# Appendix for PC/104-*plus* modules

## 1    Introduction

### 1.1    Introduction of PC/104-plus

PC/104-*plus* is a special bus architecture designed for embedded systems. A third connector opposite the PC/104 connectors supports the PCI bus. Basically the electrical specifications of the PC/104-*plus* bus are compliant with the PCI signals, except 64-bit extensions, JTAG, PRSNT or CLKRUN signals. The mechanical specifications are changed to "module stack", please refer to the figure shown below. According to the specifications of PC/104-*plus*, PC/104-*plus* modules are installed and configured by switching CLK, IDSEL, INT, REQ and GNT signals through multiplexers to the appropriate connections.
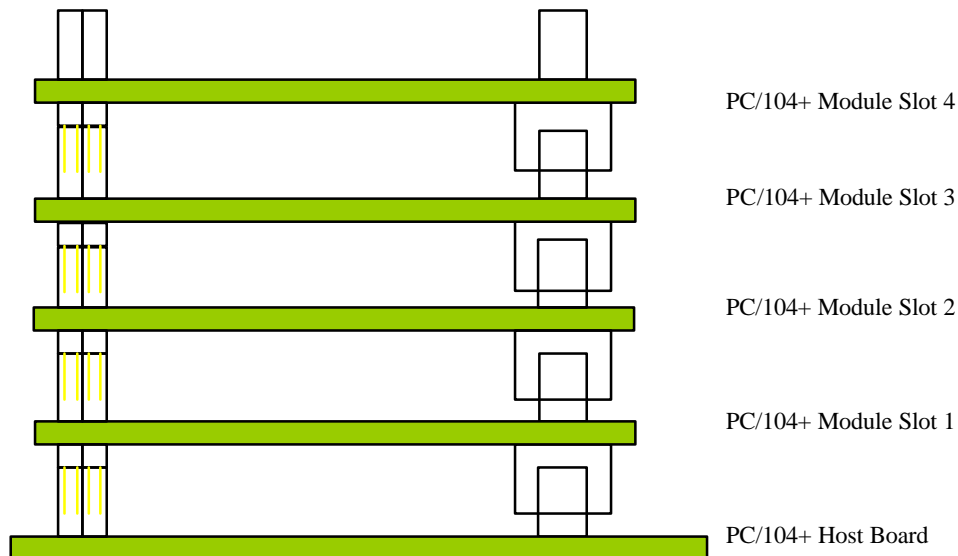


**Figure 1 PC/104-*plus* module stack**

Rotary switch on PCM-2855 is used for these signals switching, please refer to section 4 for details in this appendix

### 1.2    Feature for PCM-2855

The Feature of the PCM-2855 are as following:

- Standard PC-104 plus interface

- 4 communication ports intelligent buffers

- RS-422/485 hardware/software selectable

- RS-485 with auto direction flow control

- Isolated industry communication ports

- High speed communications concurrently (max. 115200 bps)

- Supports up to 8 cards/32 ports per system

- Supports DOS, Windows 95/98, and Windows NT operation system

## 1.3 Specifications for PCM-2855

The specifications of the PCM-2855 are as following:

- Serial communication controller:

- 16C550A compatible

- 1.8432 ~ 7.3728 MHz

- System IO mapping: Shared IRQ

- Flow control: RS-485 auto direction

- Port Capability:

- 4 isolated RS-422/485 port (DIP switch/software select)

- Max. port per system: 16 (4 modules)

- Isolation voltage: 500VDC

- Baud rate: Each port can be configured to 50~115,200 bps

- Operation System Compatibility: Windows 95/98/NT/QNX

- Connector: 4 ports pin Header wide body connector and 40pin Box Header

- Cable: Flat cable with 4 standard DB9(C409M) male connector

- Operating temperature: 0 ~ 55 °C

- Storage temperature: -20 ~ 65 °C

- Humidity: 10% ~ 95%, non-condensing

- Dimension: 160 x 100 mm$^2$ (6.3 x 3.9 in.$^2$) 3U

- Power consumption: +5V @ 1400mA typical

## 1.4 Software support

The software support is the same as the cPCI-3544. Please refer to section 1.4 of the PCI-9112 manual for detailed information.

