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Rayon Technology Inc.

Engineered to Connect

RAYON

PCIPORT CARD

MANUAL

8 port PCI

P588
P588U
P8485U
P5168U

4 port PCI

P584
P584U
P485
P485U
P514U
P524U
P534U
P984
P985
P924

2 port PCI

P232
P220
P422/I/S

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Please cheque our “RAYON repair procedure” in Appendix K

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2 Introduction

2.1 About the Serial Communication Cards

The serial communication cards are intelligent serial input/output multi-port controller cards which are suitable to PC AT with PCI bus machine. The cards can reduce the interval for serial communication controller to interrupt main CPU on the mainboard to improve the whole system performance.

Traditionally, the serial communication controller will interrupt the MPU character by character. This action will waste MPU processing time and drop the system computing power. If the MPU is processing some non-interrupted task, then the serial controller will overrun and data lost.

The serial communication interface series can support buffer capability or local processor and dual port RAM in each port's transmit and receive channel simultaneously. This capability will reduce the number of interrupt and increase the non-interrupt task's interval.

The serial communication interface series used ASIC PCI controller to interface the board to PCI bus. The ASIC fully implement the PCI local bus specification Rev. 2.1. All bus relative configurations, such as base memory address and interrupt assignment, are automatically controlled by BIOS software.

It does not need any user interaction and pre-study for the configurations. This removes the burden of searching for a conflict-free configuration.

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An introduction to the RAYON PCIPORT cards

	P232	P220/P422/I/S	P588	P588U	P5168U
Page					
Serial port	**8**	**8**	**8**	**8**	**8**
CPU					
Serial communication controler					
MAX System throughput					
Memory					
Hardware compatibility					
Software compatibility					
External connector					
Modular box 8 RS422					
Remote access box (building Mux)					
Surge protection					
Isolation protection					
Dimension					
Other specification					

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	P584	P584U	P485	P485U	P514U	P524U	P534U	P984/ P985/ P924
page								
Serial port	4	4	4	4	4	4	4	4
CPU								
Serial communication controler								
MAX System throughput								
Memory								
Hardware compatibility								
Software compatibility								
External connector								
Modular box 8 RS422								
Remote access box (building Mux)								
Surge protection								
Isolation protection								
Dimension								
Other specification								

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P588, P588U, P8485U, P5168U 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.

2.1.1 The eight ports card is made up of two parts:

- **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.

- **Expansion cable:**
  This expansion cable have eight standard DB25 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.

2.2 The four ports card is made up of two parts:

- **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.

- **Expansion cable:**
  This expansion cable have four standard DB25 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.

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

2.3 Hardware specification

- **Serial communication controller:**
  16C550A compatible
  1.8432MHz crystal. (can be used up to 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:P422 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.

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- **Interrupt Control:**
  Plug & Play to be assigned by PCI BIOS.
  We must have one IRQ assigned to PCIPORT card. We can let multiple PCI card to share IRQ. PCIPORT card is IRQ shareable

- **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 up to 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.

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2.4 Software specification:

Operating system can support:

Windows 2000/XP
Windows NT
Windows 95/98/Me
DOS
LINUX
SCO OpenServer
other operating system.

NOTE: All the software for P588U/P5168U/P8485U card is same as P588 card.
The difference for P8485U 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.

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3 Configuring the Hardware

This chapter describes the configurations of the serial communication cards. At first, the contents in the package and unpacking information that you should care about are described. The serial communication cards are plug-and-play and very easy to install into any PC system with PCI slots.

3.1 System components

3.1.1 An P588/P588U/P5168U/P8485U card system includes following components:

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

3.1.2 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 connector.**
  A400 cable is used for DB37 to four DB25 male connector.
  P485 cable is used for DB37 to four DB9 male connector.

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- **One A640 (DB37 to DB37) cable with RS4232-4 box.**
- **User manual.**

3.2 Unpacking

If any of these items is missing or damaged, contact the dealer from whom you purchased the product. Save the shipping materials and carton in case you want to ship or store the product in the future.

Warning: Your serial communication card contains sensitive electronic components that can be easily damaged by static electricity. The card should be done on a grounded anti-static mat. The operator should be wearing an anti-static wristband, grounded at the same point as the anti-static mat.

Inspect the card module carton for obvious damage. Shipping and handling may cause damage to your module. Be sure there are no shipping and handing damages on the module before processing. After opening the card module carton, extract the system module and place it only on a grounded anti-static surface component side up. Again inspect the module for damage. Press down on all the socket IC's to make sure that they are properly seated. Do this only with the module place on a firm flat surface.

Do not apply power to the card if it has been damaged.

3.3 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.

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3.3.1 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.

(6) Start up the operating system.

(7) execute the PCIPORT card software installation procedure.

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

3.4 Hardware Configuration

3.4.1 In PCIPORT card we have following jumpers to set

- **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.

3.5 Serial I/O port connection:

- **P584/P584U/P984 card:**
  Support four RS232 interface port.
  Pin definition for DB37 female connector is in Appendix table 2.

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Pin definition for DB25 male connector is in Appendix A-table 3

Pin definition for DB9 male connector is in Appendix A-table 4.

- **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)

- **P985 card:**

  Support four RS422 interface port.

- **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.

- **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.

- **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.

- **P588/P588U/P5168U card:**

  Support eight RS232 interface port.

  Pin definition for DB62 female connector is in Appendix A, table 1.

  Pin definition for DB25 male connector is in Appendix A,table 1.

