USER'S MANUAL

Universal PCI Express Multi-IO RS-232 / Parallel Communication Board

English Version

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CE FC

PCI Express Multi-IO Communication Board

User's Manual

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Trademarks

Safety Information

1.   Keep this User's Manual for future reference.
2.   Always read the safety information carefully.
3.   Keep this equipment away from direct sunlight, or in humid or damp places.
4.   Do not place this equipment in an unstable position, or on vibrating surface before setting it up.
5.   Do not use or place this equipment near magnetic fields, televisions, or radios to avoid electronic interface that affects device performance.

Table of Contents

WHQL Certification Approval

The Designed for Microsoft Windows 32/64-bit operation system WHQL logo identifies products that meet Microsoft's quality standards, SUNIX I/O products carry with this logo and listed on Windows Catalog. WHQL logo includes below operation system version

Microsoft Windows Client: Windows 2000 / XP / Vista / 7 (X86/X64)
Microsoft Windows Server: Windows 2003 / 2008 (X86/X64)

1.
Introduction

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SUNIX Golden I/O series, a line of PCI Express Multi-port Serial and Parallel Multi-IO Communication Board, is designed to meet PCI Express Base Specification Ver1.1 (Compliable with PCI Express General 2 Specification). Its can be installed in virtually any available PC system and compatible with all major operating systems. Users do not need to manually set jumpers to configure I/O addresses and IRQ locations.

This board offers independent both serial and parallel ports for connecting terminals, modems, printers, scanners, cash registers, bar code readers, keypads, numeric displays, electrical scales, data acquisition equipment, and other serial / parallel devices for the PC and compatible systems. This board offers a reliable and high performance solution for Multi-IO communications.

The following topics covered in this chapter:

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

Overview

The majority of today's motherboards are not equipped with any RS-232 or Parallel port. With SUNIX PCI Express Serial and Parallel Multi-IO Communication Board, users can expand both COM and LPT ports on their system, allowing them to use serial and parallel devices further. It is compatible with RS-232.V24 standard serial and IEEE1284 Parallel interfaces. Furthermore, this Multi-IO board supports majority of the OS on the market. We provide driver support for Microsoft Windows and Linux 32/64-bit platform, making it the best and cost efficient solution for commercial and industrial automation applications.

Package Checklist

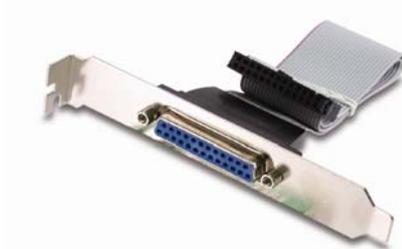Please check if the following items are present and in good condition upon opening your package. Contact your vendor if any item is damaged or missing.

1. Hardware:
   PCI Express Serial and Parallel Multi-IO Communication Board, × 1

   Cable: (Only for 2S/1P, 2S/2P or 4S/1P Solution)
   13x2 Pin Header to DB25F Flat Cable With Bracket set × 1

2. CD Driver
3. User's Manual   (This document)

Product Features

- Expands both RS-232 COM and IEEE1284 LPT ports on system.

- High performance SUNIX 16C950 UART Multi-IO controller on-board.

- Ultra low power consumption design for Green Environment.

- Designed to meet PCI Express Base Specification Revision 1.1.

- Supports x1, x2, x4, x8, x16 (lane) PCI Express Bus connector keys.

- RS-232 COM port communication speed supports up to 115.2Kbps
  (921.6Kbps Optional*).

- On-chip hardware auto flow control to guarantee no data loss.

- Built-in ±15KV ESD protection for all serial signals.

- Parallel LPT port supports IEEE 1284-1994 parallel port standard
    ECP(Enhance Capacity Port) / EPP(Enhance Parallel Port)
    SPP(Standard Parallel Port) / BPP(Bi-direction Parallel Port)

- Auto-switching between ECP/EPP/SPP/BPP modes without configuration.

- Plug-n-Play, I/O address and IRQ assigned by system.

- Certified by CE, FCC, RoHS, and Microsoft WQHL approval.

- Support Microsoft Windows, Linux, and DOS.

Product Specifications

Board Communication

Interface	PCI Express
BUS	One lane (x1)
Controller	SUNIX SUN1989 (16C950 UART Compatible)
IRQ & IO	Assigned by System

Serial Communication

Interface	RS-232
No. of Port	1, 2, or 4-port (Depend on product user bought)
FIFO	128 byte Hardware
Signal	TxD, RxD, RTS, CTS, DTR, DSR, DCD, RI, GND
Baud rate	50bps ~115.2Kbps (921.6Kpbs Optional*)
Stop bit	1, 1.5, 2
Parity	even, odd, none, mark, space
Flow Control	None, Xon/Xoff, RTS/CTS
Protection	±15KV ESD protection for each signal Human Body Model (HBM)
Board Connector	DB9 Male

Parallel Communication

Interface	IEEE-1284
Mode	SPP/ECP/EPP/BPP (Auto-switching)
Data Speed	Maximum 1.8 MB/s
FIFO	16 byte Hardware
Number of Port	1 or 2-port (Depend on product user bought)
Board Connector	DB25 Female

Driver Support

Microsoft Client	Windows XP / Vista / 7 (X86/X64)
Microsoft Server	Windows 2000 / 2003 / 2008 (X86/X64)
Microsoft Embedded	Windows XP Embedded / POS Ready 2009 / Embedded System
Linux	Linux 2.4.x / 2.6.x
DOS	DOS

Regulatory Approvals

Hardware	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, FCC Part 15 Class B, RoHS
Software	Microsoft WHQL Windows Microsoft Client: XP / Vista / 7 (X86/X64) Microsoft Server: 2000 / 2003 / 2008 (X86/X64)

Environment

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

Note:

- *SUNIX High Speed RS-232 Card (**H** Version) baud rate setting supports 921.6Kpbs. Please refer to the Chapter 5 Appendix, Product Family for detail.*

- *LPT port does NOT support legacy 278 / 378 ISA address under Windows nor Linux operation systems, but only DOS mode.*

- *Do not support LPT Key Locker Parallel devices, because of legacy ISA address limitation.*

2.
Hardware Installation

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This chapter includes information about hardware installation for PCI Express Serial and Parallel Multi-IO Communication Board. The following topics are covered:

◆   **Hardware Installation**
◆   **Pin Assignments**

Hardware Installation

The hardware installation of PCI Express Serial and Parallel Multi-IO Communication Board is easy to carry out. Before inserting the card into the PCI Express Bus, please follow the detailed steps given below to install the PCI Express board in your computer.