## 2    Installation procedures for PC/104-*plus* modules:

### 2.1    what you have

In addition to this appendix, the package includes the following items:

- PCM-2855 modules

- 4 Flat cable for extend the ports

- Manual & Software Utility CD-ROM

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

### 2.2    unpacking

Your serial communication module contains sensitive electronic components that can be easily damaged by static electricity.

The module 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 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 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.

**Note :** DO NOT APPLY POWER TO THE MODULE IF IT HAS BEEN DAMAGED.

You are now ready to install your cPCI Module.

## 2.3 layout of modules

Port1 and Port2

Port3 and Port4

PC/104 connector

PC/104-*plus* connector

Rotary switch

Card Number and Port select switch

ADLink PCM2855-A2
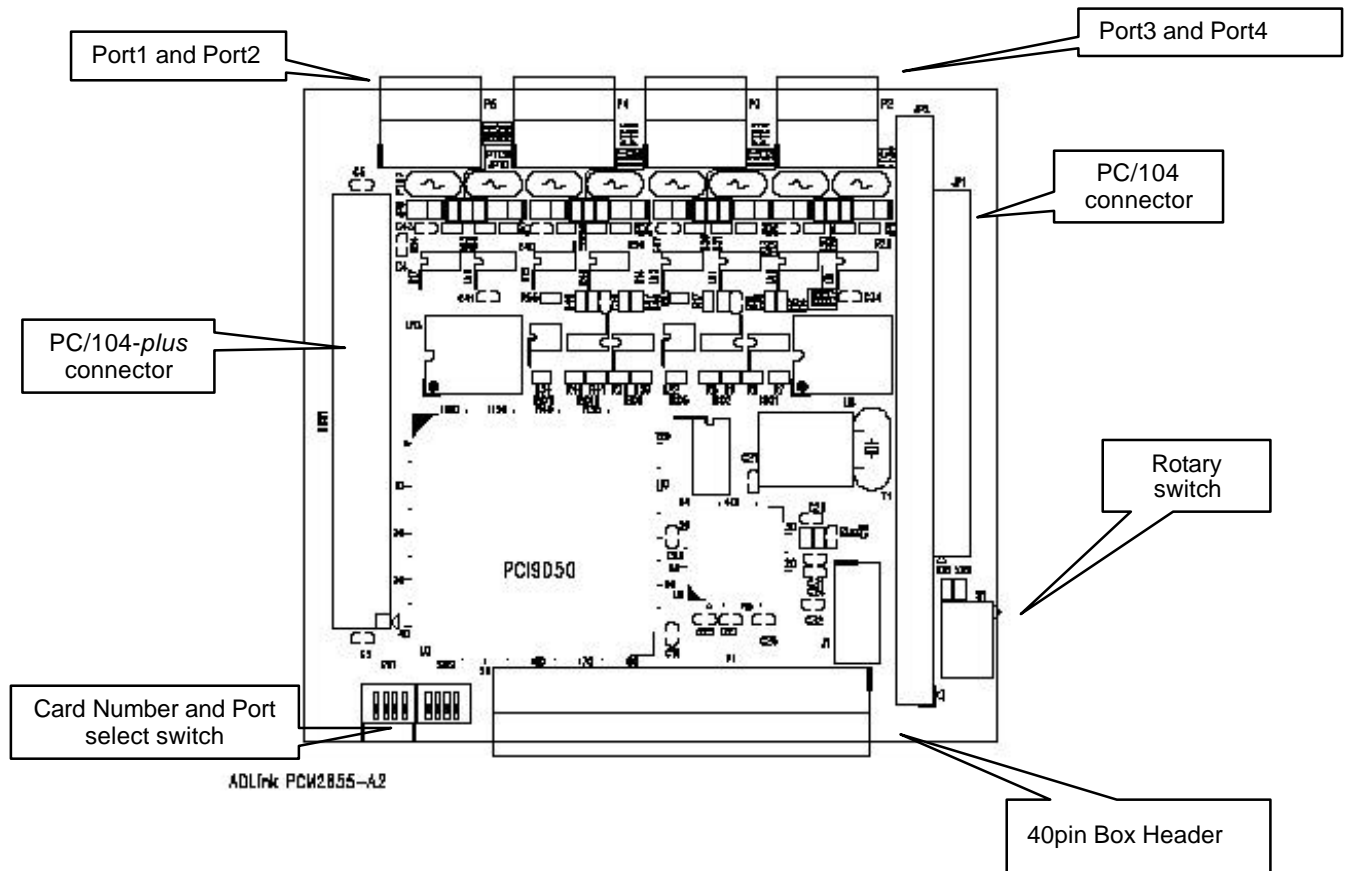
PCI9D50

40pin Box Header

**Figure 2 PCM-2855 module layout**

## 2.4 PC/104-*plus* configuration

A rotary switch on PCM-2855 is used to switch the appropriate CLK, IDSEL, INT, REQ and GNT signals from PCI bus. For example, when PCM-2855 card is plugged as the closest position to PC/104-*plus* motherboard, the switch must be set to 0 or 4. For signals stability consideration, please switch the rotary switch to the appropriate position with respect to the module slot. The module stack order is shown in Figure 1. In addition, according to the PC/104-*plus* specification, module slots 3 and 4 share REQ2/GNT2, they cannot both be bus master devices. In another word, module 3 and 4 cannot stack with 2 PCM-2855 modules.

| Rotary Switch Position | Module Slot | CLK | IDSEL | INT | REQ | GNT |
|---|---|---|---|---|---|---|
| 0 or 4 | 1 | CLK0 | IDSEL0 | INTA | REQ0* | GNT0* |
