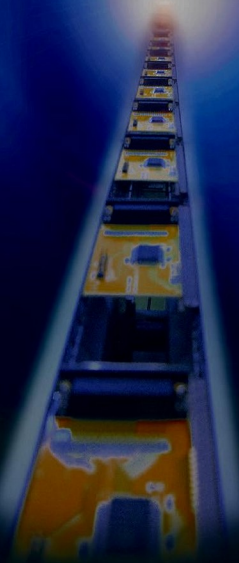










# PCI I/O CARD





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◆ **INTRODUCTION**

**The PCI 32 Bit Multi I/O series cards are equipped with High-Speed Standard Serial-Interface and/or IEEE 1284 Parallel Interface.**

1. Commercial Cards

- Serial ports cannot remap to address 3F8h, 2F8h, 3E8h, 2E8h.
- Parallel ports can remap via user interface to 378h, 278h if any one of those addresses is available.

<b>Model</b>	<b>Function</b>	<b>Connector</b>
<b>4006A</b>	1P(SPP/BPP)	1 DB25F
<b>4008A</b>	1P(ECP/EPP)	
<b>4014A</b>	2P(SPP/BPP)	1 DB25F
<b>4018A</b>	2P(ECP/EPP)	1 3x2Header
<b>4014C</b>	2P(SPP/BPP)	1 DB62F
<b>4018C</b>	2P(ECP/EPP)	
<b>4025A</b>	1S(16FIFO)	1 DB9M
<b>4027A</b>	1S(32FIFO)	
<b>4036A</b>	2S(16FIFO)	2 DB9M
<b>4037A</b>	2S(32FIFO)	
<b>4055A</b>	4S(16FIFO)	1 DB37F
<b>4056A</b>	4S(32FIFO)	
<b>4056R</b>	4S(32FIFO)	4 RJ45
<b>4065A</b>	8S(16FIFO)	1 DB37F
<b>4066A</b>	8S(32FIFO)	1 20x2Header
<b>4066R</b>	8S(32FIFO)	1 DB62F
<b>4078A</b>	2S(16 FIFO) + 1P (SPP/BPP)	2 DB9M
<b>4078U</b>	2S(32 FIFO) + 1P (SPP/BPP)	1 13x2Header
<b>4079H</b>	2S(16FIFO) + 1P (ECP/EPP)	
<b>4079A</b>	2S(32FIFO) + 1P (ECP/EPP)	
<b>4079R</b>	2S(16FIFO) + 1P (ECP/EPP)	1 DB62F
<b>4079S</b>	2S(32FIFO) + 1P (ECP/EPP)	
<b>4085H</b>	2S(16FIFO) + 2P (SPP/BPP)	1 DB9M
<b>4085U</b>	2S(32FIFO) + 2P (SPP/BPP)	1 DB25F
<b>4088A</b>	2S(16FIFO) + 2P (ECP/EPP)	1 5x2Header
<b>4089A</b>	2S(32FIFO) + 2P (ECP/EPP)	1 13x2Header
<b>4095A</b>	4S(16FIFO) + 2P (ECP/EPP)	1 DB62F

<b>4096A</b>	4S(32FIFO) + 2P (ECP/EPP)	2 13x2Header
--------------	---------------------------	--------------

## 2. Commercial Cards

- Serial ports can automatically remap to address 3F8h, 2F8h, 3E8h, 2E8h if any one of those addresses is available.
- Parallel ports can remap via user interface to 378h, 278h if any one of those addresses is available.

<b>Model</b>	<b>Function</b>	<b>Connector</b>
<b>4025D</b>	1S(16FIFO)	1 DB9M (or 1 5x2Header)
<b>4027D</b>	1S(32FIFO)	
<b>4028D</b>	1S(64FIFO)	
<b>4036D</b>	2S(16FIFO)	2 DB9M (or 2 5x2Header)
<b>4037D</b>	2S(32FIFO)	
<b>4038D</b>	2S(64 FIF0)	
<b>4079D</b>	2S(16FIFO) + 1P (ECP/EPP)	2 DB9M 1 13x2Header
<b>4079E</b>	2S(32FIFO) + 1P (ECP/EPP)	
<b>4079F</b>	2S(64FIFO) + 1P (ECP/EPP)	

## 3. Industrial RS422/485 Cards

- Serial ports cannot remap to address 3F8h, 2F8h, 3E8h, 2E8h.

<b>Model</b>	<b>Function</b>	<b>Connector</b>
<b>8137</b>	2S(32FIFO)	2 mini block
<b>8137S</b>	2S(32FIFO),surge	
<b>8138</b>	2S(32FIFO)	2 DB9M
<b>8138S</b>	2S(32FIFO),surge	
<b>8156</b>	4S(32FIFO)	4 mini block
<b>8156S</b>	4S(32FIFO),surge	
<b>8157</b>	4S(32FIFO)	4 RJ45
<b>8157S</b>	4S(32FIFO),surge	
<b>8166</b>	8S(32FIFO)	1 DB62F
<b>8166S</b>	8S(32FIFO),surge	

## 4. Industrial Current Loop Cards

- Serial ports cannot remap to address 3F8h, 2F8h, 3E8h,

2E8h.

<b>Model</b>	<b>Function</b>	<b>Connector</b>
<b>8237</b>	2S(32FIFO)	2 mini block
<b>8237S</b>	2S(32FIFO),surge	
<b>8238</b>	2S(32FIFO)	2 DB9M
<b>8238S</b>	2S(32FIFO),surge	
<b>8256</b>	4S(32FIFO)	4 mini block
<b>8256S</b>	4S(32FIFO),surge	
<b>8257</b>	4S(32FIFO)	4 RJ45
<b>8257S</b>	4S(32FIFO),surge	

➤ **The driver put in CD-ROM sub-dir.  
/IO/PCI IO/**

◆ ***RECORD OF CHANGES***

---

1. Add new models
  - Serial ports can remap to 3F8h, 2F8h, 3E8h, 2E8h
  - Industrial RS422/485 cards
  - Industrial Current Loop cards
  - New bracket for saving usage of PCI slots
  
2. Add new DOS and Win3.1 driver
  - Serial port that can remap to 3F8h, 2F8h, 3E8h, 2E8h will remap automatically if any one of those ports is available.
  - Parallel ports will remap automatically if 378h or 278h is available.
  - Inquire and display the card information (port index, I/O and IRQ)
  
3. Solve WinNT LPT port index problem
  - In V3.1 driver: To solve the connection with the scanner, the port driver will start with higher priority than scanner, thus the on board parallel port will become the last port.
  - In V3.2 driver: The on board parallel port is the LPT1 if the remap function is not enabled. When the parallel port is remap to 378h or 278h to support the scanner or ZIP disk, the on board is the last port.

## ◆ *WINDOWS 95 / 98*

### 1. *Windows 98 Driver Installation Guide*

- Turn off the power of your computer.
- Plug-in the SUNIX Multi I/O card to PCI bus of your computer
- Add-on the peripheral { Modem, Printer, Scanner... etc. } that you need to this card
- Turn on the power of your computer
- You can press “Pause” key on the keyboard to see the message when **PCI device listing** display (for example...)

Bus No	Device No	Func No	Vendor ID	Device ID	Device Class	IRQ
0	9	0	1409	7168	Simple Comm. Controller	10

or

Bus No	Device No	Func No	Vendor ID	Device ID	Device Class	IRQ
0	13	0	1409	7268	Simple Comm. Controller	10

- After running the Windows 98, Windows 98 will find a “**PCI Serial Controller**” or “**PCI Parallel Controller**” installed in your computer and need new drivers to support this hardware.

- Click **【Next】**





➤ Click **【Next】** .



➤ Please insert the driver disk provided with PCI multi I/O card by SUNIX to floppy disk Driver A: or B:  
Click **【Next】** .



➤ Click **【Next】** .

Windows 98 will install PCI multi I/O card driver to your computer.



➤ Click **【Finish】** .



- **Note:** If you install PCI parallel ports to your system, you will be requested to restart your computer when you finish setting up each parallel port. Click **【Yes】** if all parallel ports have been installed, others click **【No】**. For example, if you install two parallel ports in your system, click **【No】** for the first System Setting Change and click **【Yes】** for the last System Setting Change.



## 2. How to check your Win98 installation



### Step 1:

Double click my computer icon  
Double click Control Panel icon

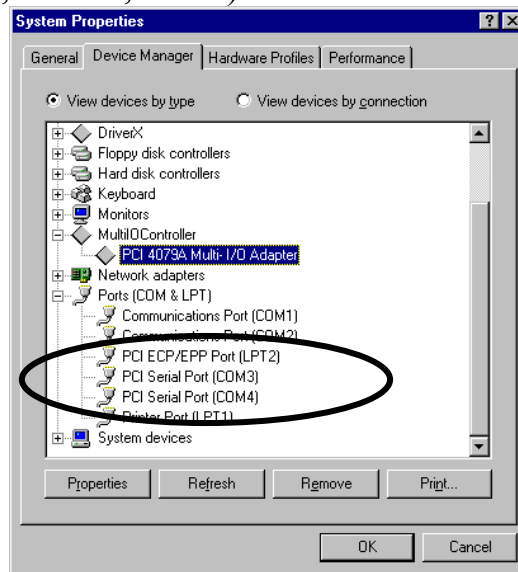
### Step 2:

Double click  
System icon



### Step 3:

After install PCI multi I/O card (for example 4079A), you will find three ports added (COM3, COM4, LPT2).

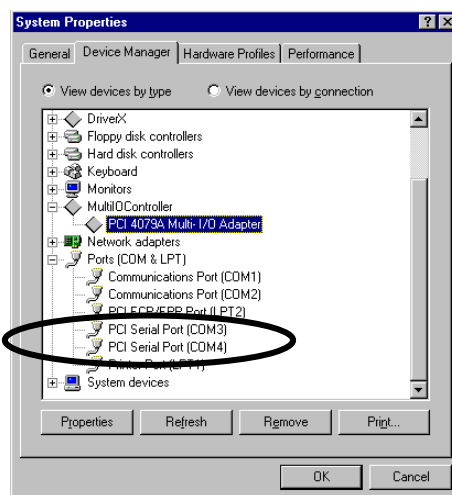


### 3. How to Configure COM port

#### Step 1:

Select the PCI Serial Port you want to configure for example COM3.

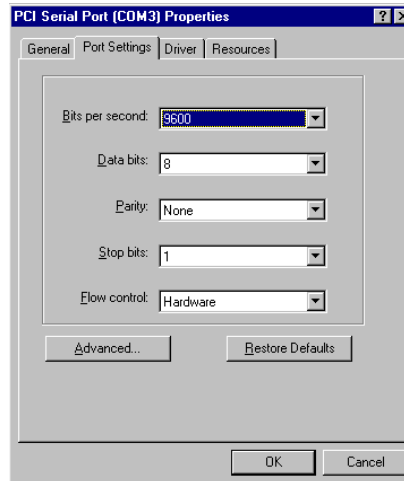
Press the **【Properties】** .



## Step 2:

Click the **【Sunix Port Settings】**.

Configure the Bits per second, Data bits, Parity, Stop bits and Flow control if you want to change.

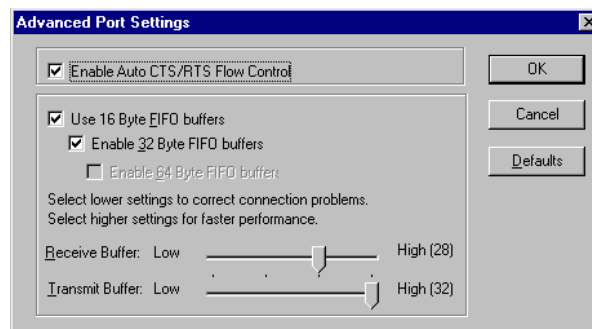


There are three kinds of flow control: Xon/Xoff, Hardware and None. The Xon/Xoff is using software protocol. The Hardware means the flow control is using RTS/CTS, but the RTS/CTS is controlled by software. The None means there is no flow control.

