

FactoryFloor PCI-ARCNET Addendum

Introduction

To take advantage of ARCNET networking on today's PCI bus-based computers, Opto 22 FactoryFloor[®] now supports several PCI20 ARCNET adapter cards from Contemporary Controls. Up to four Contemporary Controls PCI-ARCNET adapters may be used in a single system. As you replace older ISA bus-based computers with newer computers that have PCI slots, you can use these PCI adapter cards with FactoryFloor 3.1c or newer to communicate with your Opto 22 controllers via ARCNET.

Use of these PCI-ARCNET cards requires FactoryFloor version 3.1c or newer.

CAUTION: *Support is eliminated for the Opto 22 AC47 ARCNET adapter card and any other cards configured to use the AC47 driver. PCI-ARCNET supports only 2.5 Mbps data rates.*

The following Contemporary Controls PCI-ARCNET Cards are supported:

- PCI20-CXS Coaxial Star
- PCI20-FOG-ST Fiber Optic (ST)
- PCI20-485 DC-Coupled EIA-485 (backplane mode, twisted-pair)

This document includes instructions and troubleshooting information for using these adapter cards with FactoryFloor. Using FactoryFloor with a PCI-ARCNET adapter requires three main steps:

1. Make sure you have installed FactoryFloor version 3.1c or newer. You can download FactoryFloor updates from our Web site at www.opto22.com.
2. Install the adapter card ([page 2](#)).
3. Configure the new adapter card using OptoTerm ([page 5](#)).

For Help

If you have problems configuring the card or receive OptoControl errors you do not understand, check this addendum and the *OptoControl User's Guide*. For further help, contact Opto 22 Product Support.

Phone: 800-TEK-OPTO (835-6786)
 951-695-3080
 (Hours are Monday through Friday,
 7 a.m. to 5 p.m. Pacific Time)

Fax: 951-695-3017

Email: support@opto22.com

Opto 22 Web site: support.opto22.com

NOTE: Email messages and phone calls to Opto 22 Product Support are grouped together and answered in the order received.

If you have questions about buying PCI-ARCNET adapter cards, or if you have problems installing your PCI-ARCNET card, contact Contemporary Controls:

Contemporary Control Systems, Inc.
 2431 Curtiss Street
 Downers Grove, IL 60515

Phone: 630-963-7070
Web: <http://www.ccontrols.com>

Installing the Adapter Card

PCI20 adapter cards are configured automatically by the PCI-BIOS of the computer; jumper configuration is not necessary. The external switches on these cards are used only for special functions and do not control the node ID setting. The node address is configured using the FactoryFloor software utility OptoTerm.

CAUTION: *Do not use the Contemporary Controls instructions to install the card. Do not install any network software drivers or protocols for the PCI-ARCNET adapter cards. Do not use additional software such as the Contemporary Controls Enabler floppy disk. The FactoryFloor software has its own driver layer, and configuration is done using FactoryFloor.*

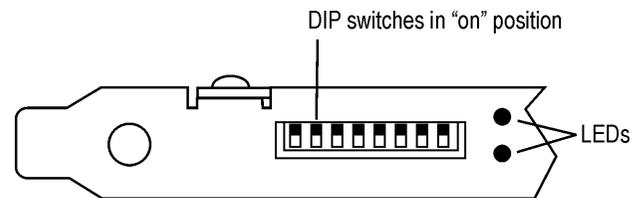
Follow these steps to install the card:

1. Turn off the computer. Remove the power cord and the computer's cover.
 The power cord must be removed, as a sudden spike may cause the computer to automatically boot.
2. Before handling the PCI20, discharge excess static electricity by touching the computer's metal chassis.

CAUTION: Do not scratch this card or other cards in the computer, as scratching may irreversibly damage the card or other devices.

3. Install the PCI20 card in the PCI expansion slot. Verify that the card is properly seated in the motherboard PCI socket. Secure the card with the screw.
4. Reinstall the power cord. Connect the card to the ARCNET network. Turn on the computer. Because the card is self-configuring, it has no jumpers. Configuration is automatically performed by the PCI-BIOS when the card is installed.

