

# **PCIPORT Card**

## **Owner's Manual**

**Support : DOS library**

**Windows 95/98/Me**

**Windows NT**

**Windows 2000**

**Windows XP/2003**

**Linux**

**SCO OpenServer**

# TWIN232

Industrial Ground Isolated  
RS232 to  
RS232,RS422,RS485 Suite

**One Box to meet both requirement**

**Safety for local and remote connection**

**Powerful and Flexible for serial device**



- ★ One set RS232 to RS232 isolator
- ★ One set RS232 to RS422 converter
- ★ One set RS232 to RS485 converter
- ★ Fully Ground Isolated Function
- ★ Auto Data Direction Control on RS485
- ★ Support RTS/CTS handshake on RS422
- ★ Support screw terminal and DC power adapter
- ★ Wide VDC range suitable for 12V and 24V environment
- ★ All function and Feature set by DIP switch
- ★ RS232 data transmission LED indicator

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-----Chapter 1-----

Introduction

1-1. An introduction to the PCIPORT card

P588, P588U, P8485U, P588U4 card are enhanced eight ports card. P584, P584U, P485, P485U, P514U, P524U, P534U, P984/P985/P924 are enhanced four ports card. P232, P220/P422/I/S card are enhanced two ports card. PCIPORT card are suitable to PC AT with PCI bus machine. PCIPORT card can reduce the interval for serial communication controller to interrupt main CPU (MPU) on the mainboard to improve the whole system performance.

The eight ports card is made up of two parts:

1) PCIPORT interface card:

PCIPORT interface card includes an PGA to support the serial communication controller and a 62 pin connector to connect external I/O port.

2) Expansion cable:

This expansion cable have eight standard DB25/DB9 connectors and one DB62 connector to connect PCIPORT interface card. User may use one DB62 to DB62 cable to connect between one PCIPORT card and RS4232-8 box.

The four ports card is made up of two parts:

1) PCIPORT interface card:

PCIPORT interface card includes an PGA to support the serial communication controller and a 37 pin connector to connect external I/O port.

2) Expansion cable:

This expansion cable have four standard DB25/DB9 connectors and one DB37 connector to connect PCIPORT interface card. User may use one DB37 to DB37 cable to connect between one PCIPORT card and RS4232-4 box.

For a PC AT Windows NT/95/98/2000/XP/2003 system, we can install up 2 pcs PCIPORT eight/four port card to support up to 16 or 8 users and 4 pcs P422/I/S card to support upto 8 users.

Traditionally, serial communication controller will interrupt MPU character by character. This action will waste MPU processing time and drop the system computation power. If the MPU is processing some non-interrupted task, then serial controller may be overrun and data lost. PCIPORT card can support 16 bytes buffer capability in each port's transmit and receive channel simultaneously. This capability will reduce the number of interrupt to MPU and increase the non-interrupted task's interval.

1-2. Hardware specification

\*serial communication controller:

16C550A compatible.

1.8432MHz crystal. (can be used upto 14.7456MHz)

\*I/O Port: ---- RS232C compatible. (P584/P584U/P588/P588U/P984/P232 card)  
RS422/485 compatible. (P422N/P485U/P924/P8485U/P524U card)  
RS422 compatible. (P985 card)  
isolated RS422/RS485 interface. (P485/P422I card  
or P588 card with RS4232-8 box)  
isolated RS232/RS422/RS485 interface. (P584/P584U/P984  
card with RS4232-4 box)

NOTE: P422N card can support RS422/485 interface for each port by jumper.  
P422I will support isolated RS422/485 interface.  
P422IS will support extra surge protector in RS422/485 interface.  
P924 will support two RS232 and two RS422/485 port.

\*Interrupt Control: ----- Plug & Play to be assigned by PCI BIOS. Each card  
must have one IRQ to be assigned. But multi-card  
can share the same IRQ.

\*I/O map: ----- Plug & Play to be assigned by PCI BIOS.

NOTE: Some operating system and software may assign I/O map for LAN card  
later and conflict with PCIPORT card's I/O address assigned by PCI  
BIOS. User may need to change the slot for PCIPORT card to have  
different I/O address assigned by PCI BIOS.

\*Flow control --- Xon/Xoff control or RTS/CTS control.

\*Baud Rate:

can be software programmable upto 115.2KBps for 1.8432MHz  
crystal or 921.6KBps for 14.7456MHz crystal.

\*Connector ----- Expansion cable can support DB25/DB9 male connectors.

P588/P588U/P5168U/P8485U card: DB62 female connector.

P584/P584U/P485/P485U/P984/P985/P924 card: DB37 female connector.

P232 and P422I/P422N card: two DB9 male connector.

\*Environment ----- PC/AT with 5V or 3.3V 33MHz PCI bus machine.

NOTE: only Universal PCIPORT card support 3.3V PCI slot.

1-3 Software specification:

\*Operating system -----can support

Windows 2000/XP/2003

Windows NT

Windows 95/98/Me

DOS

LINUX

SCO OpenServer

other operating system

NOTE: All the software for P588U/P588U4/P8485U card is same as P588 card.  
The difference for P8485U/P588U4 card and P588 card is serial port's  
interface type.

All the software for P485/P485U/P584U/P524U card is same as P584 card.  
The difference for P485/P485U card and P584 card is serial port's  
interface only or connector type. All the software for P232/P422/I/S  
card are same as P220 card. We will use P220 software to represent  
P220/P232/P422/I/S card usage.

All the software for P985/P924 card is same as P984 card. The  
difference for P984 card and P985/P924 card is serial port's  
interface only.

## Chapter 2. Configuring the Hardware

### 2-1 System components

An P588/P588U/P588U4/P8485U card system includes following components:

- \*One P588/P588U/P588U4/P8485U PCI interface card.
- \*One 62pin Expansion Cable to support eight DB25/DB9 male connector.
  - R801 cable is used for DB62 male to eight DB25 male connector.
  - R804 cable is used for DB62 male to eight DB9 male connector.
  - R802 cable is used for DB62 male to eight DB25 female connector.
- \*One R803 (DB62 male to DB62 male) cable with RS4232-8 box.  
(option for P588/P588U/P5168U card).
- \*User manual.

An P584/P485/P984/P985/P924/P584U/P485U/P524U card system includes following components:

- \*One P584/P485/P984/P985/P924/P584U/P485U/P524U PCI interface card.
- \*One 37pin Expansion Cable to support four DB25/DB9 male connector.
  - A400 cable is used for DB37 male to four DB25 male connector.
  - P485 cable is used for DB37 male to four DB9 male connector.
- \*One A640 (DB37 male to DB37 female) cable with RS4232-4 box.  
(option for P584/P984/P584U card).
- \*User manual.

### 2-2 Installation Procedures

One PCIPORT card needs a 5V or 3.3V 33MHz PCI system expansion slot.

NOTE: Only Universal type PCIPORT card support 3.3V PCI system

The installation procedures are as follows:

- (1) Turn off the power switch of your system
- (2) check the jumper to select the proper card number assigned.
- (3) Plug the PCIPORT card to system expansion slot.
- (4) Connect the 62pin(37pin) cable to P588(P584/P485) interface card.
- (5) Turn on the system power.
- (7) Start up the operating system
- (8) execute the PCIPORT card software installation procedure.

WARNING: You should not insert or remove the PCIPORT card from the system while power is on.

### 2-3 Hardware Configuration

\*In PCIPORT card we have following jumpers to set

- (1) JP1:  
This jumper is used to select the card number assigned. This jumper is ON for 1'st card. This jumper is OFF for 2'nd card. (default ON)

### 2-4 Serial I/O port connection:

- (1) P584/P584U/P984 card:
  - Support four RS232 interface port.
  - Pin definition for DB37 female connector is in Appendix A-2.
  - Pin definition for DB25 male connector is in Appendix A-3.
  - Pin definition for DB9 male connector is in Appendix A-4.
- (2) P485/P485U card:
  - Support four RS422/485 interface port.
  - Each port can be set to RS422 or RS485 interface by DIP switch. see pin definition for connector in Appendix A.

- (3) P985 card:  
Support four RS422 interface port.
- (4) P924/P524U card:  
Support two RS232 interface in port A & B and two RS422/485 interface in port C & D.  
port C & D can be set to RS422 or RS485 interface by jumper.  
see pin definition for connector in Appendix A.
- (5) P514U card:  
Support three RS232 interface in port A & B & C and one RS422/485 interface in port D.  
port D can be set to RS422 or RS485 interface by jumper.  
see pin definition for connector in Appendix A.
- (6) P534U card:  
Support one RS232 interface in port A and three RS422/485 interface in port B & C & D.  
port B & C & D can be set to RS422 or RS485 interface by jumper.  
see pin definition for connector in Appendix A.
- (7) P588/P588U/P5168U card:  
Support eight RS232 interface port.  
Pin definition for DB62 female connector is in Appendix A-1.  
Pin definition for DB25 male connector is in Appendix A-3.  
Pin definition for DB9 male connector is in Appendix A-4.
- (8) P8485U card:  
Support eight RS422/485 interface port.  
Each port can be set to RS422 or RS485 interface by DIP switch.  
see pin definition for connector in Appendix A.
- (9) P588U4 card:  
Support four RS232 interface in port A & B & C & D and four RS422/485 interface in port E & F & G & H.  
port E/F/G/H can be set to RS422 or RS485 interface by DIP switch.  
see pin definition for connector in Appendix A.

Note: Standard P584 card can support RS232 interface only. User can use our RS4232-4 box to change RS232 interface to isolated RS232/RS422/RS485. For more detail information about pin definition in DB37 connector can be found in appendix A-2.

Note: Standard P588 card can support RS232 interface only. User can use our RS4232-8 box to change RS232 interface to isolated RS422/RS485. For more detail information about pin definition in DB62 connector can be found in appendix A-1.

Note: RS4232 can use DIP switch to set each port to be RS232, RS422 or RS485 interface. More information for RS4232 box is in appendix B.

Note: P422/I/S can use SWI DIP Switch bit1&2 to set card number 1--4. The interface selection in P422I card will be set by SWI DIP Switch bit3&4 for isolated RS422 or RS485 interface. In RS485 interface we have Auto-Data-Direction-Control function.

Port A (or B) Interface Usage:

- a) RS422 interface: SWI DIP switch bit 3 (or 4) is ON.
- b) RS485 interface: SWI DIP switch bit 3 (or 4) is OFF.

In each RS422/RS485 interface user may need to have terminator resistor. User can insert the jumper in JP3 for port A and JP6 for port B to install the terminator resistor in P422/I/S card.

## Chapter 3 Windows 2000/XP/2003 Installation

### 3-1 Driver Installation

Once Windows 2000 system has been started, the Plug & Play function in 2000/XP/2003 system will find the new PCI PORT card. If this is the first time to install PCI PORT card in your 2000/XP/2003 system, you will be informed to install the driver. Please follow the instruction message to specify the driver location.

A:\WIN2000 (NOTE: don't select wrong path a:\WIN95)

If we got CD for driver installation, we need to specify the path for each card type and OS type. For example, D:\P588U\WIN2000.

Because the resource will be assigned by PCI BIOS. It is not easy to check which card is first card or second card from resource. So we have one jumper in each card to set the first card or second card for this PCI PORT card. Then we can fix the COM port number for each card. This is very important for PCI PORT card. Traditionally, we check the resource in each card to confirm the card number. Use this rule we can assign the COM port number for each card. But in PCI bus all the resource for each card is assigned by PCI BIOS in power on procedure. So it is not easy for us to confirm the COM port number for each card. Then it is not easy to maintain the application environment for different time point (You may change your system configuration due to add extra new card. This may change your PCI system's resource condition). So our jumper to assign card number is very important.

Due to the COM port start number will be assigned by WIN2000/XP/2003 in driver installation procedure. If you need to specify other COM port start number for PCI PORT card, you may need to setup it in our driver. When you installed PCI PORT driver in your WIN2000/XP/2003 system, you can enter "control panel--> system-->Hardware-->Device Manager-->Multi-port serial adapter--> setup" to specify your target value.

### 3-2 Note for multi-PCI PORT card installation.

- a) When we need to install two PCI PORT cards in one WIN2000/XP/2003 system, we must confirm to let one card's jumper is ON. And the other card's jumper is OFF. We need to insert both card one by one.
- b) The card with jumper ON will have COM port number assigned for first card. The card with jumper OFF will have COM port number assigned for second card.
- c) For easy to maintain one WIN2000 system's COM port number we suggest that user must set the jumper ON for the first card to be installed in one WIN2000/XP/2003 system.
- d) In WIN2000 system the driver for port is installed automatically. In WIN XP/2003 system the driver for port is installed and confirmed for each port.

Application Note 002: for Windows driver  
Can not install Driver in Windows system

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1. Because we have WIN95/98/Me driver and WIN2000/XP driver in same diskette, so user may assign wrong driver to install in Windows system.
2. Please keep in mind that we have following directory for different driver.
  - a) a:\WIN95 is the directory for WIN95/98/Me system
  - b) a:\WIN2000 is the directory for WIN2000/XP system
3. Because Win95/98/Me and WIN2000/XP system is P&P system, so we may have P&P procedure for new hardware. In P&P procedure the system may find the suitable driver to install. But they may show all the driver to choose and the default one is not correct one. User may always strike "ENTER" key in such procedure. So they may have problem in driver installation.
4. In WIN2000 system:
  - a) When we specify the wrong driver to install, system may show error message. Then you have "!" mark in device manager for our card.
  - b) To solve this problem we need to remove our card firstly from device manager.
  - c) Then we need to remove following files from directory c:\winnt\inf\
    - (1) oemX.inf (here X may be 0 or other number)
    - (2) oemX.pnf (here X may be 0 or other number)
    - (3) pci.inf
    - (4) pci.pnf
    - (5) pci2.inf
    - (6) pci2.pnf
  - d) After above action you can have P&P procedure in next boot , please specify the driver path in a:\win2000. Then you can install our driver successfully.
5. In WIN95/98/Me system:
  - a) When you specify the wrong driver to install, system may show error message. Then you have "!" mark in device manager for our card.
  - b) To solve this problem we need to remove our card firstly from device manager.
  - c) Then we need to remove following files
    - (1) c:\windows\inf\r2kpci1.inf
    - (2) c:\windows\inf\r2kpci2.inf
    - (3) c:\windows\inf\other\rayont~1.inf
  - d) After above action you can have P&P procedure in next boot, please specify the driver path in a:\win95. Then you can install our driver successfully.