Click the **【Advanced】** if you want to set more advanced features.

## Step 3:

Configure the **Enable Auto CTS/RTS Flow Control**, **16/32/64 bytes FIFO length**, and **Receive/Transmit Buffer trigger level** if you want to change.



Enable Auto CTS/RTS Flow Control means the CTS/RTS flow control is controlled by hardware automatically. System will be more stable if the function is enabled.

If your card can support 32 bytes FIFO, you can use 16 or 32 bytes FIFO. The default value is Use 16 Byte FIFO buffers. If your card cannot support 32 bytes FIFO, the Enable 32 Byte FIFO buffers will be shadowed.

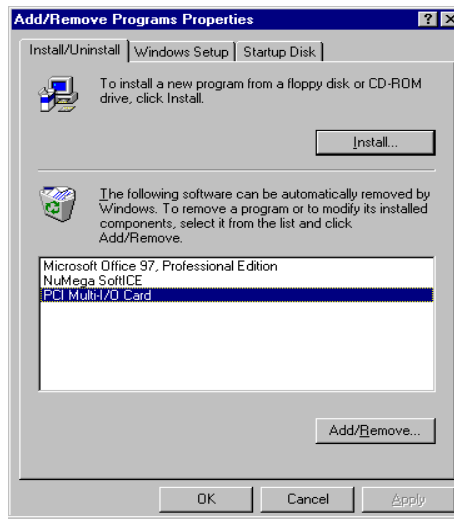
Set the Receive/Transmit Buffer to higher value will get faster performance because the interrupts will be reduced, but the time for interrupt service routine will become shorter. The receive buffer overflow will be easily happened if the CPU speed is not enough to handle. If the system is not stable, select the lower value to correct problems.

#### 4. Windows 98 uninstall guide

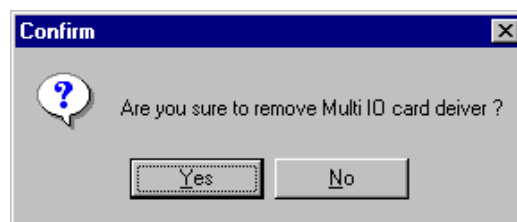
- Double click **Add/Remove Programs** in Control Panel.



- Choose PCI Multi-I/O Card.  
Click **【Add/Remove】**.



- Click **【Yes】** to remove Multi-I/O Card driver



- Click **【Yes】** to restart the computer.



## 5. How to connect your peripheral to SUNIX LPT device

### Step 1:

Be sure your printer or other parallel peripheral had connected to SUNIX PCI Multi I/O card.

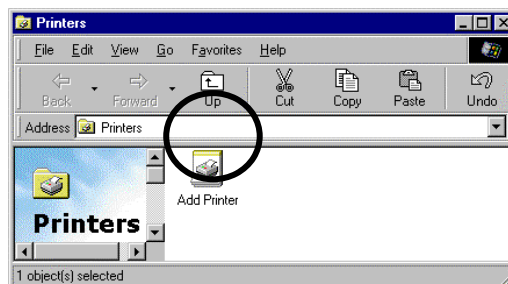
### Step 2:

Double click my computer icon, Double click Printers icon



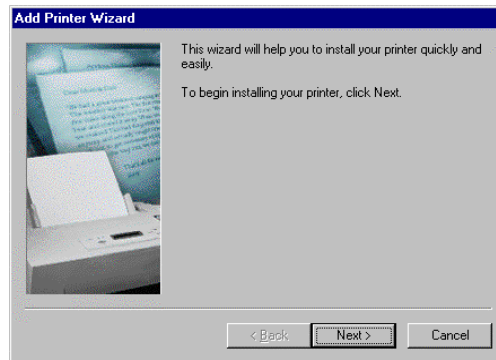
### Step 3:

Double click Add Printer icon.



**Step 4:**

Click **【Next】**.



**Step 5:**

Install Printer (for example HP DeskJet 1120C) driver from disk.

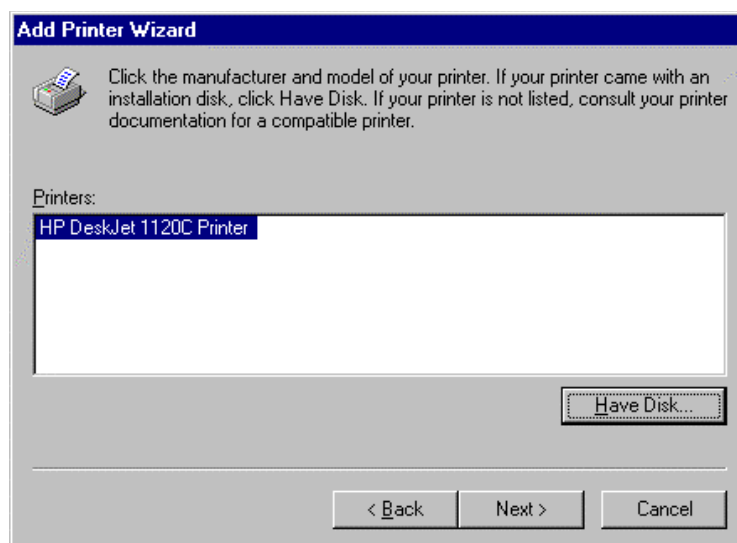
Click **【OK】**.



**Step 6:**

Select **HP DeskJet 1120C Printer**.

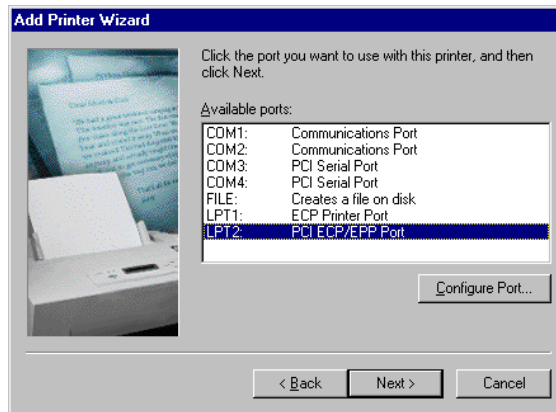
Click **【Next】**.



### Step 7:

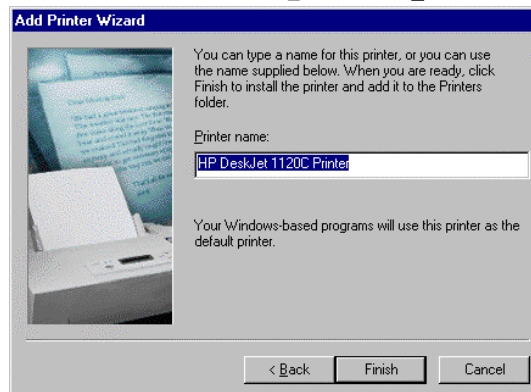
If you want to connect the printer to your PCI Multi I/O Card, select **PCI ECP/EPP Port** to your device.

Click **【Next】**.



### Step 8:

Type the printer name then click **【Finish】**.

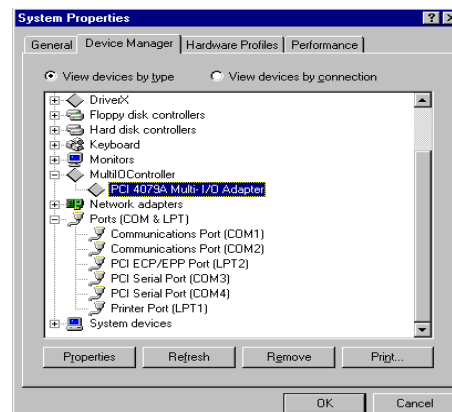


**Note:** If you want to connect the scanner or the zip disk to PCI multi I/O Card, you need to remap the Parallel Port I/O address to 0x378 or 0x278.

➤ Double click **MultiIOController** in Device Manager of System Properties.

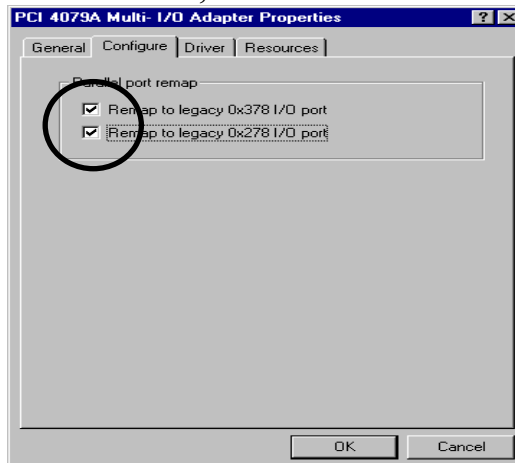
Select **PCI 4079A Multi-I/O Adapter**.

Click **【Properties】**.





- If you want to remap I/O address, select Remap to legacy 0x378 and/or 0x278 I/O ports. Click **【OK】**, then it will be set after reboot computer



- After reboot computer, you can check Parallel Port I/O address from System Properties.
- If you don't want to remap Parallel Port I/O address to 0x378 or 0x278, unselect Remap to legacy 0x378 and/or 0x278 I/O port. Click **【OK】**, then it will be set after reboot computer

## 6. How to connect your peripheral to SUNIX COM device

### Step 1:

Be sure your modem or other serial peripheral had connected to SUNIX PCI Multi I/O card.

### Step 2:

Double click my computer icon, Double click Control Panel icon.



### Step 3:

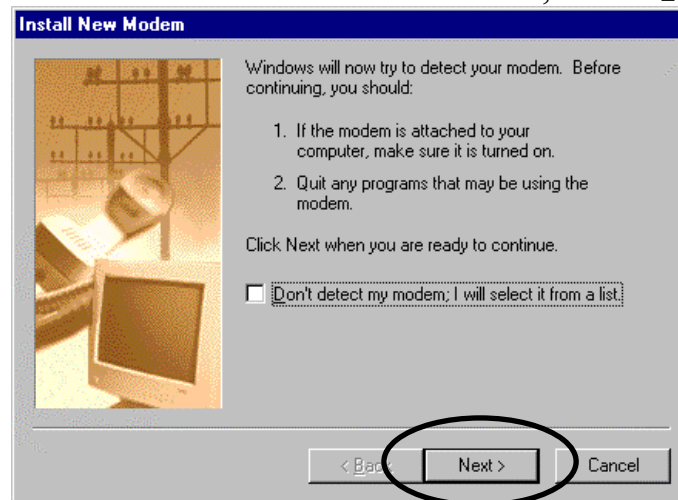
Here will take modem for example.

Click Modem icon



### Step 4:

Then Windows 98 will start modem install wizard , click **Next** .