NOTE: The DIP switches on the rear panel of the PCI20 are not used for the ARCNET address. Leave all of these switches in the closed or "on" position, as shown in the diagram at right, unless you have a very expansive ARCNET network—that is, longer than two miles between nodes. If you have a very expansive ARCNET network, you may need to set an extended timeout using these DIP switches. For instructions, contact Opto 22 Product Support and ask for form #1247.



5. If you are running Windows 95/98/2000, when the New Hardware Found dialog box appears, provide driver information as follows:
 - a. Highlight Driver From Disk Provided by Hardware Manufacturer. Click OK.
 - b. Insert the Opto 22 FactoryFloor CD in the CD-ROM drive. Enter the path for the CD and the file pci-20.inf. Click OK.

If you do not have the CD, you can download the .inf file from our Web site at www.opto22.com.

Once the PCI20 card is installed, go on to the next section.

Identifying PCI-ARCNET Cards

Since PCI-ARCNET cards are configured automatically, the PCI-BIOS keeps track of them by assigning each card an ID number. Note that this is not the node ID number.

If the PC has only one PCI-ARCNET adapter card, its ID number is one. Skip this section and continue with "Configuring a PCI-ARCNET Adapter using OptoTerm" on page 5.

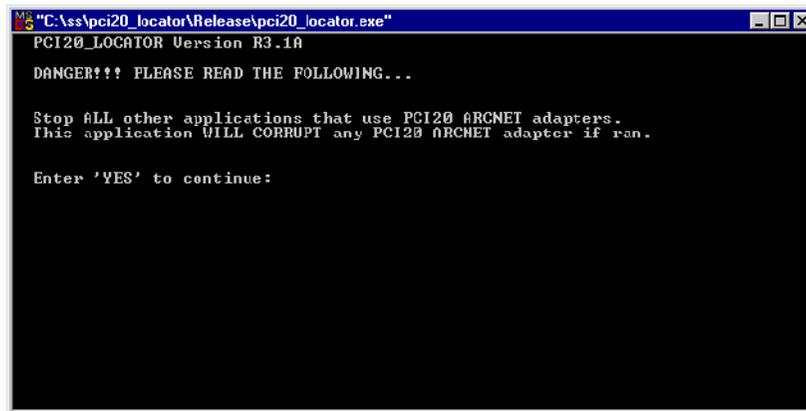
If the PC has more than one identical PCI-ARCNET card, use the Opto 22 PCI20 Locator utility (installed with FactoryFloor 3.1c or newer) to determine ID numbers. This utility should be used when a system is first configured and again if any PCI-ARCNET card is added, changed, or removed. Follow the steps on the next page to use the utility.

1. Before using the PCI20 Locator utility, disable or shut down all applications that use PCI-ARCNET.

CAUTION: *Erratic operation may result if other applications are concurrently using PCI-ARCNET hardware. If erratic operation occurs, reboot the computer to restore the status of the hardware.*

2. Choose Run from the Windows Start menu and type `PCI20_Locator` in the dialog box that appears.

The first prompt displays the application collision warning:



```

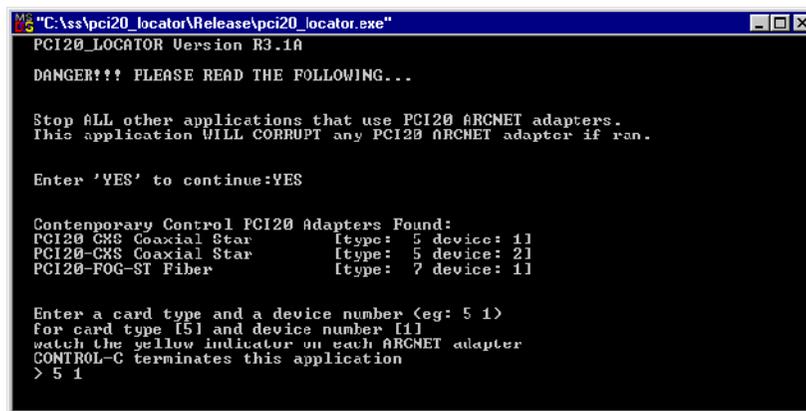
C:\Ass\pci20_locator\Release\pci20_locator.exe
PCI20_LOCATOR Version R3.1A
DANGER!!! PLEASE READ THE FOLLOWING...

Stop ALL other applications that use PCI20 ARCNET adapters.
This application WILL CORRUPT any PCI20 ARCNET adapter if ran.

Enter 'YES' to continue:
    
```

3. Before continuing, close other applications that may conflict.
4. When other applications are closed, type `YES` and press `ENTER`.