> ⚠ **Safety First**
> To avoid damaging your system and boards, make sure your PC's power is turned off before installing PCI Express Board.

Step 1: Turn your PC's power off, and shut off the power to any peripheral.

Step 2: Remove the power plug from the plug socket.

Step 3: Remove the cover from the computer case.

Step 4: If fitted. Remove the metal cover plate on the rear of a free PCI-E slot.

Step 5: Insert PCI Express Multi-port Communication Board into the free PCI

Express slot and screw it firmly on the bracket side. It supports x1, x2,

x4, x8, or x16 (lane) PCI Express Bus connector keys.

Step 6: Place the cover back onto the computer.

Step 7: Insert the plug into the plug socket.
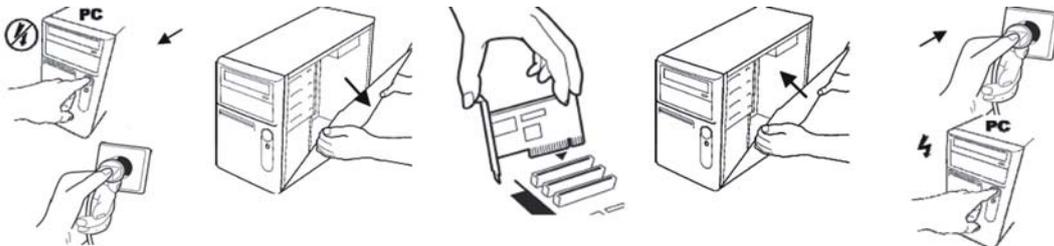
For 2S/1P or 4S/1P PCI Express Multi-IO Card, there is one extend flat cable along with the board. Please connect the cable 2x13 female header to the board. The red wire matches with the arrow mark (first pin) on the board.

Red Wire
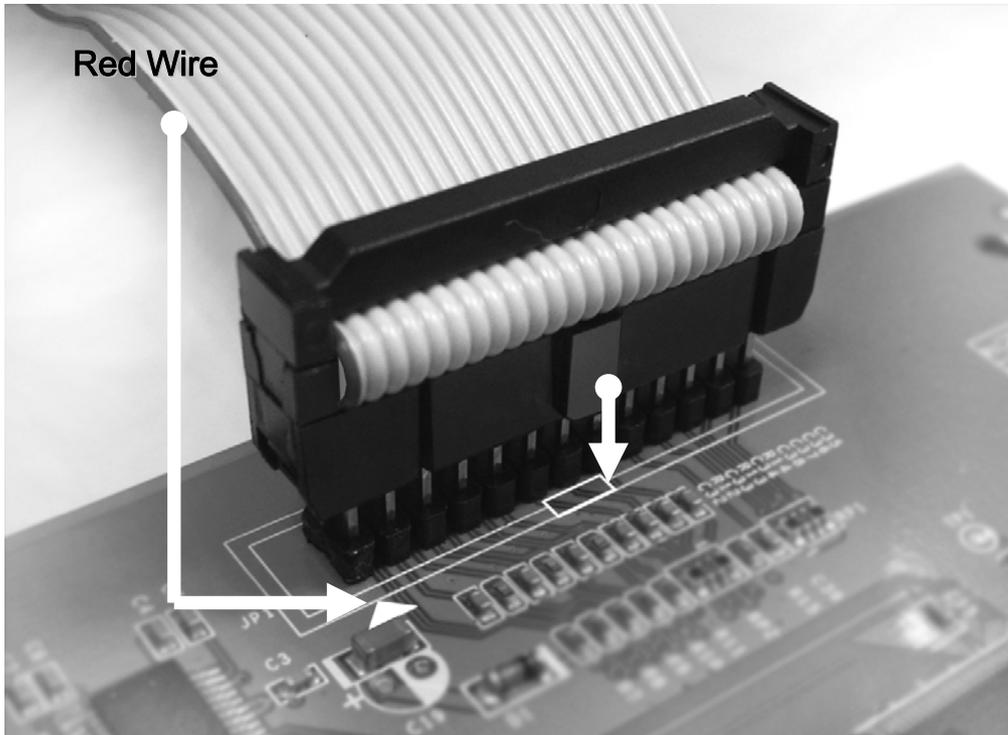
Fix the bracket on the PC chassis.
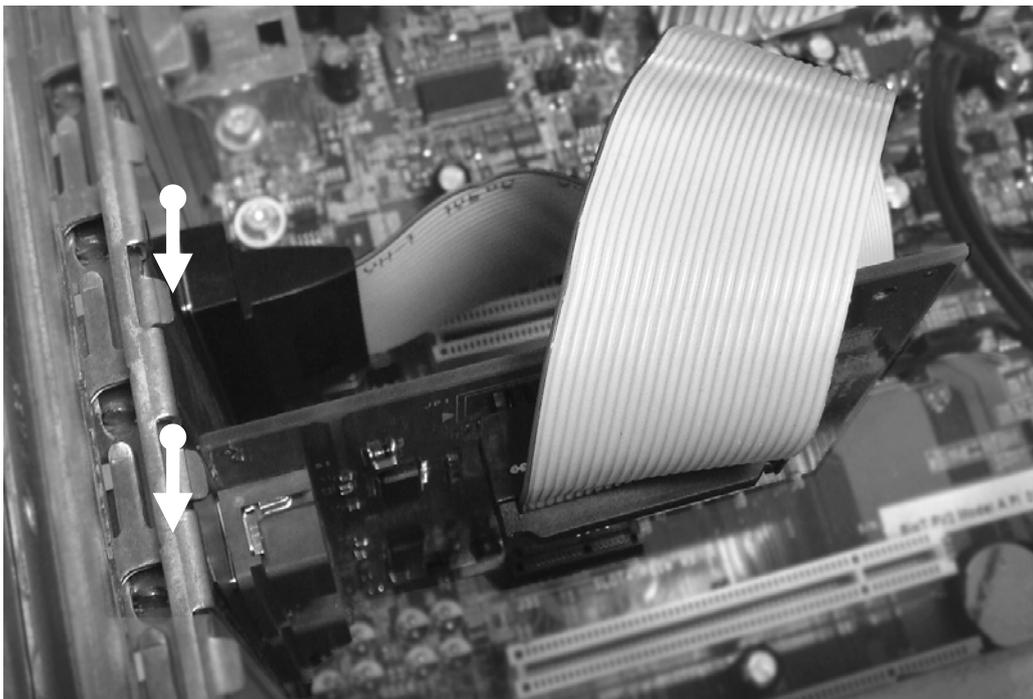
Pin Assignment

