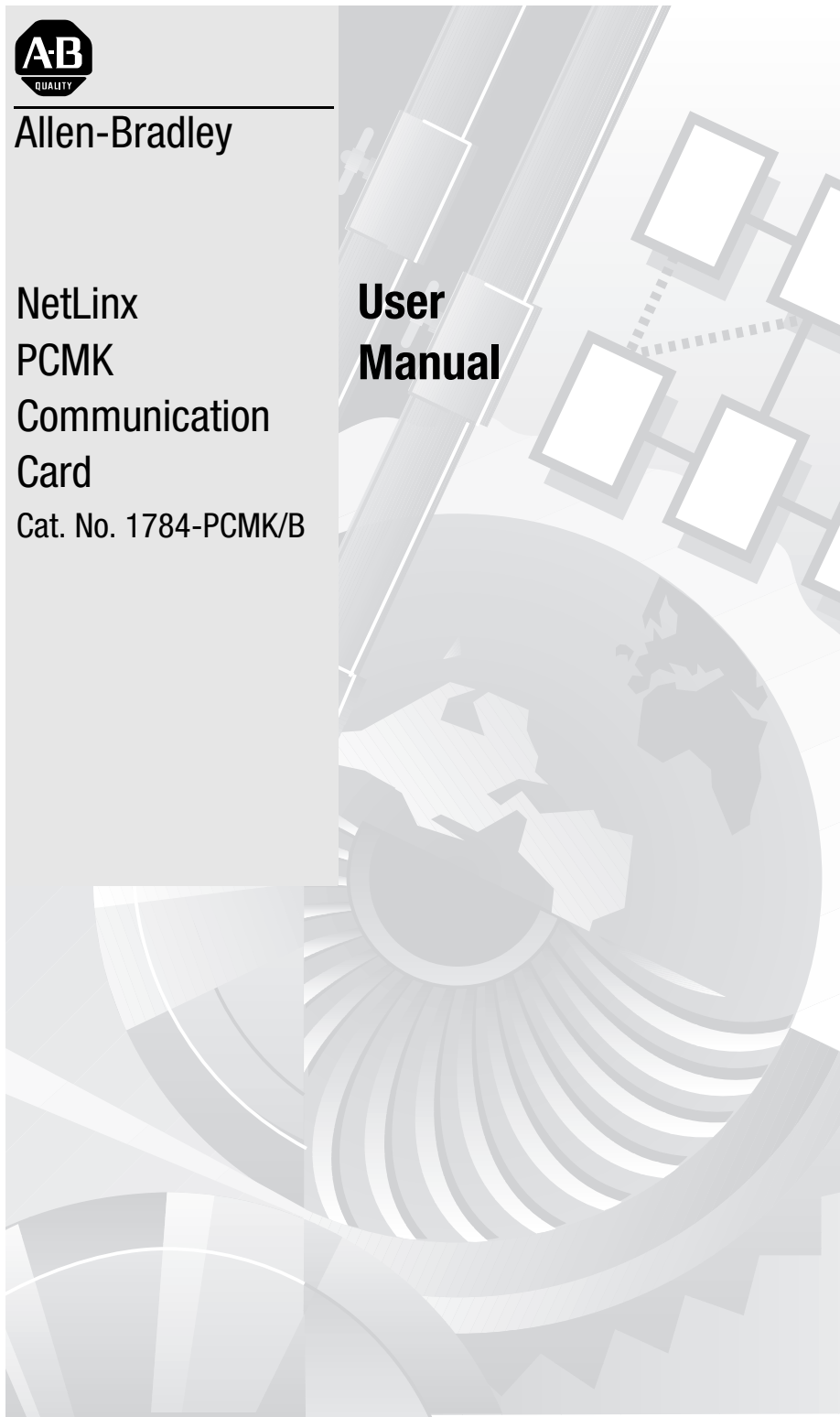




Allen-Bradley

NetLinx
PCMK
Communication
Card
Cat. No. 1784-PCMK/B

**User
Manual**



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.

Reproduction of the contents of this copyrighted publication, in whole or part, without written permission of Rockwell Automation, is prohibited.

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 a hazard
- recognize the consequences

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

Allen-Bradley is a trademark of Rockwell Automation

European Communities (EC) Directive Compliance

If this product has the CE mark it is approved for installation within the European Union and EEA regions. It has been designed and tested to meet the following directives.

EMC Directive

This product is tested to meet the Council Directive 89/336/EC Electromagnetic Compatibility (EMC) by applying the following standards, in whole or in part, documented in a technical construction file:

- EN 50081-2 EMC — Generic Emission Standard, Part 2 — Industrial Environment
- EN 5001082-2 EMC — Generic Immunity Standard, Part 2 — Industrial Environment

This product is intended for use in an industrial environment.

Low Voltage Directive

This product is tested 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 required by EN 61131-2, see the appropriate sections in this publication, as well as the Allen-Bradley publication Industrial Automation Wiring and Grounding Guidelines For Noise Immunity, publication 1770-4.1.

This equipment is classified as open equipment and must be mounted in an enclosure during operation to provide safety protection.

Summary of Changes

Summary of Changes

Several additions and changes to the PCMK card and software information have been made. The additions and changes to this manual include:

Information on the	Is in
Windows NT driver	Chapter 2
Windows 95/98 installation instructions	Chapter 4
PCMK Specifications	Appendix A

Revision Bars

We use revision bars to call your attention to new or revised information. A revision bar appears as a thick black line on the outside edge of the page as indicated here.

Using This Manual

Introduction

This manual describes how to install, configure, and troubleshoot the PCMK/B Communication card (cat. no. 1784-PCMK/B). Throughout the manual, we refer to this product as the PCMK card, or the PCMK/B card.



Audience

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

- familiar with Windows NT™, Windows 95®, Windows® (3.x), or MS-DOS®
- experienced with one or more of these Allen-Bradley products: PLC-2®, PLC-3®, PLC-5®, PLC5/250®, or SLC-500™ family programmable controllers, or any other products used that communicate with the PCMK card

Obtain Support

Technical Support	Access at
Internet Web Site	www.ab.com - for non-registered members www.ab.com/mem/technotes/techmain.html - registered members
Autofax System	(440)646-5436 - requires a touch-tone telephone
Telephone	(440)646-5800 - post-sales Technical Support

Abbreviations

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

This is the abbreviation	For
PCMCIA	Personal Computer Memory Card International Association
IRQ	Interrupt Request
TSR	Terminate and Stay Resident
API	Application Programming Interface
PC	Personal Computer

Conventions

We use these conventions in this manual:

- Screen displays and prompts are shown as:
`Press ENTER to continue with the installation`
- Text that you type is shown as:
`a:\install c:`
- Other actions to be performed are shown as:
Click on the `Memory` tab.

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About the PCMK/B Card

What's in This Chapter?

Read this chapter to familiarize yourself with *PCMCIA* technology and the PCMK 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. Allen-Bradley is a registered member of PCMCIA and developed the PCMK Communication card (cat. no. 1784-PCMK/B) under PC card 95 standard – February 1995.

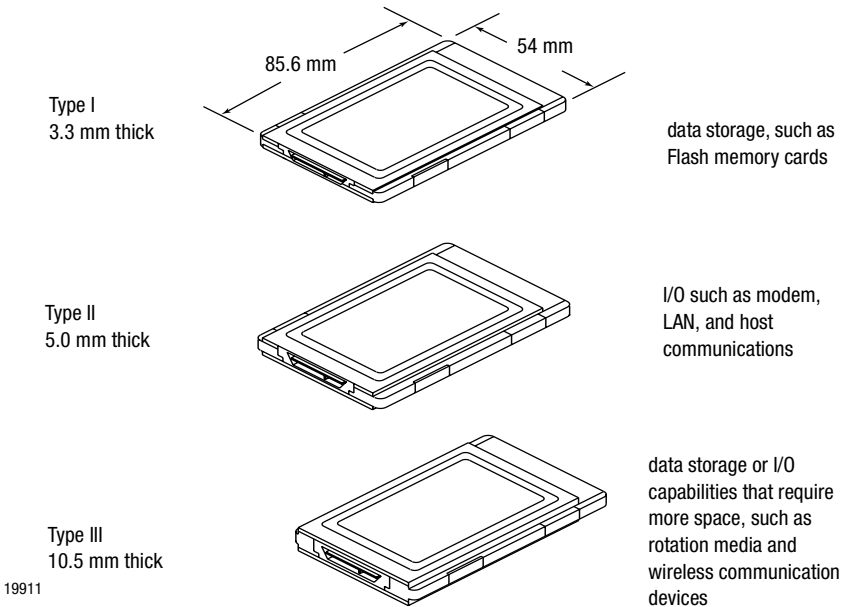
What is a PC Card?

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

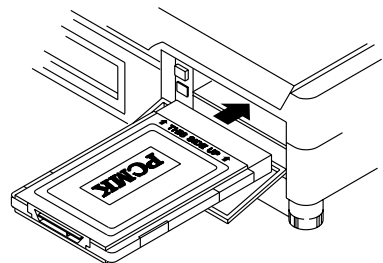
All PC cards measure the same length and width (85.6 mm x 54 mm), but differ in thickness at the center. The thickness at the connector end and along the rails is the same for all types of PC cards.

Currently, there are 3 types of PC cards. The 1784-PCMK card is a Type II card.



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

All 3 types of PC cards use the same 68-pin connector. The pins are in 2 parallel rows of 34 pins. When inserted into the PCMCIA slot on your computer, the connector mates with a single molded *socket*.