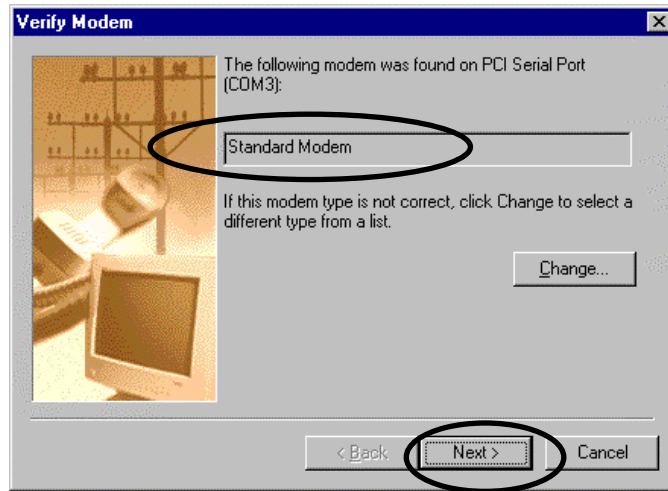


### Step 5:

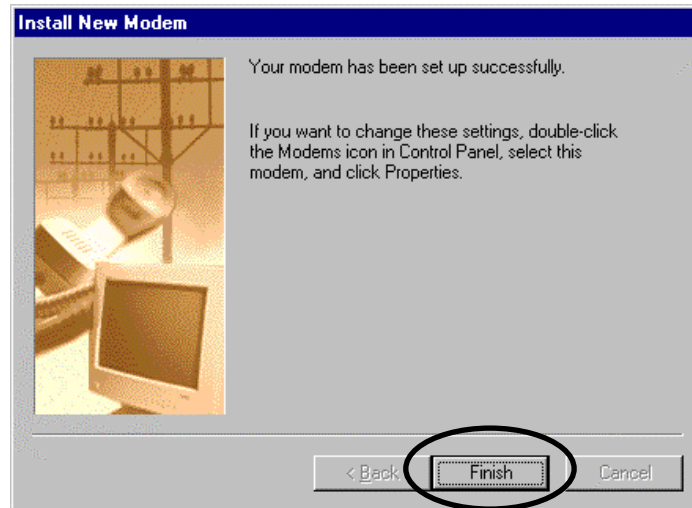
Please wait a moment, Windows 98 will search you modem.

If display standard modem or other modem type, then click **Next** .

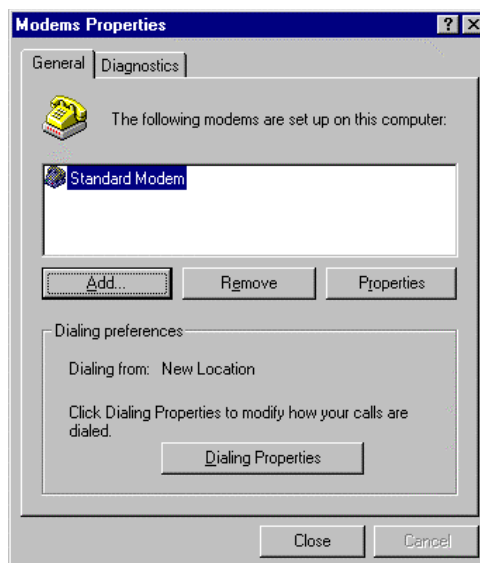
Otherwise, please check your modem. (Power on? Connect right? Telephone line?)



**Step 6:**  
Click **【Finish】**



**Step 7:**  
You can find Standard Modem in Modems Properties.  
The installation finishes.

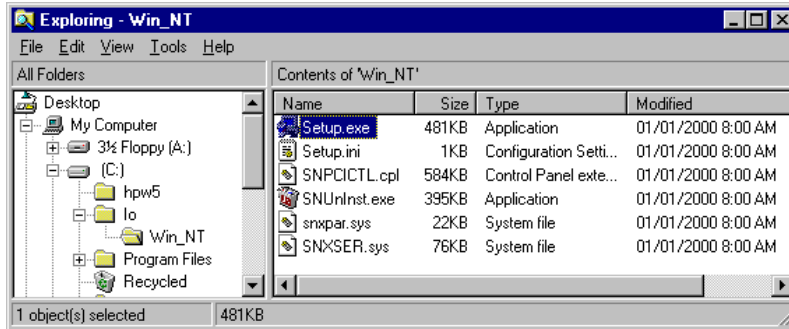


## ◆ *WINDOWS NT*

### 1. *Windows NT 4.0 Driver Installation Guide*

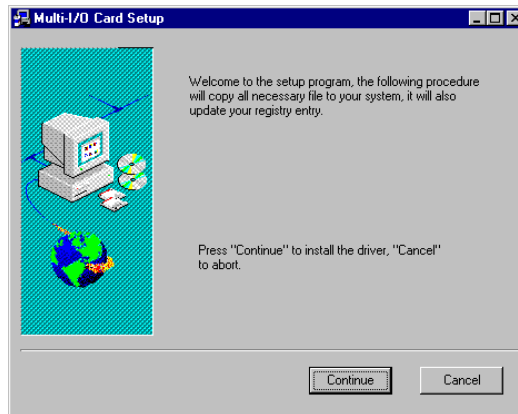
#### Step 1:

Run the setup.exe program in PCI Multi I/O card (for example 4079A) Installation Disk.



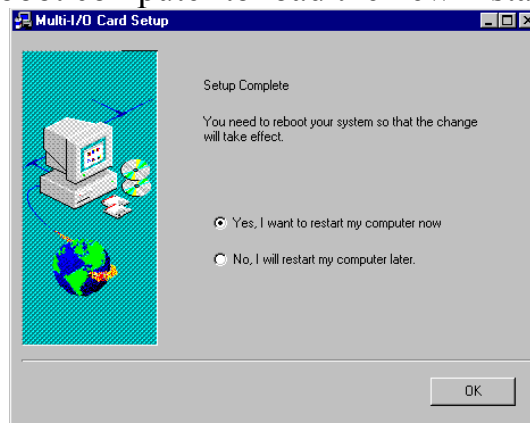
#### Step 2:

Press **【Continue】** to install the driver.



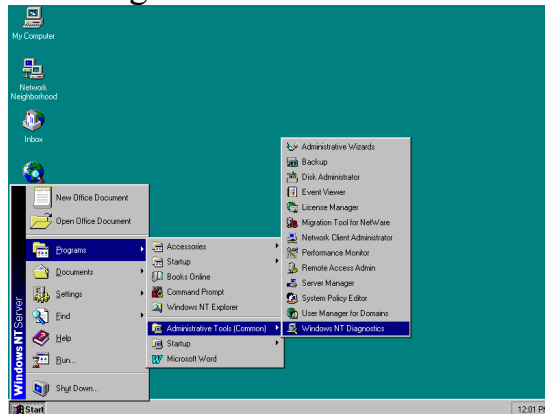
#### Step 3:

Click **【OK】** to reboot computer to load the new installed driver to NT.

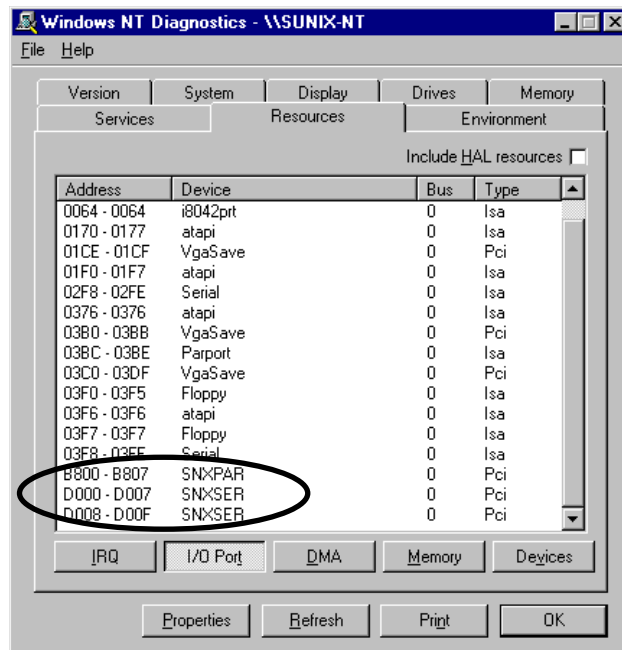


## 2. Check Your Windows NT 4.0 Installation

- Click **【 Start 】** → **【 Programs 】** → **【 Administrative Tools [Common] 】** → **【 Windows NT Diagnostics 】**

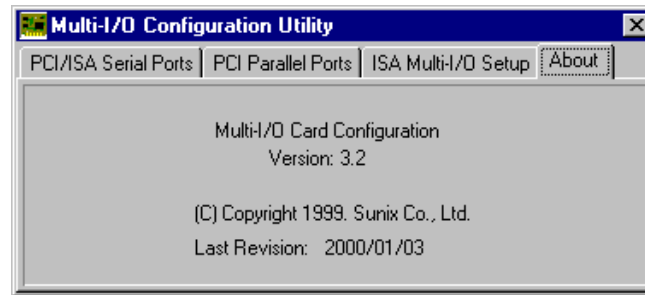
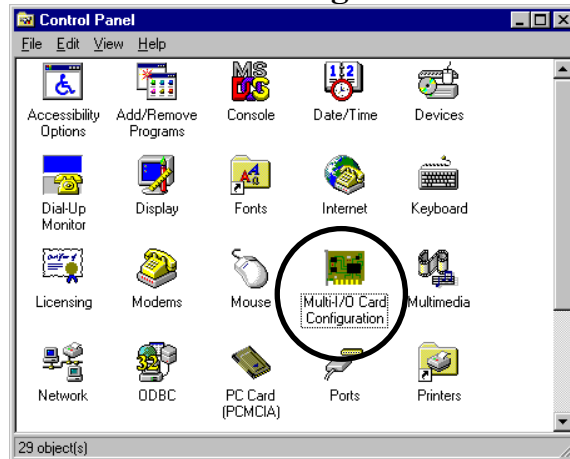


- Press Resources then press I/O port.  
You can find the I/O address of one parallel port (SNXPAR) and two serial ports (SNXSER).  
You can find the IRQ information by press **【 IRQ 】**.

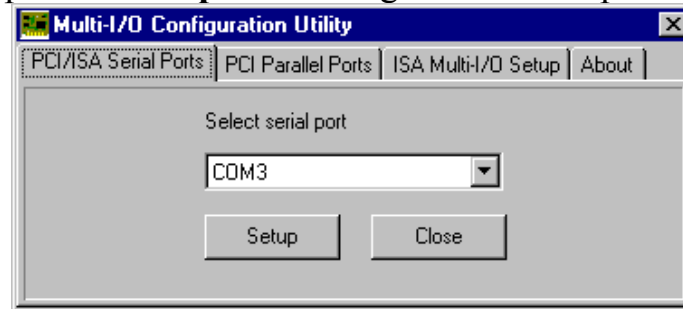


### 3. How to configure your PCI Multi I/O Card

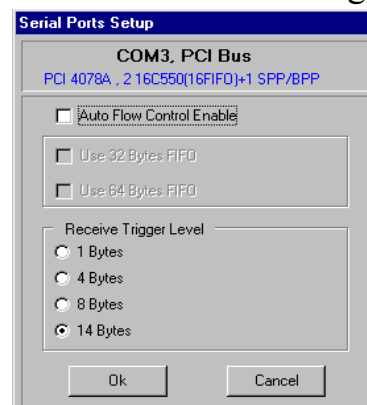
- Double click **Multi-I/O Card Configuration** icon.



- Press **【PCI/ISA Serial Ports】** and select the serial port you want to configure, press **【Setup】** to configure the serial port .



- Set the 32 byte FIFO or Auto Flow Control or Receive Trigger Level, click **【Ok】** .



If your card can support 32 (64) bytes FIFO, you can use 16 or 32 (or 64) bytes FIFO. The default value is Use 16 Byte FIFO buffers. If your card cannot support 32 (64) bytes FIFO, the Use 32 (32 and 64) Bytes FIFO will be shadowed.