This chapter provides the pin assignments for SUNIX PCI Express Serial and Parallel Multi-IO Communication Board, as well as the pin assignments for the optional accessories.

RS-232 Interface:
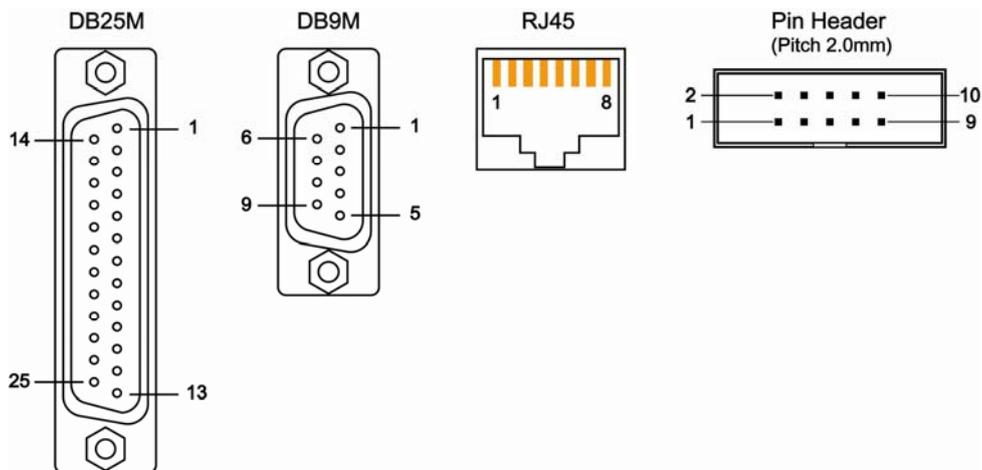
PIN	DB9M	DB25M	RJ45	Pin Header
DCD	1	8	7	1
RxD	2	3	6	3
TxD	3	2	3	5
DTR	4	20	2	7
GND	5	7	4	9
DSR	6	6	8	2
RTS	7	4	1	4
CTS	8	5	5	6
RI	9	22	-	8

Parallel Interface:
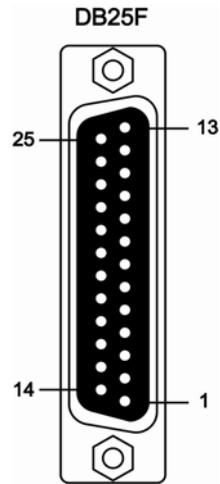
DB25F

DB25F	PIN	DB25F	PIN
1	STROBE	14	AUTO FEED
2	DATA0	15	ERROR
3	DATA1	16	INT
4	DATA2	17	SELECT INPUT
5	DATA3	18	GND
6	DATA4	19	GND
7	DATA5	20	GND
8	DATA6	21	GND
9	DATA7	22	GND
10	ACKNOWLEDGE	23	GND
11	BUSY	24	GND
12	PAPER EMPTY	25	GND
13	SELECT		

3.
Driver Installation

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After installing the PCI Express Serial and Parallel Multi-IO Communication Board in your system successfully, please follow the step by step software installation guide to confirm how to install appropriate driver and configure the serial port settings.

The driver for PCI Express board supports Windows and Linux operating systems, and you can select your requirement in the following chapter:

The following topics covered in this chapter:

◆ **Windows Driver Install**
◆ **Windows Driver Uninstall**
◆ **Windows Verify Installation**
◆ **Linux Driver Installation**

Windows Driver Installation

Please refer to following instructions to install the driver for the first time under Windows operation system. You will need to plug the board in an available PCI Express slot first, before installing the driver.

(1) After the board is physically installed and the PC boots up, system will detect the PCI Express Serial and Parallel Board and prompt for driver installation wizard, please choose cancel.

