



DeviceNet Compact PCI Communication Interface Card

Catalog Nos. 1784-CPCID and 1784-CPCIDS

To the Installer

The 1784-CPCID and -CPCIDS cards are compact peripheral component interconnect (PCI) open-bus interface cards that provide DeviceNet monitoring, configuration, and I/O scan capabilities.

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Precautionary Statements

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.

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Throughout this document we use notes to make you aware of safety consideration:



ATTENTION: This notation 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: This notation identifies information that is critical for successful application and understanding of the product.

Purpose

Use this document to learn how to install and use the DeviceNet Compact PCI™ communication interface cards, 1784-CPCID and 1784-CPCIDS.

Audience

Read this manual before you install or use the DeviceNet Compact PCI communication interface cards. You should be familiar with DeviceNet technology.

System Requirements

You must use Windows NT 4.0 and IOLinx API-compatible application software such as Allen-Bradley's Soft5.

You must use a Safety Extra Low Voltage (SELV) or a Protected Extra Low Voltage (PELV) power supply to comply with CE Low Voltage Directives.

Compliance to European Union Directives

If this product has the **CE** marking, 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 Council Directive 89/336/EEC Electromagnetic Compatibility (EMC) and 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 following Allen-Bradley publications:

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

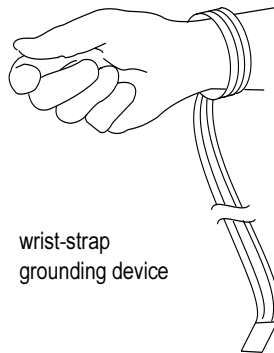
Handling the Card



ATTENTION: The CPCID(S) uses CMOS technology, which is highly sensitive to electrostatic discharge (ESD). ESD may be present whenever you are handling the CPCID(S). Handling a card without any EDS protection can cause internal circuit damage that may not be apparent during installation or initial use. A grounding wrist strap has been shipped with the CPCID(S) to be worn during the installation procedure. Instructions for use of the strap are found on the back of its package.

Take these precautions to guard against electrostatic damage:

- Before handling the card, be sure to wear the provided static strap and touch a grounded object to discharge any built-up static charge.
- Avoid touching the interface connector pins.
- If the card is not in use, store it in the anti-static bag in which it was shipped.



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

Terminology

this term	means
DeviceNet	a Controller Area Network-based network
PCI	peripheral component interconnect
1784-CPCID	DeviceNet Compact PCI card
1784-CPCIDS	DeviceNet Compact PCI scanner card

Related Publications

title	publication number
DeviceNet Manager Software User Manual	1787-6.5.3
DeviceNet Cable System Planning & Installation Manual	DN-6.7.2
DeviceNet Related Publications List	AG-5.18
DeviceNet Scanner Configuration Manual	1784-6.5.28

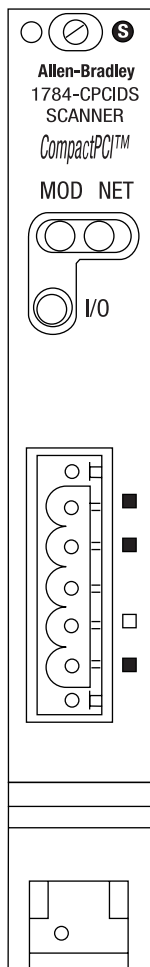
Verifying the Contents of Your 1784-CPCID(S) Order

With this package you should receive:

- 1784-CPCID or -CPCIDS card
- terminal block connector
- driver disk
- ESD wrist strap
- DeviceNet Compact PCI Communication Interface Card Installation Instructions, publication 1784-5.35

Introducing the 1784-CPCID(S) Communication Interface Card

The 1784-CPCID(S) communication interface card, pictured below, is a compact peripheral component interconnect (PCI) open-bus interface card that provides DeviceNet monitoring, configuration and I/O scan capabilities.



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Installing the 1784-CPCID(S) Drivers

Follow these steps to install the CPCID(S) drivers:

1. Insert the driver disk in your disk drive (normally drive A).
2. Press Start —> Run
3. Select Browse.
4. Select the disk drive that contains the driver disk (normally drive A).
5. Click on Setup.
6. Open a:\setup
7. Press Okay.

You see the Setup progress bar.

The system prompts you to specify a destination directory. We recommend that you let the system specify the directory.