  Pin definition for DB9 male connector is in Appendix A, table 4.

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- **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.

- **P588U-4 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 ourRS4232-8 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, table 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 SW1 DIP Switch bit1&2 to set card number 1--4.
The interface selection in P422I card will be set by SW1 DIP Switch
DIP SWITCH bit3 and bit4 can set the interface type of Port A and Port B
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: SW1 DIP switch bit 3 (or 4) is ON.

(b) RS485 interface: SW1 DIP switch bit 3 (or 4) is OFF.

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(Bit3 is for PORT A and bit4 is for PORT B)

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.

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4 Windows 2000/XP Installation

4.1 Jumper configuration

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 PCIPORT card. (see chapter 4.2)

Then we can fix the COM port number for each card. This is very important for PCIPORT card. Traditionly, 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 in driver installation procedure. If you need to specify other COM port start number for PCIPORT card, you may need to setup it in our driver.

- When you installed PCIPORT driver in your WIN2000/XP system, you can enter:
- **“control panel→ system→Hardware→Device Manager→Multi-port serial adapter→setup"**
  to specify your target value.

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4.2 Note for multi-PCIPORT card installation.

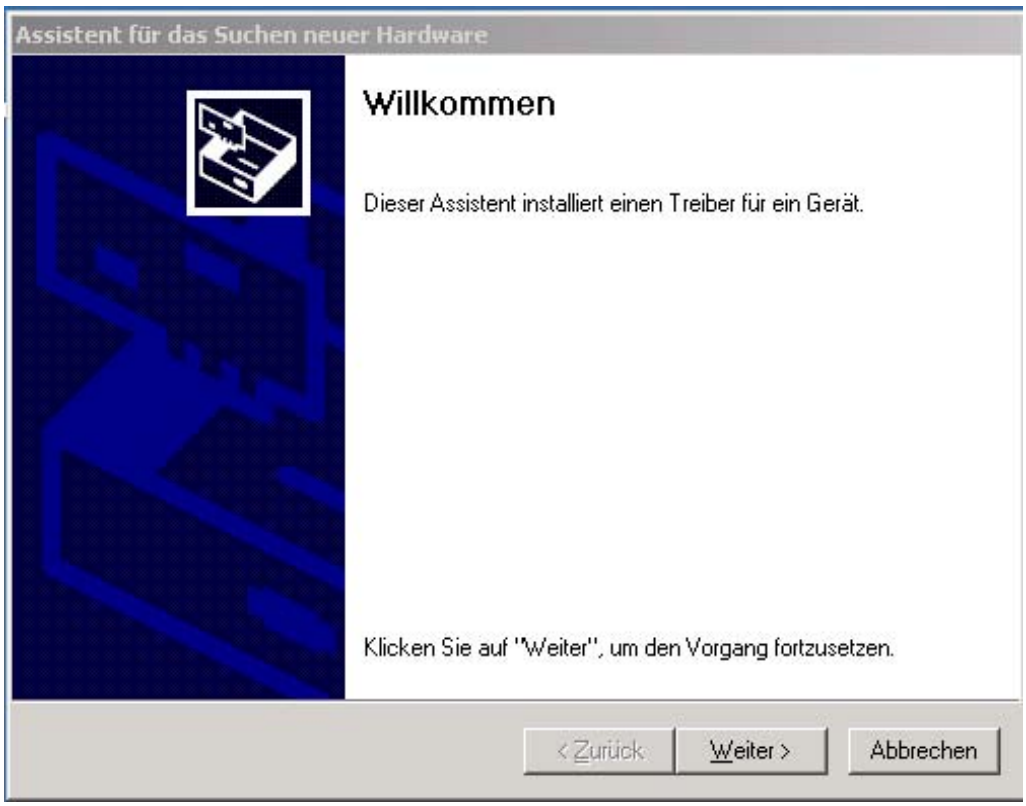
- When we need to install two PCIPORT cards in one WIN2000/XP system, we must confirm to let one card's jumper is ON. And the other card's jumper is OFF. We need to insert both card one by one.
- The card with jumper ON will have COM port number assigned for first card. The card with jumper OFF will have COM port number assigned for second card.
- 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 system.
- PCIPORT card can be used in interrupt shared mode. PCI BIOS will assign IRQ for each PCIPORT card. For multi-PCIPORT application we can just share one IRQ in each card. But user must confirm that one system may have minimum one IRQ left for P & P function. If there are no IRQ to be assigned to PCIPORT card, you may have wrong operation. Even though we can support IRQ shared mode, user must confirm that the other card with same IRQ must support IRQ shared mode.
- In WIN2000 system the driver for port is installed automatically. In XP system the driver for port is installed and confirmed for each port.