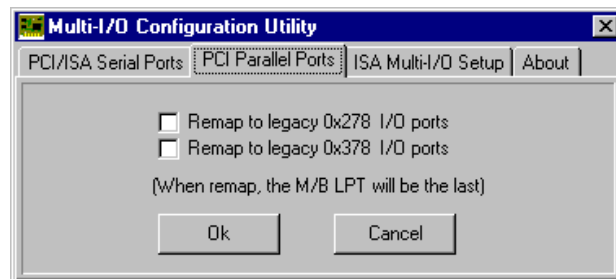
Auto Flow Control Enable means the CTS/RTS flow control is controlled by hardware automatically. System will be more stable if the function is enabled.

Set the Receive Trigger Level 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.

**Note:**

**If you stall the modem that is using auto detect by windows NT, the Auto Flow Control Enable shall be disabled.**

- Click PCI Parallel Ports to configure the I/O address of parallel port. Select Remap to legacy 0x378 and/or 0x278 I/O Ports, if you want to remap I/O address to 0x378 and/or 0x278. Click **【Ok】**.



- It will be set after reboot computer.

**Note:**

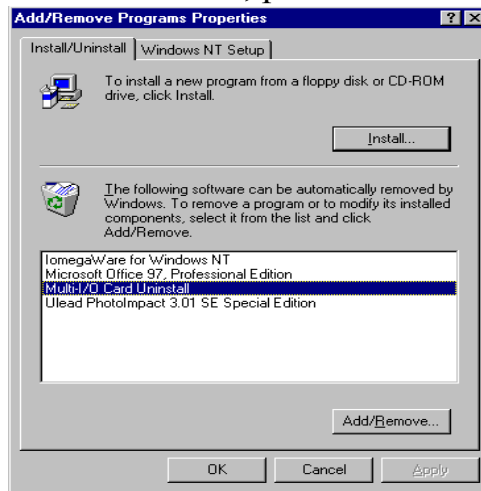
- 1. The on board parallel port is always LPT1 if the remap function is disabled. When the parallel port is remap to 0x378 or 0x278, the on board parallel port will become the last LPT port.**
- 2. When you connect the scanner to the remap parallel port, you must turn on the scanner before the computer.**

#### 4. Windows NT 4.0 Uninstall Guide

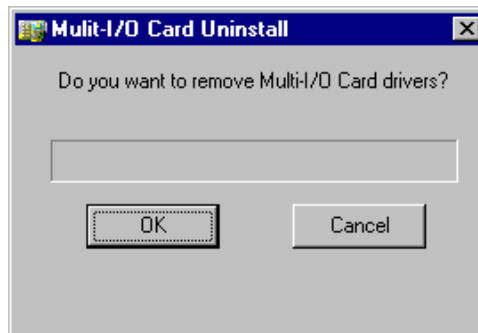
- Double click Add/Remove Programs in Control Panel.



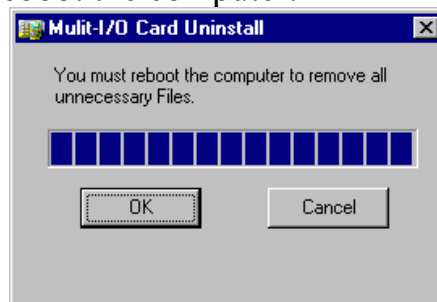
- Select Multi-I/O Card Uninstall, press **【Add/Remove】**.



- Press **【OK】** to remove Multi-I/O Card driver.



- Click **【OK】** to reboot the computer.





## ◆ *DOS*

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### **1. Installation Guide for PCI Serial / Parallel Ports**

This installation guide describes the procedures to install Sunix PCI serial / parallel ports in MS-DOS environment.

Normally serial and parallel I/O ports can be supported by BIOS call services in DOS environment. However there are only support 4 serial ports (3F8h,2F8h,3E8h,2E8h) and 3 parallel ports (3BCh/378h/278h) are supported by BIOS/DOS.

In case the Sunix PCI serial and parallel ports are different from the above configurations (e.g. I/O address or more than 4 serial ports / 3 parallel ports), they are not supported by BIOS/DOS directly. However some applications (e.g. "PComm Plus" could support 8 serial ports and each I/O address is settable) have their own driver, thus Sunix PCI cards could work correctly.

#### ***[DOS platform]***

- Microsoft DOS : V5.0/V6.0/ V6.22

#### ***[Installation Steps]***

##### **(1) Run Install.exe (from DOS driver disk)**

```
Please enter the directory path for
installation
C:\PCT DOS (return for
```

##### **(2) Enter the destination subdirectory**

You could enter your preferred destination subdirectory for installation, RETURN for default path. Once the dos driver has been installed successfully, the response looks like below.

```
succeed ...Press Any Key
```

Note:

1. The installation program will add the dos driver (one command line) "C:\Sunix\SunixPCI.exe AUTO" to autoexec.bat file. The original batch file will be saved to autoexec.SNX.
2. For uninstallation, just restore autoexec.snx into autoexec.bat.

### (3) Start the dos driver automatically

Once the installation is completed, Install.exe will start the dos driver (SunixPCI.exe) automatically. This means that it is not necessary to restart the system once again.

On-Board/ISA Serial COM1	3f8H		
On-Board/ISA Serial COM2	2f8H		
PCI Serial COM3 Remap	3e8H,IRQ	11	
PCI Serial COM4 Remap	2e8H,IRQ	11	
On-Board/ISA Parallel LPT1	3bcH		
PCI Parallel LPT2 Remap	378H,IRQ	11	
PCI Parallel LPT3 Remap	278H,IRQ	10	

Note : This display is dependent on which PCI card you have.

### (4) Check / inquire the Sunix PCI card information

You could run SunixPCI.exe any time to inquire the Sunix PCI serial and parallel port's I/O address & IRQ information.

ISA	PCI	Setup	Card	About
On-Board/ISA	Serial	COM1	3f8H	
On-Board/ISA	Serial	COM2	2f8H	
PCI	Serial	COM3 Remap	3e8H,IRQ	11
PCI	Serial	COM4 Remap	2e8H,IRQ	11
On-Board/ISA	Parallel	LPT1	3bcH	
PCI	Parallel	LPT2 Remap	378H,IRQ	11
PCI	Parallel	LPT3 Remap	278H,IRQ	10

**ESC: Exit**

ISA : Detect on-board/ISA legacy serial /parallel ports.  
 PCI : Find PCI serial /parallels ports.  
 Setup : Remap PCI serial port to legacy port / display port resources.  
 Card : Display Sunix PCI card model.  
 About : Version Information.

NOTE :

1. All Sunix PCI parallel ports are possible to be remapped to legacy I/O address (378h,278h), thus the DOS driver will start remapping function automatically if any one of legacy ports is free.
2. Since some Sunix PCI serial ports can support the remapping function (e.g. 4025D/4027D/4028D/4036D/4037D/4038D/4079D/E/F). thus please check it by "SETUP" in SunixPCI.exe utility.

Clock= 1.8432 Mhz for remapable port in DOS

Item	Actual Baudrate	BIOS/DOS setting	Remark
1	921600		Do not support
2	460800		Do not support
3	230400		Do not support
4	115200	115200	
5	57600	57600	
6	38400	38400	
7	19200	19200	
8	9600	9600	
9	4800	4800	
10	2400	2400	
11	1200	1200	
12	300	300	

3. Since Sunix PCI serial card are driven by a higher CLK (14.7456 Mhz), thus the actual baud rate is 8 times higher than the BIOS/DOS baud rate setting. The below table shows the relation.

Clock=14.7456 Mhz for all non-remapable port

Item	Actual Baud rate	BIOS/DOS setting	Remark
1	921600	115200	
2	460800	57600	
3	230400	28800	Non BIOS standard
4	115200	14400	Non BIOS standard
5	57600	7200	Non BIOS standard
6	38400	4800	
7	19200	2400	
8	9600	1200	
9	4800	600	Non BIOS standard
10	2400	300	
11	1200	150	
12	300	37.5	Non BIOS standard

## ◆ *WINDOWS 3.1*

---

### **1. Installation Guide for PCI Serial Ports**

This installation guide describes the procedures to install Sunix PCI serial / parallel ports in MS WINDOWS 3.1 environment.

Normally serial and parallel I/O ports can be supported by WINDOWS 3.1 default device driver. However there are only 4 serial ports (3F8h,2F8h, 3E8h,2E8h) and 3 parallel ports (3BCh/378h/278h) are supported by default.

Most likely the Sunix PCI serial ports are different from the above configuration (eg. I/O address or IRQ), these ports setting need to be changed / modified in WINDOWS 3.1 manually. However it is necessary to inquire these PCI serial and parallel ports's resources in advance.

#### ***[OS Platform]***

- Microsoft WINDOWS : V3.1/V3.11

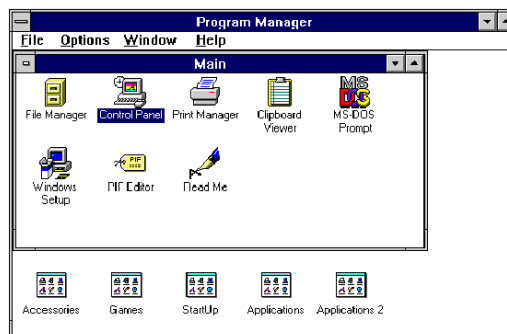
#### ***[Installation Steps]***

##### **(1) Inquire the PCI serial port resources (I/O address & IRQ) in DOS**

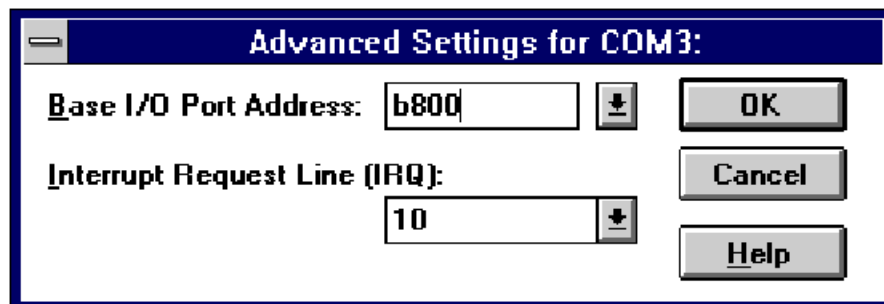
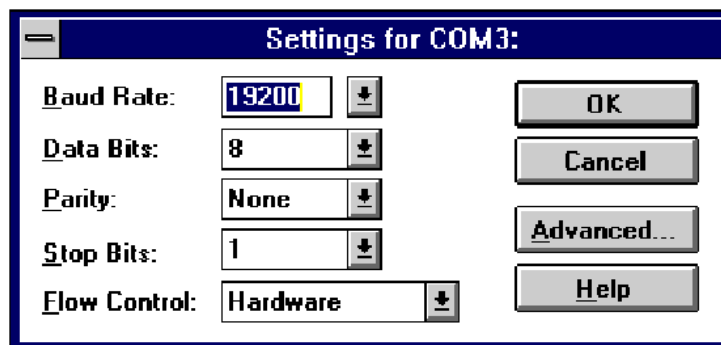
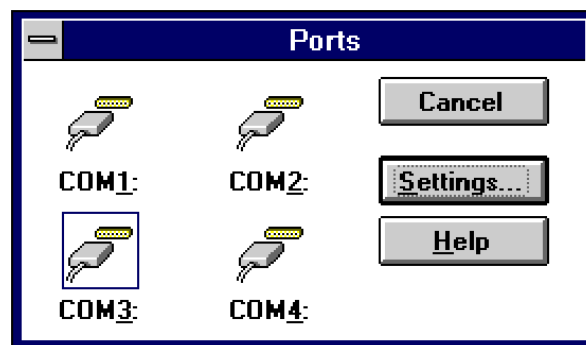
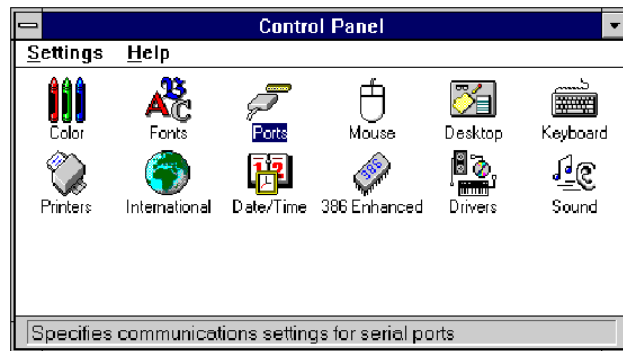
Run "C:\PCI\_DOS\SunixPCI.exe AUTO".