Application Note 003: for Windows driver  
The problem to install driver in WIN2000 system

=====

1. Normally you just need to specify the correct driver path "a:\win2000" in P&P procedure to install PCIPOPT port card's driver.
2. But you may install wrong driver or other reason to let your system with problem to install our driver.
3. Because WIN2000 system is P&P system, so you may always have problem to install correct driver (you always have error message).
4. We may need to solve problem with following procedure. We may try simple method firstly and then complex method later.
  - a) The first and simplest method is
    - (1) Please remove our card with "!" mark in device manager.
    - (2) Please remove r2kpci\*. \* and oem\*. \* file in directory c:\winnt\inf\
      - (3) After above action you can try to install driver in next boot.
  - b) If procedure a) could not solve the problem, we need try following procedure.
    - (1) Do procedure a) again firstly.
    - (2) Goto <control panel> <add or remove hardware device> to remove our card. Generally you need to show the hidden device in your system. Then you can select any possible device (maybe your current installed card, may be wrong driver's card) to remove from your system.
    - (3) After above action you can try to install driver in next boot.
  - c) If above procedure a) and b) could not solve the problem, we need try following procedure.
    - (1) Do procedure a) and b) again firstly.
    - (2) run "regedit.exe" to enter registry editor.
    - (3) In Following path
      - \HLM\SYSTEM\CurrentControlSet\Service
      - \HLM\SYSTEM\ControlSet001\Service
      - \HLM\SYSTEM\ControlSet002\ServiceNote: for different system user may have other ControlSet
    - (4) We need to find any service name (or key value) for \pciport or \mport or \nport or \iport or \pport.
    - (5) Please remove all the registry for such service name.
    - (6) After above action you can try to install driver in next boot.
  - d) If above procedure a) and b) and c) could not solve the problem, we need to try following procedure.
    - (1) Do procedure a) and b) and c) again firstly.
    - (2) run "regedit.exe" to enter registry editor.
    - (3) Find key word "rayon" in whole registry and delete every item with this "rayon" key value.
    - (4) After above action you can try to install driver in next boot.
5. In above procedure you can solve the problem to install our driver in your WIN2000/XP system
6. Please keep in mind that you must remove our device firstly before you need to upgrade your WINDOWS service pack. Because we can not confirm the real action for such upgrade procedure to conflict with our driver.

## Chapter 4 Windows NT Installation

### 4-1 Driver Installation

Once Windows NT system has been started, login using an account with administrative rights.

- a) Start the [Control Panel] applet by double clicking its icon in the [Program Managers] main group.
- b) In the [Control Panel] applet, double click [Network] icon to bring up the Network Control Panel Applet(NCPA).
- c) Within the NCPA, select the [Add Adaptor] button. A list of possible adaptors should be displayed. Go to the end of this list and select '<Other> Requires disk from manufacturer'
- d) When prompted for the path, specify the drive and directory where the NCPA can find the new driver for the card you installed.  
a: \P584\NT4 ==> specify for P584/P584U/P485/P485U/P514U/P524U/P534U  
a: \P588\NT4 ==> specify for P588/P588U/P588U4/P5168U/P8485U  
a: \P220\NT4 ==> specify for P220/P422I/P422N/P232  
a: \P984\NT4 ==> specify for P984/P985/P924

NOTE: It is very important for user to assign correct directory for each type of cards.

- e) Now, you can follow the configuration dialog boxes to finish the PCIPORT card's driver. The important thing is to let COM port number no confliction with other card.
- f) After above procedure we need to select "Binding" function to let more serial port available. If you do not have "Binding" function done, you may not have extra COM port available in next boot procedure.

### 4-2 Note for multi-PCIPORT card installation.

- a) When we need to install two same type PCIPORT cards in one NT system, we must confirm to let one card's jumper is ON. And the other card's jumper is OFF.
- b) The card with jumper ON will have low COM port number. The card with jumper OFF will have higher COM port number to follow the card with jumper ON.
- c) For easy to maintain one NT system's COM port number we suggest that user must set the jumper ON for the first card to be installed in one NT system.
- d) User must confirm that you do not have IRQ number conflicted with other card. Some new motherboard may have USB controller built-in. But we do not support USB driver in NT system. So user must disable such USB controller in BIOS setup.

## Chapter 5 Windows 95/98/Me Installation

### 5-1 Driver Installation

Once Windows 95/98 system has been started, the Plug & Play function in 95/98/Me system will find the new PCI PORT card. If this is the first time to install PCI PORT card in your 95/98/Me system, you will be informed to install the driver. Please follow the instruction message to input the COM port number start value for first card and second card.

A:\WIN95 (Don't select wrong path in a:\win2000)

NOTE: You must specify correct path for system to find INF file.

If you got CD for driver installation, you need to specify the correct path for card type and OS type.

Because the resource will be assigned by PCI BIOS. It is not easy to check which card is first card or second card from resource. So we have one jumper in each card to set the first card or second card for this PCI PORT card. Then we can fix the COM port number for each card. This is very important for PCI PORT card. Traditionally, we check the resource in each card to confirm the card number. Use this rule we can assign the COM port number for each card. But in PCI bus all the resource for each card is assigned by PCI BIOS in power on procedure. So it is not easy for us to confirm the COM port number for each card. Then it is not easy to maintain the application environment for different time point (You may change your system configuration due to add extra new card. This may change your PCI system's resource condition). So our jumper to assign card number is very important.

After you had installed the PCI PORT driver, you might be informed to have new hardware found. But you do not need to install the driver again. Windows 95/98/Me will add the COM port automatically.

### 5-2 Note for multi-PCI PORT card installation.

- a) When we need to install two PCI PORT cards in one 95/98/Me system, we must confirm to let one card's jumper is ON. And the other card's jumper is OFF.
- b) The card with jumper ON will have COM port number assigned for first card. The card with jumper OFF will have COM port number assigned for second card.
- c) For easy to maintain one 95/98/Me system's COM port number we suggest that user must set the jumper ON for the first card to be installed in one WIN95/98/Me system.
- d) In WIN98/Me system we need to assign from COM5 or later. Because COM3/4 had been reserved for legacy COM port. If user specify COM port number from COM1/COM2/COM3/COM4 may have some unpredictable problem in some application package.

## Chapter 6 DOS Driver Installation

### 6-1 Driver Installation

1. Please confirm that you have jumper ON to set your first P584/P588 card in your first card installation.
2. Change your active directory to target directory.  
ex. C:\RAYON
3. Insert our driver diskette and copy all files in driver diskette.  
ex. XCOPY /S/E/V A:\DOS\\*. \* .  
NOTE: This action will copy all the necessary files include DEMO program from driver diskette to current directory.
4. Run the driver installation command

For P584/P584U/P588/P588U/P485/P485U/P5168U/P8485U card

C:\RAYON\PCIPORT (or driver diskette \DOS\PCIPORT)

For P984/P985/P924/P422I/P422N/P232/P220 card

C:\RAYON\P220\P984 (or driver diskette \DOS\P220\P984)

5. Then you can find the cards installed in your system. Each card will show the card number in this system (this card number will be used in application program to specify the target card and target port), the card model, the card jumper setting for 1'st card or 2'nd card, the IRQ assigned and COM port number in this card.

for example,

```
card[1]  PCIPORT  P588  1'st card
IRQ number : 11
COM port : 8
card[2]  PCIPORT  P588  2'nd card
IRQ number : 12
COM port : 8
```

#### NOTE:

You may have following error message:

- a) PCIPORT & INDPORNT Already Install.  
====> The driver had been installed.
- b) Please check 'JP1' in the P588 or P584  
====> You may install the same type card have same JP1 setting.
- c) PCIPORT not in system  
====> There is no PCIPORT card to be found in PCI slot.

### 6-2 Note for multi-PCIPORT card installation.

- a) We can install upto eight P584, P588, P514, P518, P124 in one DOS system. But each type of cards must have different jumper setting for card number. For example you can not have both P584 card with JP1 ON.
- b) The PCIPORT driver function call description can be found in DOS driver diskette. We also have one DEMO program for user to modify to meet their target application program.
- c) Because we need to specify the target PCIPORT card for access in application program. We must give each card one unique card number. We will give each card's card number in driver installation console out message. User need to record such card number for each card.

## Chapter 7 Linux driver Installation

### 7-1 Driver Installation

1. Login with superuser or root.
2. Change your directory to root and copy our driver diskette to system.  
#cd /  
#tar xvf /dev/fd0 (For CD you need to uncompress first)
3. change directory to /etc/rayon and run Install command.  
#cd /etc/rayon  
#./Install
4. You will have following procedure to configure your module.
  1. choose your card type. (PCIPORT card)
  2. choose your linux kernel version.
  3. rebuild your system.
  4. exit & reboot with new setting.
5. Then, you can have extra serial port to be used.
  1. the device name will be /dev/tty8[1--2][a--h]
  2. For the card set in first card number (Jumper ON) will be /dev/tty81[a--h]
  3. For the card set in 2'nd card number (Jumper OFF) will be /dev/tty82[a--h]

NOTE: Above driver installation procedure will install module type driver. Due to the system configuration is very important from kernel 2.4.x we can not offer OBJ type driver to install. So we offer the source file type driver to install. User must have kernel source file in /usr/src/linux directory to link with our driver's source file. But some distribution Linux system (ex. REDHAT) may have different directory name for kernel source. User must rename such directory to linux or link such directory to "/usr/src/linux". Or they may have error message in driver installation procedure. (because we can not find the path for kernel source to link). User also need to use this kernel source file to generate run time image file in boot.

NOTE: Right now we have ver5.xx driver to support kernel version 2.2.x and kernel version 2.4.x. We have ver6.xx driver to support kernel version 2.4.x and kernel version before 2.6.9. We have ver7.x.x driver to support kernel version 2.4.x and kernel version after 2.6.10. In ver7.x.x driver we have special Install file for REDHAT Fedora core 4 system, Suse Linux 9.3 and Slackware 10.2 system (kernel version 2.6.x). For other older Linux system we still use standard Install file.

### 7-2 Note for multi-PCIPORT card installation.

When we need to install two PCIPORT cards in one Linux system, we must confirm that one card's jumper is ON. And the other card's jumper is OFF.

7-3 Anytime you can send me E\_mail in "[rayon@ms1.hinet.net](mailto:rayon@ms1.hinet.net)" for Linux driver support.

Application Note 001: for Linux driver  
Application Note for source file type driver  
=====

1. From Linux kernel version 2.4.x it is very important for system configuration setting. The OBJ file generated in different system configuration may have error message and can not be used. So we can not offer OBJ type driver from kernel 2.4.x version. Now we always offer source file type driver for user to install and compile in their system.

2. Because we only offer source file type driver for user to install, so user must have kernel source file in their system.

3. When you get new version source file driver from us, you can use following procedure to duplicate one diskette.

a) You may get "alnxsrc.Z" from us.

b) You can use following command to copy from DOS formatted diskette to your Linux system

```
#mcopy a:alnxsrc.Z alnxsrc.Z
```

c) Now we need to uncompress such file to get original diskette image file.

```
#uncompress alnxsrc
```

d) Then we can use "dd" command to duplicate one diskette.

```
#dd if=alnxsrc of=/dev/fd0
```

4. When you have source file type driver diskette in hand, you can use following procedure to install our driver.

a) Please goto root directory.

```
#cd /
```

b) Please "tar" driver diskette to your system

```
#tar xvf /dev/fd0
```

c) Now we can goto directory /etc/rayon to install our driver

```
#cd /etc/rayon
```

```
#./Install
```

d) Because we put all our card's driver in one diskette, so you will be asked your card type to install. Then you need to specify your Linux system's type.

e) In the final stage the system will start to compile our driver. We may have some warning message. But we can not have error message. Then we may have OBJ file of module driver.

f) In next boot procedure we can have two times display message about our cards. You can use "dmesg" command to check it. And you can have extra TTY device to be used now.

5. In above procedure we suggest that you may have kernel source file in directory /usr/src/linux. If you had another name, please use "ln" command to link with name /usr/src/linux.

6. Because the run time image file may have different system configuration with your kernel source file. So you may have some error message in your boot procedure after driver installation.

- a) Because the run time image is generated in your media supplier (ex, REDHAT) for one dedicated system configuration (generally you can see information in /boot directory). Even though this system configuration is not same as your hardware platform. There are no problem for you to run your system. Because they will be skipped in incompatible hardware device.
- b) When we install our driver and compile with your kernel source file. We will use the system configuration file in your kernel source file. If your system configuration did not set correct condition to support multi-serial port, we may have some error message and no OBJ generated. Then you may need to modify your system configuration file (.config file with make config). If there are no error message and had OBJ file generated, you can have module driver usable in next boot procedure.
- c) If we had different system configuration file for your run time image file and kernel source file, we may have error in our module driver installation. Then you need to use your kernel source file to generate one run time image.

7. Following procedure is example to generate one new run time image file. This procedure is same as user to upgrade kernel version.

- a) Please confirm that you have kernel source file in directory /usr/src/linux.
- b) Please goto directory /usr/src/linux.
- c) We can use "make config" or "make oldconfig" to set your system configuration file (You must set to meet your real hardware environment).
- d) We will run "make dep" to fix our system dependence.
- e) Now, we can use "make zImage" to generate one new run time image.
- f) If there are no error condition, you may have image file in /usr/src/linux/arch/i386/boot/zImage.
- g) You can use this image to replace your current run time image. Generally you may have "/boot/vmlinuz" as your run time image file.

8. So user must keep in mind that the image file from media supplier may not have same system configuration in their kernel source file. When you generate one run time image from kernel source file. Then it is no problem for our source file type driver to be installed.

9. Because user may always upgrade their kernel version, so they may know the procedure to generate image file from kernel source file. Then it is no problem for user to install our source file type driver.