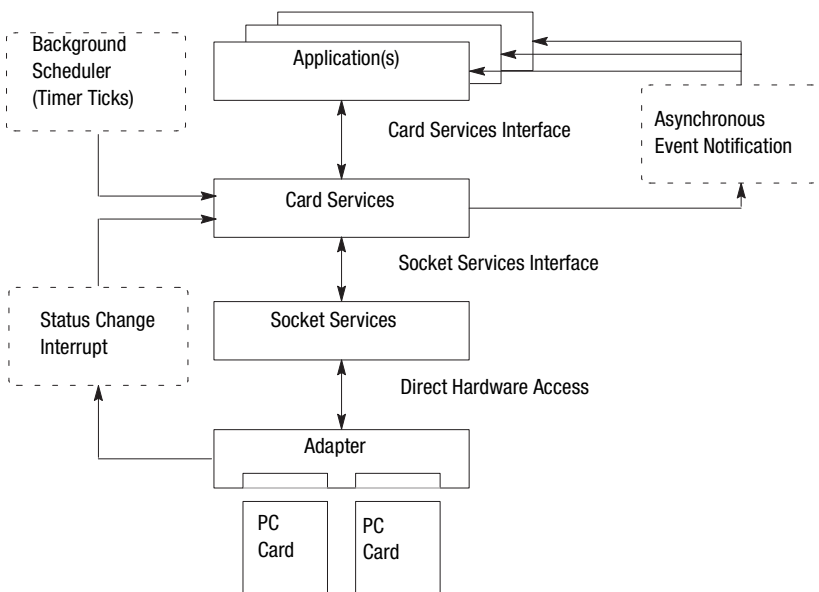


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Communication

When a PC card is inserted into the slot, the connector meets with a socket. 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*.

Communication between an installed PC card and the computer is enabled through software interfaces defined by PCMCIA. These software interfaces are called *Card and Socket Services*. For example, CardWare is a Card and Socket Services package. Windows 95 has built in Card and Socket Services capabilities. Once communication is established, the PC card identifies itself through its *Card Identification 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.

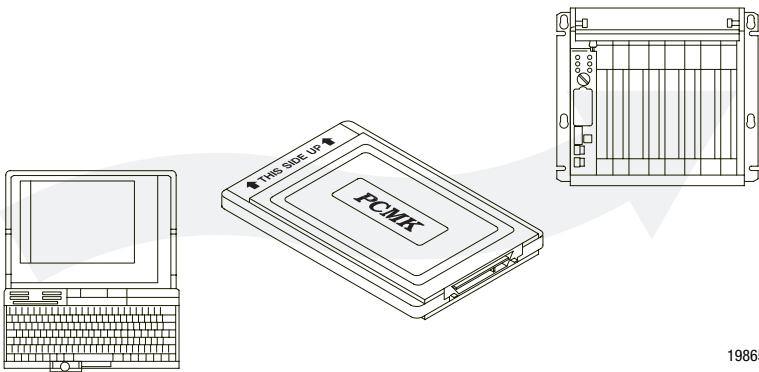
Communication between the PC card and the sockets in your computer is handled by the PCMCIA adapter. The adapter is also controlled by Socket Services.

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 provide 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 Identification Structure provides configuration information about the PC card such as available storage, device type, and data format to the computer.

What's the PCMK Card?

The PCMK/B card is a PCMCIA Type II form-factor card that allows a notebook computer to interface with other devices on both DH+, DH485, and remote I/O communication networks.



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

Enhancements to the 1784- PCMK/ B Card

The 1784-PCMK/B card contains new enhancements that were not contained in the 1784-PCMK/A card. The PCMK/B card:

- is a 16-bit card
- connects with a new series of cables using locking connectors
- will work with newer notebook computers that use PCI bus technology
- has new updated drivers
- can be used with the PCMK/A card
- contains DH+ support at 230K baud
- contains remote I/O scanner capabilities.

Important: The PCMK/B card will not connect with the Series A cables. Please verify that you are using the correct Series B cables when connecting to the PCMK/ B card.

Configuring the PCMK Card

The PCMK/B card works with drivers or enablers to inform Card and Socket Services of the requirements needed to configure the card. There are two types of enablers that you need to be aware of when using the PCMK card.

- **Generic enablers** – these enablers work with Card and Socket Services to configure the PCMK card, but they also allow you to configure other common PC cards, such as network cards.
- **Specific enablers** – these enablers also work with Card and Socket Services; however, they are designed to configure a single type of PC card, such as the PCMK card.

Refer to Chapter 2, “Pre-Installation Procedures,” for more information about determining whether to use a generic or specific enabler.

Adherence to European Union Directive Compliance

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

European Union Directive Compliance

Installation Requirements: If this product is installed within the European Union or EEA regions, the following regulations apply.

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

Pre-Installation Procedures

Verify Your Package Contents

Make sure that you have received the appropriate items, based on the catalog number used when ordering, and the list below before you discard any packing material. If an item is missing or incorrect, contact your local Allen-Bradley office.

PCMK Plug and Play driver for Windows® (1 disk) - contains:

- Windows 95 compatible driver from Rockwell software
- PCMKINIT DOS - specific enabler from Rockwell Software
- PCMKLIST and PCMKinfo diagnostic utilities for the above drivers.

Utilities software (1 disk) - contains:

- hardware diagnostic routines for the PCMK card and cable assemblies
- PCMK utility files used to update programming software

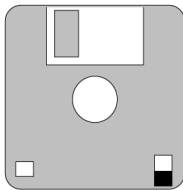
Documentation - contains:

- user manual (1784-6.5.19)
- release notes (1784-6.5.19-RN2)

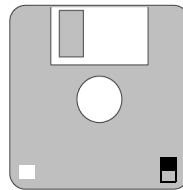
Make Backups

Before installing the PCMK/B card or any software, we recommend that you make backups of your PCMK software disks.

Important: Be sure to write protect your original disks. Slide the tab to reveal the write protect hole that is located on the lower right-hand corner.



Write Protected
hole is open



Not Write
Protected hole is
closed

Use the MS-DOS DISKCOPY command to make a backup copy of:

- the PCMK Plug and Play Driver for Windows 95 disk
- the PCMK Utilities disk

Determine Your Operating System and Software

Before you can begin to install your PCMK card, you need to determine the operating system and software packages with which you will be communicating. Then you need to determine whether or not you will use RSLINX™, the RSIPCMK driver, the PCMKINIT enabler or CardWare 5.0.

Windows NT

The Windows NT driver for the PCMK card is built into RSLINX version 1.60.17 or later. Rockwell Automation has published detailed instructions for configuring this driver. You can find these instructions in one of two places:

- Access the Rockwell Automation website at:
http://domino.automation.rockwell.com/Applications/kb/kb.nsf/WEB_V_PCMCIA and click on document 10088, “Using the PCMK Card in Windows NT.” (If you are a new user, first click on the Technical Support Home link and register as a member.)
- Call the Autofax service at (440)646-5436, and specify document 10088.

Be aware there are several different third party plug and play emulators, such as SystemSoft’s CardWizard and Softex/Phoenix’s CardExec, that may be installed on some Windows NT computers. Document 10088 refers to solutions for configuring computers with third-party, plug and play emulators.

Windows 95 Operating System

If you are using Windows 95 with	You should install
Windows 95 compatible software, for example: A.I.- Series, WIntelligent LOGIX5, RSLogix5, RSLogix500, PanelView, INTERCHANGE 6.0.5 or later, WIntelligent LINX 5.20 or later, RSLinx, 6200 PLC- 5 or 5/ 250 with INTERCHANGE or with RSLinx	the RSIPCMK driver

Important: If you are running a non-Windows 95 released software package on a Windows 95 formatted notebook computer, you must restart your computer in MS-DOS mode. Also, you must use CardWare 5.0 to control your PCMCIA system. The results of this vary. For a guide to this solution, call our Autofax line at (440)646-5436, and specify document 9659. Refer to page 2-6 for more information on CardWare. See the glossary for definitions of MS-DOS mode and the MS-DOS command.

Windows 3. x or DOS

If you are using Windows 3. x or DOS with	You should install
6200 Series Software (includes PLC-2, PLC-3, PLC-5, and PLC-5/ 250) without INTERCHANGE and with other PC cards	CardWare 5.0
6200 PLC-5 with INTERCHANGE and without other PC cards	PCMKNIT enabler
all other DOS-based software	PCMKNIT enabler

Important: If you are using an older Toshiba laptop computer (model number with 4 digits), you must use CardWare to configure your PCMK card.

Important: Only if the RSIPCMK driver or the PCMKNIT enabler are not compatible with your computer or software should you install the CardWare software to configure your PCMK card.

RSIPCMK Driver

The RSIPCMK driver is available for all Windows 95 compatible programs except for the 6200 PLC-5 and 5/250 without INTERCHANGE or RSLinx software solution. This driver works with the Windows 95 Plug and Play functionality which allows the system to immediately recognize the PCMK upon insertion. It automatically determines and assigns available resources to the PCMK card for you. These resources are the dual-port memory and interrupt level of the PCMK card. The resources can be different every time you start the system. However, with the new PCMCIA functionality, the system keeps track of all the resources for you. You must have version 2.0 or greater of the RSIPCMK driver for the PCMK/B card.

PCMKINIT Enabler

The PCMKINIT enabler is available for users who have Windows (version 3.x) or MS-DOS. PCMKINIT is a specific enabler created to only invoke the PCMK card. Therefore, if you wish to use the PCMK card with other PC cards such as a modem or network card, you must also use a generic enabler along with PCMKINIT. Usually, PCMCIA software contains generic enablers that work in conjunction with PCMKINIT. Refer to the documentation for your PCMCIA software to find the location of the appropriate generic enabler.

PCMKINIT works directly with the Card and Socket Services package loaded onto your computer when issuing interrupt requests and memory addresses. However, if you are using 6200 without INTERCHANGE, you are required to manually issue these resources. You must have version 2.0 or greater of the PCMKINIT enabler for the PCMK/B card.

Important: If you need the CardWare software and documentation, please follow instructions on the Software Request Card located in the back of this user manual.