8. Press Next.

You see the decompression progress bar followed by the Setup Complete box.

9. Select “Yes, I want to restart my computer now.”
10. Press Finish.

Installing the 1784-CPCID(S) Card

Important: Make sure you know how to:

- install hardware in your computer
- configure the computer's options before you install the CPCID(S)

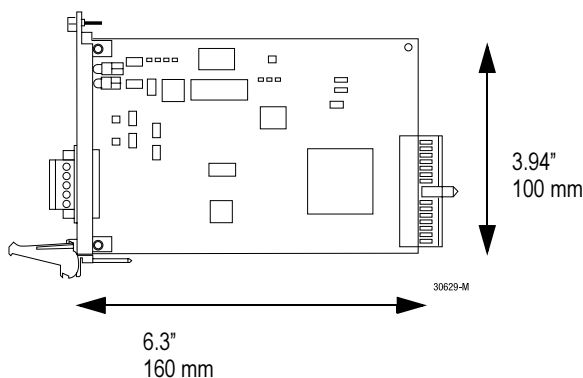
Consult your computer's documentation for specific information.

You need a Phillips-head or a flat-head screwdriver, depending on your system.

To install the card:

1. Gain access to the computer's expansion slots.
2. Insert the card into the computer.

Note: The 1784-CPCID(S) card is 3.94" (100 mm) high and 6.3" (160 mm) long.



Accessing the Computer's Expansion Slots

To install the CPCID(S) card, you must access the computer's expansion slots. Refer to your computer's user guide for instructions on how to:

1. Power down the host computer by turning off the power switch.
2. Select a vacant PCI expansion slot.
3. Remove the slot's filler plate by loosening the screws on the top and bottom of the filler plate.

Inserting the Card

To insert the card inside the computer:

1. Follow the card handling instructions on page 5.
2. Insert the CPCID(S) card into the backplane connector until the ejector locks into the rail and card lock, then tighten the top screw.
3. Turn on the computer to make sure it powers up correctly.

Removing the Card

If you need to remove the CPCID(S) interface card, follow these steps:

1. Turn off power to the computer.
2. Follow the card handling instructions on page 5.
3. Loosen the top screw.
4. Unlock and press down on the ejector to extract the card.

Using I/O Client Test Application and Diagnostics

Included with the 1784-CPCIDS is a stand-alone test application that lets you diagnose simple problems over the network before the control application may be available for integration. In addition, you can use the application to make certain that the module has been correctly installed and is functioning in the PC.

Important: I/O Client Test Application and Diagnostic is restricted to the scanner card (1784-CPCIDS).

The test application provides these features:

Configure Scanner

- baud rate - 125/250/500 kbs
- Mac ID - 0 - 63

Read Inputs

Read Inputs lets you read up to 2048 bytes from the input image table of the 1784-CPCIDS. A simple dialog box with scrolling capability is displayed and is automatically updated 10 times per second.

Write Outputs

Write Outputs lets you write up to 2048 bytes to the output image table of the scanner using manual data entry in a dialog box. You simply key in the desired values and after clicking on a “write” button, the transfer is performed.

Set Scanner State

- IDLE - input reads continue to occur. Outputs are inhibited.
- RUN - Normal operation

I/O Timer

The I/O timer feature gives you a time stamp on the round trip delay from the input table of the 1784-CPCIDS through the test application and back to the output table of the 1784-CPCIDS. This does not include delays over the network.

Starting the Test Application

The test application is automatically installed as part of the driver installation procedure, although, it will not show up as a shortcut on your screen.

To start the test application:

1. Press Start ---> Run.
2. Select Browse.

When the Browse dialog box is displayed, you can find it in:

c:\Program Files\PCID\IoClient

The test application assumes that you have the card installed, the network is powered, and a scan list is loaded into the 1784-CPCIDS using DeviceNet Manager software. If the driver cannot establish communications with the module, an error message will be displayed.

Removing the 1784-CPCID(S) Drivers

Follow these steps to remove the CPCID(S) drivers:

1. Press Start--->Settings--->Control Panel.
2. Select Add/Remove Programs.
3. Select Install/Uninstall.
4. Select the file(s) you wish to remove by highlighting them in the selection box.

The Add/Remove button is unavailable until you select a file.

5. Press Add/Remove.

You are prompted to confirm the file deletion.

