



Allen-Bradley

**NetLinx
DeviceNet
Communication
Card**
**Cat. No. 1784-PCD
Series C**

Installation Manual

Allen-Bradley

Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley publication SGI-1.1, *Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control* (available from your local Allen-Bradley office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

Due to the rapid change in technology and part availability, Allen-Bradley reserves the right to change the appearance of certain products which may not match those shown in this manual.

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Throughout this manual we use notes to make you aware of safety considerations:



ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss.

Attention statements help you to:

- identify a hazard
- avoid the hazard
- recognize the consequences

Important: Identifies information that is critical for successful application and understanding of the product.

Summary of Changes

This manual has been revised to document the series C revision of the 1784-PCD card. Therefore, the only changes you will notice in this release of the manual are references to the series C PCD card rather than the series A and B cards.

About This Manual

This manual describes how to install, configure, and troubleshoot the 1784-PCD communication card, catalog number 1784-PCD series C. Throughout the manual, we refer to this product as the PCD card.



Who Should Read This Manual

The information in this manual is intended for users who are:

- familiar with Windows 95[®], Windows 98[®], and/or
- Windows NT[™]
- experienced with DeviceNet configuration software and the DeviceNet[™] network


Understand Abbreviations

Throughout this manual, we abbreviate some terms. Use this table to become familiar with our terminology.

We use this abbreviation	To indicate
PCMCIA	Personal Computer Memory Card International Association
IRQ	Interrupt Request
TSR	Terminate and Stay Resident
API	Application Programming Interface
PC	Personal Computer

Understand Conventions

We use these conventions in this manual:

- Keys that you press look like this: 
- Other actions to be performed are shown as:
Click on the MEMORY tab.

Important: Driver and firmware versions that appear in the screen captures in this manual are not necessarily the latest version available. You should use the version that is identified in the screen capture or a later version.

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About the PCD Card

What Is in This Chapter?

Read this chapter to familiarize yourself with PCMCIA technology and the PCD card.

What Is PCMCIA?

The Personal Computer Memory Card International Association (PCMCIA) is an organization that defines standards for connecting peripherals to laptop or notebook computers. The standard ISA, EISA, PCI, and VLB buses are too large for laptop computers; the PCMCIA *PC Card* is an accepted standard.

PC cards developed under the PCMCIA release 1.0 standard are used for data storage. PC cards developed under the PCMCIA release 2.0 standard can be used for both I/O and data storage.

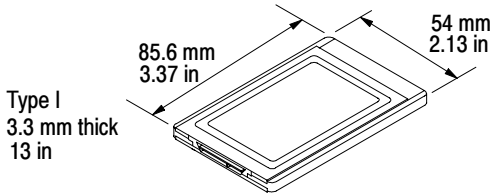
What Is a PC Card?

Since personal computers have become smaller, a need for smaller storage media developed. The PC card is a small form-factor adapter that adds memory, storage, and I/O capabilities to these smaller computers.

Architecture

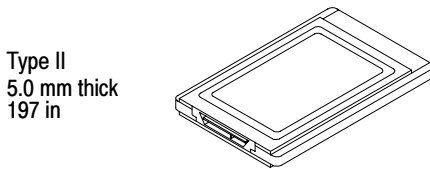
All PC cards measure the same length and width (85.6 mm x 54 mm or 3.37 in x 2.13 in), but differ in thickness at the center. The thickness at the connector end and along the rails is the same for all types of PC cards.

Currently there are three types of PC cards:



Type I
3.3 mm thick
13 in

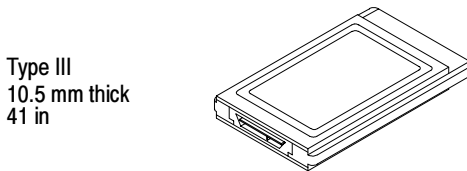
data storage, such as
Flash memory cards



Type II
5.0 mm thick
197 in

I/O such as modem, LAN,
and host communications

(The Allen-Bradley 1784-PCD, -PCMk,
and -PCC cards are Type II cards.)



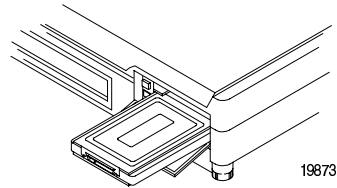
Type III
10.5 mm thick
41 in

data storage or I/O capabilities
that require more space, such
as rotating media and wireless
communication devices

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If the PCMCIA slot in your computer is wide enough to accommodate a Type III card, then it can also accommodate a Type I or II card.

All three types of PC cards use the same 68-pin connector. The pins are in 2 parallel rows of 34 pins. When you insert the connector into the PCMCIA slot on your computer, it mates with a single molded *socket*.

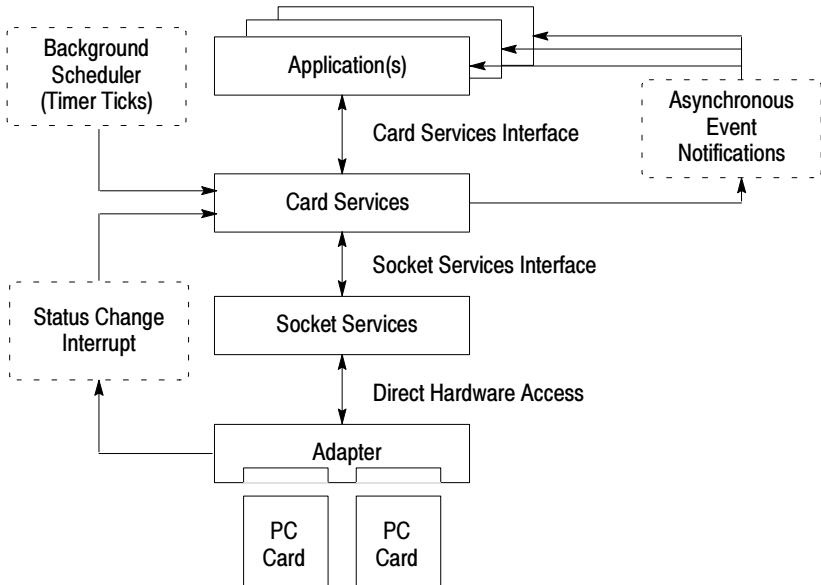


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Communication

The socket provides the physical connection to the PC card. The PC card then is connected to the I/O bus in your computer through a hardware interface called the *adapter*.

Software interfaces defined by PCMCIA enable communication between an installed PC card and the computer. We call these software interfaces *Card and Socket Services*. Windows 95/98 and Windows NT have built-in Card and Socket Services capabilities. Once you establish communication, the PC card identifies itself through its *Card Information Structure*.



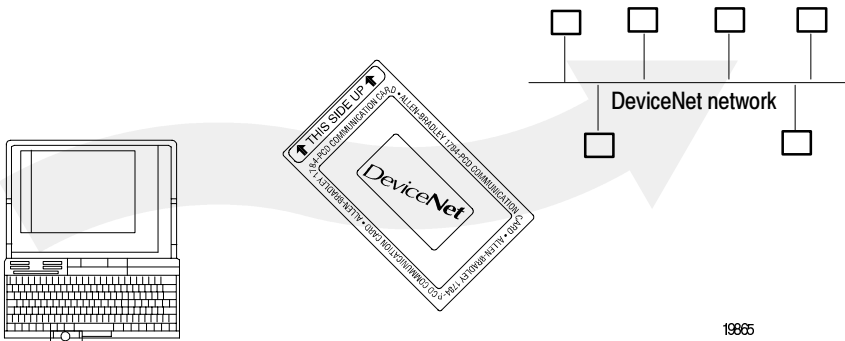
Socket Services identifies how many sockets are present in your computer and detects if a PC card is inserted into one of these sockets. The PCMCIA adapter handles communication between the PC card and the sockets in your computer. *Socket Services* controls this adapter.

Card Services provides access to system resources (such as memory and interrupt requests) and automatically releases the system resources when you remove the PC card from a socket. *Card Services* also provides an interface to higher level software if you need to load any hardware drivers.

After the PC card establishes communication with the computer, the Card Information Structure provides configuration information about the PC card such as available storage, device type, and data format to the computer.

What Is the PCD Card?

The PCD card is a PCMCIA Type II form-factor card that interfaces between your computer and the DeviceNet network.



Important: Your computer must be PCMCIA 2.1-compliant to support the PCD card. Refer to the documentation supplied with your computer to determine whether or not it is compliant.

Obtain Support

For additional support in using the PCD card, access these Rockwell Automation support services.