On-Board/ISA Serial COM1	3f8H	
On-Board/ISA Serial COM2	2f8H	
PCI Serial COM3	b800H,IRQ	10
PCI Serial COM4	b808H,IRQ	10
On-Board/ISA Parallel LPT1	3bcH	
PCI Parallel LPT2 Remap	378H,IRQ	10

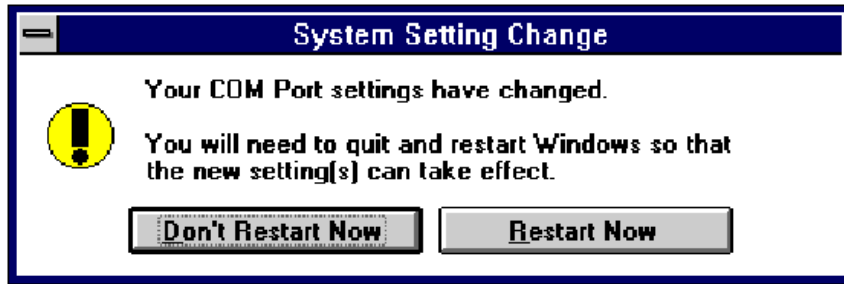
##### **(2) Start the WINDOWS 3.1**



### (3) Change the port setting in Control Panel

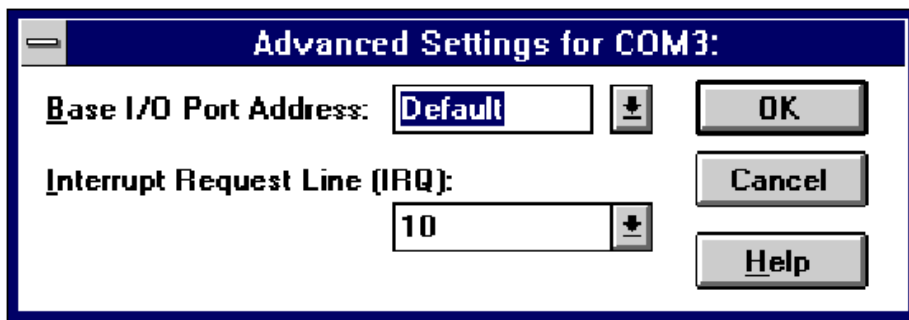


**(4) Restart the system**



**(5) Check the new setting**

After system restart, the I/O port setting maybe become DEFAULT.



At this time, it is possible to check the PCI serial port setting in \windows\system.ini file.

```
....  
....  
[386Enh]  
....  
....  
COM3Base=B800  
COM4Base=B808  
COM3Irq=10  
COM4Irq=10  
...
```

NOTE :

1. Since some Sunix PCI serial ports can support the remapping function (4025D/4027D/4028D/4036D/4037D/4038D/4079D/E/F), thus please check the Sunix PCI card by SunixPCI.exe utility.

Clock= 1.8432 Mhz for remapable port

Item	Actual Baudrate	BIOS/DOS setting	Remark
1	921600		Do not support
2	460800		Do not support
3	230400		Do not support
4	115200	115200	
5	57600	57600	
6	38400	38400	
7	19200	19200	
8	9600	9600	
9	4800	4800	
10	2400	2400	
11	1200	1200	
12	300	300	

2. Since Sunix PCI serial card are driven by a higher CLK (14.7456 Mhz), thus the actual baud rate is 8 times higher than the BIOS/DOS baud rate setting. The below table shows the relation.

Clock= 14.7456 Mhz for all non-remapable port

Item	Actual Baud rate	BIOS/DOS setting	Remark
1	921600	115200	
2	460800	57600	
3	230400	28800	Non BIOS standard
4	115200	14400	Non BIOS standard
5	57600	7200	Non BIOS standard
6	38400	4800	
7	19200	2400	
8	9600	1200	
9	4800	600	Non BIOS standard
10	2400	300	
11	1200	150	
12	300	37.5	Non BIOS standard

## 2. Installation Guide for PCI Parallel Ports

Since WINDOWS 3.1 only support 3 parallel port (3BCh, 378h,278h) by default device driver. Thus the Sunix PCI parallel ports can be recognized in WINDOWS 3.1 if the DOS driver is activated in advance.

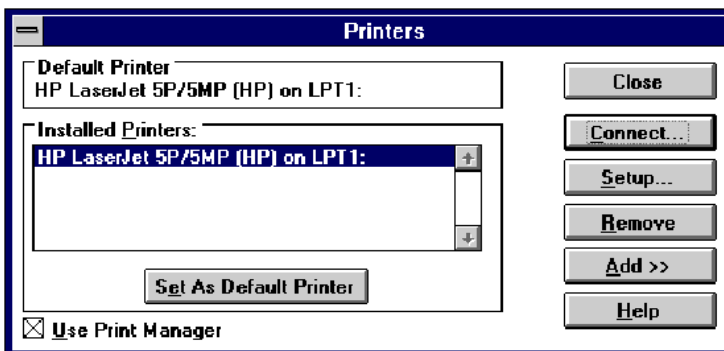
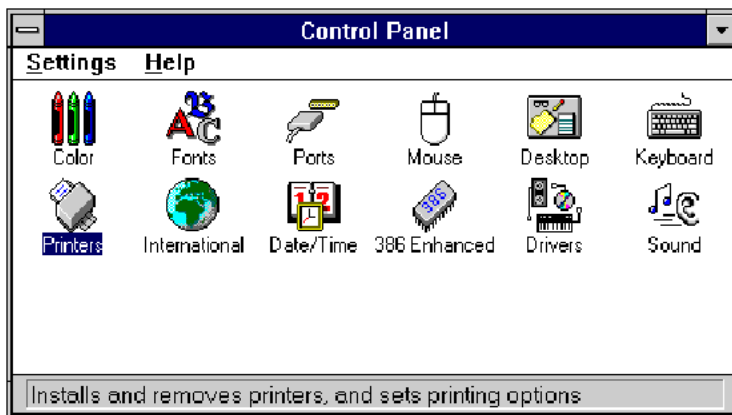
### [Installation Steps]

#### (1) Check the PCI parallel port resources in DOS

Run "C:\PCI\_DOS\SunixPCI.exe AUTO".

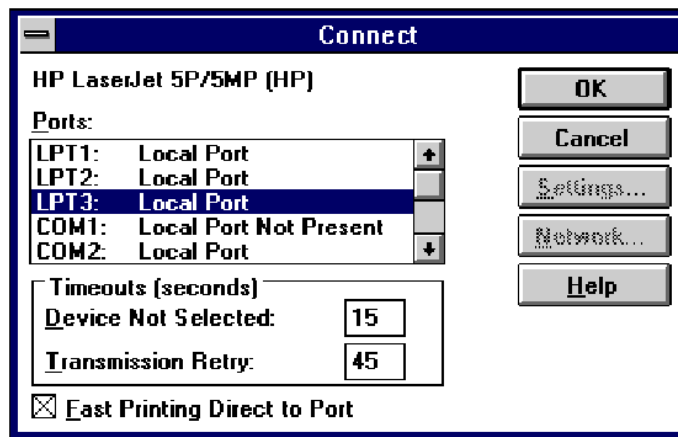
On-Board/ISA Serial COM1	3f8H		
On-Board/ISA Serial COM2	2f8H		
PCI Serial COM3	b800H,IRQ	10	
PCI Serial COM4	b808H,IRQ	10	
On-Board/ISA Parallel LPT1	3bcH		
PCI Parallel LPT2 Remap	378H,IRQ	10	
PCI Parallel LPT3 Remap	278H,IRQ	11	

#### (2) Install the Printer in Control Panel





### (3) Select Parallel Port for Printer Connection



#### NOTE :

1. All Sunix PCI parallel ports are possible to be remapped to legacy I/O address (378h,278h), thus the DOS driver will start remapping function automatically if any one of the legacy ports is free.
2. For the better compatibility, it is recommended that on-board LPT1 is set to 3BCh.

## ◆ *LINUX*

---

### **1. Installation Guide for PCI Serial Ports**

This installation guide describes the procedures to install SUNIX PCI serial ports in Linux platform.

#### ***[Linux Platform]***

- Operating System : RedHat V6.1/V6.0 (Kernel 2.2.x / 2.0.x)
- Terminal Emulation AP : minicom / xminicom
- Internet Dialer : Kppp

#### ***[Installation Steps]***

##### **(1) Find the available serial ports**

Since Linux only support 4 serial ports (ttyS0, ttyS1, ttyS2, ttyS3) under the default condition. Most likely, ttyS0 & ttyS1 are supported by mother board's built-in 16550 controllers and ttyS2 & ttyS3 are free for additional I/O card. (Note that ttyS2: S is upper case)

It could be checked by the following commands.

```
#setserial /dev/ttyS0 -a      (COM1)
#setserial /dev/ttyS1 -a      (COM2)
#setserial /dev/ttyS2 -a      (COM3)
#setserial /dev/ttyS3 -a      (COM4)
```

If COM1 is used by mouse, the response is similar to

```
/dev/ttyS0 : Device or resource busy
```

If the COM1 does not attach any device, the response is similar to

```
/dev/ttyS0, Line 0, UART: 16550A, Port: 0x3f8, irq: 4
  Baud_base: 115200, clos_delay: 50, divisor: 0
  closing_wait: 3000, closing_wait2: infinite
  Flags: spd_normal skip_test
```

In case ttyS2 (COM3) is free, the response for command # **setserial /dev/ttyS2 -a** is shown below.

```
/dev/ttyS2, Line 2, UART: unknown, Port: 0x3e8, irq: 4  
Baud_base: 115200, clos_delay: 50, divisor: 0  
closing_wait: 3000, closing_wait2: infinite  
Flags: spd_normal skip_test  
      (note that UART: unknown)
```

In case ttyS3 (COM4) is free, the response for command # **setserial /dev/ttyS3 -a** is shown below.

```
/dev/ttyS3, Line 3, UART: unknown, Port: 0x2e8, irq: 3  
Baud_base: 115200, clos_delay: 50, divisor: 0  
closing_wait: 3000, closing_wait2: infinite  
Flags: spd_normal skip_test  
      (note that UART: unknown)
```

Finally, the /dev/ttyS2 & /dev/ttyS3 are free for PCI serial ports.

## **(2) Find the PCI card resource ( IO port address & IRQ) for the serial ports**

Please enter the command "**#more /proc/pci**".

The response is similar to the following

```
.....  
.....  
Bus 0, Device 11, function 0:  
      ^^  
Serial controller : Unknown vendor Unknown device (rev 1).  
Vendor id=1409, Device id=7168  
Medium devsel. Fast back-to-back capable. IRQ 10  
                                          ^^  
I/O at 0xef80 [0xef81]  
      ^^^^  ^^^^
```

.....  
(note : ^^ means it could be different from the above.  
They are varied with the different PC.)

From the /proc/pci file, it is possible to find the PCI card's IO port address and IRQ. Especially, the SUNIX card always shows

"Vendor id=1409, Device id=7168".

