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Find the *Rockwell / Allen-Bradley 1784-PCIC* at our website: *Click HERE*

Installation Instructions

ControlNet PCI Communication Interface Card

Catalog Number 1784-PCIC and 1784-PCICS

The 1784-PCIC and -PCICS cards are peripheral component interconnect (PCI) open-bus interface cards. The cards enable PCI local bus compatible computers to communicate directly with other ControlNet™ products.

The 1784-PCIC communication interface card is a messaging only card that provides ControlNet monitoring and configuration capabilities. The 1784-PCICS communication interface card provides ControlNet I/O bridging as well as monitoring and configuration capabilities.

This document describes how to install the 1784-PCIC/PCICS ControlNet communication interface cards.

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If you connect the card directly to a ControlNet COAX network, you may also need to use:

- ControlNet Tap Installation Instructions, publication 1786-5.7
- ControlNet COAX Media Planning and Installation Manual, publication CNET-IN002A-EN-P.

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 and 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.

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Throughout this document 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

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

About the Application Software

The Allen-Bradley standard application programming interface (API) is RSLinx™ software from Rockwell Software Inc. Contact your local Rockwell Automation sales representative or distributor for further information.

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Rockwell Automation Support

Rockwell Automation offers support services worldwide, with over 75 sales/support offices, over 500 authorized distributors, and 260 authorized systems integrators located throughout the United States alone, plus Rockwell Automation representatives in every major country around the world. Contact your local Rockwell Automation representative for:

- sales and order support
- product technical training
- warranty support
- support service agreements

Obtain Pre-Sales Product Support

If you need to contact Rockwell Automation for pre-sales product support, try one of the following methods:

- Call your local Rockwell Automation representative
- Network Pre-Sales support line, 1.440.646.3638 (3NET)
- Pre-Sales e-mail, RACle3net@ra.rockwell.com

Obtain Technical Product Support

If you need to contact Rockwell Automation for technical assistance, try one of the following methods:

- Call your local Rockwell Automation representative
- Post-Sales Technical Support, 1.440.646.5800
- Fax Back system, 1.440.646.5436 (requires a touch-tone telephone)
- Web Links http://www.ab.com — as a registered member, open to http://www.ab.com/mem/technotes/techmain.html

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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 50082-2 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, publication 1770-4.1.

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

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Handling the Card

ATTENTION



The card uses CMOS technology, which is highly sensitive to electrostatic discharge (ESD). ESD may be present whenever you handle the card. When you handle the card without any ESD protection you can cause internal circuit damage that may not be apparent when you install or initially use the card.

Take these precautions to guard against ESD damage:

- Before you handle the card, touch a grounded object to discharge and built-up static charge.
- Avoid touching the backplane connector or interface connector pins located on the card.
- If the card is not in use, store it in the anti-static clamshell that the card was shipped in.

TIP



Remember, a computer with ac power disconnected is *not* a grounded object.

Install the Card Inside the Computer

Before you install the card, be certain that you:

- know how to install hardware in your computer
- consult your computer's documentation for hardware installation instructions

TIP



Installation instructions for both the 1784-PCIC and 1784-PCICS cards are exactly the same. In most illustrations, the 1784-PCIC card is shown.

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To install the card, you need to:

- access to the computer's expansion slots
- possess either a Phillip-head or a flat-head screwdriver
- insert the card into the computer

Access the Computer's PCI Local Bus Expansion Slots

To install the card, you must access the computer's PCI local bus expansion slots. Follow these general steps, or refer to your computer's user guide for instructions on how to:

1. Turn off the power to the host computer with the power switch.
2. Remove the computer's cover.
3. Select a vacant PCI local bus expansion slot.
4. Loosen the screw on the back (rear bracket) of the computer.
5. Remove the slot's expansion cover.
6. Insert the card.

To insert the card inside the computer:

1. Follow the card handling instructions on page 6.
2. Insert the card into the edge connector and tighten the expansion slot screw.
3. Turn on the computer to be certain that it comes up correctly.

If the computer:	then:
powers up	go to step 4
hangs up	• you probably have a memory or I/O conflict • you should remove all other cards and try again If you continue to experience difficulty, contact your local Rockwell Automation sales representative or distributor, or call Rockwell Automation Technical Support at 440.646.5800.