Technical Support:	Access at:
Internet Web Site	http://www.ab.com — as a registered member, open to http://www.ab.com/mem/technotes/techmain.html
Fax-back System	440.646.5436 (requires a touch-tone telephone)
Telephone	440.646.3638 (Pre-sales Technical Support) 440.646.5800 (Post-sales Technical Support)

Adherence to European Union Directive Compliance

If this product or package is marked with the  mark, the product complies with the following European Union Directives:

EMC Directive

This apparatus is tested to meet Council Directive 89/336/EEC Electromagnetic Compatibility (EMC) using a technical construction file and the following standards, in whole or in part:

- EN 50081-2 EMC – Generic Emission Standard, Part 2 – Industrial Environment
- EN 50082-2 EMC – Generic Immunity Standard, Part 2 – Industrial Environment

The product described in this manual is intended for use in an industrial environment.

Low Voltage Directive

This apparatus is also designed to meet Council Directive 73/23/EEC Low Voltage, by applying the safety requirements of EN 61131-2 Programmable Controllers, Part 2 – Equipment Requirements and Tests.

For specific information that the above situation requires, see the appropriate sections in the manual for this product, as well as the following Allen-Bradley publications:

- Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1
- Guidelines for Handling Lithium Batteries, publication AG-5.4
- Automation Systems Catalog, publication B111

Before You Install the Card

What Is in This Chapter?

Read this chapter to understand:

- what you should have received with your order
- system requirements
- the need for backup disks
- why you need to remove older drivers
- which driver to install

Verify Your Package Contents

Be certain that you have the following items before you discard any packing material. If an item is missing or incorrect, contact your local sales representative.

- 1784-PCD communication card
- three 1784-PCD setup disks
- 1784-PCD1 cable
- clear, plastic, PC-card carrying case
- installation manual, publication number 1784-5.29

Understand System Requirements

operating system	Microsoft® Windows 95, Windows 98, or Windows NT 4.0
memory	4 MB or higher
hard disk space	300K bytes
diskette drive	one 3.5" diskette drive
PCMCIA slot	one Type II slot
PC card	1784-PCD for interfacing to the DeviceNet network
application software	DeviceNet Manager™ software, cat. no. 1787-MGR, RSLinx software, catalog number 9355-WAB, version 2.00.97.30 or later, RSNetWorx for DeviceNet software, catalog number 9357-DNETL3, DeviceNet Monitor software, catalog number 9240-MON16 other third-party WinDNet16™ software
memory	8KB available memory
IRQ	1 available IRQ

Make Backups

Before you install the PCD card or any driver, we recommend that you make backups of each of your PCD setup disks.

Remove Older Series A and B PCD Drivers in Windows 95

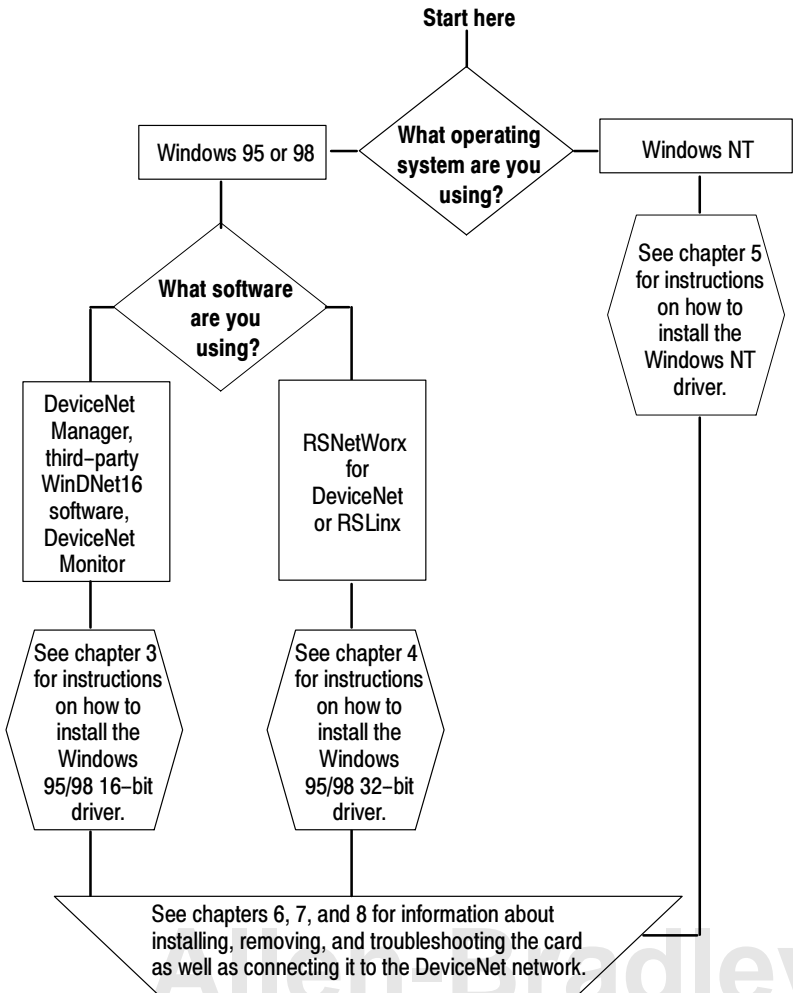
Before you install any of the PCD drivers described in this manual, you must remove all older series A and series B PCD card drivers. If you do not, you may experience difficulty in installing and/or using the current release of PCD card drivers. To remove any old drivers, follow these steps:

1. **Complete this step only if there is a possibility that someone may have installed a series A PCD card in this PC.** Read the readme.txt file included on the *1784-PCD Windows 95/98 16-bit Setup Disk*, release 2.22 or later. Follow all of the instructions contained in this file.
2. Insert the *1784-PCD Windows 95/98 16-bit Setup Disk*, release 2.22 or later, into your PC's floppy disk drive.
3. Run the `abremove.exe` file from the setup disk.

Important: If the `abremove` program reports that it finds a PCD driver, highlight this driver and click **Remove**. If it reports that it finds more than one PCD driver (which it would if someone had configured both series A and series B PCD cards), only remove **one** of these drivers. To remove the second driver, repeat step 3 and select the second driver.

Determine Which Driver to Install

Before you install the PCD card, you need to determine which driver to install. To do this, use the following chart to select your operating system and which software packages you will use. Then, follow the chart to determine which driver to install for your system and which chapters to consult for instructions.



Install the 16-bit Driver for Windows 95/98

What Is in This Chapter?

This chapter describes how to:

To	See page
understand using the driver	3-2
install the driver	3-3
test the card	3-7
stop the PCD card	3-8
remove the driver	3-9

Important: The instructions in this chapter assume that you:

- have already used chapter 2 to determine your operating system and the driver you need to install
- are using Windows 95 or Windows 98
- are using DeviceNet Manager software, DeviceNet Monitor software, or other WinDNet16 software



ATTENTION: If you already have installed the Windows 95/98 32-bit driver, or if you have older Windows 95 16-bit drivers installed on your PC, you must remove it/them from your computer before installing the current 16-bit driver. Refer to “Removing the 32-bit Driver” on page 4-8 for instructions about how to remove the 32-bit driver. Refer to page 2-2 for instructions about how to remove older 16-bit Windows 95 drivers.

Important: Right click on the My Computer icon on your Windows desktop. Select the General tab and locate the number “4.00.950” on the third line. If this number is **not** followed by an alpha character, then be aware that the screens you see may look slightly different than the ones shown in this manual.

Understand Using the Driver

Alternate Between 16- and 32-bit Drivers

Important: Although you can alternate between using the 16-bit and the 32-bit driver to suit your application needs, **do not attempt to load both the 16-bit and the 32-bit drivers onto your computer simultaneously.** The Windows 95/98 operating systems allow only one driver per card type. You must remove one driver before you install the other.

Do Not Use the Update Driver Option in Device Manager

Do not use the Update Driver option in the Windows 95/98 Device Manager. Instead, remove any existing drivers and then load the new drivers as described in chapters 3 and 4. For information about how to remove the drivers, see page 3-9 (16-bit) and 4-9 (32-bit).

Use 16-bit and 32-bit Applications Simultaneously

If you want to use both a 16-bit and a 32-bit application simultaneously (e.g., DeviceNet Monitor or DeviceNet Manager software and RSNNetWorx software), you must communicate with one of the two software packages serially through the 1770-KFD communication module. For information about how to do this, see the 1770-KFD Communication Protocol Reference Manual, publication number 1770-6.5.22.

Change Series of the PCD Card in Windows 95

If you replace a series A or B PCD card with a series C PCD card or vice versa, Windows reports that it has found new hardware and prompts you to insert the appropriate setup disk. Simply insert the setup disk with the appropriate driver for your application; the series A, B, and C PCD cards use the same setup disks to install the appropriate driver. You do not need separate setup disks for series A, B, and C PCD cards.

Important: Be certain that you install the same type of driver (16- or 32-bit) for both cards.

Install the Driver


You may install the PCD card driver with or without the PCD card installed.

With the PCD Card Installed


1. To verify that the 32-bit driver is not installed, check the list of installed components in the Add/Remove Programs application in your computer's Control Panel. If it is installed, remove it first as directed on page 3-9.
2. Insert the PCD card into your system following the directions on page 7-1. After you insert the PCD card, the system will detect the card and begin to build the driver information needed to run it. To do this, the system needs to locate the driver for the card, so it prompts you to specify where to find the driver.