(2) Put CD driver bound with product in your CD / DVD ROM drive.
Please select autorun.exe., then select "**Driver Installation**".
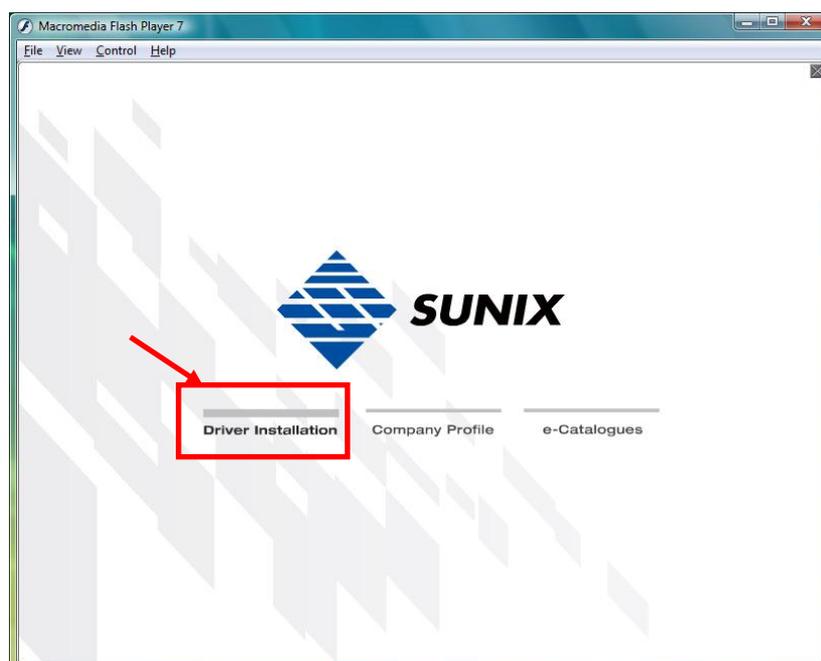
(3) Please select the product interface you bought, such as PCI Express.
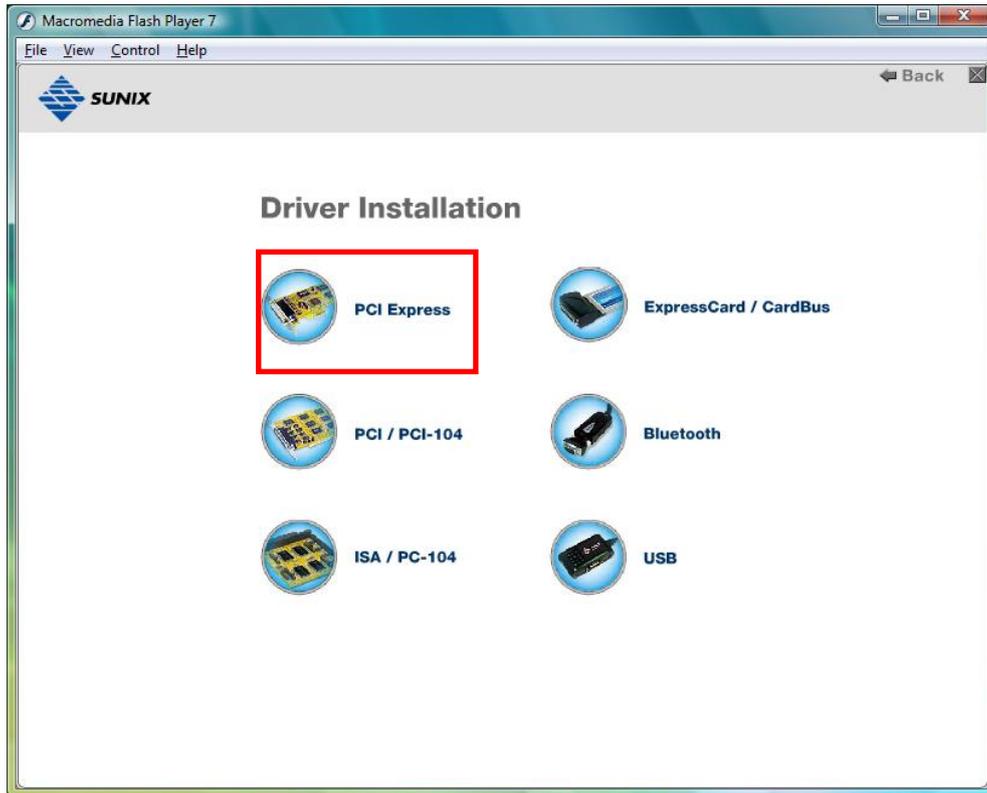
(4) Please select the O.S. version you are using, such as Windows Vista. Then system will process the driver installation step automatically.
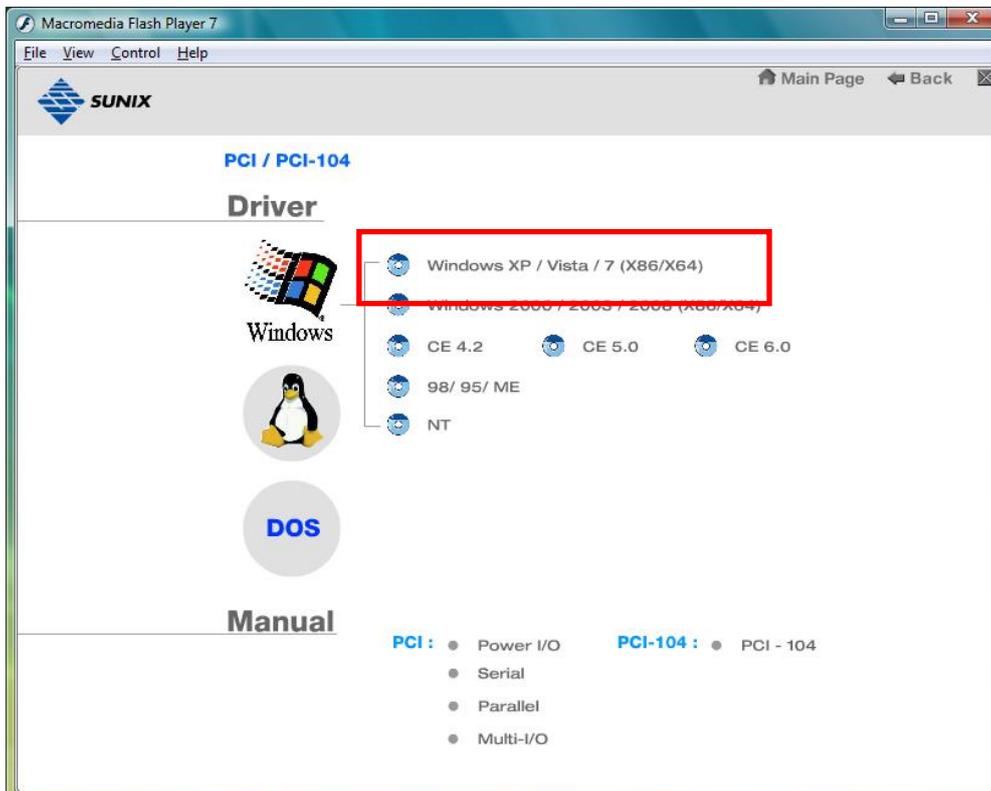
(5) Click "**Next**" to continue driver installation steps.
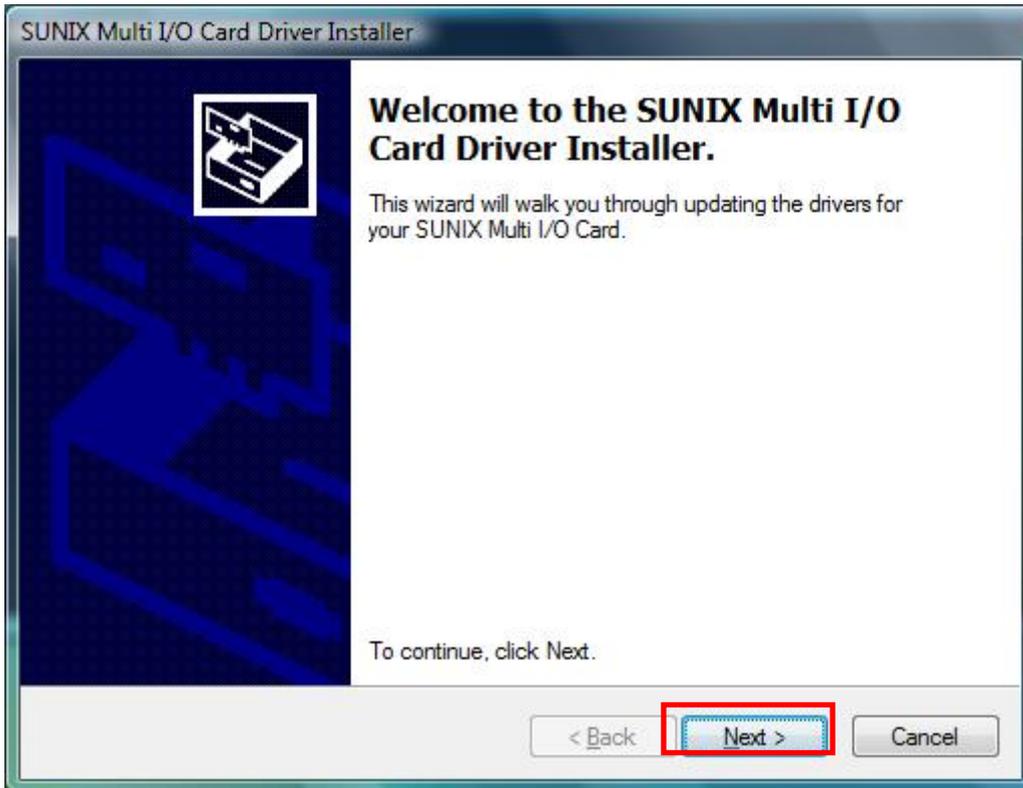
(6) Click "**Finish**" to end installation steps. If SUNIX I/O card install correct in your system, you can read "**V**" icon in this picture.