4. When the computer boots up correctly, replace the computer's cover.

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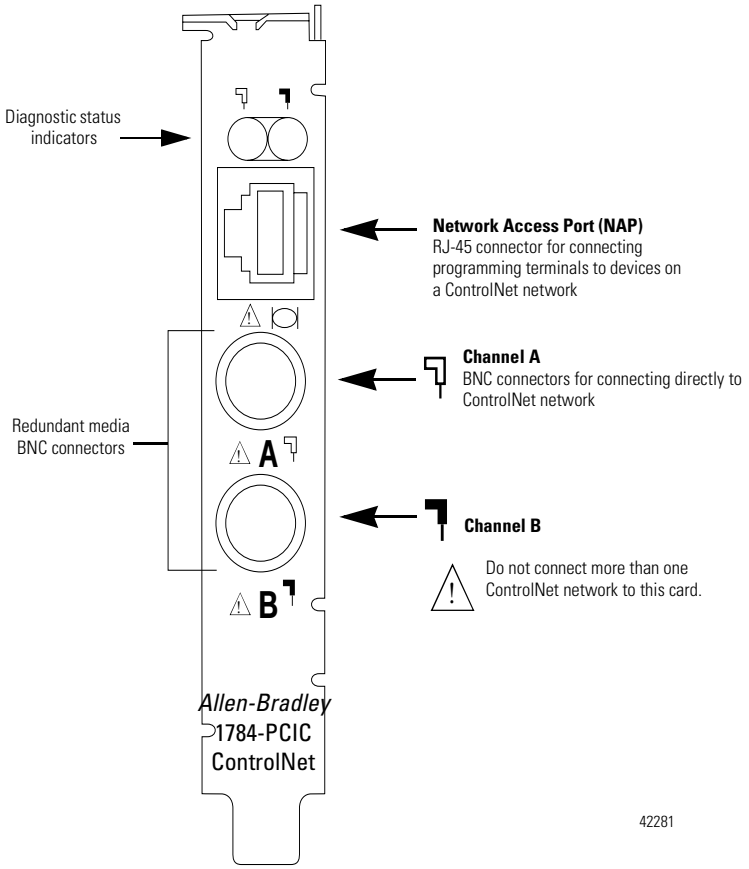
Connect the Card

After you have installed the card, you can connect it:

- to a device already connected to the ControlNet network (page 9)
- directly to a ControlNet network, which requires a tap (page 12)

See Figure 1 on page 8 for the connectors and indicators.

Figure 1 1784-PCIC or -PCICS card (1784-PCIC card shown)



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ATTENTION



Do not connect more than one ControlNet network to this card. If you attempt to connect a second network to this card, your communication system will operate erratically.

If you connect or disconnect the ControlNet cable with power applied to the module or any device on the network, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed, or the area is non-hazardous before proceeding.

See page 13 for information about status indicators. Indicators diagnose only redundant media BNC connections.

TIP

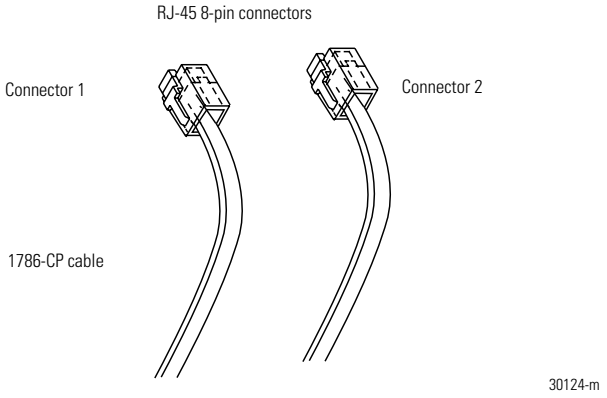


If you use a non-redundant cable system, all ControlNet devices must be on the same channel, channel A.

Connect to a Device on the ControlNet Network

The 1786-CP cable (Figure 2) connects a host computer to another ControlNet device. It has two RJ-45 8-pin connectors.

Figure 2 1786-CP cable



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ATTENTION



Use only the **1786-CP** cable when you connect a programming terminal to the network through the network access port (NAP). If you use a different cable, it could result in possible network failures or product damage.

See Tables A and B for the wiring for the 1786-CP cable.