### **(3) Configure the parameters for ttyS2 & ttyS3**

for SUNIX 4025A card (PCI 1S), please enter (if ttyS2 is free)

```
# setserial /dev/ttyS2 port 0xef80 UART 16550A
    irq 10 Baud_base 921600
```

for SUNIX 4036A card (PCI 2S), please enter (if ttyS2 & ttyS3 are free)

```
# setserial /dev/ttyS2 port 0xef80 UART 16550A
    irq 10 Baud_base 921600
# setserial /dev/ttyS3 port 0xef88 UART 16550A
    irq 10 Baud_base 921600
```

### **(4) Check the setting for ttyS2 & ttyS3**

Please enter `# setserial /dev/ttyS2 -a`  
The response look likes below

```
/dev/ttyS2, Line 2, UART: 16550A, Port: 0xef80, irq: 10
    Baud_base: 921600, clos_delay: 50, divisor: 0
    closing_wait: 3000, closing_wait2: infinite
    Flags: spd_normal skip_test
```

### **(5) Then the ttyS2 & ttyS3 are ready for application** (eg. minicom -s or xminicom -s or Kppp ...)

**(6) In case more than 4 serial ports are needed**

If there are more than 4 serial ports to be supported by Linux system, (e.g. Sunix 4055A/4056A/4065A/4066A/4095A/4096A cards) the first step is to add more tty device nodes into system.

**Inquire the system tty device nodes,**

```
#ls -al /dev/ttyS*
crw----- 1 root tty 4, 64 Jan 8 11:40 /dev/ttyS0
crw----- 1 root tty 4, 65 Jan 8 11:40 /dev/ttyS1
crw----- 1 root tty 4, 66 Jan 8 11:40 /dev/ttyS2
crw----- 1 root tty 4, 67 Jan 8 11:40 /dev/ttyS3
```

**Add tty device node one by one**

```
#mknod /dev/ttyS4 c 4 68 (for ttyS4)
#mknod /dev/ttyS5 c 4 69 (for ttyS5)
#mknod /dev/ttyS6 c 4 70 (for ttyS6)
#mknod /dev/ttyS7 c 4 71 (for ttyS7)
```

.....

Please add all tty device nodes accordingly

**Configure the parameters for all new ttyS\***

Please repeat step (2) (3) (4) to inquire and change the I/O address for each tty device. Because all the new added tty device nodes are still invalid by default.

For PCI 4S card (4055A/4056A), it allocate **2** I/O resources. You could inquire it according to step(2). E.g.

```
# more /proc/pci
```

.....

Vendor id=1409, Device id=7168  
Medium devsel. Fast back-to-back capable. IRQ 10

I/O at 0xd000 [0xd001] → 1st port=0xd000, 2<sup>nd</sup> port=0xd008  
I/O at 0xb800 [0xb801] → 3<sup>rd</sup> port=0xb800, 4<sup>th</sup> port=0xb808

For PCI 8S card (4065A/4066A), it allocate **6** I/O resources. You also need to inquire its allocated address

```
# more /proc/pci
```

```
.....  
Vendor id=1409, Device id=7168  
Medium devsel. Fast back-to-back capable. IRQ 10
```

^^

```
I/O at 0xd000 [0xd001] → 1st port=0xd000, 2nd port=0xd008  
I/O at 0xb800 [0xb801] → 3rd port=0xb800, 4th port=0xb808  
I/O at 0xb400 [0xb401] → 5th port=0xb400  
I/O at 0xb000 [0xb001] → 6th port=0xb000  
I/O at 0xa800 [0xa801] → 7th port=0xa800  
I/O at 0xa400 [0xa401] → 8th port=0xa400
```

### Re-Inquire the system tty device nodes,

```
#ls -al /dev/ttyS*
```

```
crw----- 1 root tty 4, 64 Jan 8 11:40  
/dev/ttyS0  
crw----- 1 root tty 4, 65 Jan 8 11:40  
/dev/ttyS1  
crw----- 1 root tty 4, 66 Jan 8 11:40  
/dev/ttyS2  
crw----- 1 root tty 4, 67 Jan 8 11:40  
/dev/ttyS3  
crw-r--r-- 1 root root 4, 68 Jan 18 11:40  
/dev/ttyS4  
crw-r--r-- 1 root root 4, 69 Jan 18 11:40  
/dev/ttyS5  
crw-r--r-- 1 root root 4, 70 Jan 18 11:40  
/dev/ttyS6  
crw-r--r-- 1 root root 4, 71 Jan 18 11:40  
/dev/ttyS7
```

```
.....
```

### Important Notes :

- (1) Since all serial ports on Sunix PCI card are using only one interrupt pin, you must set them the same IRQ number with **setserial** command.

(2) Un-installation,  
e.g. #rm /dev/ttyS4 (remove ttyS4 device)

## 2. Installation Guide for PCI Parallel Ports

This installation guide describes the procedure to install SUNIX PCI parallel ports in Linux platform.

### *[Linux Platform]*

- Operation System: RedHat V6.1/V6.0 (Kernel 2.2.x / 2.0.x)
- "AnotherLevel menu -> administration -> printtool" in X windows.

### *[Installation steps]*

Linux kernel provide a 'parport' code to support parallel port (/dev/lp0, /dev/lp1, /dev/lp2). This code provides the ability to share one port between multiple devices. And it is loadable when kernel is running.

The 'parport' code is split into two parts : generic (which deals with port sharing) and architecture-dependent eg. X86, SPARC. (which deals with actually using the port). Thus, please take the following steps to install 'parport' module!

#### **(1) Check the on-board parallel port's hardware resources**

Most likely each motherboard has one built-in parallel port. And its hardware resources are settable with BIOS utility.

(for example, on-board parallel is in 0x378 port, IRQ=7 )

#### **(2) Find the PCI resource ( IO port address & IRQ) for the parallel ports**

please enter the command "# more /proc/pci"

The response will look like the following

.....  
.....

**Bus 0, Device 11, function 0:**

^^





- file path. (it is varied with the different kernel version)
2. For the detailed description, please refer to /Documentation /parport.txt in Linux kernel

#### **(4) Check the attached printer device [optional]**

once the architecture-dependent part of the parport code is loaded into the kernel. You could enter the following command

```
# insmod parport_proble.o
```

to check any attached devices and log a message similar to

```
parport0: Printer, BJC-210 (Canon)
```

#### **(5) Then /dev/lp0, /dev/lp1 and /dev/lp2 are ready for service**

Now parallel port is available, please connect a correct type of printer for your printing applications.

(eg. AnotherLevel menu -> administration -> printtool in X windows)

Note :

1. Type "**# cat /dev/printcap**" to inquire the printer connection.
2. It's possible to print a text file to the printer for verification  
(**#lpr -Pprinter\_name textfile\_name**)

#### **(6) In case more than 3 parallel ports ( eg. /dev/lp3, /dev/lp4 ...) are needed for service**

Please get the root privilege and enter the following command

```
#mknod /dev/lp3 6 3  
#chmod 660 /dev/lp3  
#chgrp daemon /dev/lp3  
→to add /dev/lp3 into kernel
```

```
#mknod /dev/lp4 6 4
#chmod 660 /dev/lp4
#chgrp daemon /dev/lp4
→to add /dev/lp4 into kernel
```

```
.....
.....
```

then please enter the following command to check /dev/lp devices

```
#ls -al /dev/lp*
crwxrwxrwx 1 root daemon 6, 0 may 5 1998
/dev/lp0
crwxrwxrwx 1 root daemon 6, 1 may 5 1998
/dev/lp1
crwxrwxrwx 1 root daemon 6, 2 may 5 1998
/dev/lp2
crwxrwxrwx 1 root daemon 6, 3 dec 9 1999
/dev/lp3
crwxrwxrwx 1 root daemon 6, 4 dec 9 1999
/dev/lp4
```

and then repeat step (3) to load parport module for /dev/lp\*.

**Note :** #rm /dev/lp3 to remove it

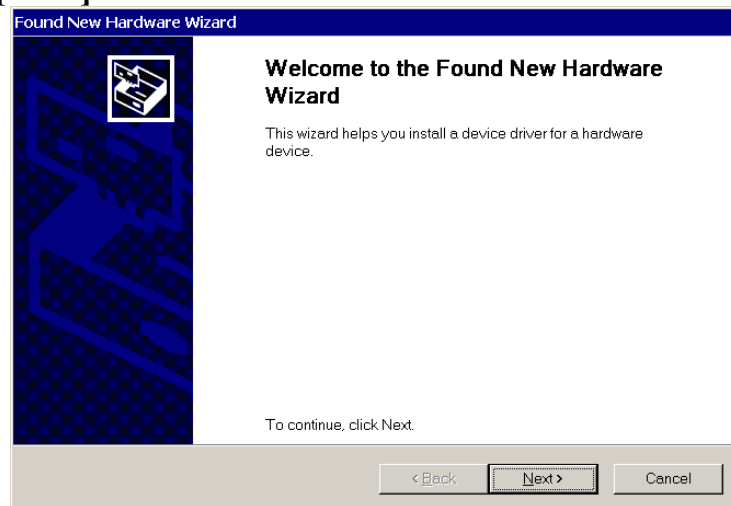
## ◆ Windows 2000

### 1. Windows 2000 Driver Installation Guide

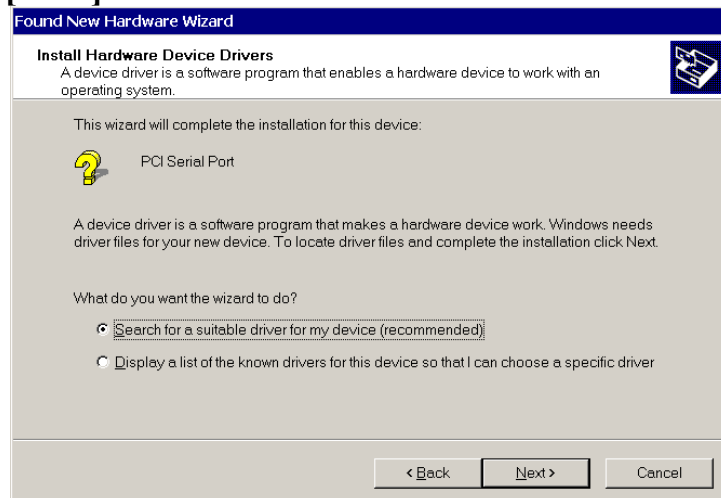
- After running the Windows 2000, Windows 2000 will find a “**PCI Serial Port**” or “**PCI Parallel Port**” installed in your computer and need new drivers to support this hardware.



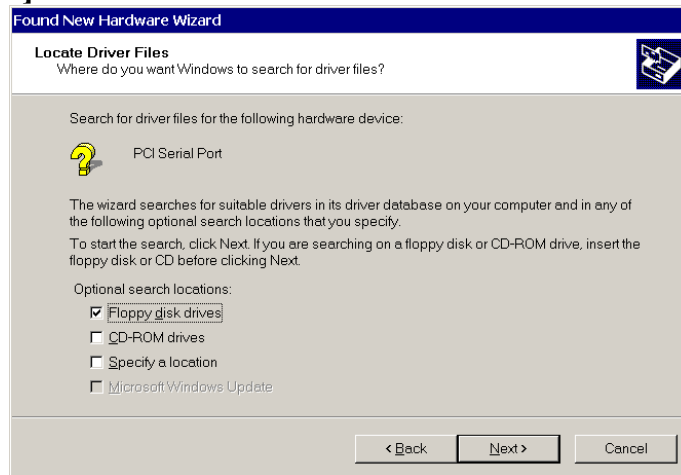
- Click [**Next**].