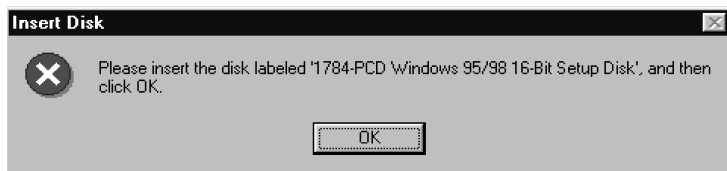
Important: If you configure a series A or B and a series C PCD card on the same system, be certain that you install the same type of driver (16- or 32-bit) for both cards.

3. Insert the *1784-PCD Windows 95/98 16-bit Setup Disk* into your system's 3.5" disk drive.


4. Press  or click **next**. You see the following dialog box:

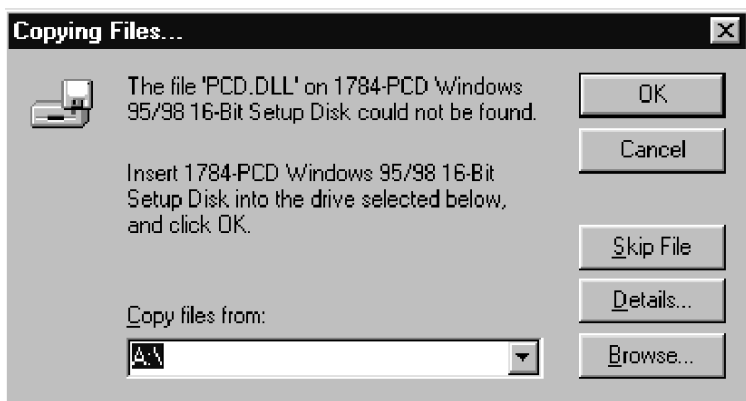



5. Press  or click **finish**. The system begins to load the driver, then prompts you with the following dialog box:



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6. Press  or click OK. Due to an anomaly with the Windows 95 operating systems, the driver wizard may search the incorrect drive for the setup files and display the following dialog box:



If it does, specify the drive letter of your disk drive (usually a:) in the copy files from pulldown menu (shown above), then press  or click OK.

You now see a progress bar advance as the installation procedure progresses.

Once the installation is complete, the system displays a message and prompts you to restart Windows. We recommend that you do so since your PCD card will not work with your software application until you have restarted Windows.






Without the PCD Card Installed

1. To verify that the 32-bit driver is not installed, check the list of installed components in the Add/Remove Programs application in your computer's Control Panel. If it is installed, remove it first as directed on page 4-9.

2. In the Windows Control Panel, double click on **Add New**

Hardware  . You see:



3. Press  or click **Next**. The system prompts you to decide if it or you will locate and install the driver. Since we provide the driver files on the setup disk, select **No**, then press  or click **Next**.
4. You now need to specify information about the PCD card. Select **Other Devices**, then press  or click **Next**.
5. Select **Have Disk**.
6. Insert the *1784-PCD Windows 95/98 16-bit Setup Disk* into your system's 3.5" disk drive, then press  or click **OK**.
7. Continue with the installation, pressing  or clicking **Next** as prompted. You should see a progress bar advance as the installation procedure progresses.

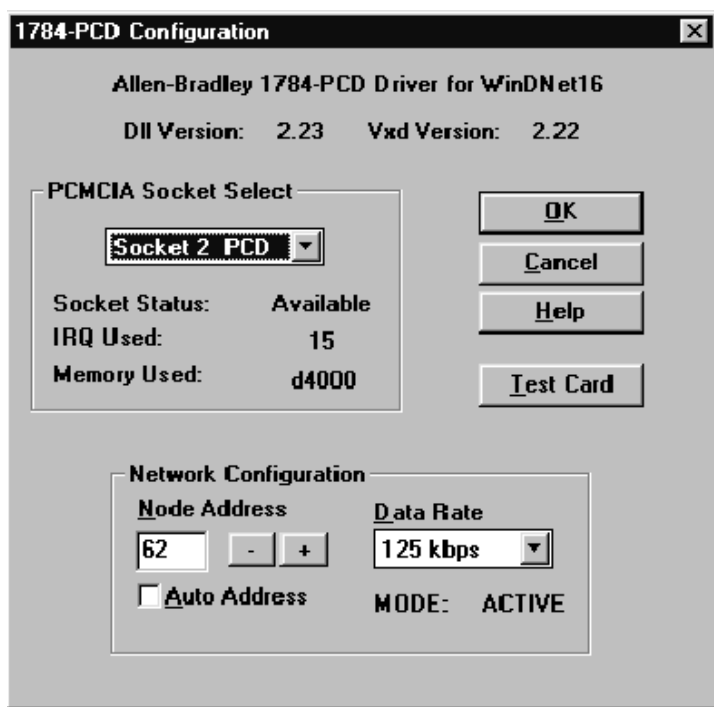
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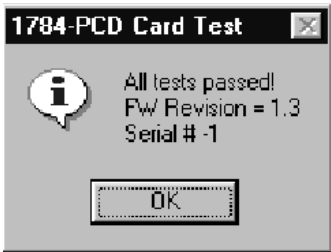
Test the PCD Card

To test the PCD card, do the following:

1. Start DeviceNet Manager software.
2. From the utilities menu, select Set Up Online Communications.
3. Select PCD Interface version 2.22 or later.
4. Click ok. You should see a screen similar to the one that follows:



5. Click `Test Card`. You should see a screen similar to the one that follows:



6. Click `OK`.

If you do not see the message “All Tests Passed,” refer to chapter 8 for troubleshooting information.

If your computer is not connected to a DeviceNet network, on the bottom of the DeviceNet Manager window, you see the following message: “1784-PCD is not connected to a network or there is no network power.”

Stop the PCD Card

Before you remove the PCD card from its socket, you should stop the communication to it. To do this:

1. Click with your right mouse button on the PC card icon in the taskbar.
2. Select `Adjust PC Card Properties`.
3. Click on the PCD card you want to stop in the list of PC cards.
4. Click on the `stop` button.
5. When you see the window that states that you may safely remove this device, click on `OK`.

Alternatively, to stop the card, you can do the following:

1. Click with your left mouse button on the PC card icon in the taskbar.
2. Click on the PCD card you want to stop in the list of PC cards.
3. When you see the window that states that you may safely remove this device, click on OK.

Remove the Driver

You can use the uninstaller provided by Windows 95/98 to remove the driver from your system.

1. Stop the PCD card as directed above.
2. Access the Windows Control Panel.
3. Double click on the Add/Remove Programs icon.
4. Select Allen-Bradley 1784-PCD.
5. Click on Add/Remove. The system confirms to remove the PCD card before deleting any files.

Alternatively, you can run the `pcdupdt.exe` file from the driver disk to remove the driver.

Install the 32-bit Driver for Windows 95/98

What Is in This Chapter?

This chapter describes how to:

To	See page
understand using the driver	4-2
install the driver	4-3
test the card	4-7
stop the PCD card	4-8
remove the driver	4-9

Important: The instructions in this chapter assume that you:

- have already used chapter 2 to determine your operating system and the driver you need to install
- are using Windows 95 or Windows 98
- are using RSNetWorx for DeviceNet software with RSLinx 2.00.97.30 or later



ATTENTION: If you already have installed the Windows 95/98 16-bit driver, you must remove it from your computer before installing the 32-bit driver. If you have configured both series A and series B cards to use the 16-bit driver, you must remove the drivers for both cards. Refer to “Removing the 16-bit Driver” on page 3-9 for instructions about how to remove the 16-bit driver.

Important: Right click on the My Computer icon on your Windows desktop. Select the General tab and locate the number “4.00.950” on the third line. If this number is not followed by an alpha character, then be aware that the screens you see may look slightly different than the ones shown in this manual.

Understand Using the Driver

Alternate Between 16- and 32-bit Drivers

Important: Although you can alternate between using the 16-bit and the 32-bit driver to suit your application needs, **do not attempt to load both the 16-bit and the 32-bit drivers onto your computer simultaneously.** The Windows 95/98 operating systems allow only one driver per card type. You must remove one driver before you install the other.

Do Not Use the Update Driver Option in Device Manager

Do not use the Update Driver option in the Windows 95/98 Device Manager. Instead, remove any existing drivers and then load the new drivers as described in chapters 3 and 4. For information about how to remove the drivers, see pages 3-9 (16-bit) and 4-9 (32-bit).

Use 16-bit and 32-bit Applications Simultaneously

If you want to use both a 16-bit and a 32-bit application simultaneously (e.g., DeviceNet Monitor or DeviceNet Manager software and RSNetWorx software), you must communicate with one of the two software packages serially through the 1770-KFD communication module. For information about how to do this, see the 1770-KFD Communication Protocol Reference Manual, publication number 1770-6.5.22.