Table A Wiring for 1786-CP connector cable

Connector 1		
Wire Number	**Signal Mnemonic**	**Signal Name**
1	ISO-GND	Isolated Ground
2	N.C.	No Connection
3	PTTX-H	Transmit Data High
4	PTTX-L	Transmit Data Low
5	PTRX-L	Receive Data Low
6	PTRX-H	Receive Data High
7	N.C.	No Connection
8	ISO-GND	Isolated Ground

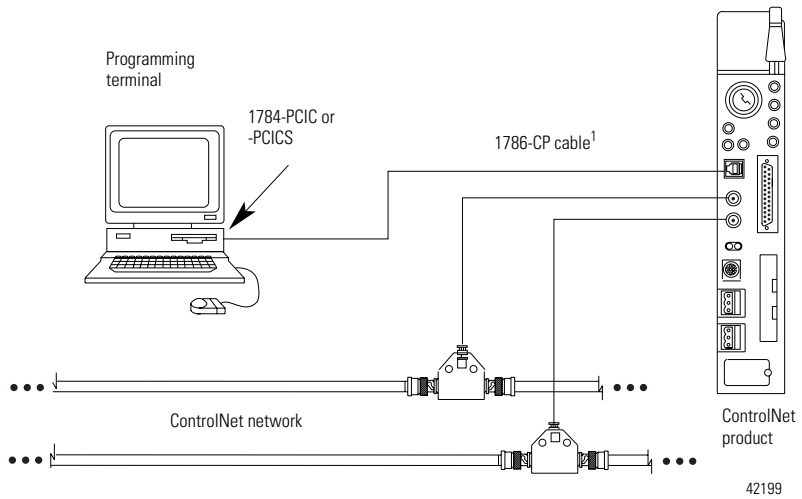
Table B Wiring for 1786-CP connector cable

Connector 2		
Wire Number	**Signal Mnemonic**	**Signal Name**
1	ISO-GND	Isolated Ground
2	N.C.	No Connection
3	PTRX-H	Receive Data High
4	PTRX-L	Receive Data Low
5	PTTX-L	Transmit Data Low
6	PTTX-H	Transmit Data High
7	N.C.	No Connection
8	ISO-GND	Isolated Ground

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When you use the RJ-45 connector, you can connect the card to a ControlNet network without a tap through the Network Access Port (or NAP) of a programmable controller, I/O adapter, or other ControlNet compliant devices (Figure 3 and Figure 4).

Figure 3 Connect a computer to a ControlNet network through a programmable controller or an I/O adapter



1 The 1786-CP cable can be plugged into any ControlNet product's NAP to provide programming capability on the ControlNet network. When you connect a programming terminal through this cable, it is counted as a node and must have a unique address.

ATTENTION

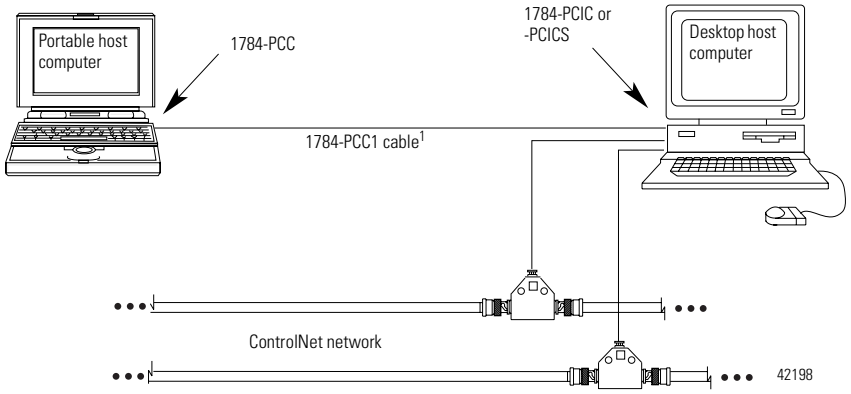


If you connect the product to a cable system that does not support redundant media, connect the tap dropline to the BNC connector labeled channel A. Channel B is left open.

If the cable system is redundant, connect the product so that all devices on the network use the same cable for the same channel. That is, all channel A connectors connect to one cable; all channel B connectors connect to the other.