Windows Driver Uninstall

Please refer to following instructions uninstall Multi-I/O card driver.

(1) Click on the "**Programs and Features**" tab in the Windows Control Panel.

Start > Controller Panel > Programs and Features
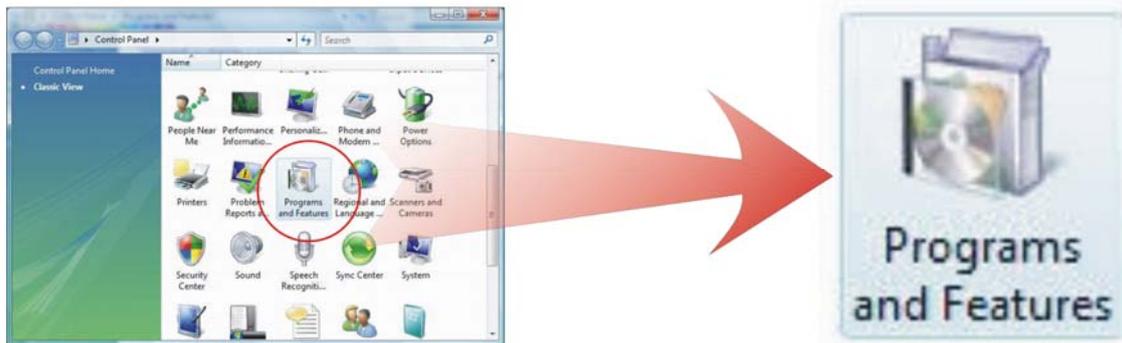
(2) Entry Uninstall or change a program page, and double click "**Windows Driver Package – SUNIX Co., Ltd SUNIX Multi-I/O Controller**" to process driver uninstall procedure.
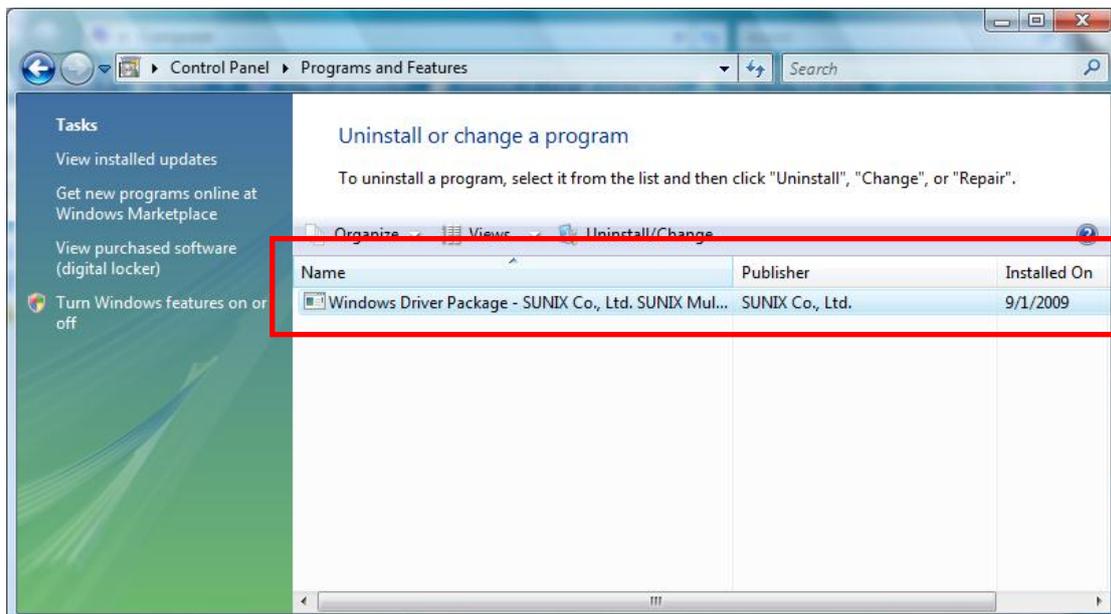
Windows Verify Installation

You can use Windows "**Device Manager**" to verify proper installation.