Application Note 004: for Linux driver  
Linux system hung after driver installation  
=====

1. When you insert our PCIPOINT card in your Linux system and install our driver successfully (no error message in OBJ generated). But the system is hung in next boot procedure. This is due to IRQ confliction problem.
2. Originally PCAT can support 16 IRQ in 8259 controller (PIC mode). In ISA bus slot IRQ can not be shared. But there are so many controllers to be used in current environment. So it is not easy to handle IRQ confliction problem.
3. Now Intel support APIC feature to remap IRQ and PCI bus slot support IRQ shared feature. But we need software to enable APIC feature and accept IRQ shared feature.
4. So it is very important for your Linux system to support APIC feature. Unfortunately some distribution media do not support APIC feature in uniprocessor mode. (Generally it is default condition for SMP mode).
5. When your system do not enable APIC feature, then your system may have IRQ confliction problem. If both controllers supported IRQ shared feature in driver service routine and hardware structure, then it is no problem to use.
6. But some controller's driver may be changed from ISA bus product (IRQ can not share). So the PCI version of such products may not support IRQ shared feature (LAN controller is major item). So you still have problem in PCI card with IRQ confliction. Generally you can disable some un-used controller in motherboard (sound card, game port and USB controller...) to remove the IRQ requirement for such controller. Then we can have enough IRQ vector left for our card to be assigned without confliction.
7. Firstly we can try to change our PCIPOINT card's slot. Maybe your BIOS can assign different IRQ number without confliction. So you can solve your problem.
8. If you always had IRQ confliction in your system (maybe more than 16 IRQ requirement in your system), you must enable APIC feature to solve this problem.
9. You must generate new run time image with APIC feature enabled. This procedure just like that you have new kernel version source file and need to generate run time image. So you need to "make config" and enable APIC feature.
10. We can use "dmesg" command to check boot procedure. If you had enabled APIC feature, you can see IRQ remap procedure. So you can solve IRQ confliction problem now.

## Chapter 8 SCO OpenServer Installation

### 8-1 Driver Installation

User can use `/etc/custom` command to install our driver or use following procedure to install our driver.

\*\*\*\*\*We strongly suggest that you use "custom" method to install firstly.

1. Login with superuser or root.
2. Change your directory to root and copy our driver diskette to system.  
#cd /  
#tar xvf /dev/fd0135ds18 (For CD you need to uncompress first)
3. change directory to `/etc/pciport` and run "build" command.  
#cd /etc/pciport  
#./build
4. Please follow the installation procedure and reboot your system.
5. Then, you can have extra serial port to be used.
  1. the device name will be `/dev/tty8[1--2][a--h]`
  2. For the card set in first card number (Jumper ON) will be `/dev/tty81[a--h]`
  3. For the card set in 2'nd card number (Jumper OFF) will be `/dev/tty82[a--h]`

NOTE: Due to the PCI PORT card's resource is assigned by PCI BIOS. We may have different resource to be assigned for different environment changed. We may need to re-install our driver for this condition. User may need to run "build" command again to remove old driver and install new driver again. We strongly recommend that user need to re-install our driver for PC environment changed condition.

NOTE: Because SCO UNIX is not P&P OS, so user must set in BIOS setup for non-P&P OS type to be used.

### 8-2 Note for multi-PCI PORT card installation.

- a) We can install upto two PCI PORT cards in one SCO system
- b) When we need to install two PCI PORT cards in one SCO OpenServer system, we must confirm that one card's jumper is ON. And the other card's jumper is OFF.
- c) In SCO OpenServer system PCI PORT card can not be used in interrupt shared mode. PCI BIOS will assign IRQ for each PCI PORT card. For multi-PCI PORT application we must have sperate IRQ for each card. So user must confirm that one system may have enough IRQ left for P & P function. If there are no unique IRQ to be assigned to PCI PORT card, you may have wrong operation. Please use our PCIIOP card in this condition. Because PCIIOP card don't need IRQ pin.
- d) User must insert our PCI PORT card in PCI slot before installed our SCO OpenServer driver.

Appendix A  
Pin assignments and Cable Wiring

A-1: DB62 Female Connector Pin assignment in P588/P588U/P5168U/P8485U card.

DB62 Pin	Signal Name	DB62 Pin	Signal Name	DB62 Pin	Signal Name
1	TXD1 / TXD1+ (0)	22	TXD2 / TXD2+ (0)	43	GND
2	RXD1 / RXD1+ (I)	23	RXD2 / RXD2+ (I)	44	GND
3	RTS1 (0)	24	RTS2 (0)	45	GND
4	CTS1 (I)	25	CTS2 (I)	46	TXD4 / TXD4+ (0)
5	DSR1 / RXD1- (I)	26	DSR2 / RXD2- (I)	47	RXD4 / RXD4+ (I)
6	DTR1 / TXD1- (0)	27	DTR2 / TXD2- (0)	48	RTS4 (0)
7	DCD1 (I)	28	DCD2 (I)	49	CTS4 (I)
8	TXD3 / TXD3+ (0)	29	TXD7 / TXD7+ (0)	50	DSR4 / RXD4- (I)
9	RXD3 / RXD3+ (I)	30	RXD7 / RXD7+ (I)	51	DTR4 / TXD4- (0)
10	RTS3 (0)	31	RTS7 (0)	52	DCD4 (I)
11	CTS3 (I)	32	CTS7 (I)	53	TXD8 / TXD8+ (0)
12	DSR3 / RXD3- (I)	33	DSR7 / RXD7- (I)	54	RXD8 / RXD8+ (I)
13	DTR3 / TXD3- (0)	34	DTR7 / TXD7- (0)	55	RTS8 (0)
14	DCD3 (I)	35	DCD7 (I)	56	CTS8 (I)
15	TXD5 / TXD5+ (0)	36	TXD6 / TXD6+ (0)	57	DSR8 / RXD8- (I)
16	RXD5 / RXD5+ (I)	37	RXD6 / RXD6+ (I)	58	DTR8 / TXD8- (0)
17	RTS5 (0)	38	RTS6 (0)	59	DCD8 (I)
18	CTS5 (I)	39	CTS6 (I)	60	GND
19	DSR5 / RXD5- (I)	40	DSR6 / RXD6- (I)	61	GND
20	DTR5 / TXD5- (0)	41	DTR6 / TXD6- (0)	62	GND
21	DCD5 (I)	42	DCD6 (I)	xxx	xxx

\*\*\*Note: R801 cable support DB62 connector to eight DB25 male connector.  
R802 cable support DB62 connector to eight DB25 female connector.  
R804 cable support DB62 connector to eight DB9 male connector.  
User can use R803 cable (DB62 male to DB62 male connector) to connect with RS4232-8 box.

\*\*\*Note: (0) is signal output from card. (I) is signal input to card.

A-2: DB37 Female Connector Pin assignment in P584/P485/P584U/P485U/P514U  
/P524U/P534U/P984/P985/P924 card.

DB37 Pin Number	RS232 Signal Name	RS422/485 Signal Name	DB37 Pin Number	RS232 Signal Name	RS422/485 Signal Name
1	RXDA (In )	RXDA+(In )	20	TXDA (Out)	TXDA+(Out)
2	CTSA (In )	---	21	RTSA (Out)	---
3	DSRA (In )	RXDA-(In )	22	DTRA (Out)	TXDA-(Out)
4	DCDA (In )	---	23	RIA (In )	---
5	GND	port A GND	24	RXDB (In )	RXDB+(In )
6	TXDB (Out)	TXDB+(Out)	25	CTSB (In )	---
7	RTSB (Out)	---	26	DSRB (In )	RXDB-(In )
8	DTRB (Out)	TXDB-(Out)	27	DCDB (In )	---
9	GND	port B GND	28	RIB (In )	---
10	GND	---	29	RIC (In )	---
11	GND	port C GND	30	DCDC (In )	---
12	DTRC (Out)	TXDC-(Out)	31	DSRC (In )	RXDC-(In )
13	RTSC (Out)	---	32	CTSC (In )	---
14	TXDC (Out)	TXDC+(Out)	33	RXDC (In )	RXDC+(In )
15	GND	port D GND	34	RID (In )	---
16	DCDD (In )	---	35	DTRD (Out)	TXDD-(Out)
17	DSRD (In )	RXDD-(In )	36	RTSD (Out)	---
18	CTSD (In )	---	37	TXDD (Out)	TXDD+(Out)
19	RXDD (In )	RXDD+(In )	----	----	----

\*\*\*Note: A400/P584 cable support DB37 connector to four DB25 male connector.  
P485 cable will support DB37 connector to four DB9 male connector.  
User can use A640 cable (DB37 male to DB37 female connector) to  
connect P584/P584U/P984 card and RS4232-4 box.  
P584/P584U/P984 card support 4 RS232 interface.  
P985 card support 4 RS422 interface.  
P485/P485U card support 4 RS422/RS485 interface.  
P514U card support 3 RS232 interface in port A/B/C and 1 RS422/485  
interface in port D.  
P924/P524U support 2 RS232 interface in port A/B and 2 RS422/485  
interface in port C/D.  
P934U card support 1 RS232 interface in port A and 3 RS422/485  
interface in port B/C/D.

A-3: DB25 Male Connector Pin assignment in R801 (DB62 to 8 DB25) cable and A400/P584 (DB37 to 4 DB25) cable for RS232 signal and RS422/485 signal.

DB25 Pin Number	RS232 Signal	RS422/485 Signal
2	TXD (Out)	TXD+ (Out)
3	RXD (In )	RXD+ (In )
4	RTS (Out)	---
5	CTS (In )	---
6	DSR (In )	RXD- (In )
7	GND	isolated GND
8	DCD (In )	---
20	DTR (Out)	TXD- (Out)

A-4: DB9 Male Connector Pin assignment in R804 (DB62 to 8 DB9) cable and P485 (DB37 to 4 DB9) cable for RS232 signal and RS422/485 signal.  
DB9 Male Connector Pin definition in P220/P232/P422I/P442N card.

DB9 Pin Number	RS232 interface Signal	RS422/485 interface Signal
1	DCD (In )	---
2	RXD (In )	RXD+ (In )
3	TXD (Out)	TXD+ (Out)
4	DTR (Out)	TXD- (Out)
5	GND	isolated GND or GND
6	DSR (In )	RXD- (In )
7	RTS (Out)	---
8	CTS (In )	---
9	RI (In )	---

\*\*\*\*Note: P485 card will support 4 isolated RS422/485 interface port. Each port has isolated GND to be used.

Note: P588/P588U/P5168U card do not support RI signal.

Note: P232 card support 2 RS232 interface.

Note: P422I card support 2 ground isolated RS422/485 interface.

Note: P422N card support 2 RS422/485 interface with common ground.

Note: P8485U card support 8 RS422/485 interface with common ground.

Note: P588U-4 card support 4 RS232 interface in port A/B/C/D and 4 RS422/485 interface in port E/F/G/H with common ground.

Note: TB485 convertor can convert DB9 connector to 3 pin terminal blocks for RS485 application.

A-5: RJ45 Connector Pin assignment in RJ422 & RJ584 card.

RJ45 Pin Number	RS232 Signal Name	RS422 Signal Name
1	TXD (Out)	TXD+ (Out)
2	RXD (In )	RXD+ (In )
3	RTS (Out)	---
4	CTS (In )	---
5	DSR (In )	RXD- (In )
6	GND	GND
7	DTR (Out)	TXD- (Out)
8	DCD (In )	---

Note: RJ584 card support 4 \* RS232 interface port.  
 RJ584-1 Card support 3 \* RS232 interface in Port A/B/C and RS422 interface in Port D.  
 RJ584-2 Card support 2 \* RS232 interface in Port A/B and 2 \* RS422 interface in Port C/D.  
 RJ584-3 Card support RS232 interface in Port A and 3 \* RS422 interface in Port B/C/D.  
 RJ422 card support 4 \* RS422 interface port.

Note: In RJ422 card we use one jumper for each port to insert terminator resistor in receiver or not. When one port do not connect with other device, we must not insert the terminator resistor (the jumper OFF) for that port. This condition can promise such port with mark condition in receiver. When you insert the terminator resistor in no use port, we may have indetermined state in receiver. Generally we suggest that user may not insert terminator resistor in each port. Except that you run in high baud rate and long cable in your application.

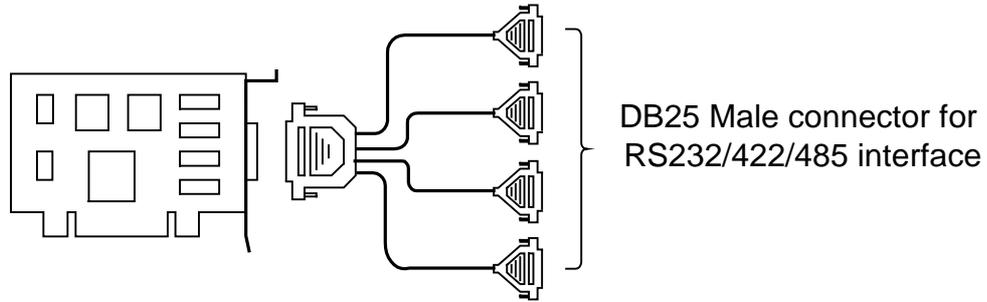
Note: In RJ422 card the RS422 signal is balanced type. We use the plus(+) and minus(-) signal pair in direct connection. But some manufacture may use inverse definition in such signal pair. So you need to check the signal definition for each device to prepare your cable.

Note: Because RJ422 card do not have ground isolation function in RS422 interface. User must confirm the ground condition for all the device connected are good. Or the ground voltage difference between both device may be higher than common mode voltage limitaion and damage the interface IC. If user can not confirm such condition, we suggest to use P485 card with ground isolation feature.