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Figure 4 Connect a portable host computer to ControlNet through the 1784-PCIC or -PCICS card



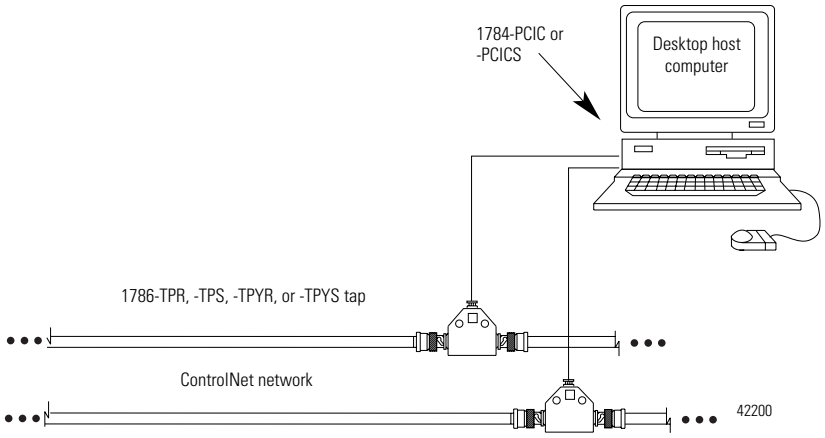
[1] The 1784-PCC1 cable ships with the 1784-PCC communication card.

Connect the Card Directly to the ControlNet Network

To connect the card directly to a ControlNet network as shown in Figure 5, follow the instructions in these publications:

- ControlNet Tap Installation Instructions, publication 1786-5.7
- ControlNet COAX Media Planning and Installation Manual, publication CNET-IN002A-EN-P.

Figure 5 Connect the card directly to the ControlNet network



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1784-PCIC and -PCICS Drivers

The drivers for the 1784-PCIC and -PCICS are included with either:

- Rockwell Software's RSLinx 2.2 Service Pack 2

Or the combination of:

- Rockwell Software's RSLinx 2.2 Service Pack 1 and
- Rockwell Automation's SoftLogix 5800 6.00

Rockwell Software's RSNetWorx for ControlNet 2.25 is required to configure a ControlNet network containing the 1784-PCICS.

Refer to online Help in RSLinx for information on how to configure the driver for the 1784-PCIC/PCICS card. For more information about RSLinx, visit http://www.software.rockwell.com. See page 4 for additional technical support information.

The 1784-PCIC and -PCICS cards require one of these operating systems:

- Windows NT 4.0, SP3
- Windows 98
- Windows 2000

Interpret the Status Indicators on the 1784-PCIC and -PCICS

The status indicators on the card give you information about the card and the network when you're connected via the BNC connectors. Table B outlines the states and explains what each state means to you and the action you should take, if any, to correct that state.

ControlNet status interpretation

- **steady** - indicator is on continuously in the defined state.
- **alternating** - the two indicators alternate between the two defined states at the same time (applies to both indicators viewed together). The two indicators are always in opposite states, out of phase.
- **flashing** - the indicator alternates between the two defined states (applies to each indicator viewed independent of the other). If both indicators flash, they must flash together, in phase.

IMPORTANT When you connect the module to a ControlNet network using the network access port (NAP) only, the LEDs are meaningless.

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Table C ControlNet status interpretation

A and B	Cause:	Action:
off	• no power	• none or apply power to the PC
	• PCIC/PCICS driver not started	• start RSLinx • verify that the PCIC/PCICS driver has been configured properly in RSLinx
	• faulted card	• check operating system event log for details of fault (if the PC's operating system supports an event log) • cycle power to the PC • verify that you have firmly inserted the PCIC/PCICS card into a PCI local bus expansion slot and that the expansion slot screw is tightened • if fault persists, contact your Rockwell Automation representative or distributor • see page 4 for technical support information
steady red	• faulted card	• check operating system event log for details of fault (if the PC's operating system supports an event log) • cycle power to the PC • verify that you have firmly inserted the PCIC/PCICS card into a PCI local bus expansion slot and that the expansion slot screw is tightened • if fault persists, contact your Rockwell Automation representative or distributor • see page 4 for technical support information
alternating red/green	• self-test	• none
alternating red/off	• incorrect node configuration • duplicate ControlNet node address	• check PCIC/PCICS node address and other ControlNet configuration parameters
off	• channel disabled	• program network for redundant media, if required
steady green	• normal operation	• none
flashing green/off	• temporary network errors	• check media for broken cables, loose connectors, missing terminators, etc. • if condition persists, refer to the ControlNet Planning and Installation Manual, publication 1786-6.2.1
flashing red/off	• media fault	• check media for broken cables, loose connectors, missing terminators, etc. • if condition persists, refer to the ControlNet Planning and Installation Manual, publication 1786-6.2.1