CardWare Software

Allen-Bradley licenses CardWare Card and Socket Services Software from Award Software International, Inc. to serve as a software vehicle to enable the PCMK card. CardWare software is compliant with PCMCIA Card and Socket Services Standard, Version 2.1.

CardWare software has a component (PCENABLE.EXE), which is the generic enabler that lets you use the PCMK card with your application software. This generic enabler also works alongside other PCMCIA cards.

You can receive a copy of CardWare by:

- mailing in the software request card shipped with the PCMK card or manual
- calling Rockwell Automation Technical Support at (440)646-5800, Fax (440)464-6890 and requesting the software.

Updating PCMK Binaries

Before you attempt to use any software packages with the PCMK card, you must update your programming software binaries.



ATTENTION: In addition to the following procedure, if you plan to use 6200 PLC-5 or PLC-5/250 (versions previous to 4.5), PLC-2, or PLC-3 Series software, you must also follow the installation procedures for updating the binaries described in the *Using the PCMK Card with 6200 Series Software Release Notes*, publication 1784-6.5.19-RN2.

Updating Your Binaries

It is important that you install all of the programming software that you plan to use with the PCMK card before running the update procedure. If you install programming software after updating your binaries, the new programming software will overwrite the changed binaries with older information. If you have not installed programming software, no binaries will be changed.

1. Insert the PCMK Utilities software disk into the diskette drive.

2. At the MS-DOS prompt, type:

```
a:\
```

3. Press **Enter**.

4. Then type:

```
binupdat c:
```

If you inserted the PCMK Utilities software disk into another drive, use the appropriate drive letter instead of A.

5. Press **Enter**.

If you installed your programming software on another hard disk, use the appropriate drive letter instead of C.

6. View the messages displayed on the screen to verify which binaries are being updated and whether or not the update was successful. If the update was not successful, the binaries must manually be updated. See page 2-8.



If you received the PCMK Utilities Software diskette, version 2.0 or 3.0, follow the Updating Your Binaries procedures also.

To manually update the binaries:

1. At the MS-DOS prompt, access and print the BINUPDAT.LOG file, which contains a listing of all the directory paths you need to update.
2. Perform the following command for each directory path listed in the log file:

```
copy a:\pckdiag\pck*.bin <drive>:\<directory path>
```

where <drive> is the root drive containing the software and <directory path> is the directory of the software binaries needing updating.

Road Map to Installing the PCMK Card and Software

Use the following chart to plot which documentation you should read based on the configuration of your system.

If you are installing the RSIPCMK Driver, read:

Chapter 3 Installing and Removing the PCMK Card	Chapter 4 Installing the RSIPCMK Driver for Windows 95	Chapter 6 Choosing and Connecting the Correct PCMK Cable
---	--	--

If you are installing the PCMKINIT enabler, read:

Chapter 3 Installing and Removing the PCMK Card	Chapter 4 Installing the PCMKINIT Enabler	Chapter 6 Choosing and Connecting the Correct PCMK Cable
---	---	--

If you are installing the CardWare software, read:

Chapter 3 Installing and Removing the PCMK Card	Release Notes Using CardWare Software with the PCMK card	Chapter 6 Choosing and Connecting the Correct PCMK Cable
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Note: Using CardWare Software with the PCMK card Release Notes are shipped with the CardWare software.

Installing and Removing the PCMK Card

What's in This Chapter?

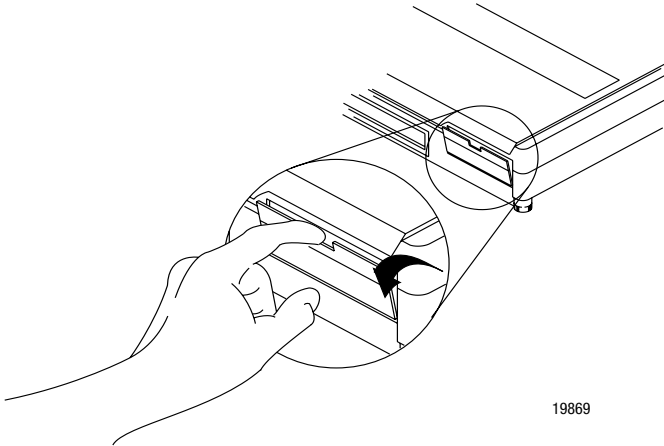
The diagrams in this chapter show a PCMCIA 2.1 compliant notebook computer that may not match the computer you are using. Your installation may be slightly different. Follow the instructions in this chapter to install or remove the PCMK card.

For	See: Page
Inserting the PCMK Card	3-1
Removing the PCMK Card	3-3

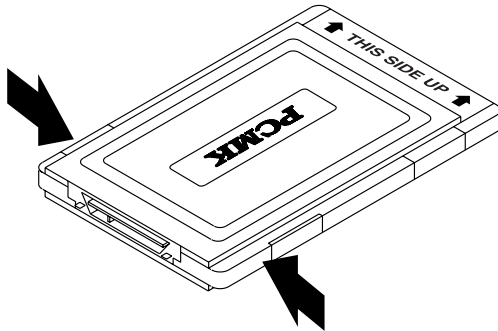
Inserting the PCMK Card

Important: You can insert or remove the PCMK card from a powered computer. However, different application programs accessing the PCMK card behave differently. Some applications, for example, INTERCHANGE, do not support removing and reinserting the card. You should stop all communication software to the PCMK Card before removing it.

1. Open the door to the PCMCIA slot.

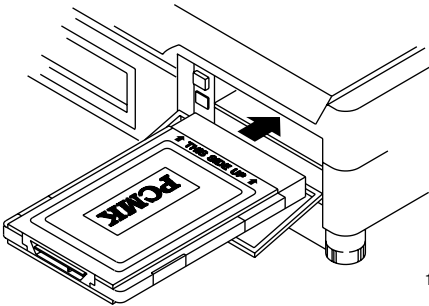


2. Grasp the PCMK card by the edges with the PCMK logo facing upward and the 68-pin connector facing into the PCMCIA slot.



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

3. Insert the PCMK 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.



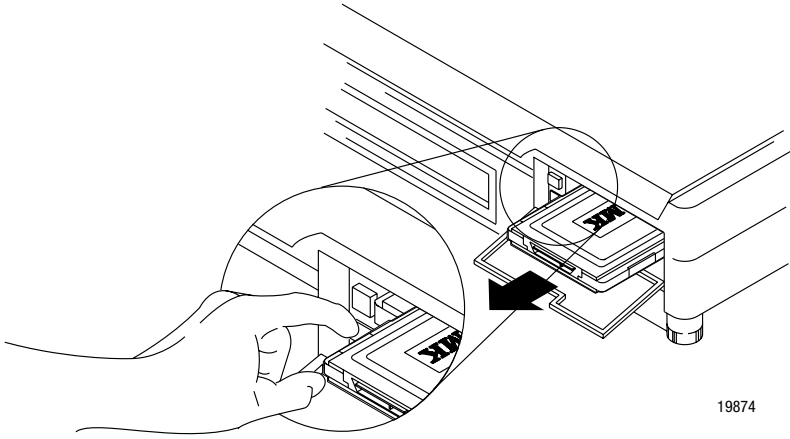
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If the computer is configured properly, your sound/speaker is enabled, and you installed the PCMK card successfully, you hear multiple tones when you insert a card or boot the computer. If you have two PCMK cards, there are 2 sets of tones, one for each card.

Important: If you are installing the PCMK card for the first time, please refer to Chapter 2, “Pre-Installation Procedures”, for information on determining which procedures you need to follow to successfully configure the PCMK card.

Removing the PCMK 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 its user manual.



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

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

Installing the RSIPCMK Driver for Windows 95

What's in This Chapter?

Refer to this chapter to perform the following:

For	See Page
Installing the RSIPCMK Driver	4-2
The PCMKinfo Program	4-5
Stopping the PCMCIA Card in Windows 95	4-6
Removing the RSIPCMK Driver	4-6
Troubleshooting	4-7

Important: The instructions in this chapter assume that you:

- have already determined your operating system and the driver or enabler you will be using from reading Chapter 2.
- have inserted the PCMK card into a PCMCIA slot in your computer.
- are using Windows 95. If you are using a version of Windows that is greater than Windows 95, your procedures and screens may be different.

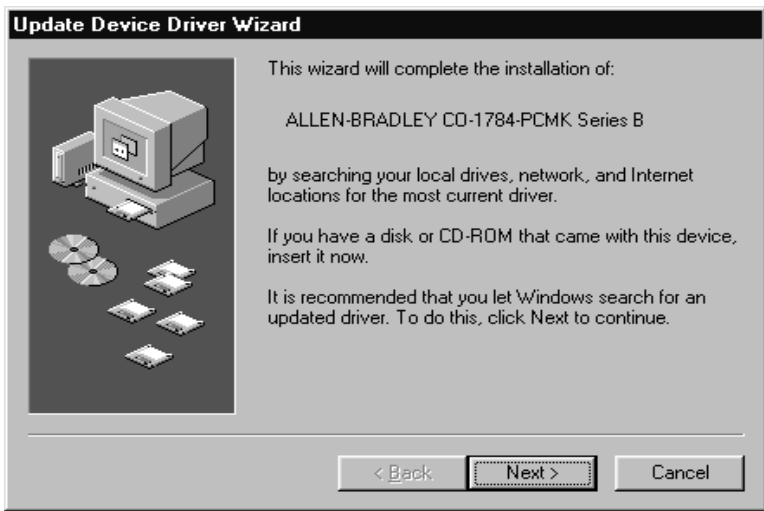


ATTENTION: If you already have a Series A PCMK card and it is properly configured, you must remove the older RSIPCMK driver from your computer before installing a new version of the driver, if your driver is older than version 2.0. The new RSIPCMK driver supports both cards. Refer to “Removing the RSIPCMK Driver” on page 4-6.