- Select “Search for a suitable driver for my device (recommended)” and click [**Next**].



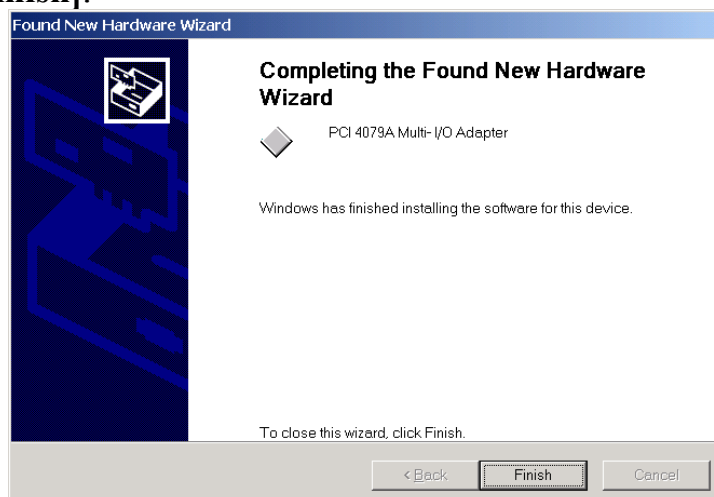
- Please insert the driver disk and select the driver location.  
Click **[Next]**.



- Click **[Next]**.  
Windows 2000 will install PCI multi I/O card driver to your computer.

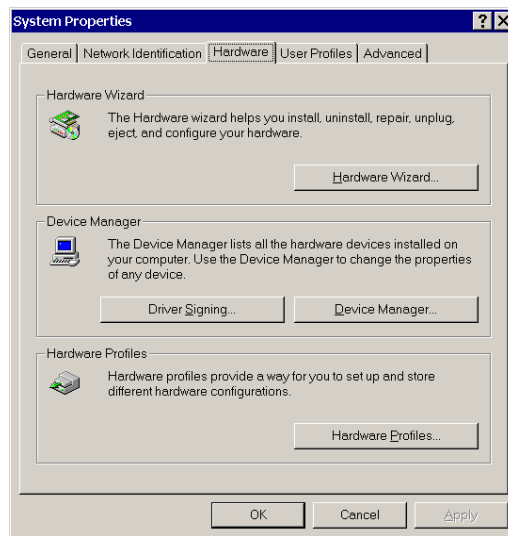


- Click **[Finish]**.

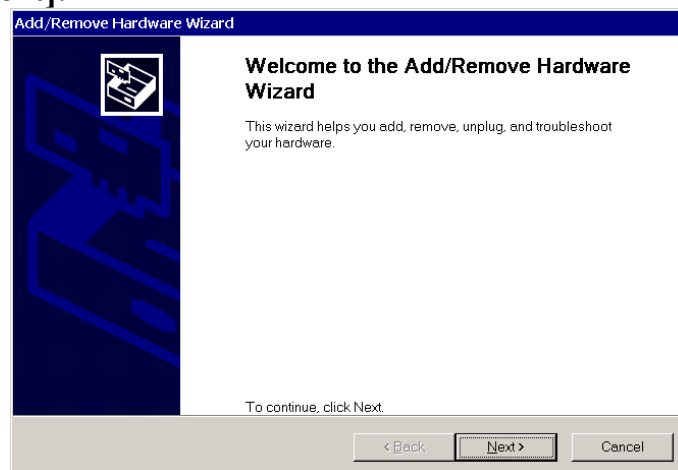


## 2. Windows 2000 uninstall guide

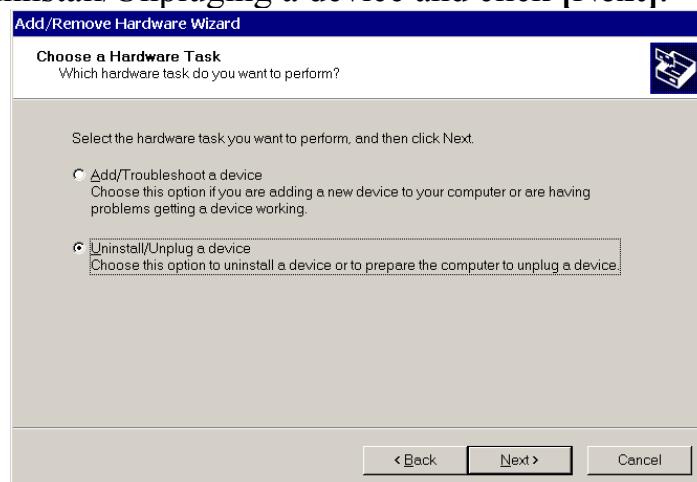
- Click the “Hardware Wizard” in “Hardware” of System Properties.



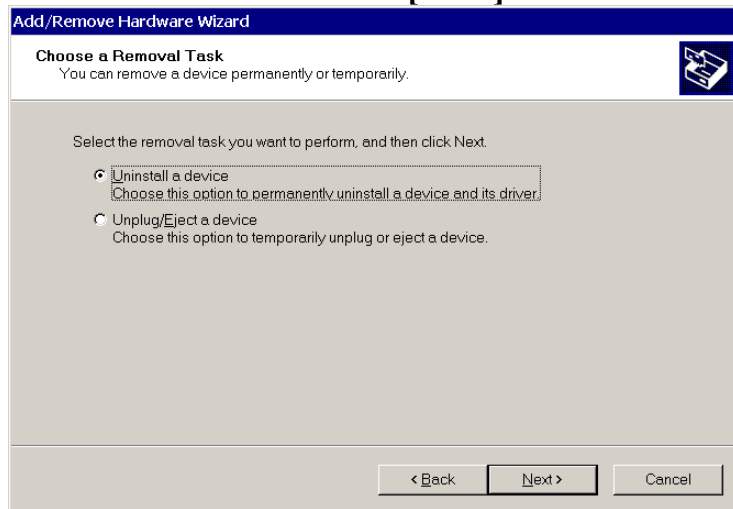
- Click [Next].



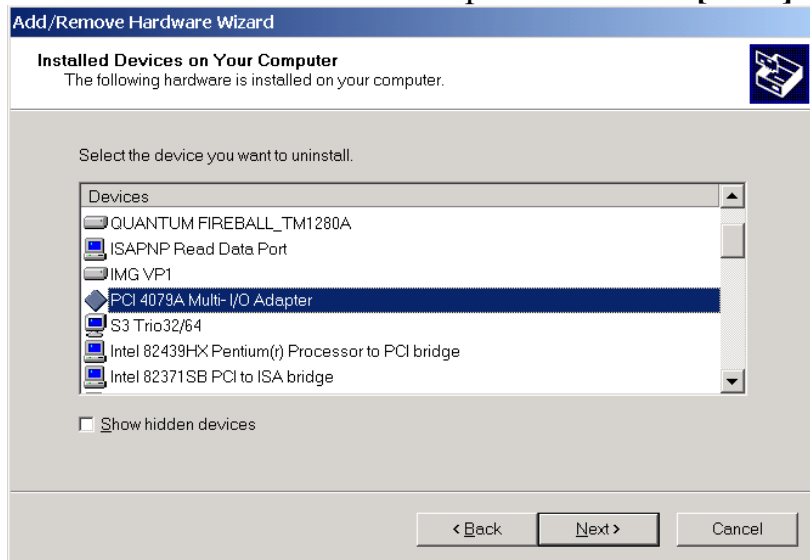
- Select “Uninstall/Unplugging a device and click [Next].



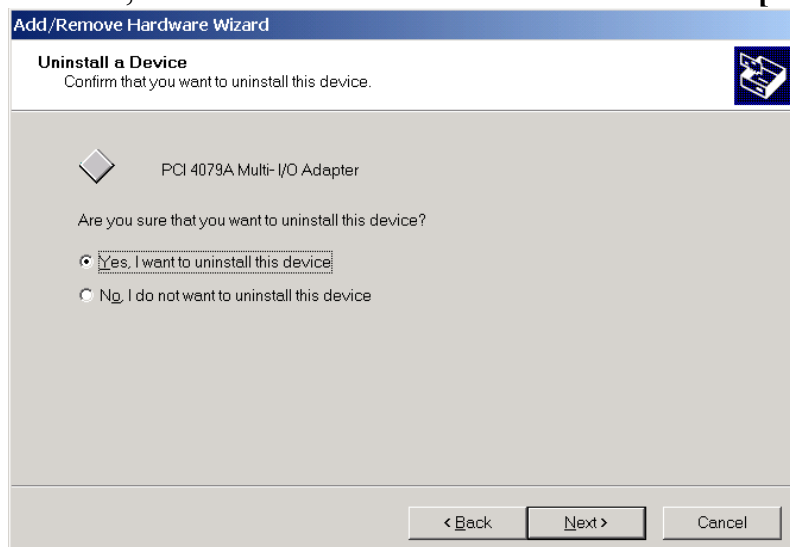
- Select “Uninstall a device and click [Next].



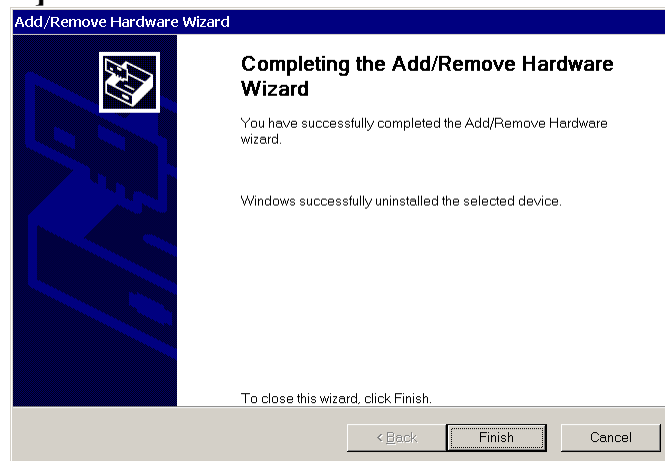
- Select the “PCI 4079A Multi I/O Adapter” and click [Next].



- Select the “Yes, I want to uninstall this device” and click [Next].



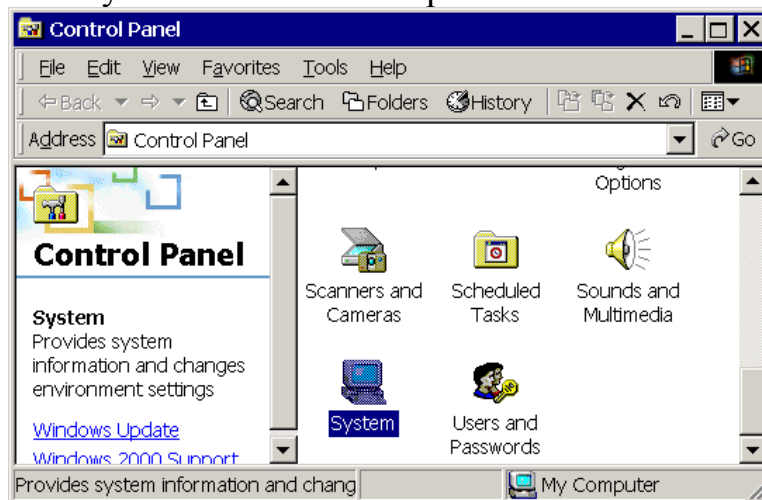
➤ Click [Finish].