(1) Click on the "**Programs and Features**" tab in the Windows Control Panel.

Start > Controller Panel > Device Manager
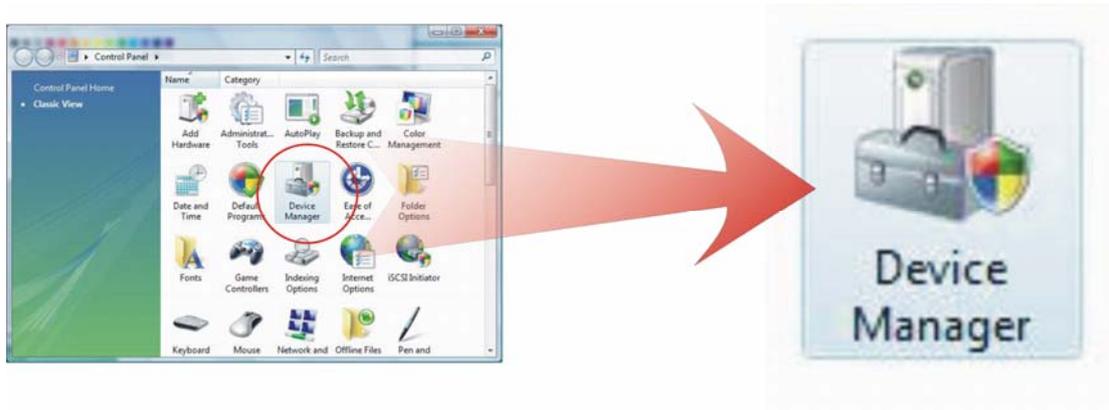
(2) In the Device Manager window, you should see this board under **Multifunction adapters** (SUNIX 1-port RS-232 Serial Card / 1-port Parallel Multi-IO Card in this example). You should also see SUNIX COM and LPT port under **Ports (COM & LPT)**.
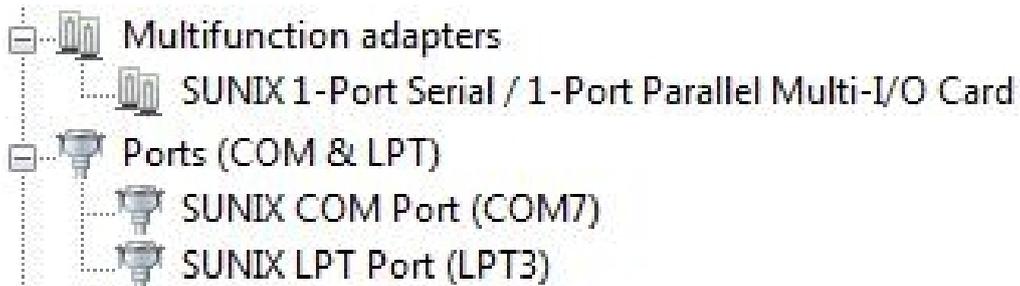
Linux Driver Installation

This installation guide describes the procedures to install the PCI or PCI Express Multi-IO board in Linux kernel 2.4.x and 2.6.x. Please refer to "snx_Vx.x.x.x.tar.gz" for driver installation detail in CD Driver (Linux folder) directory.

: \ PCI_IO \ Linux

(1) Driver install
  Please create a directory under root directory, e.g /temp, do commands:

>   # cd /
>   # mkdir temp
>
>   After get driver file "snx_Vx.x.x.x.tar.gz". Copy file to /temp
>   directory, then extract and install, do commands:
>
>   # cp snx_Vx.x.x.x.tar.gz /temp
>   # cd /temp
>   # tar xvfz snx_Vx.x.x.x.tar.gz
>   # cd /temp/snx
>   # make clean ; make install
>
>   ***
>   * If system is Suse 9.0 and errors occur when
>   * "make clean ; make install", do commands:
>   *
>   * # cd /usr/src/linux/
>   * # make cloneconfig
>   * # make dep
>   *
>   * then do "make clean ; make install" again in /temp/snx
>   ***
>   Load driver module, do command:
>
>   # modprobe snx

or
insmod /temp/snx/driver/snx.ko (snx.o for kernel 2.4)

Check driver module, do command:
lsmod | grep snx

Unload driver, do command:
rmmod snx

(2) Device node creation
   Each serial port has one device node which is named "ttySNX?", maximum up to 32 serial ports.

   Each parallel port has two device node which is name "lp?" and "parport?". This step will backup lp2~lp3 and parport2~parport3 to lp?.bak and parport?.bak in /dev for your system first. Then, create lp2~lp3 and parport2~parport3 in /dev for sunix driver, maximum up tp 2 parallel ports.

   This setp will be done when do "make clean ; make install", if device nodes aren't in /dev, do commands:

       # cd /temp/snx/snxmknod
       # ./snxmknod

   This will create device nodes in /dev.

   If there are more than two boards installed, serial port device nameing convention please refer to F1.

4.

Port Configuration

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This chapter shows all Serial COM and Parallel LPT port settings that user came with usually, such as port number, FIFO length(size), baud rate, IO address and others.

The following topics covered in this chapter:

◆ **Configure COM / LPT Port Settings**
◆ **COM / LPT Port Number Settings**
◆ **COM / LPT System Resource**
◆ **COM Port FIFO Settings**

Configure COM / LPT Port Settings

After the board drivers are installed, please refer to following instructions to configure Serial COM and Parallel LPT port settings.