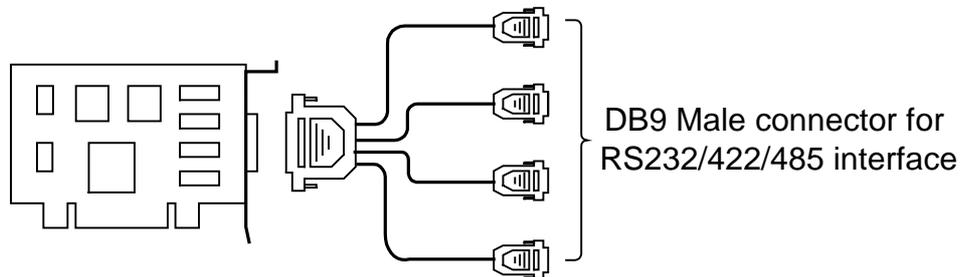
## System Structure and Cable Wiring

---

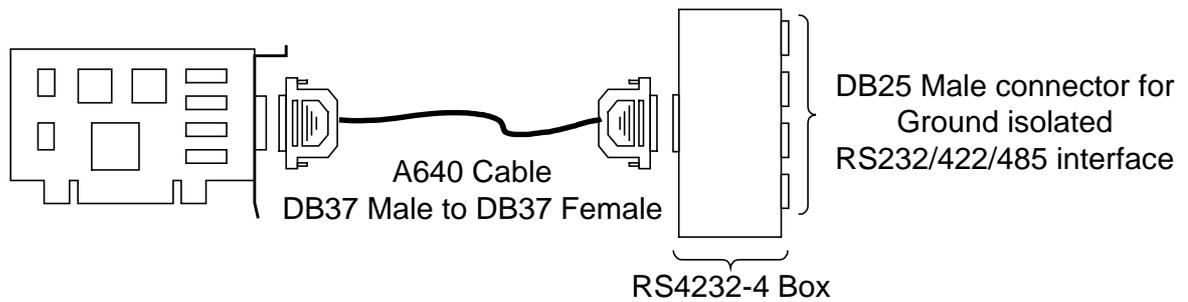
### 1. Four port card and A400 Cable ( DB37 Male to four DB25 Male )



### 2. Four port card and P485 Cable ( DB37 Male to four DB9 Male )

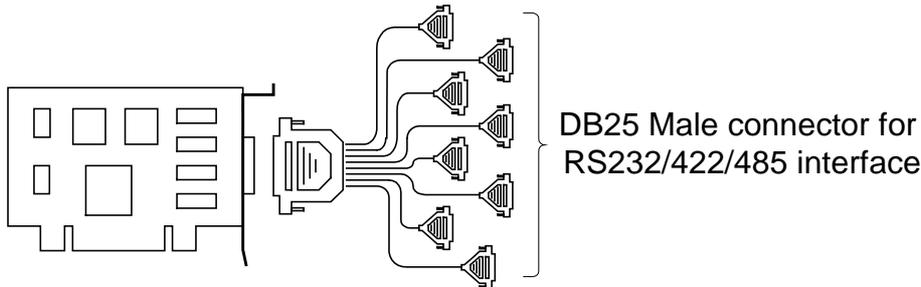


### 3. Four port card and A640 Cable to RS4232-4 Box

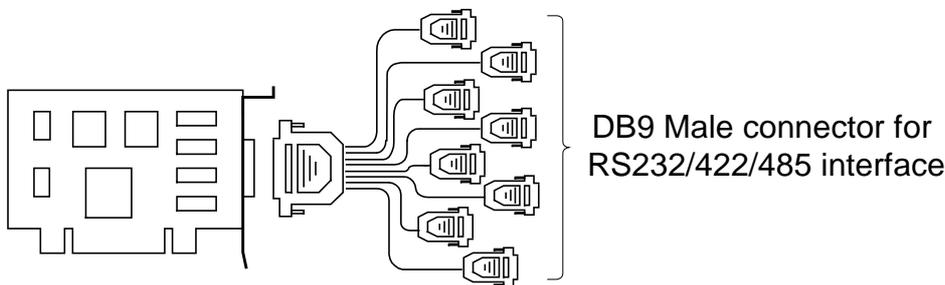


# System Structure and Cable Wiring

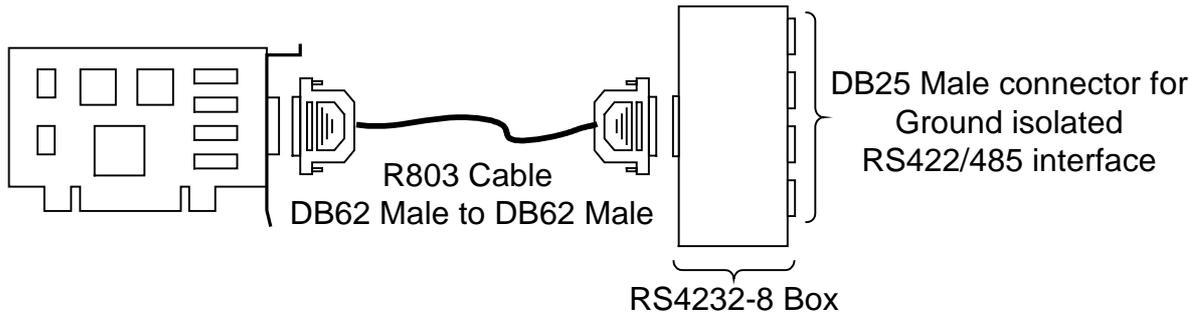
## 4. Eight port card and R801 Cable (DB62 Male to eight DB25 Male)



## 5. Eight port card and R804 Cable (DB62 Male to eight DB9 Male)



## 6. Eight port card with R803 Cable to RS4232-8 Box



Appendix B  
RS4232 Isolated Box user guide

B-1 Introduction.

RS4232 box is used to convert RS232 input signal to isolated RS232, RS422 or RS485 interface. So we can support signal ground isolation system between PC system and external application system. We have two models to support four ports(RS4232-4 model) or eight ports(RS4232-8 model).

In RS4232-4 box each port have two bit DIP switch to set for RS232, RS422 or RS485 interface. In RS4232-8 box each port have one bit DIP switch to set for RS422 or RS485 interface. In RS485 mode we had auto data direction function to maintain no local echo condition. But user may still need to maintain just only one port to output data. So RS485 mode must be used in half-duplex transmission environment. For full-duplex transmission environment user may need to use RS422 mode.

In RS4232 box we have one built-in switching power supply. This power supply can accept 100-265VAC input or 48--60VDC input(option).

In RS4232-8 box we can use one DB62 to DB62 cable to connect with P588 card. In RS4232-4 box we can use one DB37 to DB37 cable to connect with P584 card. All the cable is connected in pin to pin direct connection type.

B-2 Pin definition in DB25 Male connector.

Pin Number	RS232 mode Signal Name	RS422/485 mode Signal Name	Pin Number	RS232 mode Signal Name	RS422/485 mode Signal Name
2	TXD (Out)	---	8	DCD (In )	---
3	RXD (In )	---	9	---	RXD+ (In )
4	RTS (Out)	---	10	---	RXD- (In )
5	CTS (In )	---	11	---	TXD+ (Out)
6	DSR (In )	---	12	---	TXD- (Out)
7	GND	isolated GND	20	DTR (Out)	---

Note: In RS4232-8 box we just support RS422/RS485 interface. In RS4232-4 box we can support RS232/RS422/RS485 interface.

Note: Each connector port have isolated ground.

Note: RS485 mode may let pin9 & pin11 short together as DATA+ and pin10 & pin12 short together as DATA- to connect with other device.

Note: In RS422 mode the pin 2/3/4/5/6/8/20 may be in floating condition and with 5K ohm pull down resistor to GND.

Note: In RS232 mode the pin 9/10/11/12 may be in floating state. Don't connect any RS232 signal to these pins.

Note: We have 120 ohm terminator resistor built in each input signal pair. In RS485 mode you may need to have this terminator resistor in both end device. In other location we may need to remove such terminator. User can set jumper On/Off to use/remove this terminator resistor.

Note: The pin definition for DB62 female connector of RS4232-8 box is same as table A-1 in Appendix A. But it is DCE type connector.

B-3: RS4232-4 box Mode setting in DIP switch.

```

=====
DIP Switch | DIP Switch | Interface mode
bit 1, 3, 5, 7 | bit 2, 4, 6, 8 |
=====
ON          | ON          | RS232
-----
ON          | OFF         | RS232
-----
OFF         | ON          | RS422
-----
OFF         | OFF         | RS485
=====

```

Note: bit 1 & 2 is used for PORT A setting.  
bit 3 & 4 is used for PORT B setting.  
bit 5 & 6 is used for PORT C setting.  
bit 7 & 8 is used for PORT D setting.

B-4: RS4232-8 box Mode setting in DIP switch.

```

=====
DIP Switch | Interface mode
=====
ON          | RS422
-----
OFF         | RS485
=====

```

NOTE: bit1=Port A  
bit2=Port B  
bit3=Port C  
bit4=Port D  
bit5=Port E  
bit6=Port F  
bit7=Port G  
bit8=Port H

B-5: RS422 interface application note

RS422 interface is used for point to point connection or multi-drop application. But user may need to keep in mind that we can only let one driver output signal to be actived in one time. Or you may let the driver IC to be burnt.

Even though we had put one 120ohm terminator resistor in each input signal pair. User may need to remove this terminator resistor for proper operation.

Due to proper operation user may not let one cable left in un-connected condition. Because the crosstalk problem may let one transmit data signal to be coupled to receive data input. This may lead wrong process in some application environment.

B-6: RS485 interface application note

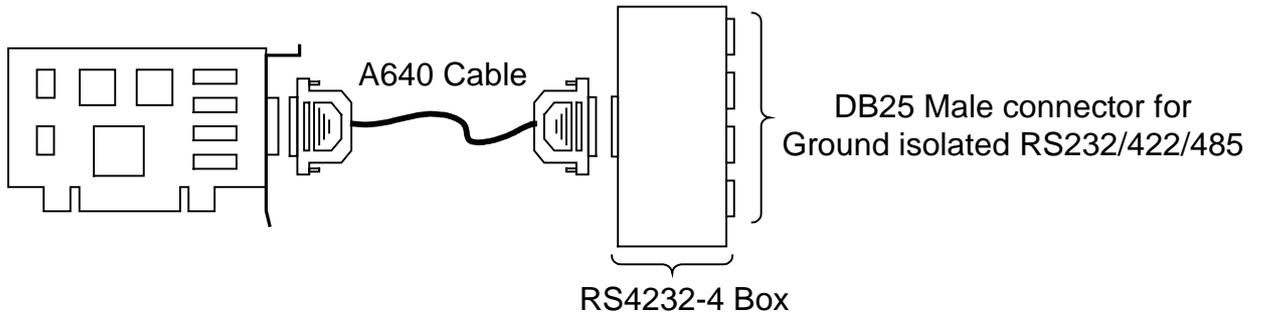
RS485 interface is used for multi-drop half-duplex application. Because we had put Auto-Data-Direction-Control capability in RS4232 box, user may not use RTS signal to control the data direction. So it is no use for RTS /CTS signal in RS485 interface. Because we had put one 120ohm terminator resistor in RXD input signal pair. User may or may not need to remove this terminator resistor for proper operation.

Due to proper operation user may not let one cable left in un-connected condition. Because the crosstalk problem may let one transmit data signal to be coupled to receive data input. This may lead wrong process in some application environment.

Due to the relationship between DATA+/DATA- and signal in UART may be different from other manufacture's definition. In our RS4232 box we have DATA+ with same phase as signal in UART (somebody may invert it).

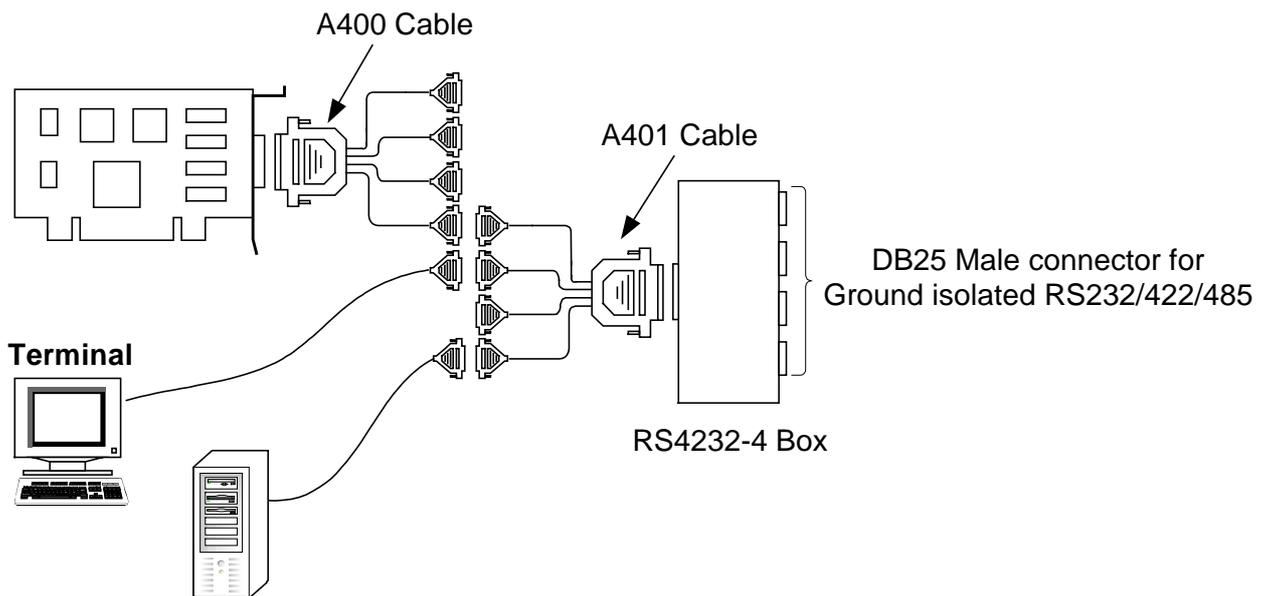
## Special Usage for RS4232-4 Box

- 1. Standard usage :** four port card use A640 Cable to connect with RS4232-4 Box directly. Support four ground isolated RS232/RS422/RS485 interface.



- 2. Special usage :** A401 Cable or P486 Cable to connect with RS4232-4 Box. Support any RS232 device to have ground isolated RS232/RS422/RS485 interface.