| 1 or 5 | 2 | CLK1 | IDSEL1 | INTB | REQ1* | GNT1* |
| 2 or 6 | 3 | CLK2 | IDSEL2 | INTC | REQ2* | GNT2* |
| 3 or 7 | 4 | CLK3 | IDSEL3 | INTD | REQ2* | GNT2* |

**Table 1 Rotary switch setting**       * only for Bus Masters card

## 2.5 Jumpers Setting

On PCM-2855 module, there are 2 switches need to be adjusted card number and port setting for user's particular applications. The following table describes the attributes of these jumpers.

*Switch Setting*

| CARD NO. | | Port Select | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SW1-3 | # | | PortA | | PortB | | PortC | | PortD | |
| 000 | 0 | SW | On | Off | On | Off | On | Off | On | Off |
| 100 | 1 | 4 | 485 | 422 | | | | | | |
| 010 | 2 | 5 | | | 485 | 422 | | | | |
| 110 | 3 | 6 | | | | | 485 | 422 | | |
| 001 | 4 | 7 | | | | | | | 485 | 422 |
| 101 | 5 | | | | | | | | | |
| 011 | 6 | | | | | | | | | |
| 111 | 7 | | | | | | | | | |

**Table 2 Switches setting**

### 2.5.1 Connector Pin Assignment of PCM-2855

40pin Box Header female connector pin assignment for PCM-2855

| 40pin Box Header Pin No. | Signal Name | 40pin Box Header Pin No. | Signal Name |
|---|---|---|---|
| 1 | 422_RXD1+(IN) | 21 | 485_D1-(I/O) |
| 2 | 422_RXD1-(IN) | 22 | 422_TXD2+(OUT) |
| 3 | GDN1 | 23 | 422_TXD2-(OUT) |
| 4 | -- | 24 | -- |
| 5 | GND1 | 25 | 422_TXD3-(OUT) |
| 6 | GND2 | 26 | 422_TXD3+(OUT ) |
| 7 | -- | 27 | 485_D4-(I/O) |
| 8 | GND2 | 28 | 485_D4+(I/O) |
| 9 | 422_RXD4-(IN) | 29 | 422_TXD1+(OUT) |
| 10 | 422RXD4+(IN) | 30 | 422_TXD1-(OUT) |
| 11 | -- | 31 | 422_RXD2+(IN) |
| 12 | -- | 32 | 422_RXD2-(IN) |
| 13 | 485_D2+(I/O) | 33 | -- |
| 14 | 485_D2-(I/O) | 34 | 485_D3-(I/O) |
| 15 | -- | 35 | 485_D3+(I/O) |
| 16 | 422_RXD3-(IN) | 36 | -- |
| 17 | 422_RXD3+(IN) | 37 | -- |
| 18 | 422_TXD4-(OUT) | 38 | -- |
| 19 | 422_TXD4+(OUT) | 39 | -- |
| 20 | 485_D1+(I/O) | 40 | -- |