PCI Locator inventories the supported PCI-ARCNET adapter cards. In the following example, the utility found two Coaxial-Star adapters and one fiber adapter:



```

C:\Ass\pci20_locator\Release\pci20_locator.exe
PCI20_LOCATOR Version R3.1A
DANGER!!! PLEASE READ THE FOLLOWING...

Stop ALL other applications that use PCI20 ARCNET adapters.
This application WILL CORRUPT any PCI20 ARCNET adapter if ran.

Enter 'YES' to continue:YES

Contemporary Control PCI20 Adapters Found:
PCI20-CMS Coaxial Star      Itype: 5 device: 11
PCI20-CMS Coaxial Star      Itype: 5 device: 21
PCI20-POG-ST Fiber          Itype: 7 device: 11

Enter a card type and a device number (eg: 5 1)
for card type [5] and device number [1]
watch the yellow indicator on each ARCNET adapter
CONTROL-C terminates this application
> 5 1
    
```

Each Contemporary Controls PCI20 card has two LEDs. The yellow LED blinks when the computer accesses the card, and the green LED shows ARCNET activity.

5. To identify a card, type its card type and a device number at the command prompt, and then watch for the yellow indicator to blink.

In this example, to identify a Coaxial-Star card, you would enter 5 1 for a Coaxial-Star card (type 5) and the first device. The second coaxial card can be located by entering 5 2 and the fiber PCI-ARCNET card by entering 7 1. As you access each card, its yellow indicator blinks for 10 seconds.

6. Label each card and its cable with its ID number, to preserve the wiring information if the cables are ever disconnected and then reconnected.
7. When you have identified all PCI-ARCNET cards, press CTRL-C to exit PCI20 Locator.

Configuring a PCI-ARCNET Adapter using OptoTerm

FactoryFloor versions 3.1c and newer change OptoTerm slightly so you can configure PCI-ARCNET ports on Opto 22 controllers. The option to configure an AC47 has been removed.

To configure a new PCI-ARCNET adapter for use with FactoryFloor, follow these steps to create a new controller port using OptoTerm.

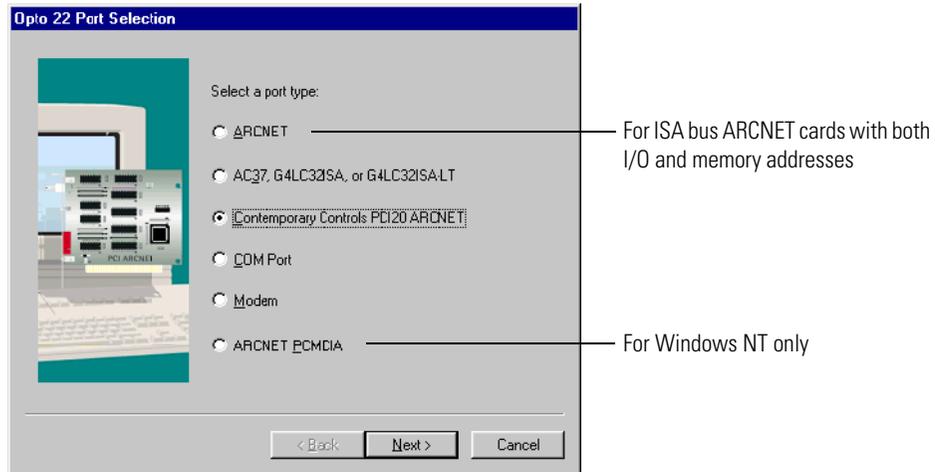
1. Click the Windows Start menu and select Programs→Opto22→OptoUtilities→OptoTerm.