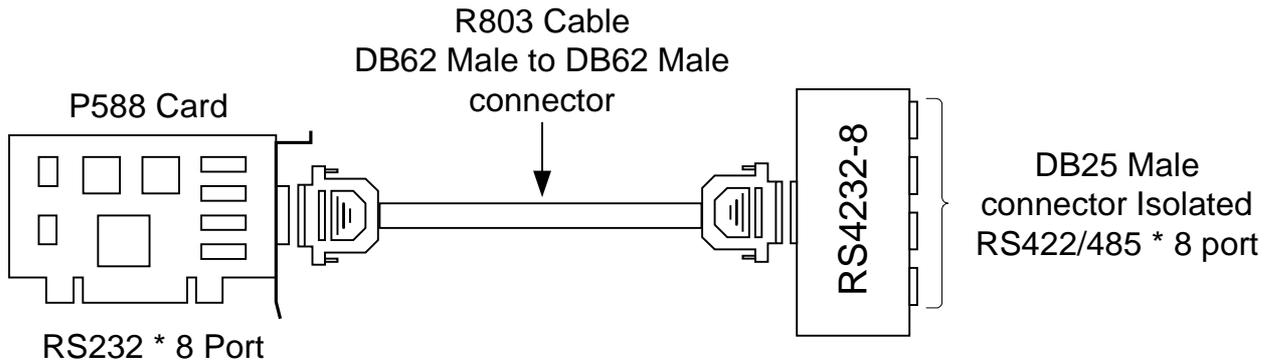
- ※ A401 Cable support four DB25 DCE type female connector.
- ※ P486 Cable support four DB9 DCE type female connector.



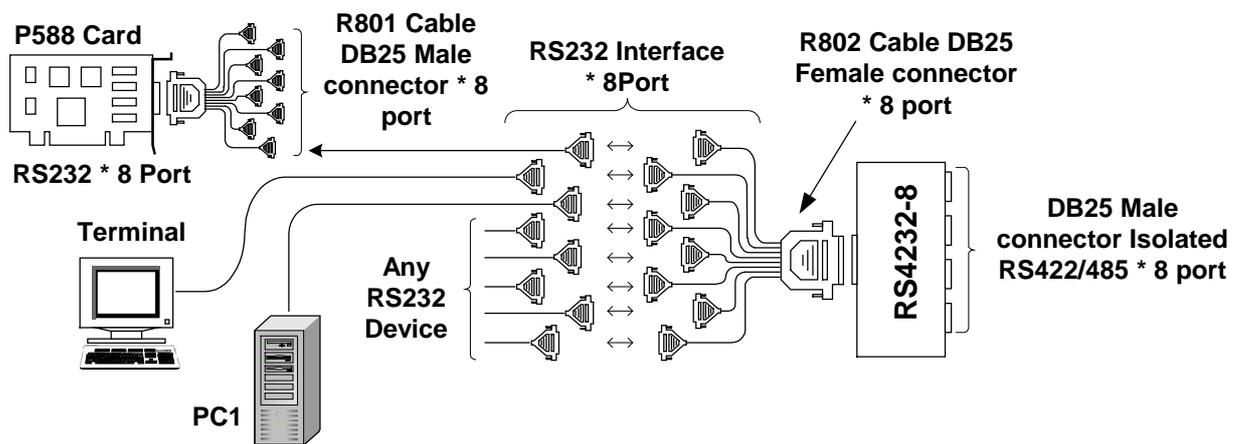
## Special Usage for RS4232-8 Box

---

- Standard usage** : Eight port card use R803 cable to connect with RS4232-8 Box directly ◦ Support eight ground isolated RS422/485 interface ◦



- Special usage** : R802 cable to connect with RS4232-8 Box ◦ Support any RS232 device to have ground isolated RS422/485 interface ◦
  - ※ Eight port card use R801 Cable to connect with R802 cable can support partial RS232 interface and partial ground isolated RS422/RS485 interface structure ◦



Appendix C  
Troubleshooting procedure for PCI PORT card  
=====

1. Please confirm your card type firstly:

a) PCI PORT card:

P588, P584, P422I, P124, P485, P514, P518, P640N, P984, P985, P924.  
P584U, P588U, P588U4, P8485U, P485U, P514U, P524U, P534U, P640NU.

b) PCIIOP card:

P640A, P640R, P960A, P960F, P990, P818, P888, IOP3927, P1688U.

2. Please specify your target O.S. type:

- a) DOS.      b) Linux.      c) SCO Openserver.      d) WN95/98/Me.  
e) WN NT.      f) WN2000.      g) WN XP/2003.      h) others.

3. Please confirm following boot procedure in which step to be wrong:

a) In power on boot procedure we can not see the PCI BIOS screen to show our PCI PORT card.

NOTE: After the power of PC is turned on, the PCI BIOS will scan the card to be inserted in PCI slot. If one PCI card were inserted in PCI slot, the PCI BIOS will assign the memory map, I/O map and IRQ number to every cards. Generally PCI BIOS will show the vendor ID and device ID of each card in screen. You can also see the bus number, function number and IRQ number for this card. Our PCI PORT card will have vendor ID "10B5" or "144A". The device ID will be "9050". So we must see such information in PCI BIOS boot procedure display screen. If we can not see such card, it means that PCI BIOS can not find our card. Then we may change the PCI slot for our card (we suggest that PCI slot may be damaged) or clean the golden finger of our PCI PORT card (we suggest that our PCB is dirty in golden finger and the touch is not good) to try again.

b) When we can find PCI PORT in PCI BIOS boot procedure, we can install our driver from diskette. But there are some problem to install the driver.

NOTE: Every O.S. must have corresponding driver to be installed. We have many OS's driver in different directory. If user did not specify the correct path for corresponding driver in driver installation procedure, you may have problem to install our driver. Generally this condition is happened in WN2000 or WN95/98 system. Because WN2000 system may choose the path for our WN95 driver's directory and user do not change to WN2000 directory. Then user may install driver and with error message finally. In this condition user must remove the INF file and force WN2000 system to enter P&P procedure to install new driver (or WN2000 system may record your old bad driver always).

c) When we install driver successfully. But we can not find the extra target COM port in next boot procedure.

NOTE: In power on boot procedure our driver will start to work. Generally our driver will check the contents of driver and the hardware information in PCI card. If the driver assigned for one card were not the card installed, our driver will say "card not found". And there are no extra COM port available. Generally you can check same hardware configuration in different OS type. If there were no problem in new OS system, then you may have some driver installation problem. You may need to check with

us to solve your problem (E-Mail to [rayon@ms1.hinet.net](mailto:rayon@ms1.hinet.net)). If there were problem in other OS system, you may have hardware problem in such card. Please check with supplier.

- d) When we have extra target COM port in next boot procedure. But there are no data transmission or receiving in such COM port.

NOTE: Generally one need to send/receive data from COM port may have two steps. The first step is to open such COM port. The second step is to send/receive data in IRQ mode or polling mode. In our driver diskette we prepare "RAYONTTY.EXE" utility file. This file is terminal emulation program. You can run this file to use one COM port for data communication. When you run "rayontty.exe" you can assign the target COM port and set the target parameter. Then you can ask to "connect". If you set the COM port that you can see in "control panel" and "rayontty.exe" say "OPEN FAIL", then you may not have such COM port (even though we can see in "control panel"). This condition is due to some problem in driver installation. Please contact with us to fix your problem. If we could open such COM port without any error message, then we need to check hardware operation. If we had one loopback connector to insert in such COM port. In normal condition we can strike any key in keyboard and see the console out in screen. If we strike any key in keyboard and there are no console out in screen (the system is hung), then you may have IRQ assigned with confliction to other device. Please change PCI PORT card to other PCI slot and you may be assigned other IRQ without confliction. Or you may enter BIOS setup to let some IRQ value to be used by ISA card in "legacy" mode. Even though our PCI PORT card is IRQ shareable. But ISA card is not IRQ shareable. When one IRQ is set to be "P&P mode" in BIOS setup. And one ISA card need such IRQ (by jumper or manual set). Then PCI BIOS may assign such IRQ to PCI PORT card. So we may have big problem in PCI PORT card's IRQ service routine.

- e) We can install Linux driver without any error message. But there are correct action or system hung in next boot procedure.

NOTE: We offer source file type driver to install in Linux system. So our driver will be compiled and linked with kernel source file in current system configuration. But user may use the booting image file for different system configuration. User must use current kernel source file and configuration to generate one image file to boot.

4. The other condition to specify and troubleshoot:
- Generally we test our PCI PORT card in DOS system.
  - In some condition the action in DOS environment may be different from other OS environment. So there are no problem in DOS test environment may not say no problem in other OS environment.
  - So anybody need to troubleshoot PCI PORT card must specify the OS type. And they may need more detail information about the problem in PCI PORT card operation.
  - Then we may test in DOS environment firstly and test in other OS environment as customer specified later.
  - So user must specify the problem in which environment to test.
  - Please send E-mail to [rayon@ms1.hinet.net](mailto:rayon@ms1.hinet.net) before returned your cards.

Appendix D  
P422I and P422N card usage

=====

D-1: P422I card usage

1. DIP SWITCH in SW1:

this is 4 bit DIP switch. bit1 & 2 is used to set card number. default condition is in ON position to set in 1'st card mode. bit3 & 4 is used to set port interface type. bit3 is used for port A. bit4 is used for port B. default condition is in ON position for RS422 interface. When we set in OFF position (the other side of ON) , port interface is RS485 mode.

2. Jumper in JP3 & JP6:

this is jumper to insert(remove) 120ohm terminator resistor in RS422/485 interface. JP3 is used for port A. JP6 is used for port B. When jumper is shorted, the terminator resistor inserted. When jumper is opened, the terminator resistor removed from interface. Default condition is no terminator resistor (jumper open).

3. usage in RS485 interface mode:

When user need to use port type RS485 interface, we need to set DIP switch in SW1 to OFF position. Then we need to short pin2 & pin3 in DB9 connector as DATA+ signal and short pin4 & pin6 as DATA- signal for RS485 connection.

User can also use our TB485 convertor for DB9 connector to 3 terminal block for DATA+ , DATA- , GND connection.

4. Pin definition for DB9 connector:

Please check Appendix A-4 table for more information.

D-2: P422N card usage

1. DIP SWITCH in SW1:

this is 4 bit DIP switch. bit1 & 2 is used to set card number. default condition is in ON position to set in 1'st card mode. bit3 & 4 is used to set port interface type. bit3 is used for port A. bit4 is used for port B. default condition is in ON position for RS422 interface. When we set in OFF position (the other side of ON) , port interface is RS485 mode.

2. Jumper in JP1 & JP2:

this is jumper to insert(remove) 120ohm terminator resistor in RS422/485 interface. JP1 is used for port A. JP2 is used for port B. When jumper is shorted, the terminator resistor inserted. When jumper is opened, the terminator resistor removed from interface. Default condition is no terminator resistor (jumper open).

3. usage in RS485 interface mode:

When user need to use port type RS485 interface, we need to set DIP switch in SW1 to OFF position. Then we need to short pin2 & pin3 in DB9 connector as DATA+ signal and short pin4 & pin6 as DATA- signal for RS485 connection.

User can also use our TB485 convertor for DB9 connector to 3 terminal block for DATA+ , DATA- , GND connection.

4. Pin definition for DB9 connector:

Please check Appendix A-4 table for more information.

D-3: How to install DOS driver

1. Please prepare one directory for our DOS driver. ex. C:\RAYON
2. Please copy our DOS driver from diskette to this directory.  
cd \RAYON  
xcopy /s/e/v a:\DOS\\*. \* .
3. Our driver is in C:\RAYON\P220 directory. We just need to run "P984" in this directory to install DOS driver.  
cd \RAYON\P220  
P984
4. We can have DEMO program and document in C:\RAYON\DEMO directory. Here you can find the source file for our DEMO program. You can also see the document for our API to call in DOS driver.

D-4: How to install WIN95/98/Me driver

1. WIN95/98/Me system is P&P system
2. Upon power on condition WINDOWS system will find new hardware device and ask to install driver. You just need to specify the driver directory in A:\WIN95

D-5: How to install WIN NT4 driver

1. WIN NT4 system is not P&P system. So we need to install driver manually. Our driver will be install as "network card".
2. In [control panel] [Network] [Add Adaptor] we can install our card from diskette. We just need to specify directory in A:\P220\NT4
3. Then you can finish the setting and port available in next booting.