Installing the RSIPCMK Driver

Perform the following steps after you have inserted the PCMK card into a PCMCIA slot in your computer, as stated in Chapter 2, and have started the computer.

1. After the PCMK card has been inserted, the system will detect the hardware and begin to build the driver information needed to run the hardware. Because the driver has not been loaded, Windows 95 displays a new hardware dialog box and the following message:

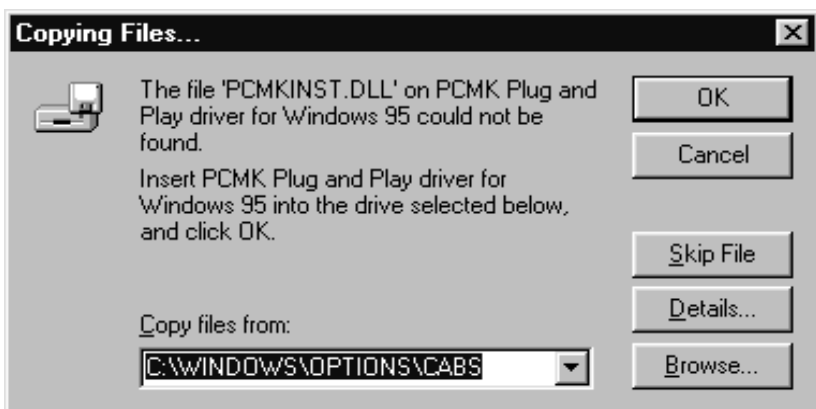


2. Click on **Next**. The system displays the following screen.

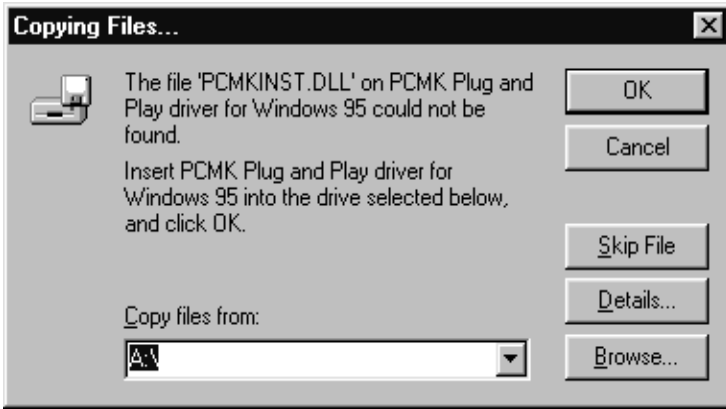


Click on **Finish**.

3. The system will ask you to insert the disk labeled “PCMK Plug and Play driver for Windows 95” into your diskette drive. Do so and click on **OK**.
4. The following message displays:



5. Enter the diskette drive letter into the dialog box. For example, A:\



6. Click on OK.

Windows 95 loads the appropriate driver and continues with its startup procedures.

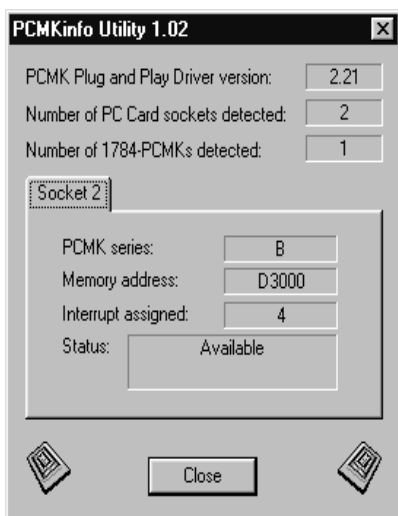
Important: The services provided by the RSIPCMK driver are only available while Windows 95 is running. If you restart the computer in MS-DOS mode, the PCMCIA support is not loaded.

The PCMKinfo Program

PCMKinfo is a utility program that allows you to verify the installation of the RSIPCMK driver and the PCMK card. We recommend you run this utility after installing the PCMK card and the driver, so you can make sure the components are working smoothly.

To run the PCMKinfo program, follow the steps below.

1. Access the Control Panel by selecting:
 - a. Start
 - b. Settings
 - c. Control Panel
2. Double-click on the PCMKinfo program icon.



If you are using a software package that is also supported by Windows 3.x under Windows 95, the socket number you use when configuring your computer is one less than that specified by PCMKinfo.

If you are using RSLinx, or any other RSI product that is supported solely by Windows 95, the socket number used for configuring your computer is the actual socket number displayed by PCMKinfo.

If you are unsure about the actual socket number, refer to your software documentation.

Important: If you have two PCMK cards, there is a Socket tab for each card. Also, the memory address displayed by the PCMKinfo utility is the linear address. This address might differ from the address viewed in other software packages.

Stopping the PCMCIA Card in Windows 95

Before you remove the PCMK card from its socket, you should stop the communication to the PC Card. This can be accomplished by performing the following:

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 PCMK Card you want to stop from the list of PC Cards.
4. Click on the `Stop` button.
5. When you see the window that states you may safely remove this device, click on `OK`.

Updating the RSIPCMK Plug and Play Driver

All users should run the PCMKUPDT program before attempting to install an updated RSIPCMK driver. This is because the OEM version of Microsoft Windows has been updated and the changes will impact installation. The PCMKUPDT program is found on the same diskette as the RSIPCMK driver. Run the program from a MS-DOS prompt. After the PCMKUPDT program is run, re-insert the PCMK card, and the system performs as if the card is new to the system.

Removing the RSIPCMK Driver

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

1. Access the Control Panel.
2. Double-click on the `Add/Remove Programs` icon.
3. Select `Allen-Bradley 1784-PCMK`.
4. Click on `Add/Remove`. You will be asked to remove the PCMK card before continuing. The system gives you the opportunity to cancel the operation before deleting any files.

Troubleshooting

Occasionally, your system may need to be altered to allow the PCMK card to work properly. Documented below are some tips and suggestions for helping you set up the RSIPCMK driver and the PCMK card successfully.

Hearing Multiple Tones

If you insert multiple PC Cards, you may hear more than one tonal notification per card. Windows 95 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 removing a card, the tones will sound again for each change.

Memory Manager Conflicts

If you are loading the EMM386.EXE file, through the CONFIG.SYS file, when you power up your system, you may be interfering with the RSIPCMK driver's ability to map the PCMK card into memory. If you are unsure if you are loading the EMM386. EXE file, perform the following steps.

1. Access the Run dialog box by choosing:
 - a. Start
 - b. Run
2. Type `sysedit` in the Open field.
3. Click on `OK`. This starts an editor that allows you to view and modify your CONFIG.SYS file.
4. Access the CONFIG.SYS file.
5. Scroll through the file to see if the EMM386.EXE file is contained in any of the lines. You can use the Find option within the Search menu to locate every instance of EMM386.

6. Determine whether or not you need this file based on the table below.

If you	Then
do not need the EMM386.EXE to load programs into high memory to create more conventional memory	remark or comment the line containing the EMM386.EXE file out by placing REM in front of the line
need the EMM386.EXE because you are receiving low memory error messages within a DOS application	<p>add <code>win= xxxx-yyy</code> to your EMM386. EXE line, where <code>xxxx- yyyy</code> is an unused memory range in the system. For example, <code>WIN= D000-D3FF</code> would be 16K.</p> <p>Unless you use applications which require expanded memory support, include NOEMS on the EMM386. EXE line.</p> <p>You must allow at least 4K of memory for 1 PCMK card.</p>

Important: You must reboot for the CONFIG. SYS changes to take effect. If you added a WIN statement and are still experiencing problems, increase the size of the WIN= range.

If you are using the Novell 32-bit network client that is supplied by Windows 95, you should have 40K of memory on the `win` line in the CONFIG.SYS file.
For example, `win= d000-d8ff`.

Errors After Removing EMM

If you are receiving errors after removing the EMM386 line, such as “EMS hardware problem,” check the properties for the DOS window you are running the programming software in by following the steps below.

1. Click on the DOS window icon with the right mouse button.
2. Select **Properties**.
3. Click on the **Memory** tab.

The memory settings display for your viewing.

4. Set the Expanded (EMS) Memory item to **None**.

PC Card Icon

If you find that there is no PC Card icon in the Control Panel, this is an indication that the PCMCIA socket hardware was not installed properly. This situation hinders Windows 95 from locating the PC Card.

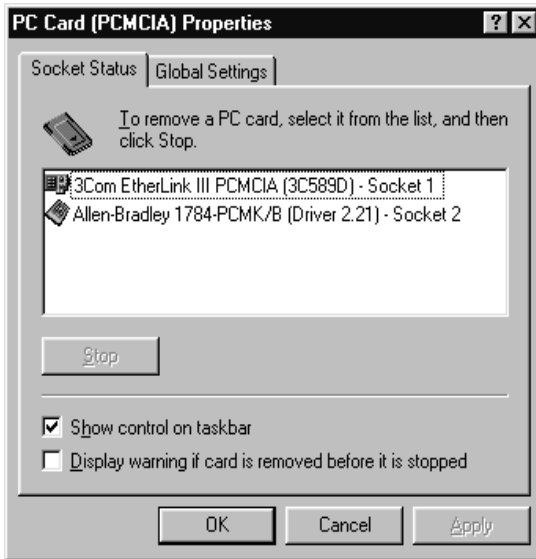
To solve this problem contact the manufacturer of the computer.

Enabling the PC Card Icon in Taskbar

The PC Card icon in the Taskbar lets you know the status of your PC Card, and allows you to stop processing before you remove or change PC Cards. This icon can be set up to display within the Taskbar on your Windows 95 desktop. The icon will only display when there is one or more PC Card installed in the computer. Use the following procedures to setup the PC Card icon within the Taskbar.