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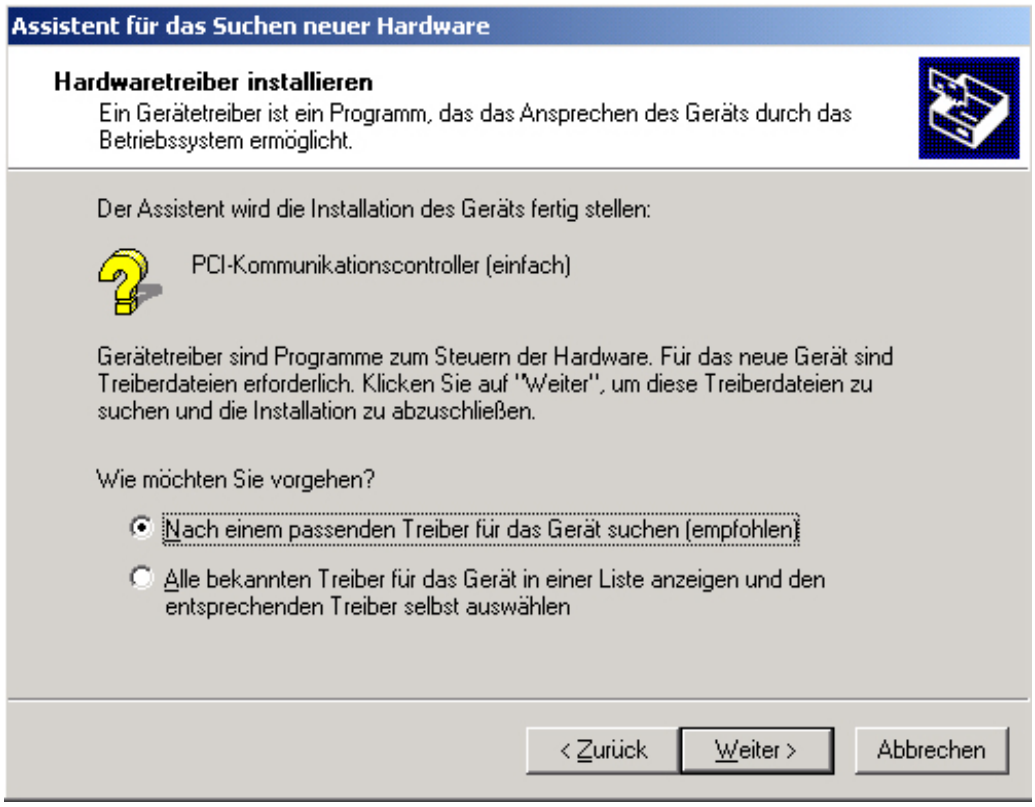
4.3 Driver installation

Once Windows 2000 system has been started, the Plug & Play function in 2000/XP system will find the new PCIPORT card. If this is the first time to install PCIPORT card in your 2000/XP system, you will be informed to install the driver.

- Please follow the instruction message to specify the driver location: A:\WIN2000



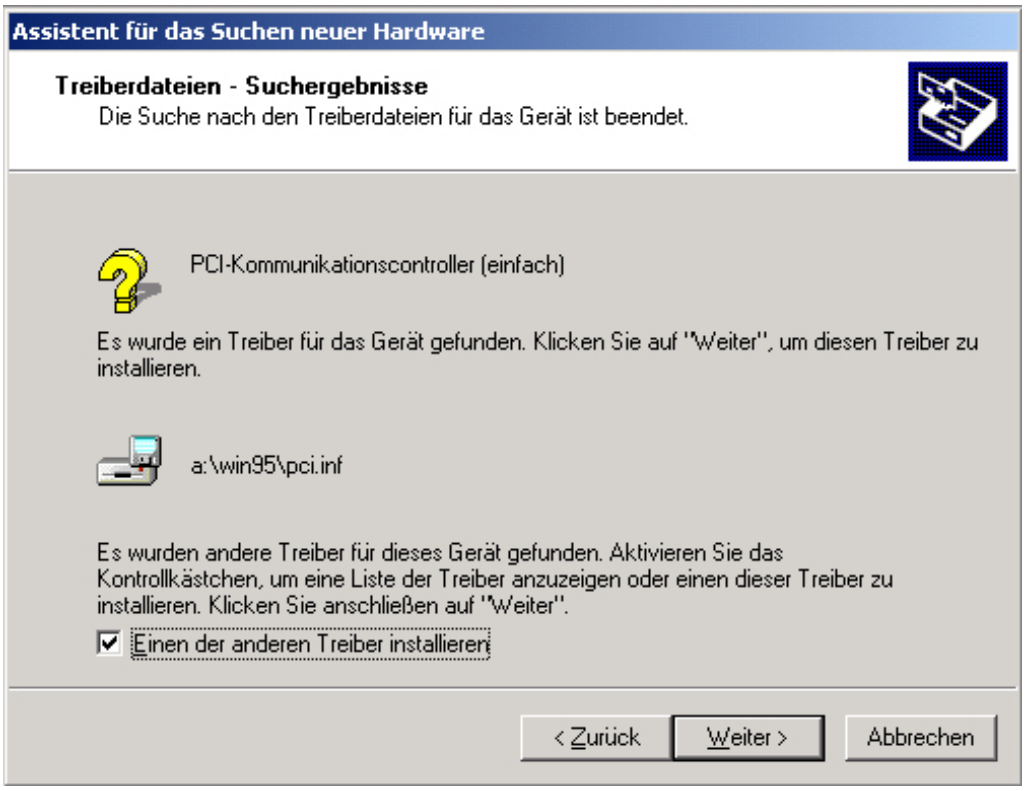
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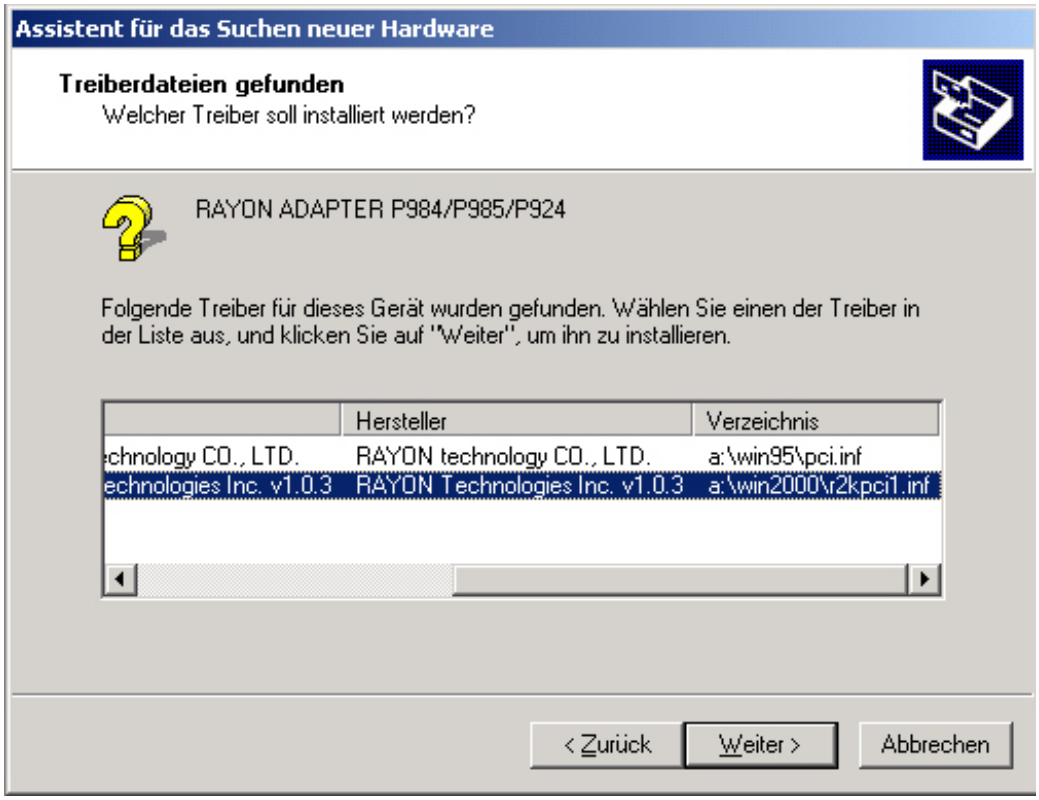