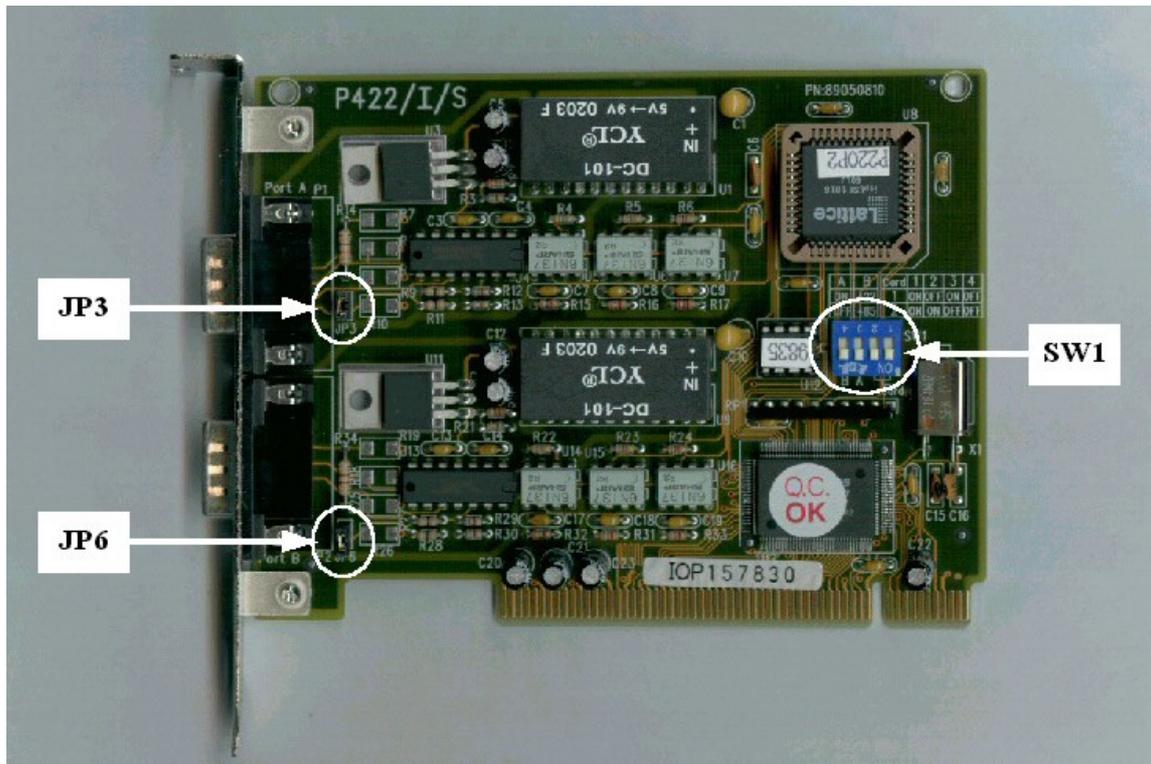
D-6: How to install WIN2000/XP/2003 driver

1. WIN2000/XP/2003 system is P&P system
2. Upon power on condition WINDOWS system will find new hardware device and ask to install driver. You just need to specify the driver directory in A:\WIN2000
3. In WIN2000 system the port driver for each COM port will be installed automatically after P422I/P422N card driver installed. In WIN XP/2003 system the port driver for each COM port will be installed one by one after card driver installed.

D-7: How to install Linux driver

1. Detail information please check Chapter 7 of this manual.
2. Please goto root directory and "tar" our driver diskette to your Linux system  
cd /  
tar xvf /dev/fd0
3. Please run "Install" to install driver.  
./Install
4. Please choose card type in "PCIPORT card".

## P422I card usage



### 1. DIP SWITCH in SW1:

this is 4 bit DIP switch. bit 1 & 2 is used to set card number. default condition is in ON position to set in 1' st card mode. bit 3 & 4 is used to set port interface type. bit 3 is used for port A. bit 4 is used for port B. default condition is in ON position for RS422 interface. When we set in OFF position (the other side of ON), port interface is RS485 mode.

### 2. Jumper in JP3 & JP6:

this is jumper to insert(remove) 120ohm terminator resistor in RS422/485 interface. JP3 is used for port A. JP6 is used for port B. When jumper is shorted, the terminator resistor inserted. When jumper is opened, the terminator resistor removed from interface. Default condition is no terminator resistor (jumper open).

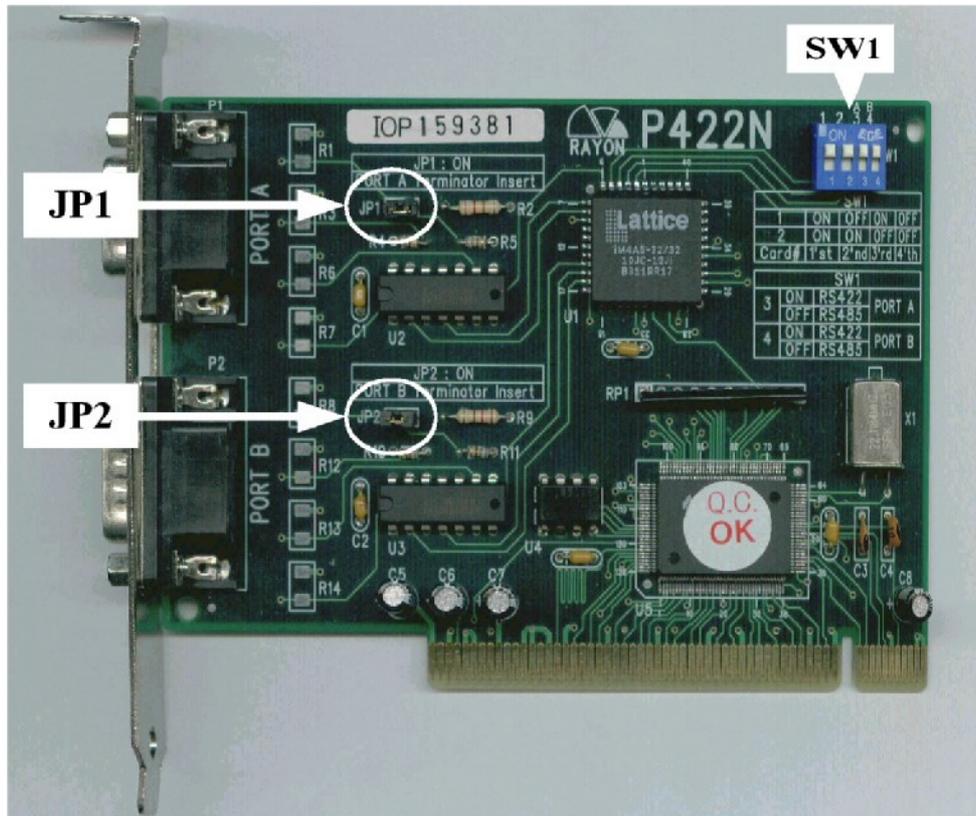
### 3. usage in RS485 interface mode:

When user need to use port type RS485 interface, we need to set DIP switch in SW1 to OFF position. Then we need to short pin2 & pin3 in DB9 connector as DATA+ signal and short pin4 & pin6 as DATA- signal for RS485 connection. User can also use our TB485 convertor for DB9 connector to 3 terminal block for DATA+ , DATA- , GND connection.

### 4. Pin definition for DB9 connector:

Please check Appendix A-4 table for more information.

## P422N card usage



1. DIP SWITCH in SW1:  
this is 4 bit DIP switch. bit1 & 2 is used to set card number.  
default condition is in ON position to set in 1'st card mode.  
bit3 & 4 is used to set port interface type. bit3 is used for port A.  
bit4 is used for port B. default condition is in ON position for  
RS422 interface. When we set in OFF position (the other side of ON)  
, port interface is RS485 mode.
2. Jumper in JP1 & JP2:  
this is jumper to insert(remove) 120ohm terminator resistor in  
RS422/485 interface. JP1 is used for port A. JP2 is used for port B.  
When jumper is shorted, the terminator resistor inserted. When jumper  
is opened, the terminator resistor removed from interface. Default  
condition is no terminator resistor (jumper open).
3. usage in RS485 interface mode:  
When user need to use port type RS485 interface, we need to set DIP  
switch in SW1 to OFF position. Then we need to short pin2 & pin3 in  
DB9 connector as DATA+ signal and short pin4 & pin6 as DATA- signal  
for RS485 connection.  
User can also use our TB485 convertor for DB9 connector to 3 terminal  
block for DATA+ , DATA- , GND connection.

Appendix E  
P584/P584U and P524U card usage

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E-1: P584 card usage

1. Jumper in JP1:  
this is jumper to set card number. Default condition is shorted in jumper for 1'st card mode. When jumper is opened, it is 2'nd card mode.
2. Pin definition for DB25 connector: (use with A400 cable)  
Please check Appendix A-3 table for more information.
3. Pin definition for DB9 connector: (use with P485 cable)  
Please check Appendix A-4 table for more information.

E-2: P584U card usage

1. Jumper in JP1:  
same function as above P584 card to set card number.
2. Pin definition for DB25 connector: (use with A400 cable)  
Please check Appendix A-3 table for more information.
3. Pin definition for DB9 connector: (use with P485 cable)  
Please check Appendix A-4 table for more information.

E-3: P524U card usage

1. Jumper in JP2:  
this is 2 bit jumper. Each bit will set the corresponding port interface type. Bit 1(label PORT C) is used for port C. Bit2(label PORT D) is used for port D. Default condition is shorted in jumper for RS422 interface. When jumper is opened, it is set for RS485 interface.
2. Jumper in JP1:  
same function as above P584/P584U card to set card number.
3. Jumper in JP6, JP8:  
this is jumper to insert(remove) 120ohm terminator resistor in RS422/485 interface. JP8 is used for port C. JP6 is used for port D. When jumper is shorted, the terminator resistor inserted. When jumper is opened, the terminator resistor removed from interface. Default condition is no terminator resistor (jumper open).
4. Pin definition for DB25 connector: (use with A400 cable)  
Please check Appendix A-3 table for more information.
5. Pin definition for DB9 connector: (use with P485 cable)  
Please check Appendix A-4 table for more information.
6. port A and port B is RS232 interface. port C and port D can be set in RS422 or RS485 interface.

E-4: How to install DOS driver

1. Please prepare one directory for our DOS driver. ex. C:\RAYON
2. Please copy our DOS driver from diskette to this directory.  
cd \RAYON  
xcopy /s/e/v a:\DOS\\*. \* .
3. Our driver is in C:\RAYON directory. We just need to run "PCIPORT" in this directory to install DOS driver.  
cd \RAYON  
PCIPORT
4. We can have DEMO program and document in C:\RAYON\DEMO directory. Here you can find the source file for our DEMO program. You can also see the document for our API to call in DOS driver.

E-5: How to install WIN95/98/Me driver

1. WIN95/98/Me system is P&P system
2. Upon power on condition WINDOWS system will find new hardware device and ask to install driver. You just need to specify the driver directory in A:\WIN95

E-6: How to install WIN NT4 driver

1. WIN NT4 system is not P&P system. So we need to install driver manually. Our driver will be install as "network card".
2. In [control panel] [Network] [Add Adaptor] we can install our card from diskette. We just need to specify directory in A:\P584\NT4
3. Then you can finish the setting and port available in next booting.

E-7: How to install WIN2000/XP/2003 driver

1. WIN2000/XP/2003 system is P&P system
2. Upon power on condition WINDOWS system will find new hardware device and ask to install driver. You just need to specify the driver directory in A:\WIN2000
3. In WIN2000 system the port driver for each COM port will be installed automatically after P584/P584U/P524U card driver installed. In WIN XP/2003 system the port driver for each COM port will be installed one by one after card driver installed.

E-8: How to install Linux driver

1. Detail information please check Chapter 7 of this manual.
2. Please choose card type in "PCIPORT card".

E-9: How to install SCO driver

1. Detail information please check Chapter 8 of this manual.
2. P584/P584U/P524U card will be shown as PCIPORT card and P584 card type.

Appendix F  
P485 and P485U card usage

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F-1: P485 card usage

1. DIP SWITCH in SW1:  
this is 4 bit DIP switch. Each bit will set the corresponding port interface type. Bit 1 is used for port A. Bit2 is for port B. Bit3 is for port C and bit4 is for port D. Default condition is in ON position for RS422 interface. When we set in OFF position (the other side of ON) port interface is RS485 mode.
2. Jumper in JP1:  
this is jumper to set card number. Default condition is shorted in jumper for 1'st card mode. When jumper is opened, it is 2'nd card mode.
3. Jumper in JP2, JP3, JP4 & JP5:  
this is jumper to insert(remove) 120ohm terminator resistor in RS422/485 interface. JP5 is used for port A. JP4 is used for port B. JP3 is used for port C. JP2 is used for port D.  
When jumper is shorted, the terminator resistor inserted. When jumper is opened, the terminator resistor removed from interface. Default condition is no terminator resistor (jumper open).
4. usage in RS485 interface mode:  
When user need to use port type RS485 interface, we need to set DIP switch in SW1 to OFF position. Then we need to short pin2 & pin3 in DB9 connector as DATA+ signal and short pin4 & pin6 as DATA- signal for RS485 connection. Or we need to short pin2 & pin3 in DB25 connector as DATA+ signal and short pin6 & pin20 in DB25 connector as DATA- signal for RS485 connection.  
User can also use our TB485 convertor for DB9 connector to 3 terminal block for DATA+ , DATA- , GND connection.
5. Pin definition for DB25 connector: (use with A400 cable)  
Please check Appendix A-3 table for more information.
6. Pin definition for DB9 connector: (use with P485 cable)  
Please check Appendix A-4 table for more information.

F-2: P485U card usage

1. DIP SWITCH in SW1:  
same function as above P485 card to set interface type.
2. Jumper in JP1:  
same function as above P485 card to set card number.
3. Jumper in JP2, JP4, JP6 & JP8:  
this is jumper to insert(remove) 120ohm terminator resistor in RS422/485 interface. JP8 is used for port A. JP6 is used for port B. JP4 is used for port C. JP2 is used for port D.  
When jumper is shorted, the terminator resistor inserted. When jumper is opened, the terminator resistor removed from interface. Default condition is no terminator resistor (jumper open).
4. usage in RS485 interface mode and pin definition in connector:  
same function as above P485 card.

F-3: How to install DOS driver

1. Please prepare one directory for our DOS driver. ex. C:\RAYON
2. Please copy our DOS driver from diskette to this directory.  
cd \RAYON  
xcopy /s/e/v a:\DOS\\*. \* .
3. Our driver is in C:\RAYON directory. We just need to run "PCIPORT" in this directory to install DOS driver.  
cd \RAYON  
PCIPORT
4. We can have DEMO program and document in C:\RAYON\DEMO directory. Here you can find the source file for our DEMO program. You can also see the document for our API to call in DOS driver.

F-4: How to install WIN95/98/Me driver

1. WIN95/98/Me system is P&P system
2. Upon power on condition WINDOWS system will find new hardware device and ask to install driver. You just need to specify the driver directory in A:\WIN95

F-5: How to install WIN NT4 driver

1. WIN NT4 system is not P&P system. So we need to install driver manually. Our driver will be install as "network card".
2. In [control panel] [Network] [Add Adaptor] we can install our card from diskette. We just need to specify directory in A:\P584\NT4
3. Then you can finish the setting and port available in next booting.

F-6: How to install WIN2000/XP/2003 driver

1. WIN2000/XP/2003 system is P&P system
2. Upon power on condition WINDOWS system will find new hardware device and ask to install driver. You just need to specify the driver directory in A:\WIN2000
3. In WIN2000 system the port driver for each COM port will be installed automatically after P485/P485U card driver installed. In WIN XP/2003 system the port driver for each COM port will be installed one by one after card driver installed.