1. Access the Control Panel by selecting:
 - a. Start
 - b. Settings
 - c. Control Panel
2. Double-click on the PC Card (PCMCIA) icon.

3. When the PC Card Properties dialog box appears, click on Show control on taskbar.



4. Click on OK. The PC Card icon appears in the Taskbar.

The Driver Still Does Not Work

Use the following procedures to resolve any other driver issues.

1. Click on the My Computer icon with the right mouse button.

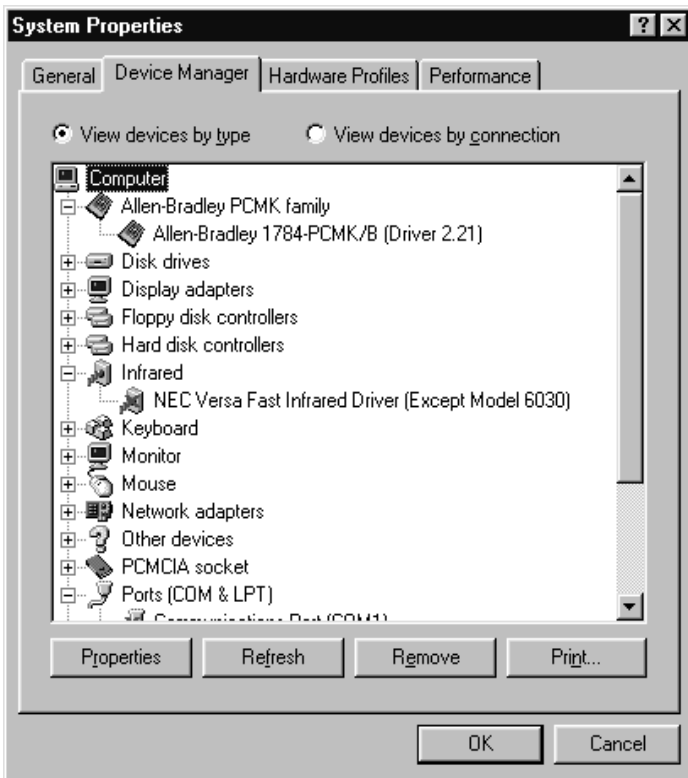
2. Select **Properties** from the menu. The System Properties dialog box appears.
3. Click on the **Device Manager** tab.

All of the devices within the system are displayed.

4. Scroll through the devices and search for the Allen-Bradley PCMK Family line.

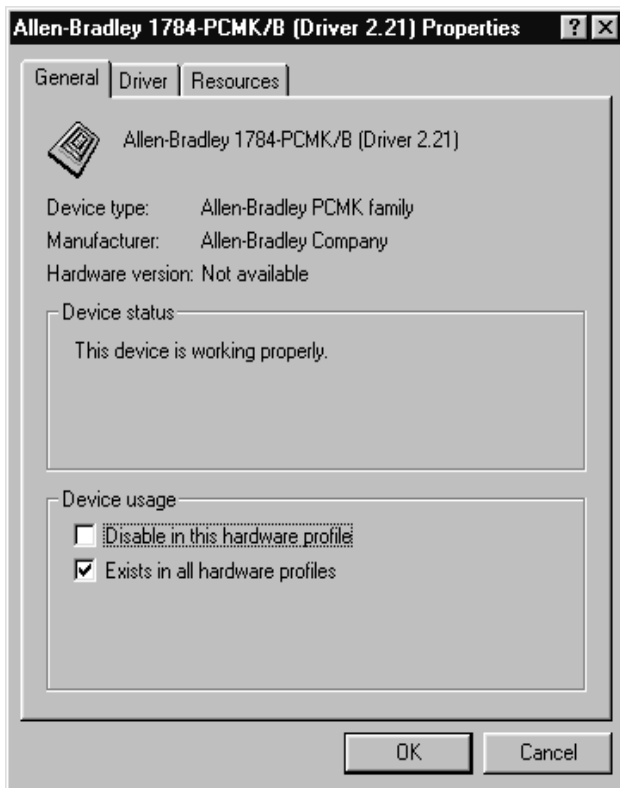
If this line has a plus sign, click on the plus sign to expand the item.

The Allen-Bradley 1784-PCMK device should be listed.



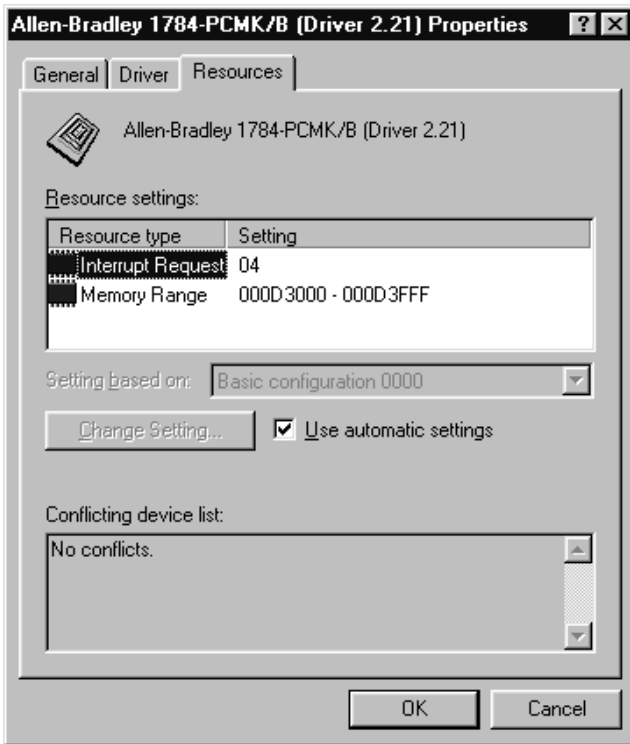
5. Select **Allen-Bradley 1784-PCMK/B**.

6. Click on the `Properties` pushbutton.



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

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



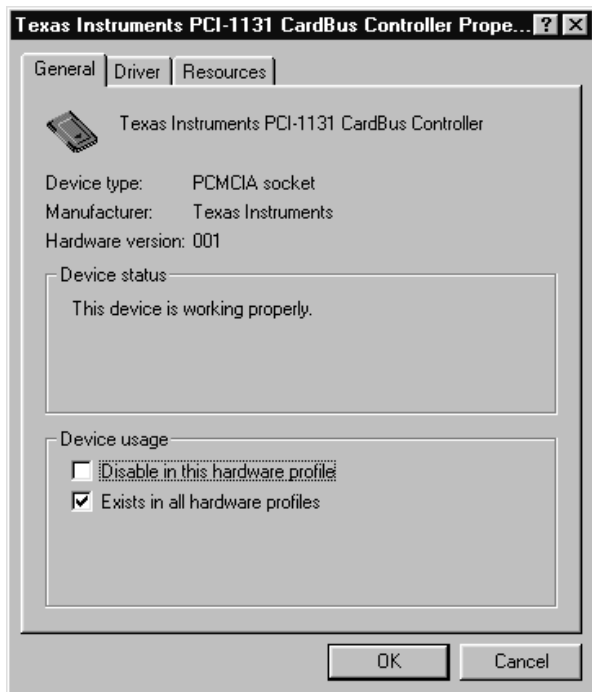
Verify that there are no resources conflicts listed in the Conflicting Device list. Also, verify that an interrupt has been assigned to the PCMK card. An interrupt must be assigned. You may have to disable another device to make an interrupt available for the PCMK card.

8. If there are conflicts, you may need to alter the settings of devices involved in the conflict to get the PCMK card to function properly. Try deselecting 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 socket.

10. Double-click on `PCMCIA socket` 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 Resources tab and check the Conflicting Device list for possible hardware conflicts, or you may want to try enabling the Use Automatic Settings option. Refer to step 7.
the device status does not say, "This device is working properly."	you have a general PCMCIA problem, and you should contact your hardware supplier for a resolution.

Installing the PCMKINIT Enabler

What's in This Chapter?

Refer to this chapter to perform the following:

To	See Page
copy the PCMKINIT file to your computer	5-3
edit the AUTOEXEC.BAT file	5-3
run the PCMKLIST utility	5-4

Important: The instructions in this chapter assume that you:

- have already determined your operating system and the driver or enabler you will be using from reading chapter 2
- have inserted the PCMK card into the PCMCIA slot in your computer.

Before You Begin

PCMKINIT is a specific PCMK card enabler that allows the PCMK card to be used with Card and Socket Services software, such as CardSoft and CardWizard. PCMKINIT only enables the PCMK card, not other PC cards such as a modem or ethernet card. If you want to use other PC cards with the PCMK card, you need to use your Card and Socket Services packaged generic enabler in conjunction with PCMKINIT.

Important: PCMKINIT cannot be used in conjunction with CardWare's generic enabler (PCENABLE). This is because PCENABLE is a generic enabler that contains built-in support for the PCMK card.

Typically, you add a command line for the PCMKINIT enabler to your AUTOEXEC.BAT file, and your Card and Socket Services software assigns a block of memory and an interrupt request to the card from the pool of free resources. You can add extra parameters to the PCMKINIT line that allow you to assign a specific interrupt level or memory allocation. For example, if you are using 6200 Series software without INTERCHANGE, 6200 only accepts certain PCMK memory addresses on its Online Configuration screens. Assigning extra parameters does require you to disable your resource manager from your system and therefore you lose the ability to configure other PC cards. For more information on adding specific command line parameters, refer to Appendix B.

Packages, such as WinLinx, INTERCHANGE, and A.I., are configured by specifying a socket number, which queries the PCMKINIT enabler for the specific address and interrupt of the PCMK card. PCMKINIT provides this information to the application which can then make use of the PCMK card. This allows the use of any available address and simplifies the use of the PCMK card.

Copying the PCMKINIT File to Your Hard Drive

PCMKINIT is located on the “PCMK Plug and Play Driver for Windows 95” diskette. Follow these procedures to install the driver on your computer.