- Please insert disk “PCIPORT Windows driver”

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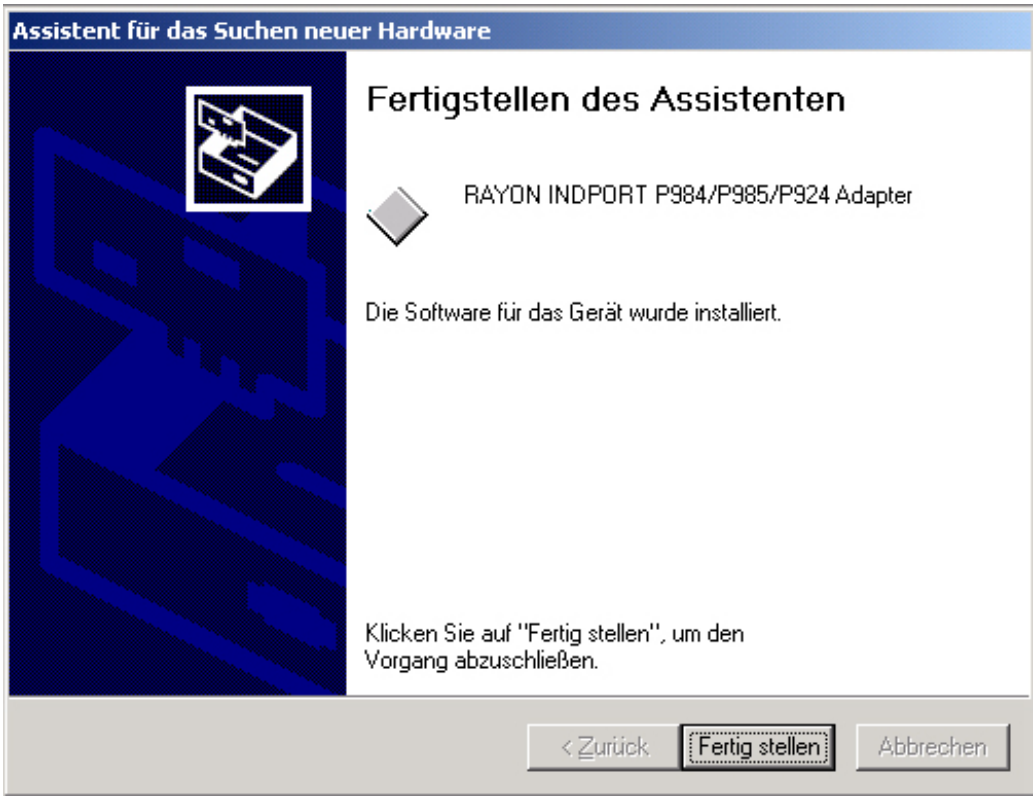


- **NOTE**: don't select wrong path a:\WIN95



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5 Windows NT Installation

5.1 Driver Installation

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

- Start the **Control Panel** applet by double clicking its icon in the **Program Managers** main group.
- In the **Control Panel** applet, double click **Network** icon to bring up the Network Control Panel Applet (NCPA).
- 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'
- 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/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.

- 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.

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- 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.

5.2 Note for multi-PCIPORT card installation.

- 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.
- 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.
- 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.
- 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.