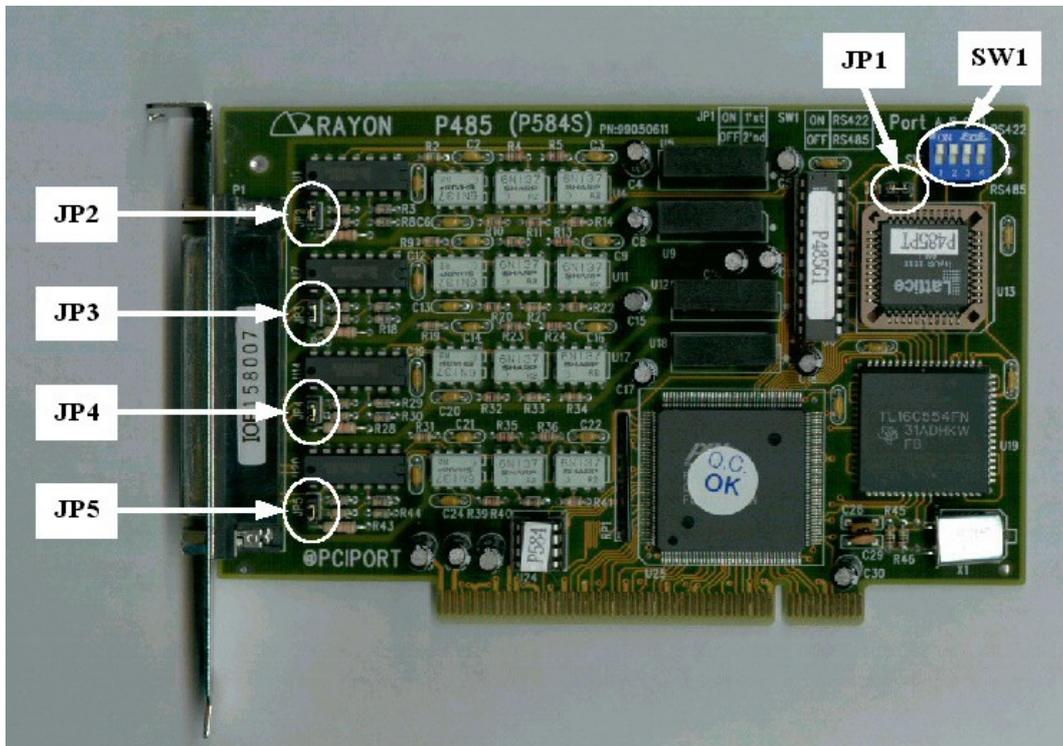
F-7: How to install Linux driver

1. Detail information please check Chapter 7 of this manual.
2. Please choose card type in "PCIPORT card".

F-8: How to install SCO driver

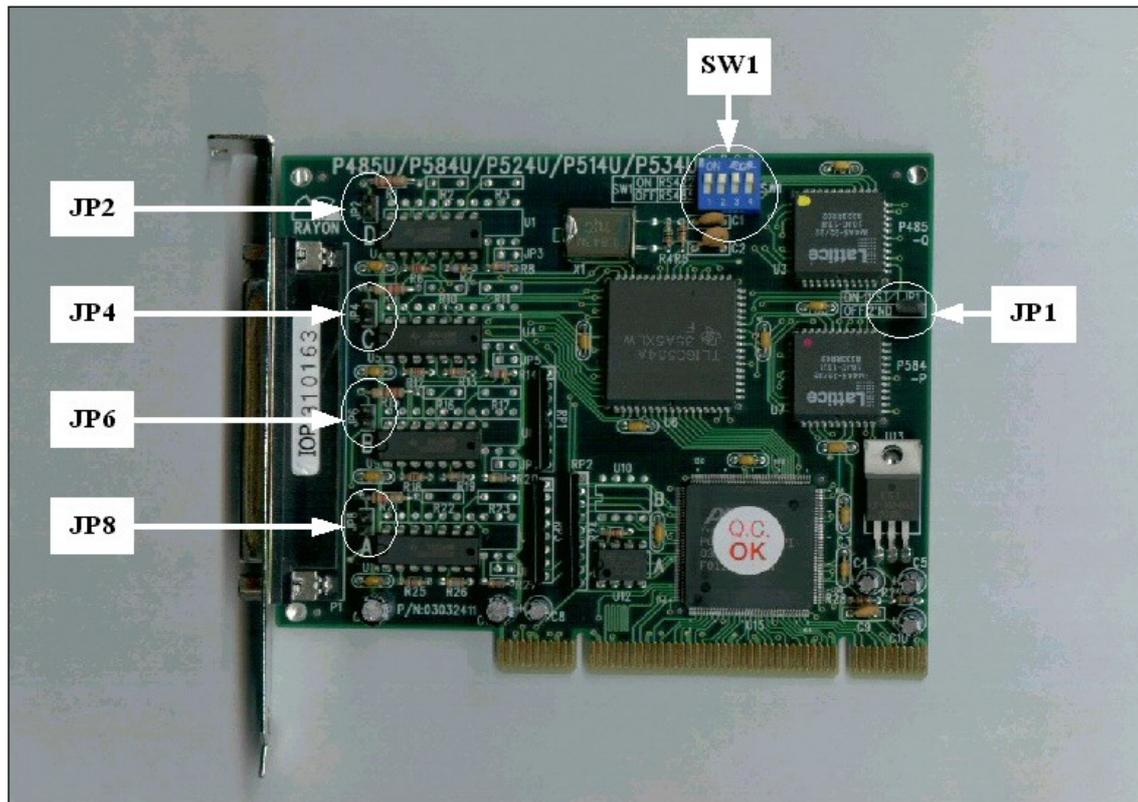
1. Detail information please check Chapter 8 of this manual.
2. P485/P485U card will be shown as PCIPORT card and P584 card type.

## P485 card usage



1. DIP SWITCH in SW1:  
this is 4 bit DIP switch. Each bit will set the corresponding port interface type. Bit 1 is used for port A. Bit 2 is for port B. Bit 3 is for port C and bit 4 is for port D. Default condition is in ON position for RS422 interface. When we set in OFF position (the other side of ON) port interface is RS485 mode.
2. Jumper in JP1:  
this is jumper to set card number. Default condition is shorted in jumper for 1'st card mode. When jumper is opened, it is 2'nd card mode.
3. Jumper in JP2, JP3, JP4 & JP5:  
this is jumper to insert(remove) 120ohm terminator resistor in RS422/485 interface. JP5 is used for port A. JP4 is used for port B. JP3 is used for port C. JP4 is used for port D. When jumper is shorted, the terminator resistor inserted. When jumper is opened, the terminator resistor removed from interface. Default condition is no terminator resistor (jumper open).
4. usage in RS485 interface mode:  
When user need to use port type RS485 interface, we need to set DIP switch in SW1 to OFF position. Then we need to short pin2 & pin3 in DB9 connector as DATA+ signal and short pin4 & pin6 as DATA- signal for RS485 connection. Or we need to short pin2 & pin3 in DB25 connector as DATA+ signal and short pin6 & pin20 in DB25 connector as DATA- signal for RS485 connection. User can also use our TB485 convertor for DB9 connector to 3 terminal block for DATA+ , DATA- , GND connection.
5. Pin definition for DB25 connector: (use with A400 cable)  
Please check Appendix A-3 table for more information.
6. Pin definition for DB9 connector: (use with P485 cable)  
Please check Appendix A-4 table for more information.

## P485U card usage



1. DIP SWITCH in SW1:  
same function as above P485 card to set interface type.
2. Jumper in JP1:  
same function as above P485 card to set card number.
3. Jumper in JP2, JP4, JP6 & JP8:  
this is jumper to insert(remove) 120ohm terminator resistor in RS422/485 interface. JP8 is used for port A. JP6 is used for port B. JP4 is used for port C. JP2 is used for port D. When jumper is shorted, the terminator resistor inserted. When jumper is opened, the terminator resistor removed from interface. Default condition is no terminator resistor (jumper open).
4. usage in RS485 interface mode:  
When user need to use port type RS485 interface, we need to set DIP switch in SW1 to OFF position. Then we need to short pin2 & pin3 in DB9 connector as DATA+ signal and short pin4 & pin6 as DATA- signal for RS485 onnection. Or we need to short pin2 & pin3 in DB25 connector as DATA+ signal and short pin6 & pin20 in DB25 connector as DATA- signal for RS485 connection. User can also use our TB485 convertor for DB9 connector to 3 terminal block for DATA+ , DATA- , GND connection.
5. Pin definition for DB25 connector: (use with A400 cable)  
Please check Appendix A-3 table for more information.
6. Pin definition for DB9 connector: (use with P485 cable)  
Please check Appendix A-4 table for more information.

Appendix G  
P588/P588U and P5168U card usage

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G-1: P588 card usage

1. Jumper in JP1:  
this is jumper to set card number. Default condition is shorted in jumper for 1'st card mode. When jumper is opened, it is 2'nd card mode.
2. Pin definition for DB25 connector: (use with R801 cable)  
Please check Appendix A-3 table for more information.  
R801 cable is one DB62 male connector to eight DB25 male connector.
3. Pin definition for DB9 connector: (use with R804 cable)  
Please check Appendix A-4 table for more information.  
R804 cable is one DB62 male connector to eight DB9 male connector.
4. P588 card can connect with RS4232-8 box by R803 cable. R803 cable is DB62 male connector to DB62 male connector pin to pin connection cable. The other document for RS4232-8 box can be found in Appendix B for more information.

G-2: P588U card usage

1. Jumper in JP1:  
same function as above P588 card to set card number.
2. Pin definition for DB25 connector: (use with R801 cable)  
Please check Appendix A-3 table for more information.
3. Pin definition for DB9 connector: (use with R804 cable)  
Please check Appendix A-4 table for more information.

G-3: P5168U card usage

1. Jumper in JP1:  
same function as above P588 card to set card number.
2. Pin definition for DB25 connector: (use with R801 cable)  
Please check Appendix A-3 table for more information.
3. Pin definition for DB9 connector: (use with R804 cable)  
Please check Appendix A-4 table for more information.

G-4: How to install DOS driver

1. Please prepare one directory for our DOS driver. ex. C:\RAYON
2. Please copy our DOS driver from diskette to this directory.  
cd \RAYON  
xcopy /s/e/v a:\DOS\\*. \* .
3. Our driver is in C:\RAYON directory. We just need to run "PCIPORT" in this directory to install DOS driver.  
cd \RAYON  
PCIPORT
4. We can have DEMO program and document in C:\RAYON\DEMO directory. Here you can find the source file for our DEMO program. You can also see the document for our API to call in DOS driver.

G-5: How to install WIN95/98/Me driver

1. WIN95/98/Me system is P&P system
2. Upon power on condition WINDOWS system will find new hardware device and ask to install driver. You just need to specify the driver directory in A:\WIN95

G-6: How to install WIN NT4 driver

1. WIN NT4 system is not P&P system. So we need to install driver manually. Our driver will be install as "network card".
2. In [control panel] [Network] [Add Adaptor] we can install our card from diskette. We just need to specify directory in A:\P588\NT4
3. Then you can finish the setting and port available in next booting.

G-7: How to install WIN2000/XP/2003 driver

1. WIN2000/XP/2003 system is P&P system.
2. Upon power on condition WINDOWS system will find new hardware device and ask to install driver. You just need to specify the driver directory in A:\WIN2000
3. In WIN2000 system the port driver for each COM port will be installed automatically after P588/P588U/P5168U card driver installed. In WIN XP/2003 system the port driver for each COM port will be installed one by one after card driver installed.

G-8: How to install Linux driver

1. Detail information please check Chapter 7 of this manual.
2. Please choose card type in "PCIPORT card".

G-9: How to install SCO driver

1. Detail information please check Chapter 8 of this manual.
2. P588/P588U card will be shown as PCIPORT card and P588 card type.

Appendix H  
P8485U and P588U4 card usage

=====

H-1: P8485U card usage

1. DIP SWITCH in SW1 & SW2:  
this is 4 bit DIP switch for SW1 & SW2. Each bit will set the corresponding port interface type. SW1 bit1 is used for port A. SW1 bit2 is for port B. SW1 bit3 is for port C. SW1 bit4 is for port D. SW2 bit1 is for port E. SW2 bit2 is for port F. SW2 bit3 is for port G and bit4 is for port H. Default condition is in ON position for RS422 interface. When we set in OFF position (the other side of ON) port interface is RS485 mode.
2. Jumper in JP1:  
this is jumper to set card number. Default condition is shorted in jumper for 1'st card mode. When jumper is opened, it is 2'nd card mode.
3. usage in RS485 interface mode:  
When user need to use port type RS485 interface, we need to set DIP switch to OFF position. Then we need to short pin2 & pin3 in DB9 connector as DATA+ signal and short pin4 & pin6 as DATA- signal for RS485 connection. Or we need to short pin2 & pin3 in DB25 connector as DATA+ signal and short pin6 & pin20 in DB25 connector as DATA- signal for RS485 connection.  
User can also use our TB485 convertor for DB9 connector to 3 terminal block for DATA+ , DATA- , GND connection.
4. Pin definition for DB25 connector: (use with R801 cable)  
Please check Appendix A-3 table for more information.
5. Pin definition for DB9 connector: (use with R804 cable)  
Please check Appendix A-4 table for more information.

H-2: P588U4 card usage

1. DIP SWITCH in SW2:  
same function as above P8485U card. But we just have portE--portH as RS422/485 interface and portA--portD as RS232 interface.  
SW2 bit1 is for port E. SW2 bit2 is for port F. SW2 bit3 is for port G and bit4 is for port H. Default condition is in ON position for RS422 interface. When we set in OFF position (the other side of ON) port interface is RS485 mode.
2. Jumper in JP1:  
same function as above P8485U card to set card number.
3. usage in RS485 interface mode and pin definition in connector:  
same function as above P8485U card.
4. Pin definition for DB25 connector: (use with R801 cable)  
Please check Appendix A-3 table for more information.
5. Pin definition for DB9 connector: (use with R804 cable)  
Please check Appendix A-4 table for more information.