6. Press Yes.

Uninstall Shield pops up and prompts you with the message, Uninstall Successfully Completed.

7. Press OK.

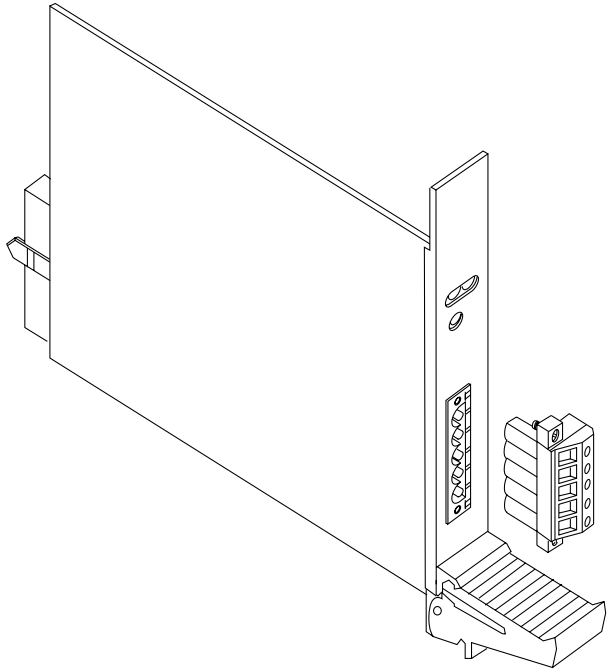
Communicating on DeviceNet

You must have IOLinx API or WinDNet32 compatible application software to communicate on a DeviceNet network with a CPCIDS card. The CPCID module is compatible only with WinDNet16 or WinDNet32 software.

For details about communicating on a DeviceNet network, see your application software documentation.

Connecting to the Network

This figure and table show the necessary network connections you make to the card. The label (on the retaining bracket) is color-coded for easy wiring.

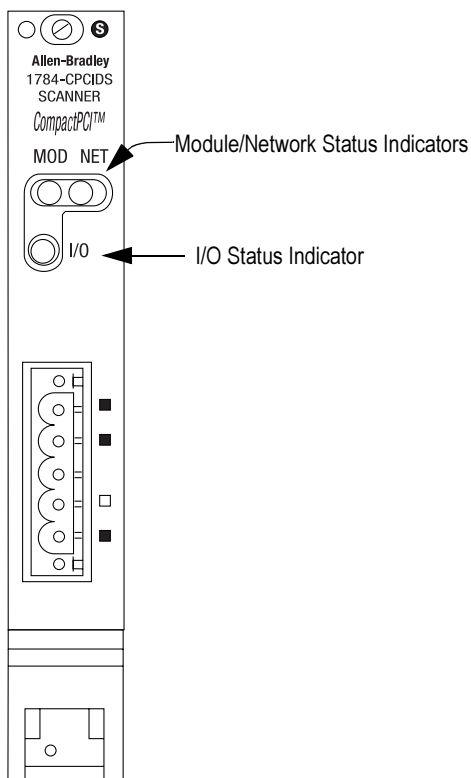


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pin number	wire color	abbreviation	description
1	black	V-	24V dc power return
2	blue	CAN_L	data low - data line
3	bare	DRAIN	shield
4	white	CAN_H	data high - data line
5	red	V+	+24V dc

Interpreting Status Indicators (LEDs)

The three status indicators on the card give you information about your network and its connections. This figure identifies each status indicator.



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The tables on pages 16 through 18 outline the indicator condition and the corresponding status, and explain what each condition means to you.

I/O Status Indicator

This bi-color (green/red) LED provides information concerning the states of inputs and/or outputs.

Important: The 1784-CPCID (non-scanner CPCID card) will always show off for the I/O LED.

condition	status	indicates
off	output(s) inactive input(s) inactive	<ul style="list-style-type: none"> • All outputs are inactive. • All inputs are inactive.
green	output(s) active input(s) active	<ul style="list-style-type: none"> • One or more outputs are active and under control, and no outputs are "faulted." • One or more inputs are active and producing data, and no inputs are "faulted."
flashing green ¹	output(s) idle	<ul style="list-style-type: none"> • One or more outputs are idle and no outputs are active or "faulted."
flashing red ¹	output(s) faulted input(s) faulted	<ul style="list-style-type: none"> • One or more outputs are "faulted," and may be in the fault state. • One or more inputs are "faulted," and may be in the fault state.
red	output(s) forced off input unrecoverable fault	<ul style="list-style-type: none"> • One or more outputs are forced off (may be an unrecoverable fault). • One or more inputs has an unrecoverable fault.