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6 Windows 95/98/Me Installation

6.1 Driver Installation

Once Windows 95/98 system has been started, the Plug & Play function in 95/98/Me system will find the new PCIPORT card. If this is the first time to install PCIPORT 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**
  NOTE: You must specify correct path for system to find INF file.

Because the resource will be assigned by PCI BIOS. It is not easy to check which card is first card or secong card from resource. So we have one jumper in each card to set the first card or second card for this PCIPORT card. Then we can fix the COM port number for each card. This is very important for PCIPORT card. Traditionly, 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 PCIPORT 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.

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6.2 Note for multi-PCIPORT card installation.

- When we need to install two PCIPORT 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.
- 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.
- For easy to maintain one 95/98 system's COM port number we suggest that user must set the jumper ON for the first card to be installed in one 95/98 system.
- PCIPORT card can be used in interrupt shared mode. PCI BIOS will assign IRQ for each PCIPORT card. User must confirm that one system may have minimum one IRQ left for P & P function. If there are no IRQ to be assigned to PCIPORT card, you may have wrong operation. Even though our driver can support IRQ shared mode, user also need to confirm that the other card with same IRQ number must support IRQ shared mode (some ISA card do not support).
- 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.

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7 DOS Driver Installation

- Please confirm that you have jumper ON to set your first P584/P588 card in your first card installation.

- Change your active directory to target directory.

  ex. C:\RAYON.

- 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.

- 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)

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

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7.1.1 You may have following error message:

- **PCIPORT & INDPORT Already Install.**
  → The driver had been installed.

- **Please check 'JP1' in the P588 or P584**
  →You may install the same type card have same JP1 setting.

- **PCIPORT not in system.**
  →There is no PCIPORT card to be found in PCI slot.

7.2 Note for multi-PCIPORT card installation.

- 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.

- 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.

- 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.

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8 Linux system Installation

8.1 Driver Installation

- Login with superuser or root.
- Change your directory to root and copy our driver diskette to system.

  #cd /

  #tar xvf /dev/fd0

- change directory to /etc/rayon and run Install command.

  #cd /etc/rayon

  #./Install

- 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.

- 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].

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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.

8.2 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.
- PCIPORT card can be used in interrupt shared mode. PCI BIOS will assign IRQ for each PCIPORT card. For multi-PCIPORT application we can just share one IRQ in each card. But user must confirm that one system may have minimum one IRQ left for P & P function. If there are no IRQ to be assigned to PCIPORT card, you may have wrong operation.
- Even though PCIPORT card can be used in interrupt shared mode. But user must confirm that the other card with same IRQ must also support interrupt shared mode (ISA card do not support).

8.3 E-mail support for Linux driver

Anytime you can send an E_mail for Linux driver support.

ACCEED (Germany):	rayon@acceed.com
RAYON (Taiwan):	rayon@ms1.hinet.net

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9 SCO OpenServer Installation

9.1 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.

- Login with superuser or root.
- Change your directory to root and copy our driver diskette to system.

  #cd /

  #tar xvf /dev/fd0135ds18
- Change directory to /etc/pciport and run "build" command.

  #cd /etc/pciport

  #./build
- Please follow the installation procedure and reboot your system.
- 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 PCIPORT card's resource is assigned by PCI BIOS. We may have different resource to be assigned for different environment changed. We may need to reinstall our driver for this condition.

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User may need to run "build" command again to remove old driver and install new driver again. We strongly recommend that user need to reinstall our driver for PC environment changed condition.

9.2 Note for multi-PCIPORT card installation.

- We can install upto two PCIPORT cards in one SCO system.
- When we need to install two PCIPORT cards in one SCO OpenServer system, we must confirm that one card's jumper is ON. And the other card's jumper is OFF.
- In SCO OpenServer system PCIPORT card can not be used in interrupt shared mode. PCI BIOS will assign IRQ for each PCIPORT card. For multi-PCIPORT 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 PCIPORT card, you may have wrong operation. Please use our PCIIOP card in this condition. Because PCIIOP card don't need IRQ pin.
- User must insert our PCIPORT card in PCI slot before installed our SCO OpenServer driver.
- If PCIPORT card can not have proper operation, user may remove our driver firstly. Then user can install our driver again. If user try above procedure many times and fail, we may have failed card.

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10 Appendix A

10.1 Pin assignements and Cable Wiring

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

table 1

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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: (O) is signal output from card. (I) is signal input to card.

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10.1.2 DB37 Female Connector Pin assignment in P584/P485/P584U/P485U/P514U /P524U/P534U/P984/P985/P924 card.

DB37 P(In)	RS232 Signal Name	RS422/485 Signal Name	DB37 P(In)	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)	----	---- ---	---- ---

table 2

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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.

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10.1.3 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)

table 3

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10.1.4 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)	---

table 4

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

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

P232 card support 2 RS232 interface.

P422I card support 2 ground isolated RS422/485 interface.

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

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

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.

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

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10.1.5 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)	---

table 5

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.

J422 card support 4 * RS422 interface port.

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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 RS422 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 connectted 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.

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11 Appendix B

11.1 RS4232 Isolated Box user guide

11.1.1 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 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. power supply. This power supply can

- 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.

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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)	---

table 6

- **Note**: In RS4232-8 box we just support RS422/RS485 interface. In RS4232-4 box we can support RS232/RS422/RS485 interface.
- Each connector port have isolated ground.
- RS485 mode may let pin9 & pin11 short together as DATA+ and pin10 & pin12 short together as DATA- to connect with other device.
- 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.
- In RS232 mode the pin 9/10/11/12 may be in floating state. Don't connect any RS232 signal to these pins.
- 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.