#### H-3: How to install DOS driver

1. Please prepare one directory for our DOS driver. ex. C:\RAYON
2. Please copy our DOS driver from diskette to this directory.  
cd \RAYON  
xcopy /s/e/v a:\DOS\\*. \* .
3. Our driver is in C:\RAYON directory. We just need to run "PCIPORT" in this directory to install DOS driver.  
cd \RAYON  
PCIPORT
4. We can have DEMO program and document in C:\RAYON\DEMO directory. Here you can find the source file for our DEMO program. You can also see the document for our API to call in DOS driver.

#### H-4: How to install WIN95/98/Me driver

1. WIN95/98/Me system is P&P system
2. Upon power on condition WINDOWS system will find new hardware device and ask to install driver. You just need to specify the driver directory in A:\WIN95

#### H-5: How to install WIN NT4 driver

1. WIN NT4 system is not P&P system. So we need to install driver manually. Our driver will be install as "network card".
2. In [control panel] [Network] [Add Adaptor] we can install our card from diskette. We just need to specify directory in A:\P588\NT4
3. Then you can finish the setting and port available in next booting.

#### H-6: How to install WIN2000/XP/2003 driver

1. WIN2000/XP/2003 system is P&P system
2. Upon power on condition WINDOWS system will find new hardware device and ask to install driver. You just need to specify the driver directory in A:\WIN2000
3. In WIN2000 system the port driver for each COM port will be installed automatically after P8485U/P588U4 card driver installed. In WIN XP/2003 system the port driver for each COM port will be installed one by one after card driver installed.

#### H-7: How to install Linux driver

1. Detail information please check Chapter 7 of this manual.
2. Please choose card type in "PCIPORT card".

#### H-8: How to install SCO driver

1. Detail information please check Chapter 8 of this manual.
2. P8485U/P588U4 card will be shown as PCIPORT card and P588 card type.

Appendix I  
P232 card usage

=====

I-1: How to install DOS driver

1. Please prepare one directory for our DOS driver. ex. C:\RAYON
2. Please copy our DOS driver from diskette to this directory.  
cd \RAYON  
xcopy /s/e/v a:\DOS\\*. \* .
3. Our driver is in C:\RAYON\P220 directory. We just need to run "P984" in this directory to install DOS driver.  
cd \RAYON\P220  
P984
4. We can have DEMO program and document in C:\RAYON\DEMO directory. Here you can find the source file for our DEMO program. You can also see the document for our API to call in DOS driver.

I-2: How to install WIN95/98/Me driver

1. WIN95/98/Me system is P&P system
2. Upon power on condition WINDOWS system will find new hardware device and ask to install driver. You just need to specify the driver directory in A:\WIN95

I-3: How to install WIN NT4 driver

1. WIN NT4 system is not P&P system. So we need to install driver manually. Our driver will be install as "network card".
2. In [control panel] [Network] [Add Adaptor] we can install our card from diskette. We just need to specify directory in  
A:\P220\NT4
3. Then you can finish the setting and port available in next booting.

I-4: How to install WIN2000/XP/2003 driver

1. WIN2000/XP/2003 system is P&P system
2. Upon power on condition WINDOWS system will find new hardware device and ask to install driver. You just need to specify the driver directory in A:\WIN2000
3. In WIN2000 system the port driver for each COM port will be installed automatically after P422I/P422N card driver installed. In WIN XP/2003 system the port driver for each COM port will be installed one by one after card driver installed.

I-5: How to install Linux driver

1. Detail information please check Chapter 7 of this manual.
2. Please goto root directory and "tar" our driver diskette to your Linux system. Then you can run "Install" to install driver.  
cd /  
tar xvf /dev/fd0  
./Install
3. Please choose card type in "PCIPORT card".

Appendix J  
P984/P985 and P924 card usage  
=====

J-1: P984 card usage

1. Jumper in JP1:  
this is jumper to set card number. Default condition is shorted in jumper for 1'st card mode. When jumper is opened, it is 2'nd card mode.
2. Pin definition for DB25 connector: (use with A400 cable)  
Please check Appendix A-3 table for more information.
3. Pin definition for DB9 connector: (use with P485 cable)  
Please check Appendix A-4 table for more information.

J-2: P985 card usage

1. Jumper in JP1:  
this is jumper to set card number. Default condition is shorted in jumper for 1'st card mode. When jumper is opened, it is 2'nd card mode.
2. Pin definition for DB25 connector: (use with A400 cable)  
Please check Appendix A-3 table for more information.
3. Pin definition for DB9 connector: (use with P485 cable)  
Please check Appendix A-4 table for more information.

J-3: P924 card usage

1. Jumper in JP5:  
this is 2 bit jumper. Each bit will set the corresponding port interface type. Bit 1(label C) is used for port C. Bit2(label D) is for port D. Default condition is shorted in jumper for RS422 interface. When jumper is opened, it is set for RS485 interface.
2. Jumper in JP1:  
same function as above P984/P985 card to set card number.
3. Jumper in JP2, JP3:  
this is jumper to insert(remove) 120ohm terminator resistor in RS422/485 interface. JP3 is used for port C. JP2 is used for port D. When jumper is shorted, the terminator resistor inserted. When jumper is opened, the terminator resistor removed from interface. Default condition is no terminator resistor (jumper open).
4. usage in RS485 interface mode and pin definition in connector:  
same function as above P984/P985 card and P485 card.
5. port A and port B is RS232 interface. port C and port D can be set in RS422 or RS485 interface.

J-4: How to install DOS driver

1. Please prepare one directory for our DOS driver. ex. C:\RAYON
2. Please copy our DOS driver from diskette to this directory.  
cd \RAYON  
xcopy /s/e/v a:\DOS\\*. \* .

3. Our driver is in C:\RAYON\P220 directory. We just need to run "P984" in this directory to install DOS driver.

```
cd \RAYON\P220
```

```
P984
```

4. We can have DEMO program and document in C:\RAYON\DEMO directory. Here you can find the source file for our DEMO program. You can also see the document for our API to call in DOS driver.

J-5: How to install WIN95/98/Me driver

1. WIN95/98/Me system is P&P system
2. Upon power on condition WINDOWS system will find new hardware device and ask to install driver. You just need to specify the driver directory in A:\WIN95

J-6: How to install WIN NT4 driver

1. WIN NT4 system is not P&P system. So we need to install driver manually. Our driver will be install as "network card".
2. In [control panel] [Network] [Add Adaptor] we can install our card from diskette. We just need to specify directory in A:\P984\NT4

3. Then you can finish the setting and port available in next booting.

J-7: How to install WIN2000/XP/2003 driver

1. WIN2000/XP/2003 system is P&P system
2. Upon power on condition WINDOWS system will find new hardware device and ask to install driver. You just need to specify the driver directory in A:\WIN2000
3. In WIN2000 system the port driver for each COM port will be installed automatically after P984/P985/P924 card driver installed. In WIN XP/2003 system the port driver for each COM port will be installed one by one after card driver installed.

J-8: How to install Linux driver

1. Detail information please check Chapter 7 of this manual.
2. Please choose card type in "PCIPORT card".

J-9: How to install SCO driver

1. Detail information please check Chapter 8 of this manual.
2. P984/P985/P924 card will be shown as PCIPORT card and P984 card type.

Appendix M  
RAYON REPAIR PROCEDURE

=====

1. RETURN MATERIAL AUTHORIZATION (RMA or RA)

RAYON requires that you provide the following information :

- \* Model number
- \* RAYON serial number
- \* The reason for returning the products

```
#####  
# We strongly suggest that you can check with RAYON by E_mail before#  
#you can confirm the reason for returning the products. Because some #  
#problem may be due to wrong software usage or setup only.          #  
#                               rayon@ms1.hinet.net                    #  
#####
```

- \* Your purchase-order number

You will be given the following information from your RAYON Service Representative:

- \* Your Return Material Authorization Number (RMA or RA Number)
- \* Information regarding applicable charges
- \* The address to which you will return the products

2. REPAIR CHARGES

All RAYON products have a one year warranty. Products that are damaged or modified are not covered.

This limited warranty covers defects in materials and workmanship in your RAYON-branded hardware products. This limited warranty does not cover problems that result from

- \*external causes such as accident, abuse, misuse, or problems with electrical power.
- \*Servicing not authorized by us.
- \*Usage that is not in accordance with product instructions.
- \*Failure to follow the product instructions or failure to perform preventive maintenance.

Products that are covered under the original warranty and that are found defective by RAYON will be repaired at no cost. A standard handling and testing charge will be assessed for products returned for warranty repair that are found to be operating properly.

Products that are no longer covered under warranty will be repaired, if deemed repairable, for a flat rate charge regardless of the repair work required.

Please contact the nearest RAYON Service Center for current pricing information.

# P1688U

PCI/IOP Series  
RAS-PRO Card

Intelligent Eight Port Card



133MHz-----MIPS CPU  
16Mbyte-----local buffer  
3.3V & 5V-----Universal PCI  
1Mbyte-----receive buffer per port  
512Kbyte-----transmit buffer per port

## P1688U Feature :

- \*Support **eight RS232 port** in one card.
- \*Built-in **3927 MIPS** local processor, a workstation grade **32bit** Processor, faster and powerful for your system.
- \*Built-in **FIFO** type communication controller.
- \*Support 115200 bps and 230400bps baud rate high speed MODEM.
- \*Support isolated **RS422 or RS485** interface for each port independently.
- \*Support Windows **NT/2000/XP/2003** System driver.
- \*Support **Linux & SCO UNIX** System driver

# ***GPORT116*** IP Serial Device Server

★**10/100Mbps LAN Connection**

★**16 Port RS232 Serial Interface**

★**Linux based system board**



- ® 32bit 100MHz RISC CPU higher performance than 16bit CPU
- ® Auto-detecting 10/100Mbps Ethernet interface.
- ® Support **WIN NT/2000/XP/2003 virtual COM** driver.
- ® Support **UNIX & Linux** real TTY driver.
- ® Support **TCP server/Client** mode.
- ® Support **UDP send/receive** mode.
- ® Support **WEB, TELNET** and terminal setup.
- ® Support **SDK for value added. GPORT116 can be your Linux Box. You can develop any specific application in this compact Linux Box.**

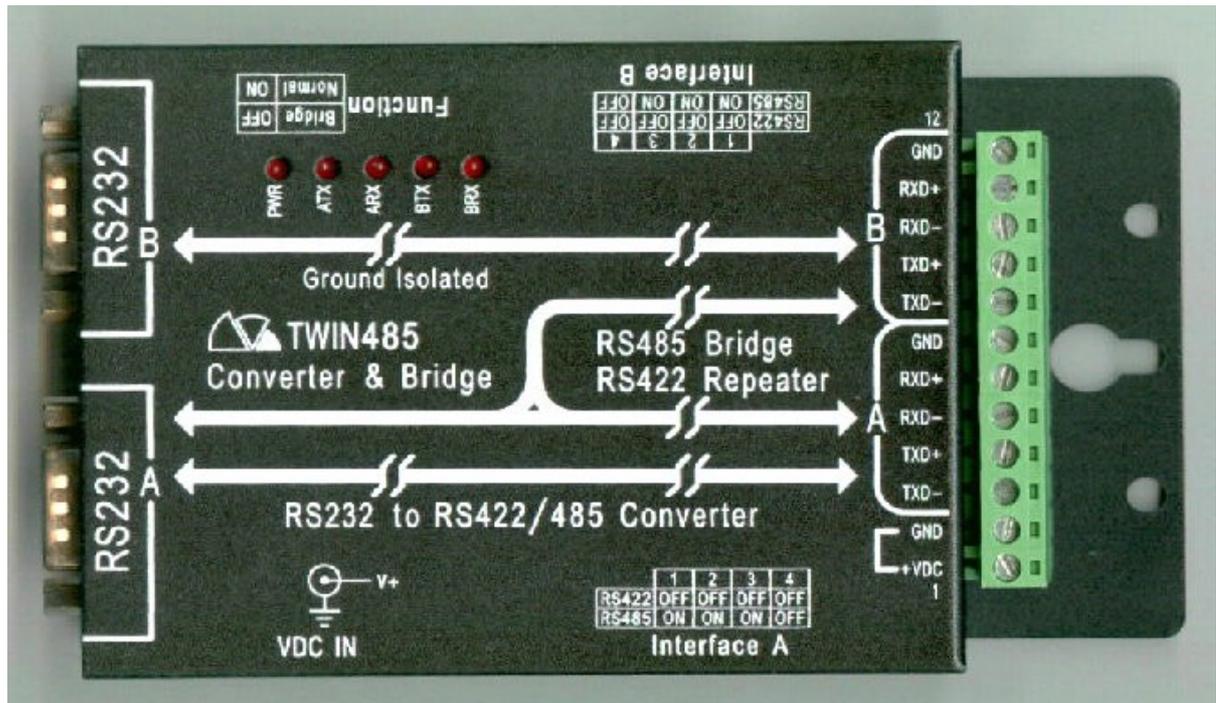
# TWIN485

Industrial Ground Isolated  
RS232 to RS422,RS485  
Converter & Bridge .

**One device to meet both requirement**

**No more separate converter and repeater**

**Powerful and Flexible for redundancy usage**



- ★ Double RS232 to RS485 converter
- ★ Double RS232 to RS422 converter
- ★ One set RS422 to RS485 converter
- ★ One set RS422 to RS422 repeater
- ★ One set RS485 to RS485 bridge
- ★ One RS232 to double segment RS485 network
- ★ Fully Ground Isolated Function
- ★ Auto Data Direction Control on RS485
- ★ Support screw terminal and DC power adaptor
- ★ All function and Feature set by DIP switch
- ★ RS232 data transmission LED indicator

# PCIPORT Card

## *Support*

**P584**

**P584U**

**P588**

**P588U**

**P984**

**P588U4**

**P985**

**P5168U**

**P924**

**P524U**

**P485**

**P485U**

**P232**

**P8485U**

**P422I**

**P422N**