(1) Please launch the "**Device Manager**".
(2) Right click the "**SUNIX 2-port RS-232 Serial Card / 1-port Parallel Multi-IO Card**" item from the "**Multifunction adapters**" sub-tree and click "**Properties**".
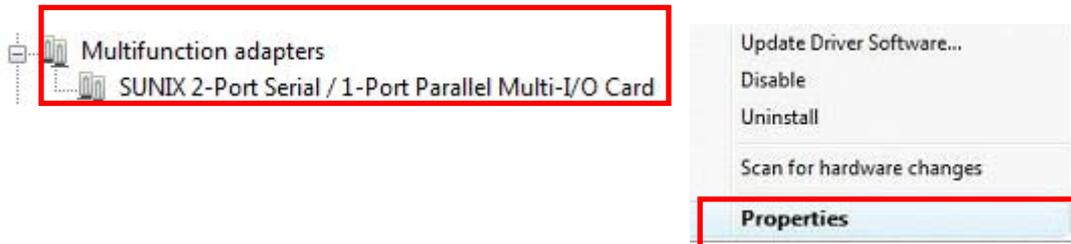
(3) On the "**Port Control**" tab, select a port to configure. You can set both COM and LPT ports settings through this page.
  * Click "**OK**" to approve the settings for the selected port.
  * Click "**Apply to All**" to approve the settings for all COM and LPT ports.
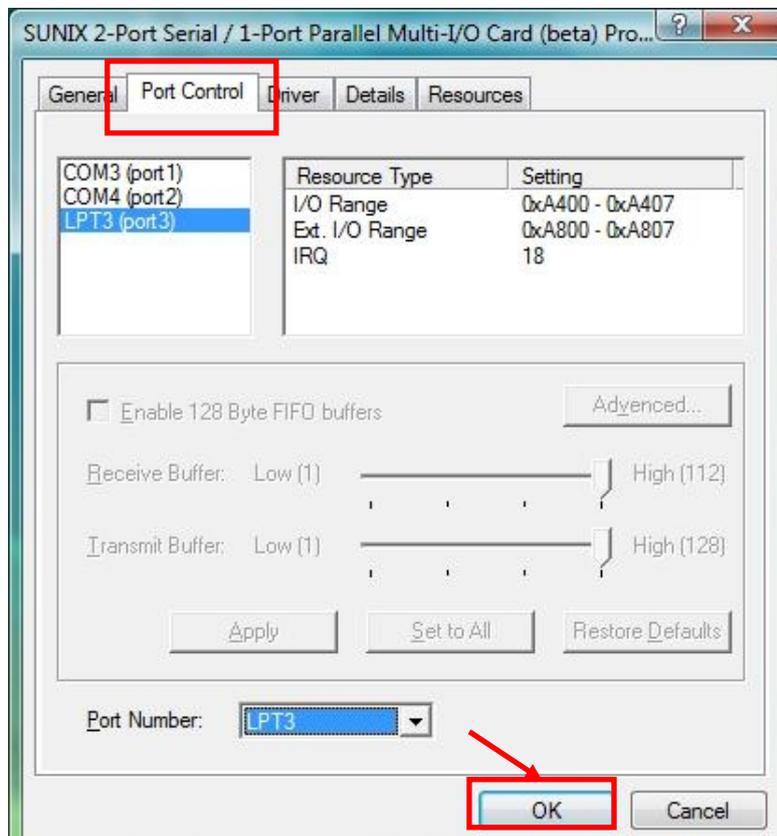
COM / LPT Port Number Settings

Under Port Number, select a COM number to assign to the serial port. Click "**OK**" to approve the settings for the selected port.

Note: In order to prevent system resource conflict, do not select "**in use**" port.

COM / LPT System Resource

User can read the COM or LPT port's "**IO Range**" and "**IRQ**" located in system by selecting assigned port.

COM Port FIFO Settings

Select RS-232 COM port's Receiver FIFO Trigger and Transmit FIFO Size.
The default Rx FIFO Trigger is 112 bytes. The default Tx FIFO Size is 128 bytes. Click "**Apply to All**" to change this setting for all serial ports on the board. Then click "**OK**" to save the settings. If the system is not stable, select the **lower** value to correct problems.
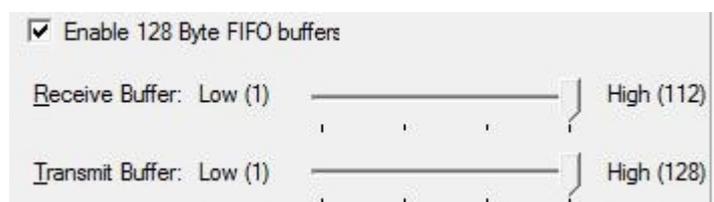
5.
Appendix

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This chapter shows some problems that user came with usually. Also you can check it if the PCI Express serial and parallel board can not work properly in your system after following hardware and software installation steps. In addition, you could contact with us for detail technical product information.

In this appendix, we cover the following topics.

◆ **Troubleshooting**
◆ **Product Family**
◆ **Contact Information**

Troubleshooting

1. System fails to find the PCI Express Multi-I/O Board or COM / LPT port.
A: It may cause by following issue:

    a. The board is not properly plugged into the PCI Express slot.

    b. Please clean the golden finger on the board.

    c. The PCI Express slot maybe defective. Please try other slots until you find one that works.

    d. The mainboard does not have an available IRQ for the PCI Express Multi-I/O board. Enter the PC.s BIOS and make sure an IRQ setting is available in the PCI/PnP settings.

    e. The board itself might be defective. You can try another mainboard testing this board working or not.

2. There is a blue screen when I entry operation system.
A: The possible reason is an IRQ or I/O address conflict with other PCI Express Bus adapters, such as LAN or serial boards, or with the system BIOS. Refer to the corresponding problem in the previous FAQ for solutions.

3. There are some exclamation marks in device manager and serial ports can not work properly.
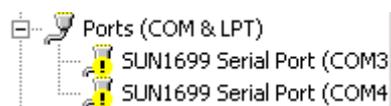
A: It caused by the wrong driver installing or hardware settings. Please turn off your computer firtly and re-install hardware and software, especially re-install the correct driver. If problem still happens, please change another PCI Express Bus slot to install this board.