### 3. How to check your Win2000 installation

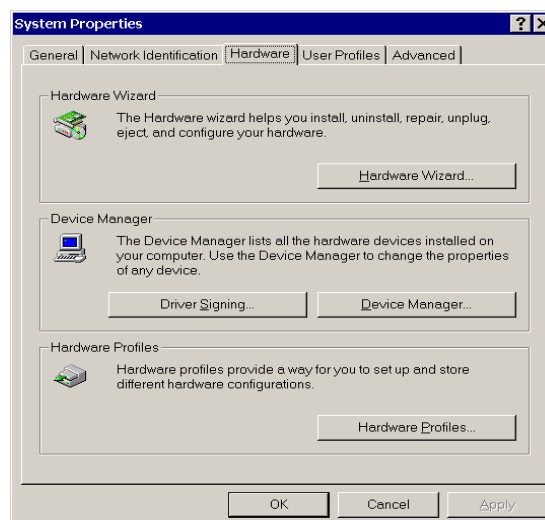
#### Step 1:

Double click the System icon in control panel.



#### Step 2:

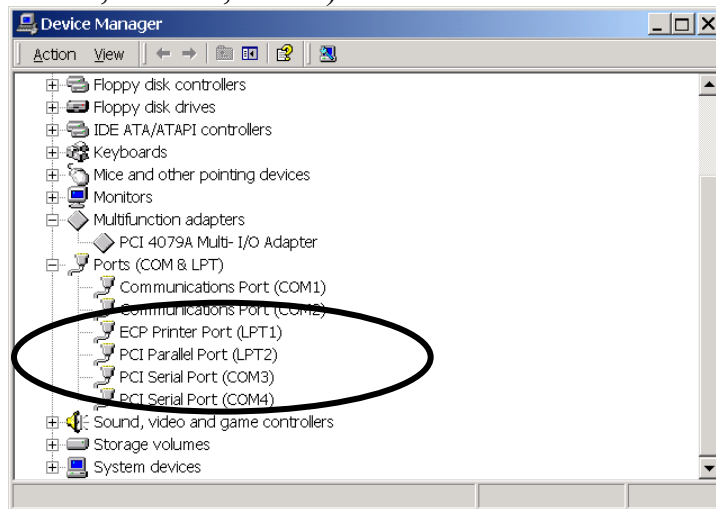
Select the “Hardware” in system properties and click the “Device Manager”.



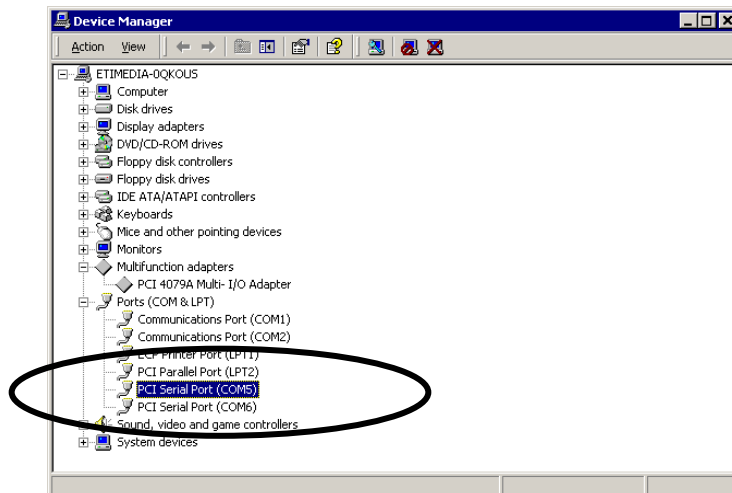


### Step 3:

After install PCI multi I/O card (for example 4079A), you will find three ports added (COM3, COM4, LPT2).



Note: Sometimes you may find the PCI serial port does not locate just behind the on board Communication Port. It may happen as following. The COM3 and COM4 are not used.



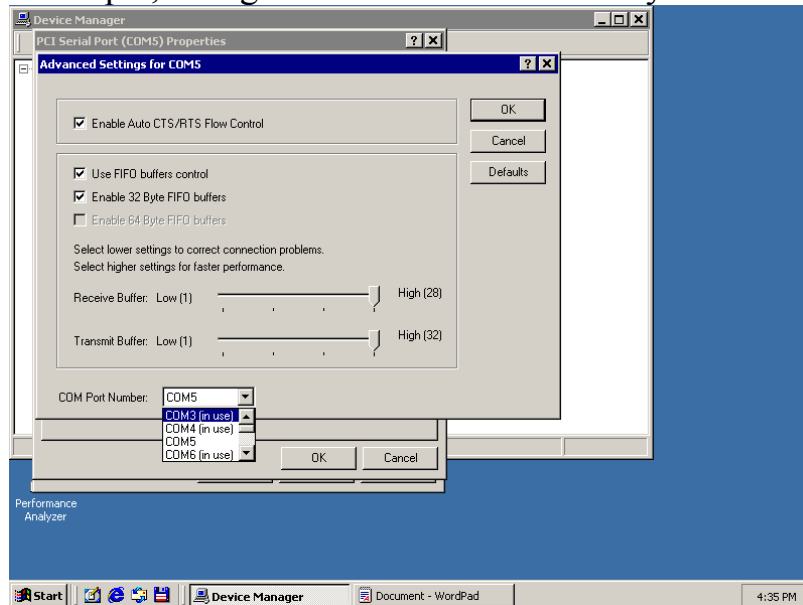
This problem is caused from the following reasons.

- When you plug the installed PCI card to another PCI slot without un-installing and re-installing the driver.
- When you remove the installed PCI card and installed a different PCI card without un-installing and re-installing the driver.

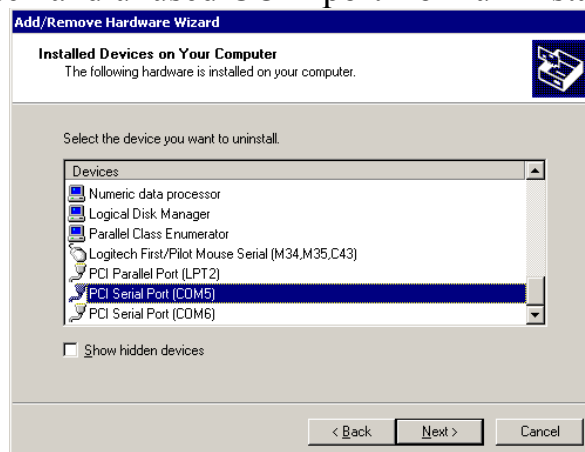
There are three methods to solve this problem.

1. When you want to remove or change the PCI card, please un-install the driver first.

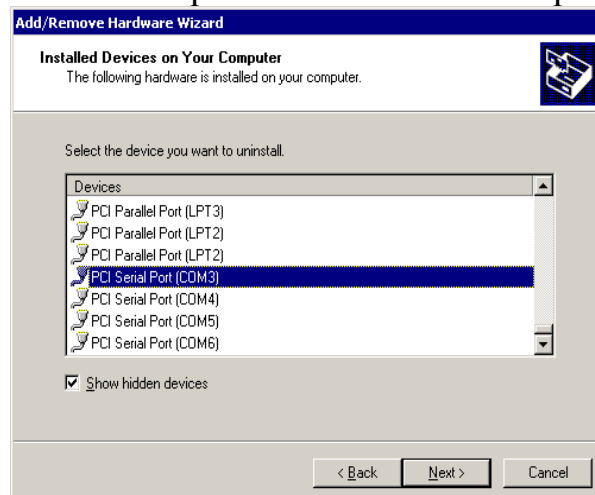
2. Change the individual COM port number in Advanced Setting for COM port. For example, change the COM5 to the actually unused COM3 port.



3. Delete the hidden and unused COM port from un-installing a device.



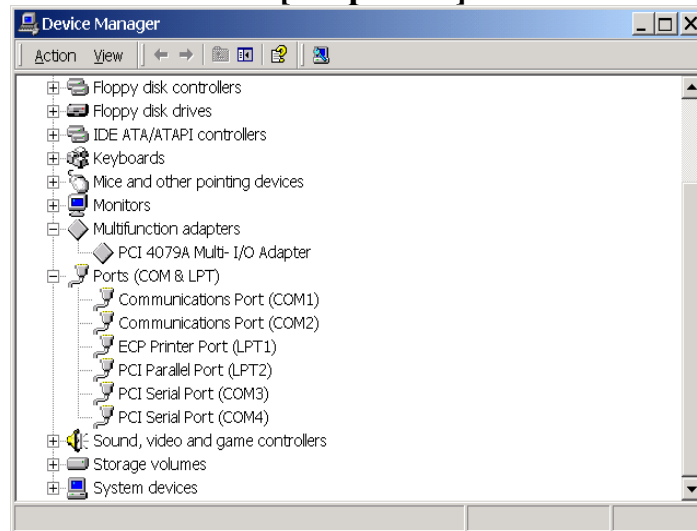
- Click the “Show hidden devices”, You will find all COM ports. Please remove the driver and all COM ports and re-install the driver. You will find the continuous COM port index for the COM ports.



## 4. How to Configure COM port

### Step 1:

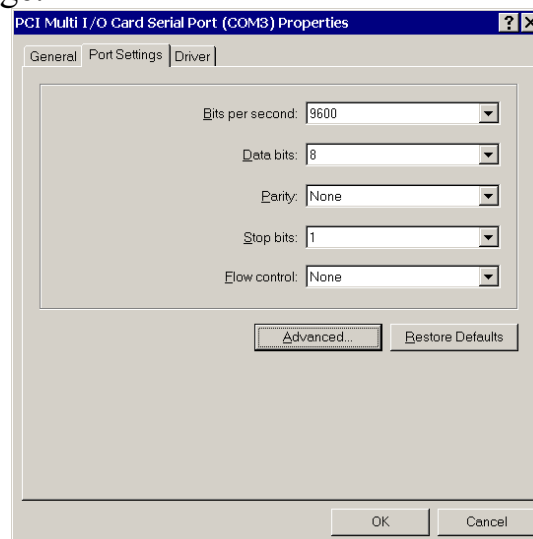
Select the PCI Serial Port you want to configure for example COM3.  
Press the right button and select **[Properties]**.



### Step 2:

Click the **[Port Settings]**.

Configure the Bits per second, Data bits, Parity, Stop bits and Flow control if you want to change.

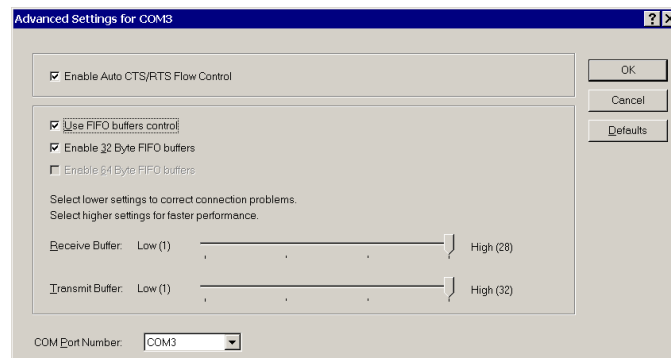


There are three kinds of flow control: Xon/Xoff, Hardware and None. The Xon/Xoff is using software protocol. The Hardware means the flow control is using RTS/CTS, but the RTS/CTS is controlled by software. The None means there is no flow control.

Click the [Advanced] if you want to set more advanced features.

### Step 3:

Configure the **Enable Auto CTS/RTS Flow Control**, **16/32/64 bytes FIFO length**, and **Receive/Transmit Buffer trigger level** if you want to change.



Enable Auto CTS/RTS Flow Control means the CTS/RTS flow control is controlled by hardware automatically. System will be more stable if the function is enabled.

If your card can support 32 bytes FIFO, you can use 16 or 32 bytes FIFO. The default value is Use 16 Byte FIFO buffers. If your card cannot support 32 bytes FIFO, the Enable 32 Byte FIFO buffers will be shadowed.

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.

If you want to change the COM port index, please select from “COM Port Number” and choose the new index that is not in use.