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11.1.2 RS4232-4 box Mode setting in DIP switch.

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

table 7

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.

11.1.3 RS4232-8 box Mode setting in DIP switch.

DIP Switch	Interface mode
ON	RS422
OFF	RS485

table 8

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

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11.1.4 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 120 Ohm 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.

11.1.5 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 120 Ohm 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 manuafacture's definition. In our RS4232 box we have DATA+ with same phase as signal in UART (somebody may invert it).

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12 Appendix C

12.1 Troubleshooting procedure for PCIPORT card

12.1.1 Please confirm your card type firstly:

- **PCIPORT card:**
  P588, P584, P422I, P124, P485, P514, P518, P640N, P984, P985, P924, P584U, P588U, P5168U, P8485U, P485U, P514U, P524U, P534U.

- **PCIIOP card:**
  P640A, P640R, P960A, P960F, P990, P818, P888.

12.1.2 Please specify your target O.S. type:

DOS	Linux	SCO Openserver	WIN95/98/Me
WIN NT	WIN2000	WIN XP	others

table 9

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

- **In power on boot procedure we can not see the PCI BIOS screen to show our PCIPORT card.**

  NOTE: After the power of PC is truned 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 PCIPORT 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 PCIPORT card (we suggest that our PCB is dirty in golden finger and the touch is not good) to try again.

- **When we can find PCIPORT in PCI BIOS boot procdure, 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 WIN2000 or WIN95/98 system. Because WIN2000 system may choose the path for our WIN95 driver's directory and user do not change to WIN2000 directory. Then user may install driver and with error message finally. In this condition user must remove the INF file and force WIN2000 system to enter P&P procedure to install new driver (or WIN2000 system may record your old bad driver always).

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- **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). If there were problem in other OS system, you may have hardware problem in such card. Please check with supplier.

- **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 PCIPORT 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.

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Even though our PCIPORT 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 PCIPORT card. So we may have big problem in PCIPORT card's IRQ service routine.

- **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.

12.1.4 The other condition to specify and troubleshoot:

- Generally we test our PCIPORT 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 PCIPORT card must specify the OS type. And they may need more detail information about the problem in PCIPORT 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 before returned your cards.

ACCEED (Germany):	rayon@acceed.com
RAYON (Taiwan):	rayon@ms1.hinet.net

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13 Appendix D

13.1 P422I and P422N card usage

13.1.1 P422I card usage

- **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.

- **Jumper in JP3 & JP6:**
  This is jumper to insert(remove) 120 Ohm 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).

- **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.

- **Pin definition for DB9 connector:**
  Please check Appendix A, table 4 for more information.

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13.1.2 P422N card usage

- **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.

- **Jumper in JP1 & JP2:**
  This is jumper to insert(remove) 120 Ohm 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).

- **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.

- **Pin definition for DB9 connector:**
  Please check Appendix A, table 4 for more information.

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13.2 How to install DOS driver

- Please prepare one directory for our DOS driver.
  ex. C:\RAYON
- Please copy our DOS driver from diskette to this directory.

  cd \RAYON

  xcopy /s/e/v a:\DOS*.* .
- 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
- 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.

13.3 How to install WIN95/98/Me driver

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

13.4 How to install WIN NT4 driver

- WIN NT4 system is not P&P system. So we need to install driver manually. Our driver will be install as "network card".

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- In [control panel] [Network] [Add Adaptor] we can install our card from diskette. We just need to specify directory in

  A:\P220\NT4

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

13.5 How to install WIN2000/XP driver

- WIN2000/XP system is P&P system.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

- In WIN2000 system the port driver for each COM port will be installed automatically after P422I/P422N card driver installed. In WIN XP system the port driver for each COM port will be installed one by one after card driver installed.

13.6 How to install Linux driver

- Detail information please check chapter 7 of this manual.
- Please goto root directory and "tar" our driver diskette to your Linux system.

  cd /

  tar xvf /dev/fd0

- Please run "Install" to install driver.

  /Install

- Please choose card type in "PCIPORT card".

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14 Appendix E

14.1 P584/P584U and P524U card usage

14.1.1 P584 card usage

- **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.

- **Pin definition for DB25 connector: (use with A400 cable)**
  Please check Appendix table 3 for more information.

- **Pin definition for DB9 connector: (use with P485 cable)**
  Please check Appendix A-4 table for more information.

14.1.2 P584U card usage

- **Jumper in JP1:**
  Same function as above P584 card.

- **Pin definition for DB25 connector: (use with A400 cable)**
  Please check Appendix table 3 for more information.

- **Pin definition for DB9 connector: (use with P485 cable)**
  Please check Appendix table 4 for more information.

14.1.3 P524U card usage

- **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.

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Bit2(label PORT D) is for port D. Default condition is shorted in jumper for RS422 interface. When jumper is opened, it is set for RS485 interface.

- **Jumper in JP1:**
  Same function as above P584/P584U card.

- **Jumper in JP6,JP8:**
  This is jumper to insert(remove) 120 Ohm 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).

- **Usage in RS485 interface mode and pin definition in connector:**
  same function as above P584/P584U card.

- **Port A and port B is RS232 interface.**
  Port C and port D can be set in RS422 or RS485 interface.

14.1.4 How to install DOS driver

- Please prepare one directory for our DOS driver. ex. C:\RAYON

- Please copy our DOS driver from diskette to this directory.

  cd \RAYON

  xcopy /s/e/v a:\DOS*.* .