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Table C ControlNet status interpretation

A and B	Cause:	Action:
	• no other nodes present on network	• add other nodes to the network
flashing red/green	• incorrect node address	• change PCIC/PCICS node address so that it is less than or equal to UMAX[1] • stop and restart the PCIC/PCICS driver in RSLinx
	• incorrect network configuration	• reconfigure the ControlNet network so that UMAX[1] is greater than or equal to the PCIC/PCICS node address

[1] UMAX is the highest node address on a ControlNet network that can transmit data.

Specifications

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

ATTENTION



This product must be mounted within a suitable system enclosure to prevent personal injury resulting from accessibility to live parts. The interior of this enclosure must be accessible only by the use of a tool.

This industrial control equipment is intended to operate in a Pollution Degree 2 environment, in overvoltage category II applications, (as defined in IEC publication 664A) at altitudes up to 2000 meters without derating.

Table D Specifications

General Specifications	
Characteristic	Value
Power Requirements	5 V dc, 700 mA Maximum, Class 2
Conductor	Category 2 Use this conductor category information when you plan conductor routing as described in publication 1770-4.1, Industrial Automation Wiring and Grounding Guidelines.

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Environmental Specifications		
	Operating	Nonoperating
Slot Temperature	0 to 50 °C (32 to 122 F)	-40 to 85° C (-40 to 185° F)
Humidity	5 to 95% without condensation	5 to 95% without condensation
Vibration	10 th 150 Hz, constant .012 in displacement 10 to 150 Hz, constant 2.0G acceleration	not applicable
Shock	30G peak/11 ms	50G peak/11 ms
Agency Certification		
(when product or packaging is marked)	UL Recognized Industrial Control Component Certified Component Process Control Equipment Certified Component Class I, Division 2, Groups A, B, C, D Marked for all applicable directives Marked for all applicable acts N223 ControlNet™ CONFORMANCE TESTED	

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Hazardous Location Approval

The following information applies when operating this equipment in hazardous locations:

Products marked "CL I, DIV 2, GP A, B, C, D" are suitable for use in Class I Division 2 Groups A, B, C, D, Hazardous Locations and nonhazardous locations only. Each product is supplied with markings on the rating nameplate indicating the hazardous location temperature code. When combining products within a system, the most adverse temperature code (lowest "T" number) may be used to help determine the overall temperature code of the system. Combinations of equipment in your system are subject to investigation by the local authority that has jurisdiction at the time of installation.



EXPLOSION HAZARD –

- Do not disconnect equipment unless power has been removed or the area is known to be nonhazardous.
- Do not disconnect connections to this equipment unless power has been removed or the area is known to be nonhazardous. Secure any external connections that mate to this equipment by using screws, sliding latches, threaded connectors, or other means provided with this product.
- Substitution of components may impair suitability for Class I, Division 2.
- If this product contains batteries, they must only be changed in an area known to be nonhazardous.

Informations sur l'utilisation de cet équipement en environnements dangereux:

Les produits marqués « CL I, DIV 2, GP A, B, C, D » ne conviennent qu'à une utilisation en environnements de Classe I Division 2 Groupes A, B, C, D dangereux et non dangereux. Chaque produit est livré avec des marquages sur sa plaque d'identification qui indiquent le code de température pour les environnements dangereux. Lorsque plusieurs produits sont combinés dans un système, le code de température le plus défavorable (code de température le plus faible) peut être utilisé pour déterminer le code de température global du système. Les combinaisons d'équipements dans le système sont sujettes à inspection par les autorités locales qualifiées au moment de l'installation.



RISQUE D'EXPLOSION –

- Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher l'équipement.
- Couper le courant ou s'assurer que l'environnement est classé non dangereux avant de débrancher les connecteurs. Fixer tous les connecteurs externes reliés à cet équipement à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens fournis avec ce produit.
- La substitution de composants peut rendre cet équipement inadapté à une utilisation en environnement de Classe 1, Division 2.
- S'assurer que l'environnement est classé non dangereux avant de changer les piles.

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