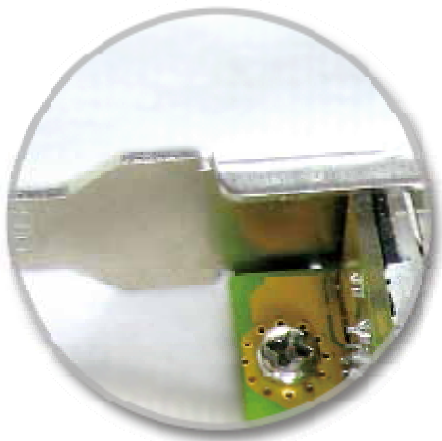
◆ **Over Current Protection**

In order to satisfy over current protection feature, each Powered USB port is protected with a 3.0 Amp PTC (Positive Temperature Coefficient) resettable fuse. The PTC may temporarily allow more than 3.0 Amp to be drained. Typically, a PTC will shut off after approximately 15 seconds drawing more than 3.0 Amp. The PTC will turn off the power for each individual port if an unusual overload is sustained.



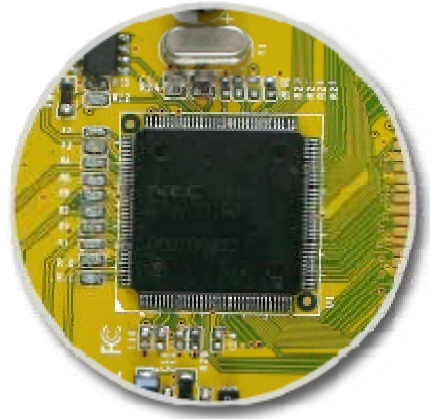
◆ **Rugged and User-friendly Design**

Rugged bracket and Powered USB connection board design prevents man-made bending and shaking problem. Besides each Powered USB port's interval space is big enough for user easily connect cable without any mechanical interruption. SUNIX Powered USB card design considers with safe, stable, powerful, and user-friendly feature.



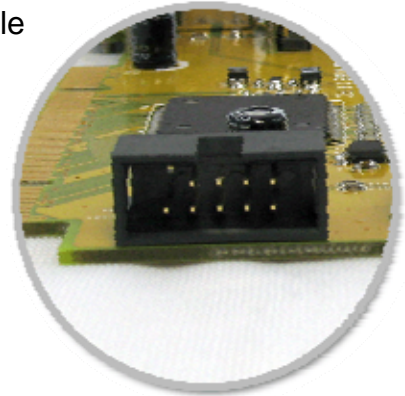
◆ **High Performance USB Controller**

SUNIX Powered USB card built-in high quality NEC 5 ports USB2.0 host controller, and it guarantee data transmission accuracy and maximize the data communication performance in kinds of application.



◆ **Internal USB Expansion Port**

SUNIX Powered USB card built-in one right-angle internal USB2.0 expanded port. The fifth independent USB2.0 port is an internal pin header type form factor that is convenient for user connecting front bay or chassis internal expansion using.



◆ **Green Product**

RoHS - The Restriction on Hazardous Substances prohibits the use of lead, cadmium, mercury, hexavalent chromium, Polybrominated Biphenyl (PBB), and Polybrominated Diphenyl Ether (PBDE) flame retardants. One of the main concerns of manufacturers of equipment is getting rid of lead, since lead is one of the main ingredients of solder. Our products are all "Green Products" and also satisfied with the EU's RoHS directive.



## Contract Information

Customer satisfaction is our number one concern, and to ensure that customers receive the full benefit of our products, SUNIX services has been set up to provide technical support, driver updates, product information, and user's manual updates.

The following services are provided

E-mail for technical support ..... [info@sunix.com.tw](mailto:info@sunix.com.tw)

World Wide Web (WWW) Site for product information: <http://www.sunix.com.tw>