- Our driver is in C:\RAYON directory. We just need to run "PCIPORT" in this directory to install DOS driver.

  cd \RAYON

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PCIPORT

- 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.

14.1.5 How to install WIN95/98/Me driver

- WIN95/98/Me system is P&P system.
- 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

14.1.6 How to install WIN NT4 driver

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

  A:\P584\NT4

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

14.1.7 How to install WIN2000/XP driver

- WIN2000/XP system is P&P system.
- 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

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- In WIN2000 system the port driver for each COM port will be installed automatically after P584/P584U/P524U card driver installed. In WIN XP system the port driver for each COM port will be installed one by one after card driver installed.

14.1.8 How to install Linux driver

- Detail information please check Chapter 8 of this manual.
- Please choose card type in "PCIPORT card".

14.1.9 How to install SCO driver

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

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15 Appendix F

15.1 P485 and P485U card usage

- **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.

- **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.

- **Jumper in JP2,JP3,JP4 & JP5:**

  This is jumper to insert(remove) 120 Ohm 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).

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- **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.

- **Pin definition for DB25 connector: (use with A400 cable)**
  Please check Appendix A-3 table for more information.

- **Pin definition for DB9 connector: (use with P485 cable)**
  Please check Appendix A-4 table for more information.

15.1.1 P485U card usage

- **DIP SWITCH in SW1:**
  Same function as above P485 card.

- **Jumper in JP1:**
  Same function as above P485 card.

- **Jumper in JP2,JP4,JP6 & JP8:**
  This is jumper to insert(remove) 120 Ohm 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).

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- **Usage in RS485 interface mode and pin definition in connector:**

  Same function as above P485 card.

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15.1.2 How to install DOS driver

- Please prepare one directory for our DOS driver. ex. C:\RAYON
- Please copy our DOS driver from diskette to this directory.

  cd \RAYON

  xcopy /s/e/v a:\DOS*.* .

- Our driver is in C:\RAYON directory. We just need to run "PCIPORT" in this directory to install DOS driver.

  cd \RAYON

  PCIPORT

- 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.

15.1.3 How to install WIN95/98/Me driver

- WIN95/98/Me system is P&P system.
- 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

15.1.4 How to install WIN NT4 driver

- WIN NT4 system is not P&P system. So we need to install driver manually. Our driver will be install as "network card".

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- In [control panel] [Network] [Add Adaptor] we can install our card from diskette. We just need to specify directory in

  A:\P584\NT4

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

15.1.5 How to install WIN2000/XP driver

- WIN2000/XP system is P&P system.
- 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

- In WIN2000 system the port driver for each COM port will be installed automatically after P485/P485U card driver installed.
- In WIN XP system the port driver for each COM port will be installed one by one after card driver installed.

15.1.6 How to install Linux driver

- Detail information please check Chapter 8 of this manual.
- Please choose card type in "PCIPORT card".

15.1.7 How to install SCO driver

- Detail information please check Chapter 9 of this manual.
- P485/P485U card will be shown as PCIPORT card and P584 card type.

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16 Appendix G

16.1 P588/P588U and P5168U card usage

16.1.1 P588 card usage

- **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.

- **Pin definition for DB25 connector: (use with R801 cable)**
  Please check Appendix table 3 for more information. R801 cable is one DB62 male connector to eight DB25 male connector.

- **Pin definition for DB9 connector: (use with R804 cable)**
  Please check Appendix for more information.

  R804 cable is one DB62 male connector to eight DB9 male connector.

- **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.

16.1.2 P588U card usage

- **Jumper in JP1:**
  same function as above P588 card.

- **Pin definition for DB25 connector: (use with R801 cable)**
  Please check Appendix A-3 table for more information.

- **Pin definition for DB9 connector: (use with R804 cable)**
  Please check Appendix A-4 table for more information.

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16.1.3 P5168U card usage

- **Jumper in JP1:**
  same function as above P588 card.

- **Pin definition for DB25 connector: (use with R801 cable)**
  Please check Appendix table 3 for more information.

- **Pin definition for DB9 connector: (use with R804 cable)**
  Please check Appendix table 4 for more information.

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16.1.4 How to install DOS driver

- Please prepare one directory for our DOS driver. ex. C:\RAYON
- Please copy our DOS driver from diskette to this directory.

  cd \RAYON

  xcopy /s/e/v a:\DOS*.* .

- Our driver is in C:\RAYON directory. We just need to run "PCIPORT" in this directory to install DOS driver.

  cd \RAYON

  PCIPORT

- 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.

16.1.5 How to install WIN95/98/Me driver

- WIN95/98/Me system is P&P system.
- 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

16.1.6 How to install WIN NT4 driver

- WIN NT4 system is not P&P system. So we need to install driver manually. Our driver will be install as "network card".

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- In [control panel] [Network] [Add Adaptor] we can install our card from diskette. We just need to specify directory in

  A:\P588\NT4

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

16.1.7 How to install WIN2000/XP driver

- WIN2000/XP system is P&P system.
- 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

- In WIN2000 system the port driver for each COM port will be installed automatically after P588/P588U card driver installed. In WIN XP system the port driver for each COM port will be installed one by one after card driver installed.

16.1.8 How to install Linux driver

- Detail information please check Chapter 8 of this manual.
- Please choose card type in "PCIPORT card".

16.1.9 How to install SCO driver

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

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17 Appendix H

17.1 P8485U and P588U4 card usage

17.1.1 P8485U card usage

- **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.