Change Series of the PCD Card in Windows 95

If you replace a series A or B PCD card with a series C PCD card or vice versa, Windows reports that it has found new hardware and prompts you to insert the appropriate setup disk. Simply insert the setup disk with the appropriate driver for your application; series A, B, and C PCD cards use the same setup disks to install the appropriate driver. You do not need separate setup disks for series A, B, and C PCD cards.

Important: Be certain that you install the same type of driver (16- or 32-bit) for both cards.

Install the Driver


You may install the PCD card driver with or without the PCD card installed.

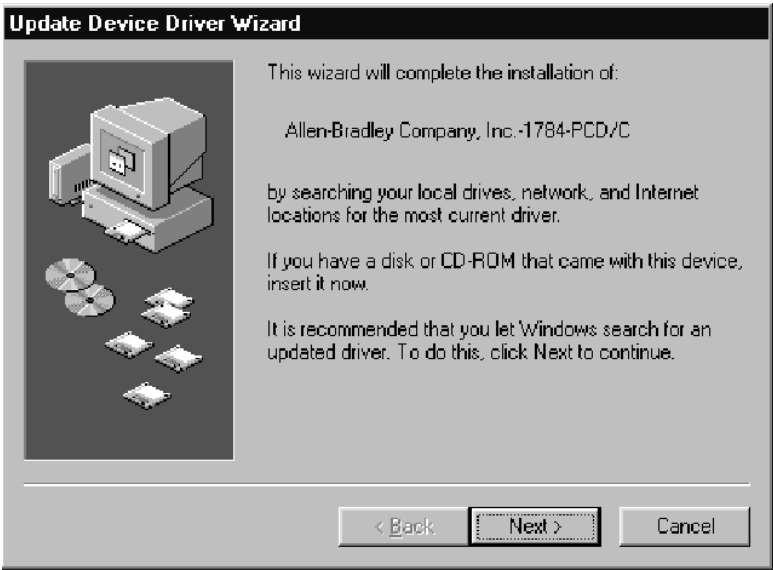
With the PCD Card Installed


1. To verify that the 16-bit driver is not installed, check the list of installed components in the Add/Remove Programs application in your computer's Control Panel. If it is installed, remove it first as directed on page 3-9.
2. Insert the PCD card into your system following the directions on page 7-1. After you insert the PCD card, the system will detect the card and begin to build the driver information needed to run it. To do this, the system needs to locate the driver for the card, so it prompts you to specify where to find the driver.

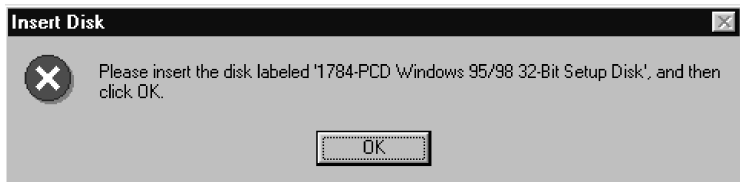
Important: If you configure both a series A or B and a series C PCD card on the same system, be certain that you install the same type of driver (16- or 32-bit) for all cards.


3. Insert the *1784-PCD Windows 95/98 32-bit Setup Disk* into your system's 3.5" disk drive.

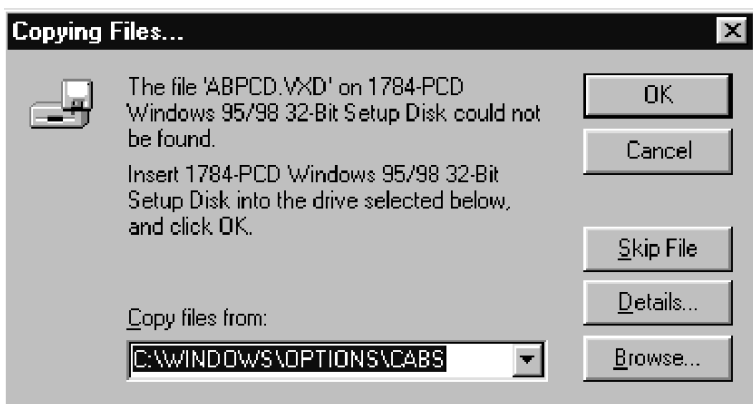
4. Press  or click **next**. You see the following dialog box:




5. Press  or click **finish**. The system begins to load the driver, then prompts you with the following dialog box:



6. Press  or click OK. Due to an anomaly with the Windows 95 operating systems, the driver wizard searches the incorrect drive for the setup files and displays the following dialog box:



To work around this problem, specify the drive letter of your disk drive (usually a:) in the `Copy files from` pulldown menu (shown above), then press  or click OK.






You now see a progress bar advance as the installation procedure progresses.

Once the installation is complete, the system displays a message and prompts you to restart Windows. We recommend that you do so since your PCD card will not work with your software application until you have restarted Windows.

Without the PCD Card Installed

1. To verify that the 16-bit driver is not installed, check the list of installed components in the Add/Remove Programs application in your computer's Control Panel. If it is installed, remove it first as directed on page 3-9.
2. In the Windows Control Panel, double click on Add New Hardware. You see:



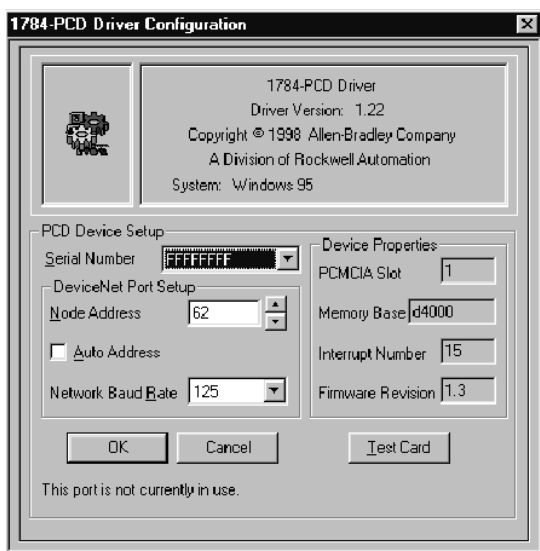
3. Press  or click Next. The system prompts you to decide if it or you will locate and install the driver. Since we provide the driver files on the setup disk, select no, then press  or click Next.
4. You now need to specify information about the PCD card. Select other Devices, then press  or click Next.
5. Select Have Disk.
6. Insert the *1784-PCD Windows 95/98 32-bit Setup Disk* into your system's 3.5" disk drive, then press  or click OK.
7. Continue with the installation, pressing  or clicking Next as prompted. You should see a progress bar advance as the installation procedure progresses.

Once the installation is complete, the system displays a message and prompts you to restart Windows. We recommend that you do so since your PCD card will not work with your software application until you have restarted Windows.

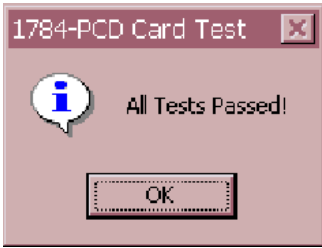
Test the PCD Card

To test the PCD card, do the following:

1. Start RSLinx software.
2. From the **Communications** menu, select **Configure Drivers**.
3. Select **DeviceNet Drivers**.
4. Click **Add New**.
5. Select **1784-PCD**. You see a screen similar to the following:



6. Click `Test Card`. You should see:



7. Click `OK` twice.

If you do not see the message “All Tests Passed,” refer to chapter 8 for troubleshooting information.

Stop the PCD Card

Before you remove the PCD card from its socket, you should stop the communication to it. To do this:

1. Click with your right mouse button on the `PC Card` icon in the taskbar.
2. Select `Adjust PC Card Properties`.
3. Click on the PCD card you want to stop in the list of PC cards.
4. Click on the `Stop` button.
5. When you see the window that states that you may safely remove this device, click on `OK`.

Alternatively, to stop the card, you can do the following:

1. Click with your left mouse button on the `PC Card` icon in the taskbar.
2. Click on the PCD card you want to stop in the list of PC cards.
3. When you see the window that states that you may safely remove this device, click on `OK`.

Remove the Driver

You can use the uninstaller provided by Windows 95/98 to remove the driver from your system.

1. Stop the PCD card as directed above.
2. Access the Windows Control Panel.
3. Double click on the `Add/Remove Programs` icon.
4. Select `Allen-Bradley 1784-PCD`.
5. Click on `Add/Remove`. The system confirms to remove the PCD card before deleting any files.

Alternatively, you can run the `pcdupdt.exe` file from the driver disk to remove the driver.

Install the Driver for Windows NT

What Is in This Chapter?

This chapter describes how to:

To	See page
use third-party, Windows NT, plug & play or PC card controller software	5-1
install the driver	5-2
test the card	5-6
remove the driver	5-7

Important: The instructions in this chapter assume that you:

- have already used chapter 2 to determine your operating system and the driver you need to install
- are using Windows NT
- are using RSNetWorx for DeviceNet software with RSLinx release 2.00.97 or later

Important: Be aware that you can only use one PCD card at a time in the Windows NT operating system.