1. Access an MS-DOS prompt.
2. Insert the Plug and Play driver into your diskette drive.
3. Access your root drive and type:

```
cd\  
md pcmkinit  
copy a:\dos\pcmkinit.com c:\pcmkinit
```

The system copies the file to your hard drive.

Editing the AUTOEXEC.BAT File

Once the PCMKINIT enabler is copied to your hard drive, we recommend adding an enabler command to your AUTOEXEC.BAT file. This allows the enabler to be started when you start your computer. While running, the enabler will stay resident in memory, taking up about 2K of RAM.

To access your AUTOEXEC.BAT, follow these steps:

1. Determine your operating system. If you are using DOS, go to step 2. If you are using Windows, go to step 3.
2. Access your root drive and type:

```
edit autoexec.bat
```

When the Editor appears, go to step 4.

3. Access the Program Manager and select the following:

a. File

b. Run

When the Run dialog box appears, type `sysedit`.

A window appears with all of your system files displaying. Locate the AUTOEXEC.BAT file.

4. Add the following line to the AUTOEXEC.BAT file. You should add this line before the line installing Windows (`win`). If you do not have the `win` line, add the following line to the end of the file.

```
lh c:\pcmkinit\pcmkinit.com s
```

5. Save the AUTOEXEC.BAT file and reboot the computer, so the modification takes effect.

The PCMKLIST Program

PCMKLIST is a utility program that allows you to verify that the PCMKINIT enabler and the PCMK card are working together properly. We recommend that you run this utility after installing the PCMK card and the enabler, so you can ensure that the components are working smoothly. When the setup has been properly established, you do not have to run the utility.

To install the PCMKLIST program, follow these steps:

1. Access an MS-DOS prompt.
2. Insert the “PCMK Plug and Play” disk into your diskette drive.

3. Access your root drive and type:

```
copy a:\pcmklis.exe c:\pckinit
```

The system copies the file to your hard drive.

To run the PCMKLIST program, follow these steps:

1. Access an MS-DOS prompt.
2. At the prompt, type: `cd pcmklis`
3. At the prompt, type: `pcmklis`

The PCMKLIST program reports the PCMK card's parameters, such as the socket number, dual-port address, and the interrupt request.

Choosing and Connecting the Correct PCMK Cable

What's in This Chapter?

Follow the instructions in this chapter to connect the PCMK card to a network or processor.

The instructions in this chapter assume that you have inserted the PCMK card into the PCMCIA slot (completed Chapter 3).

For information about	See page
determining the required cable	6-2
attaching the wedge	6-2
connecting the cable	6-5

Determine the Required Cable

If you are connecting to Allen-Bradley	You need
PLC-2 [®] Family Processors	PCM2/B Cable Assembly (cat. no. 1784-PCM2/B)
SLC-5/01 [™] Processors SLC-5/02 [™] Processors SLC-5/03 [™] Processors 1747-AIC link coupler for DH485 other DH485 devices with an RJ45 jack	PCM4/B Cable Assembly (cat.no. 1784-PCM4/B)
PLC-3 [®] Family Processors ⁽¹⁾ PLC-5 [®] Family Processors PLC-5/250 [™] Classic Processors	PCM5/B Cable Assembly (cat. no. 1784-PCM5/B)
SLC-5/04 [™] Processors and PLC-5 [®] Enhanced Processors ControlNet PLC-5 Family Processors ⁽²⁾ other DH+ devices ⁽²⁾	PCM6/B Cable Assembly (cat. no. 1784-PCM6/B) or 1784-PCM5/B cable with CP7 adapter
Remote I/O Network	PCMS/A Cable Assembly (cat. no. 1784-PCMS/A)

⁽¹⁾ Connection is made via DH+ through 1775-S5, SR5

⁽²⁾ Connection can be made with a PCM5/B cable using an 8-pin mini-DIN connector

All cables contain captive hardware to support the use of positive-locking connections.

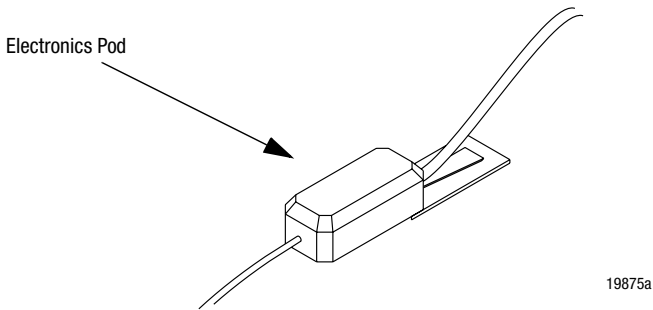
Attach the Wedge



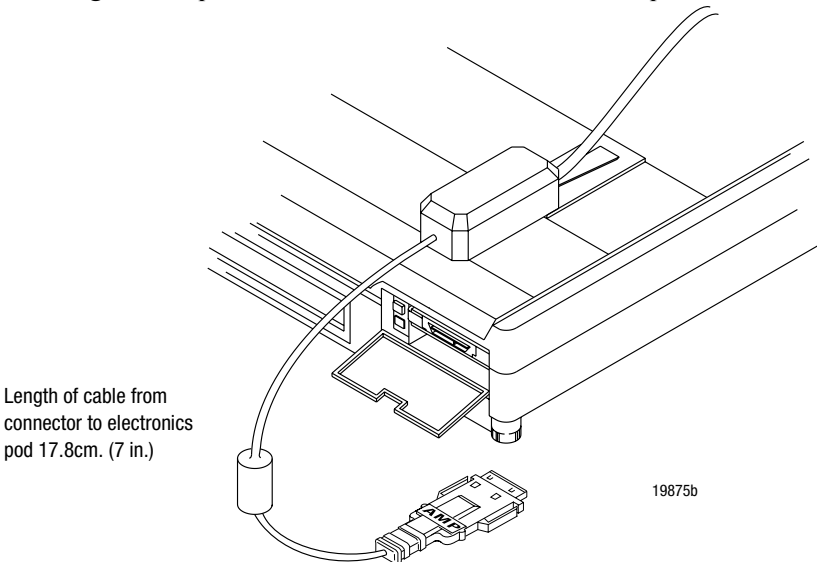
ATTENTION: You must attach the wedge that is provided with your cable to the computer. This wedge provides strain relief for the cable and secures the cable to the computer so the cable is not accidentally disconnected. If you do not use the wedge and the cable disconnects, it can damage the connector on the cable and PCMK card.

To attach the wedge to your computer:

1. Slide the wedge into the slot on the bottom of the cable's electronics pod as shown below.

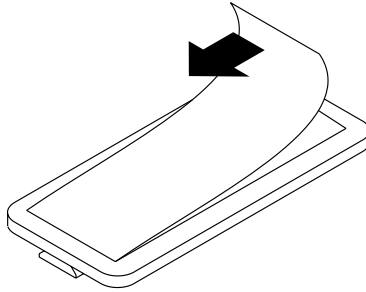


2. Position the assembly on the computer so the narrow end of the wedge is closest to the PCMCIA slot. When you find the best location for the wedge, use a pencil to mark the location on the computer.



3. Separate the wedge from the electronics pod.

4. Remove the paper backing from the wedge.

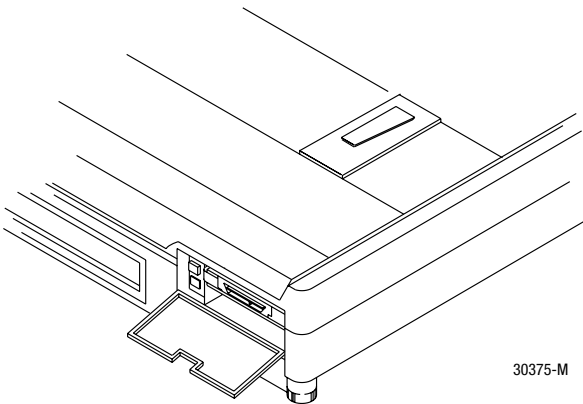


19950



ATTENTION: The adhesive on the wedge is very strong. Once you remove the protective paper and attach the wedge to the computer, you cannot remove the wedge. Be sure you are confident about the position of the wedge before you secure it.

5. Place the wedge on the computer where you marked the location.

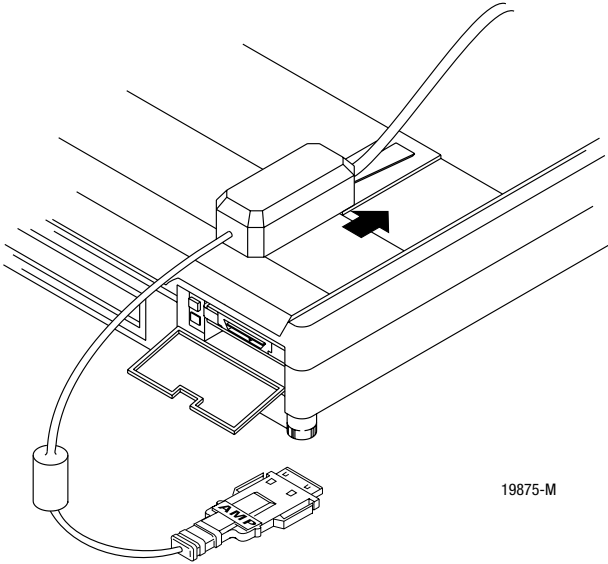


30375-M

Connect the Cable

To connect the cable to the PCMCIA slot:

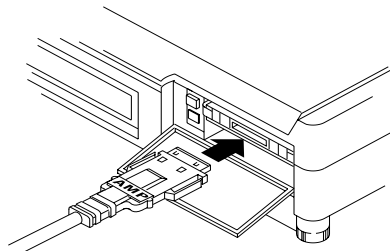
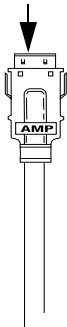
1. Slide the cable's electronics pod onto the wedge on the computer.