- **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.

- **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.

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

- **Pin definition for DB25 connector: (use with R801 cable)**
  Please check Appendix table 3 for more information.

- **Pin definition for DB9 connector: (use with R804 cable)**
  Please check Appendix A-4 table for more information.

17.1.2 P588U4 card usage

- **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
  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.

- **Jumper in JP1:**
  Same function as above P8485U card.

- **Usage in RS485 interface mode and pin definition in connector:**
  Same function as above P8485U card.

- **Pin definition for DB25 connector: (use with R801 cable)**
  Please check Appendix A table 3 for more information.

- **Pin definition for DB9 connector: (use with R804 cable)**
  Please check Appendix A table 4 for more information.

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17.1.3 How to install DOS driver

- Please prepare one directory for our DOS driver.

  ex. C:\RAYON

- Please copy our DOS driver from diskette to this directory.

  cd \RAYON

  xcopy /s/e/v a:\DOS*.* .

- Our driver is in C:\RAYON directory. We just need to run "PCIPORT" in this directory to install DOS driver.

  cd \RAYON

  PCIPORT

- 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.

17.1.4 How to install WIN95/98/Me driver

- WIN95/98/Me system is P&P system.
- 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

17.1.5 How to install WIN NT4 driver

- WIN NT4 system is not P&P system. So we need to install driver manually. Our driver will be install as "network card".

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- In [control panel] [Network] [Add Adaptor] we can install our card from diskette. We just need to specify directory in

  A:\P588\NT4

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

17.1.6 How to install WIN2000/XP driver

- WIN2000/XP system is P&P system.
- 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

- In WIN2000 system the port driver for each COM port will be installed automatically after P8485U/P588U4 card driver installed. In WIN XP system the port driver for each COM port will be installed one by one after card driver installed.

17.1.7 How to install Linux driver

- Detail information please check Chapter 8 of this manual.
- Please choose card type in "PCIPORT card".

17.1.8 How to install SCO driver

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

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18 Appendix I

18.1 P232 card usage

18.1.1 How to install DOS driver

- Please prepare one directory for our DOS driver. ex. C:\RAYON
- Please copy our DOS driver from diskette to this directory.

  cd \RAYON

  xcopy /s/e/v a:\DOS*.* .

- 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

- 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.

18.1.2 How to install WIN95/98/Me driver

- WIN95/98/Me system is P&P system.
- 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

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18.1.3 How to install WIN NT4 driver

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

  A:\P220\NT4

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

18.1.4 How to install WIN2000/XP driver

- WIN2000/XP system is P&P system.
- 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

- In WIN2000 system the port driver for each COM port will be installed automatically after P422I/P422N card driver installed. In WIN XP system the port driver for each COM port will be installed one by one after card driver installed.

18.1.5 How to install Linux driver

- Detail information please check Chapter 7 of this manual.
- 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

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- Please choose card type in "PCIPORT card".

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19 Appendix J

19.1 P984/P985 and P924 card usage

19.1.1 P984 card usage

- **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.

- **Pin definition for DB25 connector: (use with A400 cable)**
  Please check Appendix for more information.

- **Pin definition for DB9 connector: (use with P485 cable)**
  Please check Appendix A-4 table for more information.

19.1.2 P985 card usage

- **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.

- **Pin definition for DB25 connector: (use with A400 cable)**
  Please check Appendix A-3 table for more information.

- **Pin definition for DB9 connector: (use with P485 cable)**
  Please check Appendix A-4 table for more information.

19.1.3 P924 card usage

- **Jumper in JP5:**
  This is 2 bit jumper. Each bit will set the corresponding port interface type.

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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.

- **Jumper in JP1:**
  Same function as above P984/P985 card.

- **Jumper in JP2,JP3:**
  This is jumper to insert(remove) 120 Ohm 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).

- **Usage in RS485 interface mode and pin definition in connector:**
  Same function as above P984/P985 card.

- Port A and port B is RS232 interface.

- Port C and port D can be set in RS422 or RS485 interface.

19.1.4 How to install DOS driver

- Please prepare one directory for our DOS driver. ex. C:\RAYON

- Please copy our DOS driver from diskette to this directory.

  cd \RAYON

  xcopy /s/e/v a:\DOS*.* .

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- 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

- 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.

19.1.5 How to install WIN95/98/Me driver

- WIN95/98/Me system is P&P system.
- 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

19.1.6 How to install WIN NT4 driver

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

  A:\P984\NT4

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

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19.1.7 How to install WIN2000/XP driver

- WIN2000/XP system is P&P system.
- 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

- In WIN2000 system the port driver for each COM port will be installed automatically after P984/P985/P924 card driver installed. In WIN XP system the port driver for each COM port will be installed one by one after card driver installed.

19.1.8 How to install Linux driver

- Detail information please check Chapter 7 of this manual.
- Please choose card type in

  "PCIPORT card".

19.1.9 How to install SCO driver

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

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20 Appendix K

20.1 RAYON repair procedure

20.1.1 Return material authorization (RMA or RA)

20.1.2 RAYON requires that you provide the following information :

- Model number
- RAYON serial number
- The reason for returning the products
- Your purchase-order number

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.

Taiwan: rayon@ms1.hinet.net

Europe: rayon@acceed.com

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

- Your Return Material Authorization Number (RMA or RA Number)

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- Information regarding applicable charges
- The address to which you will return the products

20.2 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 yourRAYON-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.

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