If You Use Third-party, Windows NT, "Plug & Play" or PC Card Controller Software

If you have third-party, Windows NT, "plug & play" or PC card controller software installed on your system, be aware of the following guidelines:

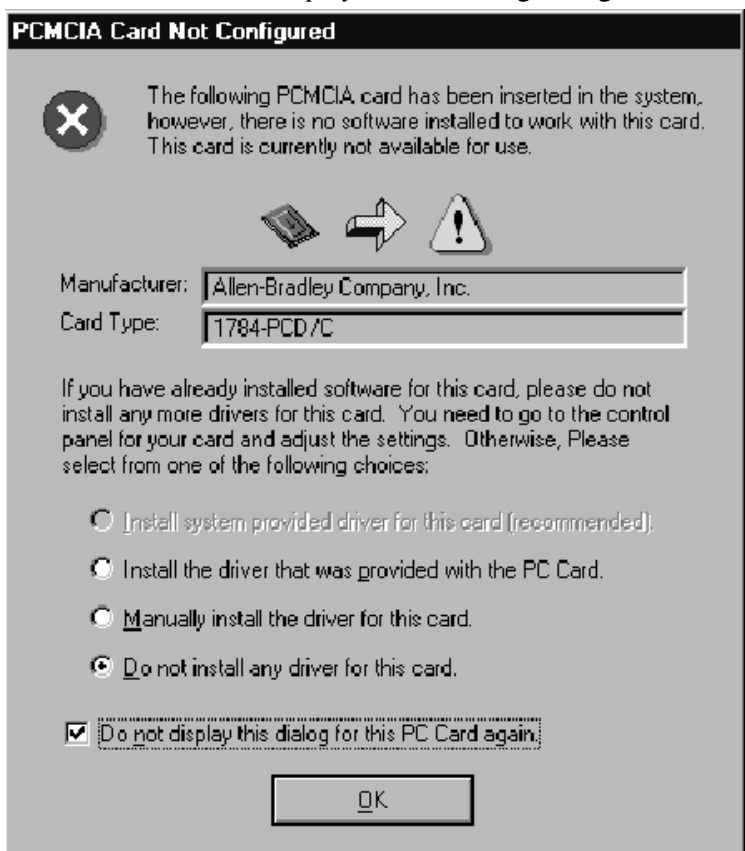
- If you have Softex/Phoenix, Windows NT, “plug & play” or PC card controller software installed on your system, you must upgrade to release 2.21 or later. In addition, if you have installed Softex/Phoenix power management software, you must upgrade it to release 2.21 or later as well. Contact your computer vendor to obtain these upgrades, or contact Softex directly:
 - on the Internet: www.softexinc.com
 - by phone: 512.452.8836
 - by FAX: 512.795.8702
- If you have Softex/Phoenix PC Card Controller software installed on your system, do not use the Allen-Bradley 1784-PCD card icon in the Control Panel to assign memory and interrupt resources. The Softex PC Card controller makes these changes for you automatically.
- If you have the SystemSoft Card Wizard installed on your system, you must upgrade to release 4.0 or later. In addition, you will need to assign memory and interrupt resources for the card by doubleclicking the Allen-Bradley 1784-PCD card icon in the computer’s Control Panel. Contact your PC’s manufacturer to obtain this upgrade or contact SystemSoft directly:
 - on the Internet: www.systemsoft.com
 - by phone: 508.651.0088
 - by FAX: 508.651.8188

Install the Driver

To install the driver, do the following:

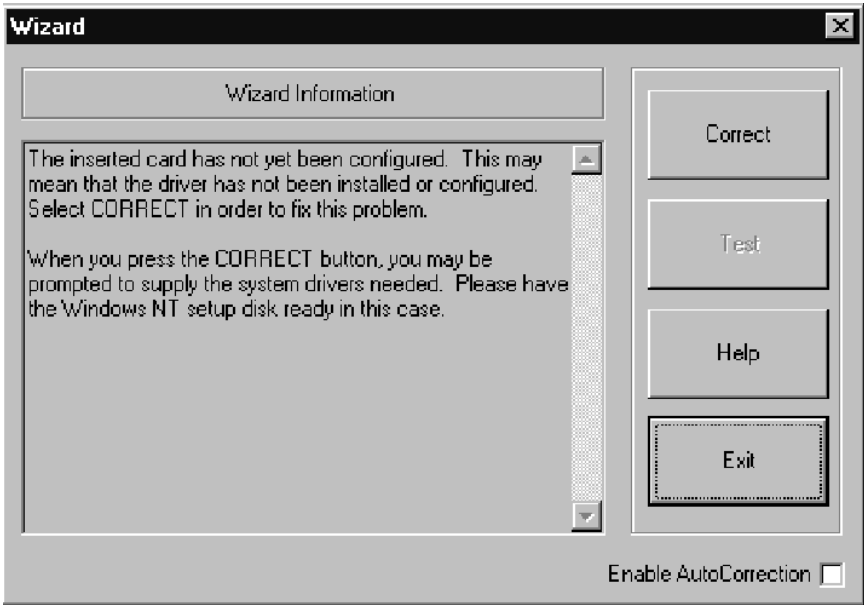
1. Disconnect power from the PC.
2. Insert the PCD card into your system following the directions on page 7-1.
3. Start Windows NT.

4. **Complete this step only if you have Softex/Phoenix, Windows NT, plug & play or PC card controller software installed on your system.** After you insert the PCD card in step 2, the system detects the card and tries to load the driver for it. Because we are using a custom driver, Softex displays the following dialog box:



Select “Do not install any driver for this card” and “Do not display this dialog for this PC Card again” and then click on ok. Continue with step 5 on the next page.

5. **Complete this step only if you have SystemSoft, Windows NT, plug & play or PC card controller software installed on your system.** Click Exit to bypass this screen and continue with step 5.

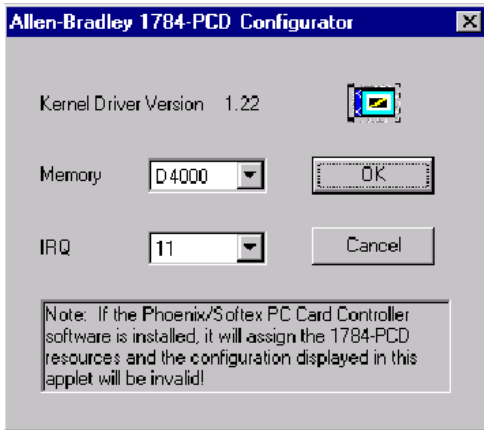


6. Insert the *1784-PCD Windows NT Setup Disk* into your system's 3.5" disk drive.
7. Run the *setup.exe* file from the setup disk to load the driver.

You see a progress bar advance as the installation procedure progresses. Once the installation is complete, the system displays a message and prompts you to restart Windows.
8. **If you have Softex/Phoenix plug & play software installed on your system,** you do not need to assign memory and interrupt resources; Softex does this for you. Select *yes* to restart the computer.

Otherwise, if you do not have Softex/Phoenix plug & play software installed on your system, select *No* to avoid restarting the computer so that you can assign memory and interrupt resources.

9. Click **Finish**. If you are using Softex/Phoenix plug & play software, reboot your computer manually and then continue with the “Testing the PCD Card” section on page 5–6. Otherwise, continue with step 9.
10. Click on the Allen–Bradley 1784–PCD icon in the Control Panel to set memory and interrupt resources for the PCD card. You see:



To find the available resources in your system, select **start > Programs > Administrative Tools > Windows NT Diagnostics**.

11. Select the **Resources** tab.
12. Select an interrupt number that is **not** listed and enter it in the 1784–PCD Configurator window.
13. Click on **Memory** to see which addresses the system is using and are **not** available.
Important: Be aware that Windows NT protects its memory as well as its interrupts and therefore may not list all of the resources that it is using. We suggest that you select a memory address in the D range.
14. Enter the memory address in the 1784–PCD Configurator window.
15. Click **ok** twice.

16. Restart the computer manually.

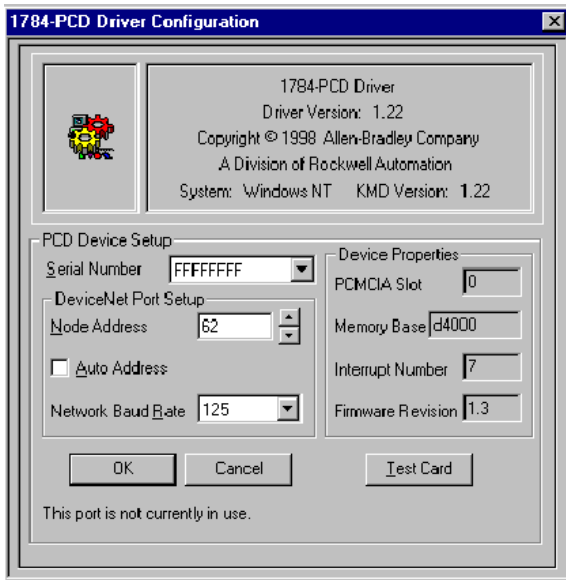
Important: The PCD card will not work with your software application until you have restarted Windows NT.