19875-M

2. Attach the cable to the PCMK card.

The silver side should face upward as you connect the cable to the PCMK card.

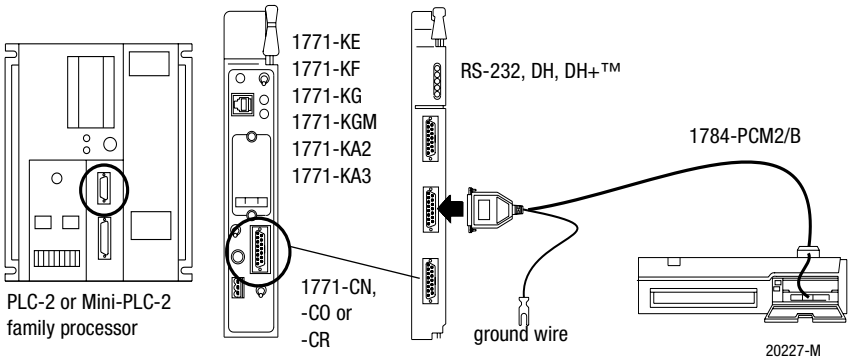
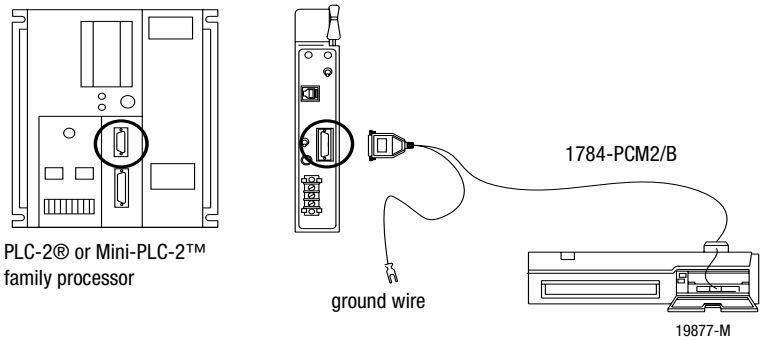
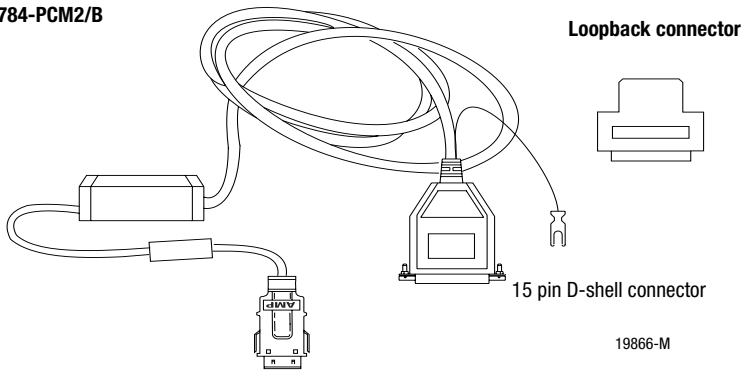


30380-M

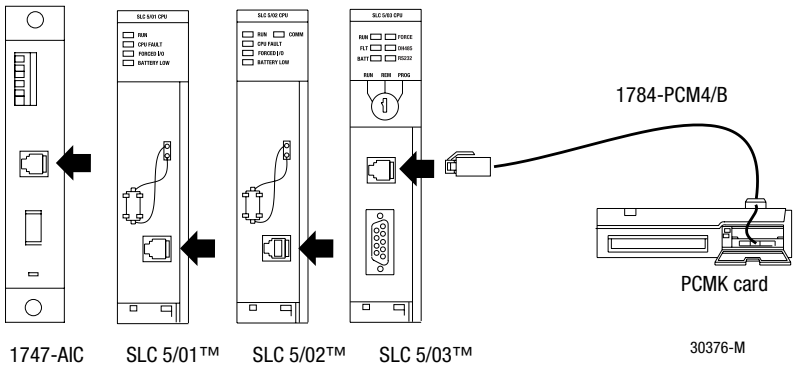
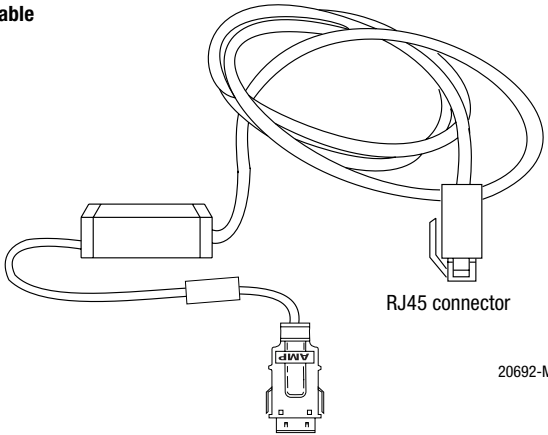
3. Attach the cable to the processor.

The cable you use depends on your processor. The following figures show the PCMK cables and illustrate how to attach each cable to its respective processor (PCL or SLC programmable controller).

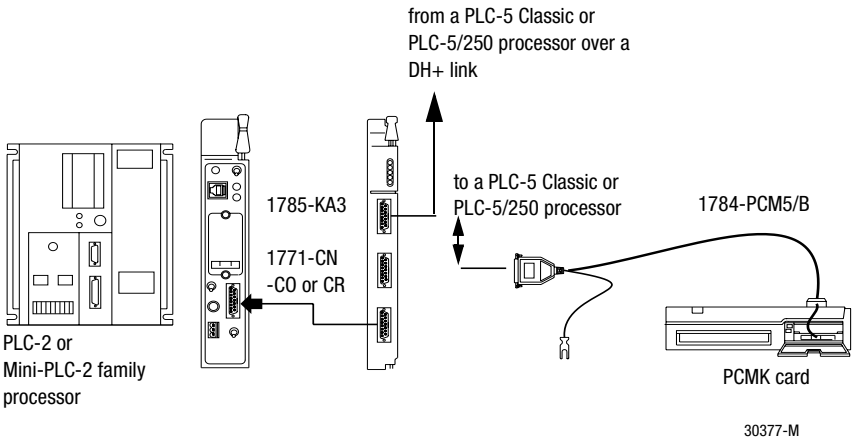
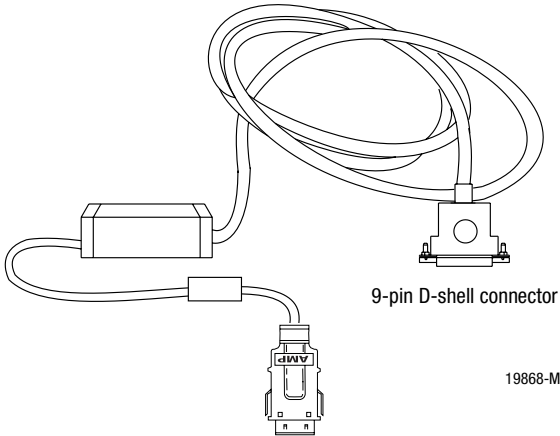
1784-PCM2/B



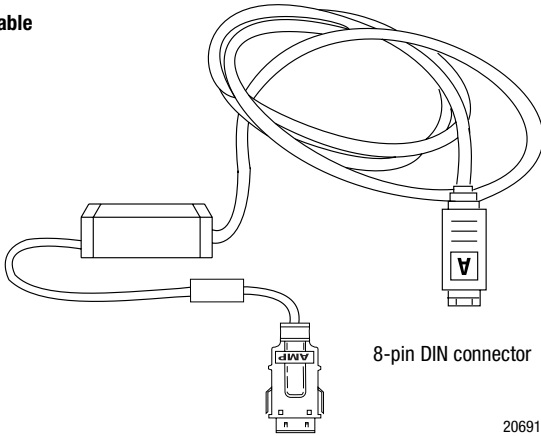
1784-PCM4/B cable



1784-PCM5/B

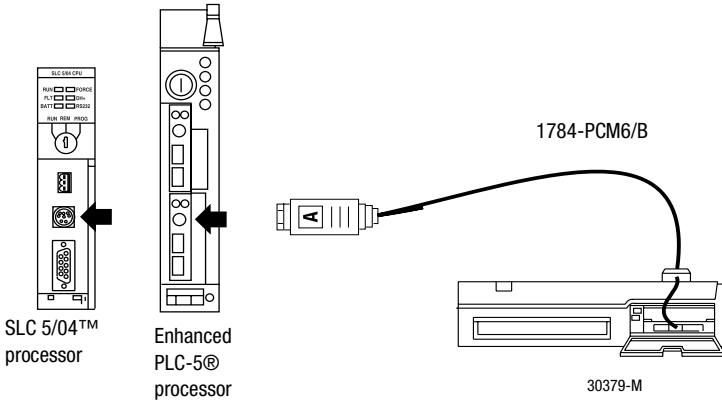


1784-PCM6/B cable



8-pin DIN connector

20691-M



SLC 5/04™ processor

Enhanced PLC-5® processor

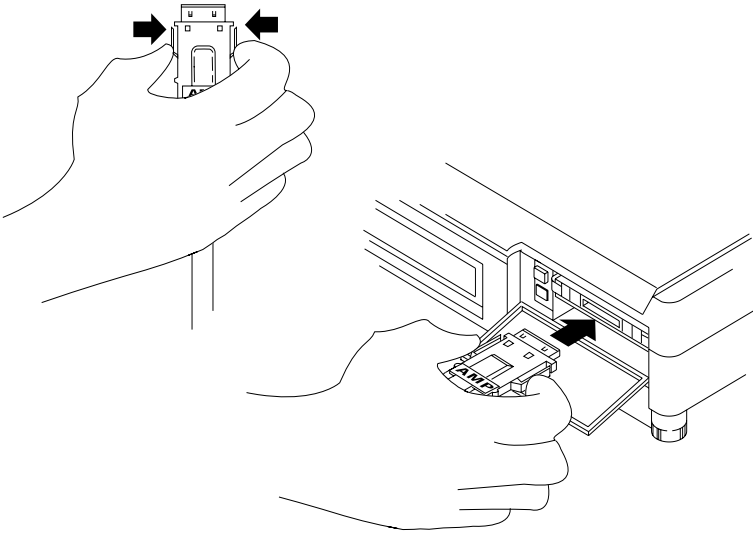
1784-PCM6/B

30379-M

4. Verify that you can go online with the PCMK card and your application software.

Removing the Cable

1. Verify all communications software has been stopped.
2. Remove the cable by gently pinching the side bars and pulling the connector toward you.



adapter

The hardware that connects the computer bus to the 68-pin PC card sockets in the PCMCIA slot. See also socket.

application programming interface

The set of services that an operating system makes available to programs that run under it.

binary file

A name which denotes any file that is not a text file, such as an executable file.