4. How can I set the LPT port to the legacy 278 or 378 ISA address?
A: Because of PCI and PCI Express plug-n-play rule and windows operation system limitation, you can NOT remap to 278H or 378H legacy ISA IO address under Microsoft Windows 2000, XP, 2003 Vista, 2008, 7 or Linux OS.

5. How large FIFO length I should set?

A: FIFO (First-in-First-out) buffers are used to reduce the frequency of interrupt processes for UART chips. The size of the buffer will determines the number of times the cards need to interrupt the computer's CPU in order to process a string of data. With larger FIFO buffer size; there is more data flow and less interruption to the CPU, therefore allowing the CPU to be free to handle other more crucial tasks.

Set the Receive/Transmit Buffer to higher value will get faster performance because the interrupts will be reduced, but the time for interrupt service routine will become shorter. The receive buffer overflow will be easily happened if the CPU speed is not enough to handle. If the system is not stable, select the lower value to correct problems.
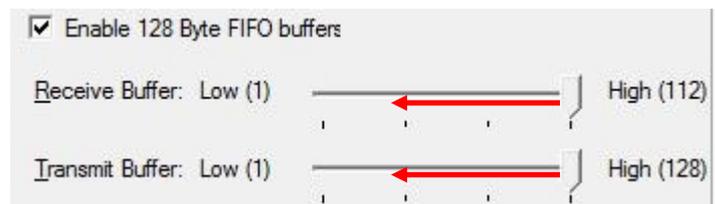
6. How come my parallel device can not work on this Card, but work properly under on-board LPT port??

A: a. Please confirms your parallel device connect to the LPT port correctly.

b. Make sure the LPT port number you connected matches with parallel device settings.

c. Your parallel device only works under 278/378 legacy ISA IO address. This card can not satisfy with this feature. Please contact with your parallel device vendor for driver updating.

7. How can I set the different ECP / EPP / SPP / BPP operation mode?

A: Under Windows OS such as 2000, XP, Vista, and 7, this board will automatically communicate with the device to which it is connected and sets to that particular mode. For example if this card is connected to a printer that support SPP mode, then this parallel card will communicate with this printer and will automatically set to SPP mode. It means that this card will handshake with the device to which it is connected and configures to that mode. User does not require changing to any particular mode. This parallel card's working mode can not force setting particular mode by driver or BIOS!!

Product Family

SUNIX provides kinds of RS-232 and IEE1284 interface cards for customer selection, including PCI Express, PCI, CardBus, and ExpressCard. Please refer to the product family table for reference.

Multi I/O PCI Express Interface						
Port		**Connecter**		**Serial Baud Rate**	**Power output**	**Bracket**	**Model NO.**
COM	LPT	COM	LPT				
1	1	DB9 Male	DB25 Female	115.2Kbps	-	Standard	MIO5469A
				921.6Kbps			MIO5469H
2	1	DB9 Male	DB25 Female	115.2Kbps		Standard	MIO5479A
				921.6Kbps			MIO5479H
		DB44 Female		115.2Kbps		Loiw Profile	MIO5479AL
				921.6Kbps			MIO5479HL
4	1	DB44 Female	13x2 Pin Header	115.2Kbps		Standard	MIO5499A
				921.6Kbps			MIO5499H
				115.2Kbps		Loiw Profile	MIO5499AL
				921.6Kbps			MIO5499HL

Multi I/O PCI Interface						
Port		**Connecter**		**Serial Baud Rate**	**Power output**	**Bracket**	**Model NO.**
COM	LPT	COM	LPT				
1	1	DB9 Male	DB25 Female	115.2Kbps	-	Standard	MIO5069A
					5V12V		MIO5069P
				921.6Kbps	-		MIO5069H
					5V/12V		MIO5069PH
		5x2 Pin Header	13x2 Pin Header	115.2Kbps	-	Standard	MIO5069U
					-	Low Profile	MIO5069UL
				921.6Kbps	-	Standard	MIO5069UH

Multi I/O PCI Interface

Port		Connecter		Serial Baud Rate	Power output	Bracket	Model NO.
COM	LPT	COM	LPT				
2	1	DB9 Male	13x2 Pin Header	115.2Kbps	-	Standard	MIO5079A
		DB9 Male	13x2 Pin Header	921.6Kbps	-	Standard	MIO5079H
		5x2 Pin Header	13x2 Pin Header	115.2Kbps	-	Standard	MIO5079U
		5x2 Pin Header	13x2 Pin Header	115.2Kbps	-	Low Profile	MIO5079UL
		5x2 Pin Header	13x2 Pin Header	921.6Kbps	-	Standard	MIO5079UH
		DB44 Female		115.2Kbps	-	Low Profile	MIO5079AL
		DB44 Female		921.6Kbps	-	Low Profile	MIO5079HL
4	1	DB44 Female	13x2 Pin Header	115.2Kbps	-	Standard	MIO5099A
		DB44 Female	13x2 Pin Header	115.2Kbps	-	Standard	MIO5099H
		DB44 Female	13x2 Pin Header	921.6Kbps	-	Low Profile	MIO5099AL
		DB44 Female	13x2 Pin Header	921.6Kbps	-	Low Profile	MIO5099HL

Multi I/O ExpressCard Interface

Port		Connecter		Serial Baud Rate	Power output	Bracket	Model NO.
COM	LPT	COM	LPT				
1	1	DB44 Female		921.6Kbps	-	34mm	ECM1010
2	1	DB44 Female		921.6Kbps	-	34mm	ECM2010

Multi I/O CardBus Interface

Port		Connecter		Serial Baud Rate	Power output	Bracket	Model NO.
COM	LPT	COM	LPT				
1	1	DB44 Female		921.6Kbps	-	54mm	CBM1010
2	1	DB44 Female		921.6Kbps	-	54mm	CBM2010

Contact 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

World Wide Web (WWW) Site for product information:

.............................http://www.sunix.com.tw