System Soft notifies you whether you have successfully configured the card. If you have not, it reports which resources are in conflict.

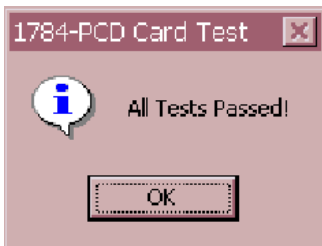
Test the PCD Card

To test the PCD card, do the following:

1. Start RSLinx software.
2. From the `Communications` menu, select `Configure Drivers`.
3. Select `DeviceNet Drivers` from the `Available Driver Types` menu.
4. Click `Add New`.
5. Select `1784-PCD`. You see a screen similar to the one that follows:



6. Click test card. You should see:



If you do not see this message, you may have a resource conflict. To work around this problem, try to select a different IRQ or memory address by clicking on the PCD card in the Control Panel. If you still have difficulty, see chapter 8 for troubleshooting information.

7. Click ok.

Remove the Driver

You can use the uninstaller provided by Windows NT to remove the driver from your system.

1. Access the Control Panel.
2. Double click on the `Add/Remove Programs` icon.
3. Select `Allen-Bradley 1784-PCD Driver`.
4. Click on `Add/Remove`. The system confirms to remove the PCD card before deleting any files.

Insert and Remove the PCD Card

What Is in This Chapter?

The diagrams in this chapter show a PCMCIA-2.1-compliant notebook computer that may not be identical to the computer you are using. Your installation may be slightly different.

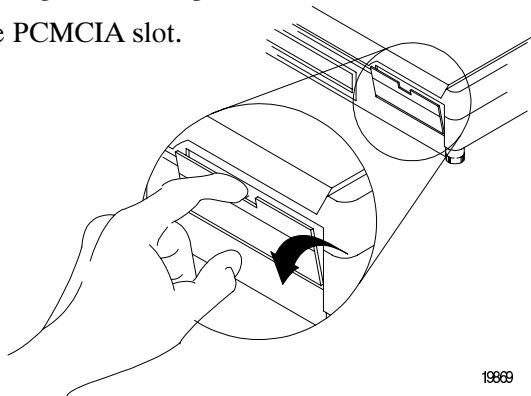
Follow the instructions in this chapter to insert or remove the PCD card.

To	See page
Inserting the PCD Card	6-1
Removing the PCD Card	6-4

Insert the PCD Card

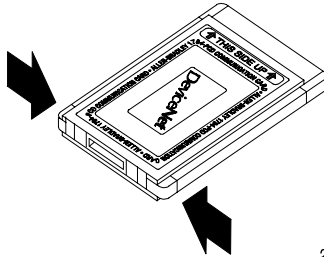
Important: If you are using Windows 95 or 98, you can insert or remove the PCD card from a powered computer. If you are using a different operating system, shut down the computer before inserting or removing the PCD card.

1. Open the door to the PCMCIA slot.



19869

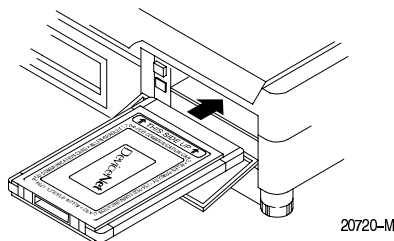
2. Grasp the PCD card by the edges with the DeviceNet logo facing upward and the 68-pin connector facing into the PCMCIA slot.



20718-M

Important: If you have more than one slot in your computer, you can insert the PCD card into any empty slot. Check your computer's documentation for the slot numbers. You can use the other available slots for other PC cards such as network or modem cards.

3. Insert the PCD card into the PCMCIA slot and slide it in until firmly seated in the connector. Some computers have an ejector button that pops out when the card is seated in the connector.

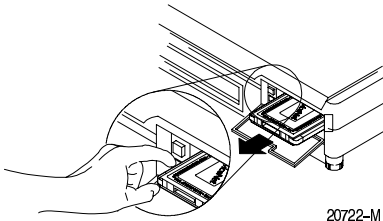


If the computer is configured properly, your sound/speaker is enabled, and you installed the PCD card successfully, you hear multiple tones when you insert a card or boot the computer. If you have two PCD cards, there are two sets of tones, one for each card.

Important: If you are installing the PCD card for the first time, refer to chapter 2, “Before You Install the Card,” for information about the procedures you need to follow to successfully configure the PCD card.

Remove the PCD Card

On most computers, you press the release button and remove the card from the slot. If this is not applicable to your computer, follow the instructions specified in the computer's user manual.



You hear multiple tones for each card that you remove, if your system is configured properly. These tones indicate that the card is now disabled.

Important: You should stop any software that is communicating with the card before removing the PC card. If you do not do this, the stray processes may slow the system's overall performance.

Troubleshooting the Card

Occasionally, you may need to modify your system to help the PCD card to function properly. Use the tips and suggestions that follow to help you set up the PCD card and driver(s) successfully.

To	See page
understand a missing PC card icon in the Control Panel	7-1
specify node addresses and baud rates in Windows NT	7-1
change memory and interrupt resources in Windows NT	7-2
enable the PCD card icon in the taskbar in windows 95/98	7-2
understand hearing multiple tones in Windows 95/98	7-3
if the driver still does not work in Windows 95/98	7-4

Understand a Missing PC Card Icon in Windows 95/98 and NT

If you find that there is no PC card icon in the Control Panel, this indicates that there is a problem with the PCMCIA socket hardware properly. This situation hinders Windows from locating the PC card.

To solve this problem contact the computer manufacturer.

Specify Node Addresses and Baud Rates

Be certain to configure the PCD card with a unique node address and a correct baud rate for the DeviceNet network or errors will occur.

Change Memory and Interrupt Resources in Windows NT

If you use RSLinx software and experience difficulty in configuring the PC card, you should change the memory and interrupt resources. Use the Allen-Bradley 1784-PCD icon in the Windows Control Panel to change these resources.

To find the available resources in your system, select `start > Programs > Administrative Tools > Windows NT Diagnostics`. If no interrupts are available, you may need to disable another device.

Important: After you change these resources, you must reboot your PC for the changes to take effect.

Enable the PC Card Icon in the Taskbar in Windows 95/98

The PC card icon in the taskbar informs you about the status of your PC card and lets you stop any processing before you remove or change PC cards. You can configure your system to display this icon within the taskbar on your Windows 95/98 desktop. The icon is displayed only when there is one or more PC card installed in the computer. To display the PC card icon within the taskbar:

1. Double-click on the PC card icon in the Control Panel.
2. When the PC card `Properties` dialog box appears, click on `show control on taskbar`. You see:



3. Click on OK. The PC card icon appears in the taskbar.



The PC card icon.

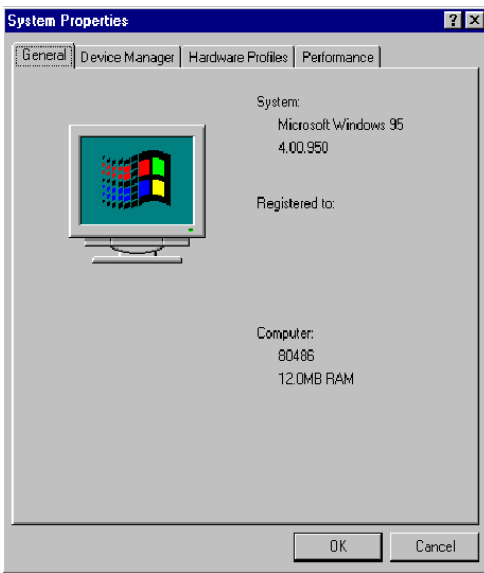
Understand Hearing Multiple Tones in Windows 95/98

If you insert multiple PC cards, you may hear more than one tonal notification per card. Windows 95/98 detects devices during the power up process, and adjusts the device resources accordingly. This results in sounding multiple tones. When the system changes settings, for example when you remove a card, the tones sound again for each change.