¹ The flash rate of the LED is approximately 1 flash per second. The LED should be on for approximately 0.5 seconds and off for approximately 0.5 seconds.

Module (MOD) Status Indicator

This bi-color (green/red) LED provides device status. It indicates whether or not the device has power and is operating properly.

condition	status	indicates
off	no power	No power applied to device
green	device operational	Device is operating in a normal condition.
flashing green ¹	device in standby (device needs commissioning)	Device needs commissioning due to configuration missing, incomplete, or incorrect. Device may be in the standby state. Refer to the DeviceNet Specification, Volume II, Identity Object.
flashing red ¹	minor fault	Recoverable fault
red	unrecoverable fault	Device has an unrecoverable fault and may need to be replaced.
flashing red-green	device self testing	Device is in self test. Refer to the DeviceNet Specification, Volume II, Identity Object.

¹ The flash rate of the LED is approximately 1 flash per second. The LED should be on for approximately 0.5 seconds and off for approximately 0.5 seconds.

Network (NET) Status Indicator

This bi-color (green/red) LED indicates the status of the communication link.

condition	status	indicates
off	not powered, not online	Device is not online. <ul style="list-style-type: none"> • The device has not completed the Dup_MAC_ID test yet. • The device may not be powered; look at the Module Status LED.
flashing green ¹	online, not connected	Device is online, but has no connections in the established state. <ul style="list-style-type: none"> • The device has passed the Dup_MAC_ID test, is online, but has no established connections to other nodes. • For a Group 2 Only device, it means that this device is not allocated to a master. • For a UCMM capable device, it means that the device has no established connections.
green	link okay, online, connected	The device is online and has connections in the established state. <ul style="list-style-type: none"> • For a Group 2 Only device, it means that the device is allocated to a master. • For a UCMM capable device, it means that the device has one or more established connections.
flashing red ¹	connection time-out	One or more I/O connections are in the timed-out state.
red	critical link failure	Failed communication device. The device has detected an error that has rendered it incapable of communicating on the network (Duplicate MAC ID or Bus-off).

¹ The flash rate of the LED is approximately 1 flash per second. The LED should be on for approximately 0.5 seconds and off for approximately 0.5 seconds.

CSA Hazardous Location Approval

CSA certifies products for general use as well as for use in hazardous locations. **Actual CSA certification is indicated by the product label** as shown below, and not by statements in any user documentation.

Example of the CSA certification product label:

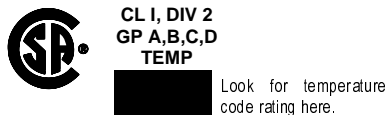


To comply with CSA certification for use in hazardous locations, the following information becomes a part of the product literature for this CSA-certified industrial control product.

- This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D, or non-hazardous locations only.
- The products having the appropriate CSA markings (that is, Class I, Division 2, Groups A, B, C, D) are certified for use in other equipment where the suitability of combination (that is, application or use) is determined by the CSA or the local inspection office having jurisdiction.

Important: Due to the modular nature of a programmable control system, the product with the highest temperature rating determines the overall temperature code rating of a programmable control system in a Class I, Division 2, location. The temperature code rating is marked on the product label as shown.

Temperature code rating:



The following warnings apply to products having CSA certification for use in hazardous locations.

WARNING: Explosion hazard--



- Substitution of components may impair suitability for Class I, Division 2.
- Do not replace components unless power has been switched off or the area is known to be non-hazardous.
- Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
- Do not disconnect connectors unless power has been switched off or the area is known to be non-hazardous. Secure any user-supplied connectors that mate to external circuits on this equipment by using screws, sliding latches, threaded connectors, or other means such that any connection can withstand a 15 Newton (3.4 lb.) separating force applied for a minimum of one minute.
- Batteries must only be changed in an area known to be non-hazardous.

CSA logo is a registered trademark of the Canadian Standards Association.

Approbation d'utilisation dans des emplacements dangereux par la CSA

La CSA certifie les produits d'utilisation générale aussi bien que ceux qui s'utilisent dans des emplacements dangereux. La certification CSA en vigueur est indiquée par l'étiquette du produit et non par des affirmations dans la documentation à l'usage des utilisateurs.