**Table 3 40pin Box Header pin definition**

DB9 connector pin assignment for each port

Hint: This pin assignment is transfered from 10pin header by Flat cable in PCM-2855 module for RS-422/485 interface.

| DB9 Pin No. | Signal Name |
|---|---|
| 1 | 485_D- |
| 2 | 422_RXD+ |
| 3 | 422_TXD+ |
| 4 | 422_TXD- |
| 5 | GND |
| 6 | 422_RXD- |
| 8 | 485_D+ |
| 9 | |

**Table 4 Pin definition of DB9 connector for each port**

**RS-422**

TXD+      :      Transmit Data Positive

TXD-      :      Transmit Data Negative

RXD+      :      Receive Data Positive

RXD-      :      Receive Data Negative

**RS-485**

D+      :      Data Signal Positive

D-      :      Data Signal Negative

## 2.6    Software Installation

### 2.6.1    Windows NT Installation

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

1.    Start the [Control Panel] applet by double clicking the icon in the [Program Managers] main group.

2.    In the [Control Panel] applet, double click [Network] icon to bring up the Network Control Panel Applet (NCPA).

3.    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.

4.    When prompted for the path, specify the drive and directory where the NCPA can find the new driver for the card you install.

5.    Now, you can follow the configuration dialog boxes to install the driver.

6.    In the default condition, the TTY port is given name from "COM3". User can specify the start "COM" port number in installation procedure.

7.    We can install up to two same type serial communication cards in one NT system.

8.    When you need to install two same type serial communication cards in one NT system, you must confirm to let one card's SW1-1 is ON while the other card's SW1-1 is OFF for cPCI-3534 and JP1 is ON while the other card's JP1 is OFF for cPCI-3538. The same manner can be apply to cPCI-3544 with SW1-3 adjusting to different number.

9.    The card with switch ON will have low COM port number. The card with switch OFF will have higher COM port number follow the card with switch ON.

10.    If you install two the same type serial communication modules with switch ON or OFF simultaneously, we can not confirm that both cards will active properly.

11.    If you install multiple cards in one NT system simultaneously, please confirm that the COM port number assigned do not overlap for different card. Or you may have improperly operation in your system.

12.    For easy to maintain NT system's COM port number, we suggest that you must set the switch ON for the first card to be installed in NT system.

13. After you install the driver, you need to reboot your PC, then you can have more COM port available.

14. If you had installed our NT driver in your system before, you might remove this driver firstly, then you can install our new version driver. Or you might have some problem in your system.

### 2.6.2 Windows 95/98 Installation

Once Windows 95/98 system has been started, the plug & play function in 95/98 system will find the new serial communication card. If this is the first time to install serial communication card in your Windows 95/98 system, you will be informed to install the driver. Please follow the instruction message to input the COM port number starting value for the first and second cards.

Because the resource will be assigned by PCI BIOS, it is not easy to check which card is first or second from resource. So the switch will play the role for system to fix the COM port number for each card.

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

1. You can install up to two cPCI-3534/3538 cards in one 95/98 system.

2. When you need to install two same type cards in one 95/98 system, you must confirm to let one card's switch is ON, and the other card's switch is OFF.

3. The card with switch ON will have COM port number assigned for first card. The card with switch OFF will have COM port number assigned for second card.

4. If you install two the same type serial communication cards with switch ON or OFF simultaneously, we can not confirm that both cards will active properly.

5. If you install multiple cards in one 95/98 system simultaneously, please confirm that the COM port number assigned does not overlap for different card. Or you may have improperly operation in your system.

6. For easy to maintain 95/98 system's COM port number, we suggest that you must set the switch ON for the first card to be installed in 95/98 system.

7. The serial communication card can be used in interrupt shared mode. PCI BIOS will assign IRQ for each serial communication card. For multi-card application, we can just share one IRQ in each card, but you must confirm that one system may have minimum one IRQ left for P&P function. If there are no IRQ left to be assigned to serial communication card, you might have wrong operation.

### 2.6.3 For UNIX, LINUX and QNX user

You can download the .tar driver from ADLINK website or contact the dealer near you for service and support.