If the Driver Still Does Not Work in Windows 95/98

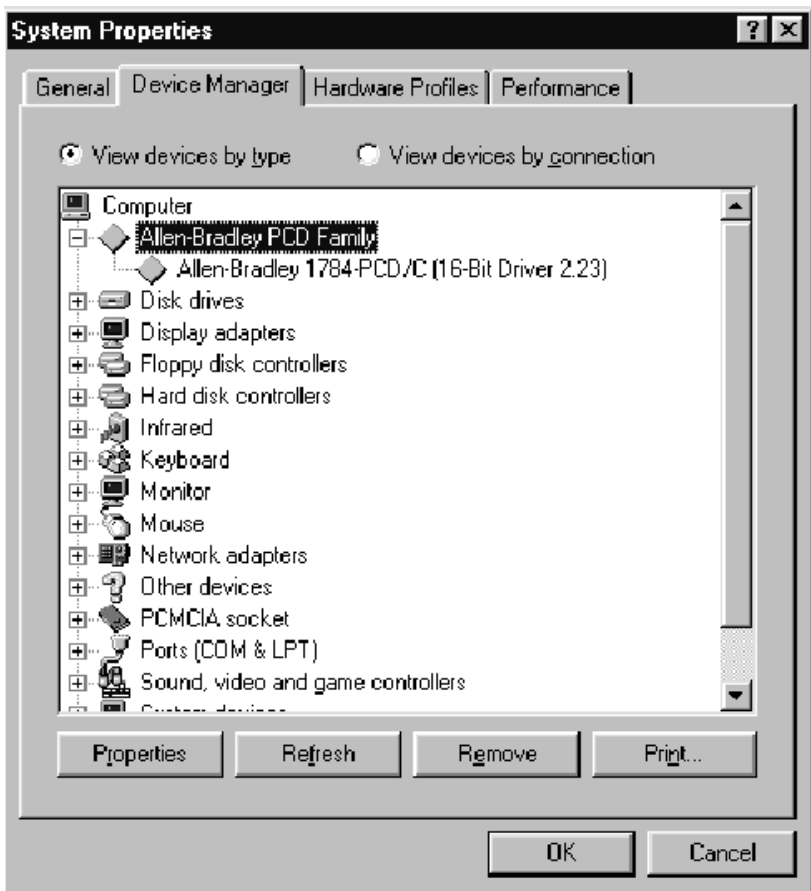
Use the following procedure to resolve any other driver issues.

1. Click on the My Computer icon with the right mouse button.
2. Select `Properties` from the menu to see the System Properties dialog box.



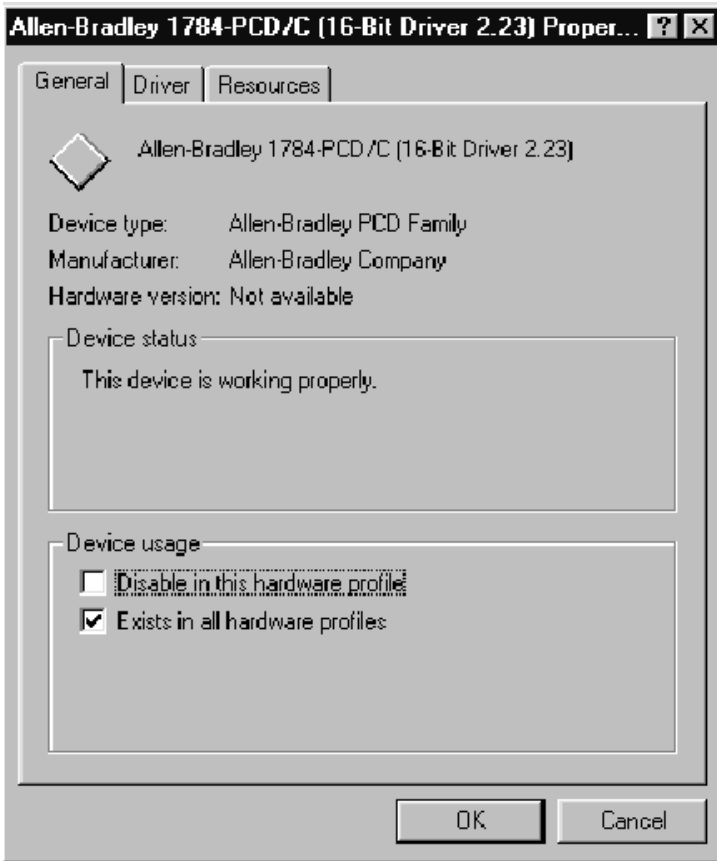
3. Click on the `Device Manager` tab.
4. Scroll through the devices and search for the Allen-Bradley PC card line.

The Allen-Bradley 1784-PCD device is listed.



5. Select Allen-Bradley 1784-PCD/C.

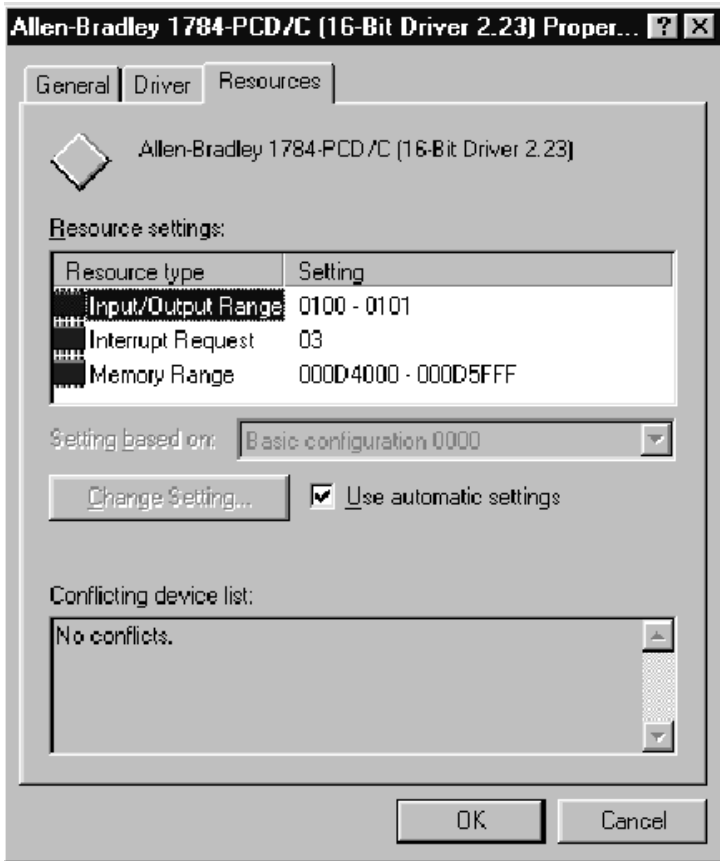
6. Click on the Properties pushbutton.



If Code 10 (conflicting memory resources) is reported in the Device Status box, continue with the following steps.

Allen-Bradley P

7. Click on the Resources tab in the Properties dialog box.



Verify that there are no resource conflicts listed in the Conflicting Device list. Be aware that series A 1784-PCD cards do not use an Input/Output range. You also should verify that you have assigned an interrupt to the PCD card. If you have not, then you need to do so. You may have to disable a device to make an interrupt available.

8. If there are conflicts, you may need to alter the settings of devices involved in the conflict to get the PCD card to function properly. Try unchecking the `Use automatic settings` box and then changing the interrupt or memory resources.

If there are no conflicts, continue with the following steps.

9. Return to the Device Manager and scroll through the list to find `PCMCIA sockets`.
10. Double-click on `PCMCIA sockets` to expand it.
11. Click on the PCMCIA controller used by your system.
12. Click on `Properties`. Verify that the socket controller is enabled in the hardware profile you are using.

If	Then
the device status says "This device is not present, not working properly, or does not have all drivers installed, code 10."	click on the <code>Resources</code> tab and check the <code>Conflicting Device</code> list for possible hardware conflicts. or you may want to verify that the <code>Use Automatic Settings</code> option is enabled.
the device status does not say, "This device is working properly."	you have a general PCMCIA problem, and you should contact your computer manufacturer for a resolution.

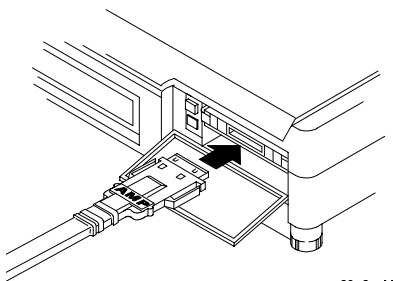
Connecting the Card to the DeviceNet Network

These instructions assume that you have installed:

- your application software
- the card (chapter 6)
- the 1784-PCD drivers and restarted Windows (chapter 3, 4, or 5)

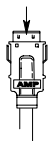
Important: If you have questions or need additional information about connecting cables, see the DeviceNet Cable Planning and Installation Manual, publication DN-6.7.2.

Important: The following diagrams show a PCMCIA-2.1-compliant system. If you are using another computer, your installation may appear slightly different.



20724-M

1. Attach the smaller end of the 1784-PCD1 cable to the 1784-PCD card.



The silver side should face upward as you connect the cable to the 1784-PCD card.