Exemple d'étiquette de certification d'un produit par la CSA:



Pour satisfaire à la certification de la CSA dans des endroits dangereux, les informations suivantes font partie intégrante de la documentation ce produit industriel de contrôle certifié par la CSA.

- Cet équipement convient à l'utilisation dans des emplacements de Classe 1, Division 2, Groupes A, B, C, D, ou ne convient qu'à l'utilisation dans des endroits non dangereux.
- Les produits portant le marquage approprié de la CSA (c'est à dire, Classe 1, Division 2, Groupes A, B, C, D) sont certifiés a l'utilisation pour d'autres équipements où la convenance de combinaison (application ou utilisation) est déterminée par la CSA ou le bureau local d'inspection qualifié.

Important: Par suite de la nature modulaire du système de contrôle programmable, le produit ayant le taux le plus élevé de température détermine le taux d'ensemble du code de température du système de contrôle d'un programmable dans un emplacement de Classe 1, Division 2. Le taux du code de température est indiqué sur l'étiquette du produit.

Taux du code de température:



Le taux du code de température est indiqué ici.




Les avertissements suivants s'appliquent aux produits ayant la certification CSA pour leur utilisation dans des emplacements dangereux.

AVERTISSEMENT: Risque d'explosion --

- La substitution de composants peut rendre ce matériel inacceptable pour les emplacements de Classe I, Division 2.
- Couper le courant ou s'assurer que l'emplacement est désigné non dangereux avant de remplacer les composants.
- Avant de débrancher l'équipement, couper le courant ou s'assurer que l'emplacement est désigné non dangereux.
- Avant de débrancher les connecteurs, couper le courant ou s'assurer que l'emplacement est reconnu non dangereux. Attacher tous connecteurs fournis par l'utilisateur et reliés aux circuits externes de cet appareil à l'aide de vis, loquets coulissants, connecteurs filetés ou autres moyens permettant aux connexions de résister à une force de séparation de 15 Newtons (3,4 lb. - 1,5 kg) appliquée pendant au moins une minute.
- Afin d'éviter tout risque d'explosion, s'assurer que l'emplacement est désigné non dangereux avant de changer la batterie.

Le sigle CSA est la marque déposée de l'Association des Standards pour le Canada.

Specifications

General Specifications	
Compact PCI	compliant to Compact PCI Spec. 2.0 & 2.1
mechanical form factor	Compact PCI 5V, 32-bit 3U 3.937" (100 mm) H x 6.30" (160 mm) L
driver compatibility	Windows NT 4.0 or greater
power requirements <ul style="list-style-type: none"> • PC • DeviceNet ¹ 	5V @ 625 mA max. +24V dc @ 90 mA max.
conductor	Category 2 ³
Environmental Conditions	
ambient slot temperature rating <ul style="list-style-type: none"> • operating ² • non-operating 	0 to 60C (32 to 140F) -40 to +85 C (-40 to 185F)
ambient humidity rating	5% to 95% without condensation
vibration (operating)	0 to 70Hz, constant .012" displacement 70 to 500Hz, constant 2G acceleration
shock <ul style="list-style-type: none"> • operating ² • non-operating 	30G peak/11 ms 50G peak/11 ms
Agency Certification	
(when product is marked)	<ul style="list-style-type: none"> •  Certified, Class I, Division 2, Groups A, B, C, D •  •  Marked for all applicable directives
<p>¹ To remain compliant with UL/CSA certifications, the DeviceNet power supply must meet NEC Class 2 requirements.</p> <p>² The operating parameters describe the environment within the PCI slot. Refer to the documentation for your computer for environmental requirements. The CPCID(S) card should not exceed those specifications.</p> <p>³ Refer to the Industrial Automation Wiring and Grounding Guidelines for Noise Immunity, publication 1770-4.1.</p>	

Compact PCI is a trademark of PCI Industrial Computers Manufacturing Group.
PCI is a trademark of the PCI Special Interest Group.
DeviceNet is a trademark of the Open Device Vendors Association (ODVA).
DeviceNetManager, IOLinx, WinDNet16, and WinDN32 are trademarks of
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Windows NT is a trademark of Microsoft Corp.



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Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204 USA
Tel: (1) 414 382-2000 Fax: (1) 414 382-4444