Card Identification Structure

A data structure written on every PC card that complies with the PCMCIA standard. Card Identification 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. See also Socket Services.

dual-port memory

Memory that can be viewed from two different hosts. This memory allows the PCMCIA 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 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 machine and indicates shutting down Windows 95 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 card, socket and adapter.

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.

Specifications

PCMK Communication Card


The following are the PCMK card's PCMCIA specifications:

- PCMCIA Type II form-factor network adapter card
- Compliant to PCMCIA PC card standard - February 1995
- Compliant to PCMCIA Card and Socket Services Standard, Version 2.1



ATTENTION: The PCMK card does not have a termination resistor; use caution when connecting this PCMK card at the end of a DH+ and DH485 link. If your application software prompts you to set termination of the PCMK card, set this field to OFF.

Agency Certification
(when product or packaging is marked)

-  recognized⁽¹⁾
- CE marked for all applicable directives

⁽¹⁾ Must be used with UL Listed IT Equipment or UL Listed Industrial Control Equipment

Environmental Specifications

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

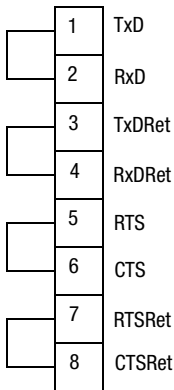
	Operating	Non-operating
Slot Temperature	0 to 55° C (32 to 131° F)	-20 to 65° C (-4 to 149° F)
Humidity	5 to 95% without condensation	5 to 95% without condensation
Vibration	10 to 70 Hz, constant .6 in displacement 70 to 200 Hz, constant 15G acceleration	N/A
Shock	30G peak/11 ms	50G peak/11 ms
Electrical Ratings	input 5Vdc 160mA	

Cable Specifications

1784-PCM2/B, -PCM4/B, -PCM5/B, -PCM6/B	
Total length of cable	3.16 m (10.4 ft.) ⁽¹⁾
Length from PCMK card connector to pod	17.8 cm (7 in.)
Length from pod to processor	2.8 m (9.2 ft.)
Storage temperature	-20 to 65° C (-4 to 149° F)
Operating temperature	0 to 55° C (32 to 131° F)
Humidity	5 to 95% without condensation

⁽¹⁾ Refer to publication 1770-4.1, Industrial Automation Wiring and Grounding Guidelines

Loopback Connector Pin Assignments



**PCM2 Cable Assembly
1784-PCM2**

The PCM2 cable assembly uses the loopback connector for its diagnostic loopback test (see appendix B). The PCM5 and PCM6 cable assemblies have a loopback test but do not have a loopback connector. In addition, the PCM4 cable assembly, used for DH485 communications, has neither a loopback connector nor a diagnostic loopback test.

The PCMS cable assembly, used for remote I/O communications, has no loopback connector and does not do a loopback test.

New DH+™ Specifications-Link Baud Rate

Allen-Bradley has added 230k baud rate enhancements to the DH+ binary.

Note this update to link baud rate in the DH+ memory map:

:007h	Link Baud Rate	INI	FCh = 57600 FEh = 230400	R.....W	Host writes a valid value (PCMK baud rate) to byte :00007h. PCMK reads at start-up.
-------	----------------	-----	-----------------------------	---------	---

Important: Check the product documentation for your RSI communication software to see if the product supports 230k baud rate.

Specifying Memory Addresses and Interrupts for PCMKINIT

The PCMK card requires a dual-port address in RAM to communicate through an interrupt line. The memory is normally assigned by the host computer's native PCMCIA system and used by the PCMKINIT driver when making its API calls to the programming software. PCMKINIT configures PCMK cards on any PCMCIA level 2.1 or greater compliant system. The driver functions using new PCMCIA functions which allow the assignment of resources to the PCMK to be transparent to the user. Afterward, users only need to know the physical socket number. Most software has been written to make use of the new PCMCIA functionality; however, there are still software packages which have not been updated, for example, some 6200 Series products. These packages require a specific, pre-defined address of the dual-port memory address of the PCMK card.

PCMKINIT was designed to allow the user the ability to assign specific memory addresses and interrupts. When these parameters are added to the PCMKINIT line within your CONFIG.SYS and AUTOEXEC.BAT files, they conflict with what your resource manager is attempting to assign. Therefore, you must disable your resource manager from the native PCMCIA system.

Important: When you disable your resource manager, the system loses its ability to configure other PC cards within the same bootup session. Only the PCMKINIT enabler has resources to configure a card, the PCMK card.

Issuing Unique Memory Addresses

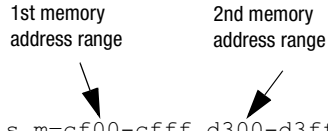
To configure the PCMKINIT enabler, you must have at least 8K worth of memory assigned. The PCMK card's dual-port memory uses 4K, and the other 4K is for the PCMKINIT enabler itself. If you have two PCMK cards, you need to specify another 4K for the second card as well. All memory ranges specified on the command line for the PCMKINIT enabler must also be excluded from your system's memory manager through your CONFIG.SYS file. This allows no other programs access to the PCMK's dual-port address which may cause general protection faults on your computer.

The following is a list of the allowable addresses for 6200 Series software packages. Two valid addresses are assigned to the PCMKINIT enabler so no matter where the 4K memory of the PCMK card is placed, it always registers with the programming software. Use the PCMKLIST program to obtain the address of the PCMK card after starting your computer.

Address range added to AUTOEXEC.BAT	Address excluded from EMM386 in CONFIG.SYS
m=cf00-cfff, d300-d3ff	x=cf00-d3ff
m=d300-d3ff, d700-d7ff	x=d300-d7ff
m=d700-d7ff, db00-dbff	x=d700-dbff
m=db00-dbff, df00-dfff	x=db00-dfff

An example of appending a memory range to a command line for the PCMKINIT is as follows:

1st memory address range 2nd memory address range



```
lh c:\pcmkinit\pcmkinit s m=cf00-cfff,d300-d3ff
```

The dual-port memory range switch, m=, is followed by one or more comma-separated ranges. You can specify one memory range of 8K of memory, or you can break up the ranges so each refers to 4K of memory.

The s switch allows for sound on your PC.

To edit your AUTOEXEC.BAT file:

1. Determine your operating system. If you are using DOS, go to step 2. If you are using Windows, go to step 3.
2. Access your root drive and type:

```
edit autoexec.bat
```

When the Editor appears, go to step 4.

3. Access the Program Manager and select the following:

- a. File
- b. Run

When the Run dialog box appears, type `sysedit`.

A window appears with all of your system files displaying. Locate the AUTOEXEC.BAT file.

4. Locate the PCMKINIT line and make the appropriate memory changes.
5. Save the file through the File menu.

As a result of specifying memory ranges with your AUTOEXEC.BAT line, a memory range exclusion statement must be added to the EMM386 line within your computer's CONFIG.SYS file.

To edit your CONFIG.SYS file:

1. Determine your operating system. If you are using DOS, go to step 2. If you are using Windows, go to step 3.

2. Access your root drive and type:

```
edit config.sys
```

When the Editor appears, go to step 4.

3. Access the Program Manager and select the following:

- a. File

- b. Run

When the Run dialog box appears, type `sysedit`.

A window appears with all of your system files displaying. Locate the CONFIG.SYS file.

4. Locate the following line.

```
device=c:\dos\emm386.exe
```

5. Add to the line the following information.

```
device=c:\dos\emm386.exe noems x=
```

6. Add the appropriate memory range based on the previous table.

For example:

```
device=c:\dos\emm386.exe noems x=cf00-d3ff
```

Interrupt Requests

Interrupt request need to be assigned to the PCMK card and your Card and Socket Services software. The standard notebook generally has several of the following interrupts available. The PCMKINIT enabler determines whether the interrupt can be added to its list and should not conflict with any existing system devices. If you know your system has one of the following used, do not add the interrupt to your command line.

IRQ	Associated with
3	Comm Port 2 and 4 (possible serial port conflicts)
5	LTP2 (does not exist on standard notebook computer)
7	LPT1 (typical printer port)
9, 10, 11, 12	Reserved for system (one of these is usually open)

To assign interrupt requests:

1. Determine your operating system. If you are using DOS, go to step 2. If you are using Windows, go to step 3.

2. Access your root drive and type:

```
edit autoexec.bat
```

When the Editor appears, go to step 4.

3. Access the Program Manager and select the following:

a. File

b. Run

When the Run dialog box appears, type `sysedit`.

A window appears with all of your system files displaying. Locate the AUTOEXEC.BAT file.

4. Locate the following PCMKINIT line and make the appropriate interrupt request change. For example:

```
lh c:\pckinit\pckinit m=cf00-cfff,d300-d3ff i=5,10,11
```

`i=` is the switch for interrupt requests.

5. Save the file through the File menu.

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