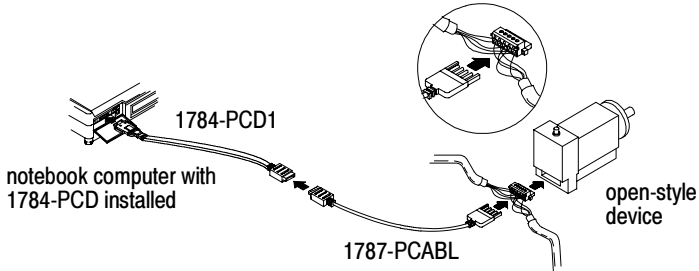
2. Attach the other end of the 1784-PCD1 cable to the linear plug or cable you are using.

Connect to the network using a	Catalog or Part No. ^①	See figure
5-pin probe cable	1787-PCABL	1
sealed mini-male cable	1787-MCABL	2
5-pin linear plug without jack screws	PN 94215305	3 ^②
T-style cable	1787-TCABL	4 on page -3
optional 1787-OPCAB	1787-OPCAB/A	5 on page -3

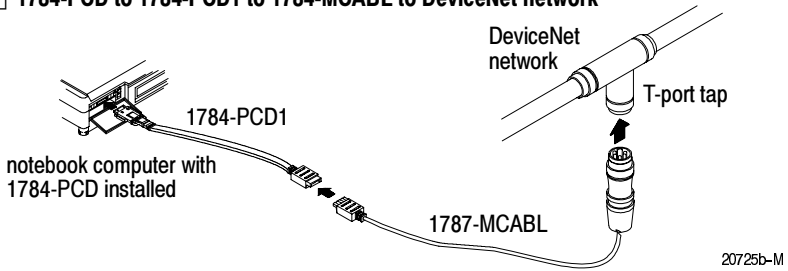
^① You purchase the cables separately from Allen-Bradley.

^② This plug is supplied with the 1784-PCD card.

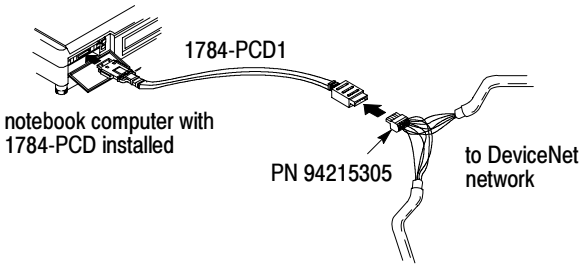
1 1784-PCD to 1784-PCD1 to 1784-PCABL to DeviceNet network



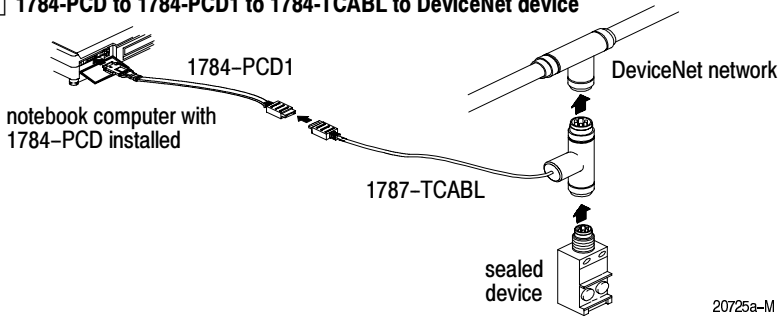
2 1784-PCD to 1784-PCD1 to 1784-MCABL to DeviceNet network



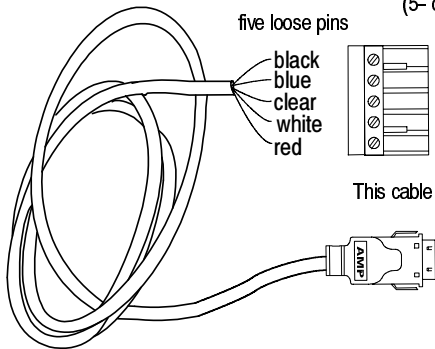
3 1784-PCD to 1784-PCD1 to 5-pin linear plug (PN 94215305) DeviceNet network



4 1784-PCD to 1784-PCD1 to 1784-TCABL to DeviceNet device



5 1784-PCD to 1787-OPCAB/A



These pins plug into any open-style connector (5- or 10-position).




3. Verify that you can go on line with the card and your application software. If you have difficulty establishing communication, check your cable connections and refer to the documentation for your application software.

Specifications

PCD Communication Card

The following table lists the PCD card's PCMCIA specifications.

1784-PCD

PCMCIA Type	Type II form-factor network adapter card		
PCMCIA Standard	compliant to PCMCIA Standard, release 2.1		
Card and Socket Services Standard	compliant to PCMCIA Card and Socket Services Standard, revision 2.1 or greater		
Power Requirements	PC	DeviceNet network	
	series C: 5 V @ 210 mA maximum	25 V maximum 10 mA maximum	
Environmental Conditions	Operating ^①	Non-operating	
	Slot Temperature	0–50° C (32–122° F)	-40–85° C (-40–185° F)
	Humidity	5–95% without condensation	5–95% without condensation
	Vibration	0–70 Hz, constant 0.012" displacement	NA
		70–500 Hz, constant 2G acceleration	
Shock	30 G peak/11 ms	50 G peak/11 ms	
Agency Certification (when product or packaging is marked)	 <ul style="list-style-type: none"> •  •  marked for all applicable directive 		

^① The operating parameters describe the environment within the PCMCIA slot. Refer to the documentation for your computer for environmental requirements. The PCD card should not exceed those specifications.

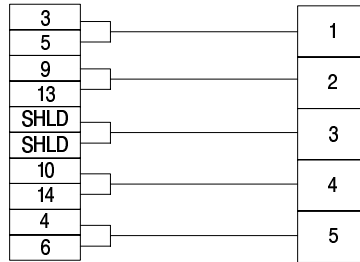
1784-PCD1

Total length of cable	34.9 cm (13.75")
-----------------------	------------------

Pin Assignments

PC card plug

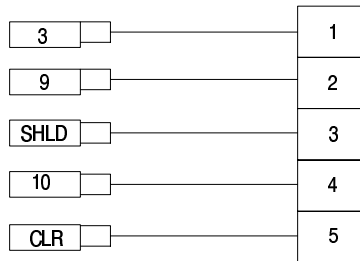
DeviceNet header

**1787-OPCAB**

Pin Assignments

PC card plug

DeviceNet header



Glossary of PCMCIA Terms

adapter	The hardware that connects the computer bus to the 68-pin PC Card sockets in the PCMCIA slot. <i>See also</i> socket.
application programming interface (API)	The set of services that an operating system makes available to programs that run under it.
binary file	A file consisting of a sequence of 8-bit data or executable code, as distinguished from files consisting of human-readable ASCII text.
Card Identification Structure	A PC card that complies with the PCMCIA standard. Card Information Structure (CIS) contains configuration information about the PC card and communicates it to the computer.
Card Services	The software interface that coordinates traffic among the computer and the PC cards, sockets, and system resources. <i>See also</i> Socket Services.

- dual-port memory** Memory that can be viewed from two different hosts. This memory allows the PCD card and a host computer to communicate. The memory range marked as dual-port memory is a common shared memory area.
- enabler** Software used to control PC cards. There are three types of enablers: generic (which can control many different types of cards), specific (which is designed for a specific manufacturer's PC card), and point enabler (which is designed for a specific manufacturer's PC card but does not require Card and Socket Services).
- MS-DOS command prompt** The area in which you can execute commands to your computer. Access to the MS-DOS command prompt merely gives you the ability to utilize the DOS environment for command execution.
- MS-DOS mode** This term is used in reference to a Windows 95/98/NT machine and indicates shutting down Windows 95/98/NT to access MS-DOS only. This removes the plug and play system from a notebook's memory and eliminates any conflict between virtual file managers, virtual display drivers, and other virtual hardware drivers with any DOS only software packages.
- PC card** Credit-card size, 68-pin add-in cards that were designed to meet PCMCIA standards.

- socket** The 68-pin physical connection in the PCMCIA slot in your computer that connects to the 68 pins on the PC card.
- Socket Services** The software interface that manipulates the PC cards, sockets, and adapters. *See also* PC cards, sockets, adapters.
- Type** Refers to the physical size of the PC card. There are three types of cards that have the same length and width (54 mm x 85.6 mm). The cards differ in thickness in the center, but have identical thickness at the connector end and along the rails. This lets you use all three types in the same PCMCIA slot, if the slot is thick enough in the center.
- Type I** A 3.3 mm thick PC card that is used for memory enhancements, such as Flash memory cards. *See also* PC card.
- Type II** A 5 mm thick PC card that is used for I/O features such as modem, LAN, and host communications. *See also* PC card.
- Type III** A 10.5 mm thick PC card that is used for memory enhancements or I/O capabilities that require more space, such as rotating media and wireless communication devices. *See also* PC card.

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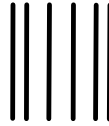
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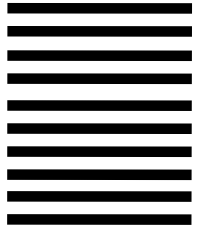
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