The OptoTerm window appears:

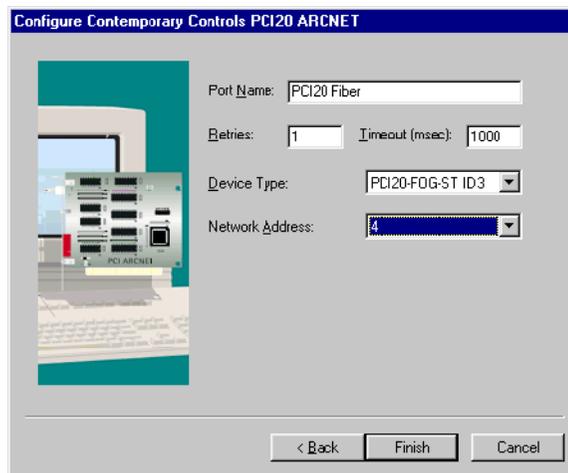


2. Right-click the controller and choose Modify from the pop-up menu. (If the controller doesn't exist yet, choose Configure→Controller and click Add in the dialog box.)
3. In the Select Connection Type dialog box, click Direct. Click Next.
4. In the Configure Direct Connection dialog box, click Add to add a port.

The Opto 22 Port Selection dialog box appears:



5. Click Contemporary Controls PCI20-ARCNET and click Next.



6. Give the port a name and change Retries and Timeout values if necessary. Choose the device type from the following table.

Remember that if the PC has only one PCI-ARCNET card, the card's ID number is one; if the PC has multiple cards, see ["Identifying PCI-ARCNET Cards" on page 3](#) to determine the ID number.

Device Type Selections	Description
PCI20-CXS ID1	PCI20-CXS PCI Coaxial Star ARCNET Card ID #1
PCI20-CXS ID2	PCI20-CXS PCI Coaxial Star ARCNET Card ID #2
PCI20-CXS ID3	PCI20-CXS PCI Coaxial Star ARCNET Card ID #3
PCI20-CXS ID4	PCI20-CXS PCI Coaxial Star ARCNET Card ID #4

Device Type Selections	Description
PCI20-FOG-ST ID1	PCI20-FOG-ST PCI Fiber ARCNET Card ID #1
PCI20-FOG-ST ID2	PCI20-FOG-ST PCI Fiber ARCNET Card ID #2
PCI20-FOG-ST ID3	PCI20-FOG-ST PCI Fiber ARCNET Card ID #3
PCI20-FOG-ST ID4	PCI20-FOG-ST PCI Fiber ARCNET Card ID #4
PCI20-485 ID1	PCI20-485 PCI DC-Coupled ARCNET Card ID #1
PCI20-485 ID2	PCI20-485 PCI DC-Coupled ARCNET Card ID #2
PCI20-485 ID3	PCI20-485 PCI DC-Coupled ARCNET Card ID #3
PCI20-485 ID4	PCI20-485 PCI DC-Coupled ARCNET Card ID #4

7. Choose a network address that is unique on the ARCNET network.
Address 0 is a reserved ARCNET addresses and cannot be used.
8. Click Finish to return to the main OptoTerm window.
The configuration is complete.

Troubleshooting

The following table lists errors you may encounter and possible workarounds. For additional help, see the contact information on [page 2](#).

Error	Remedy
My application reports a -29 error.	The -29 error indicates that the PC sent the message but didn't receive a reply in time. First try setting the timeout to a larger value. Also, a very busy controller may cause this error. See Opto 22 Application Note 9712 for suggestions regarding this problem.
My application continually reports a -33 error.	The addressed destination node cannot be found. Make sure the ARCNET connection is complete between the computer reporting the error and the controller. Make sure the destination controller's ARCNET address is properly configured. Verify that the controller has an active host task running on the ARCNET port. A host task may be started by initiating a "start host task" instruction within OptoControl or by configuring the default host task jumpers (H0 and H1).
My application returns a -102 error.	Use the PCI20 Locator to see if the specified card can be located in the computer's configuration. Reinstall the PCI20 ARCNET adapter to make sure it is fully seated in the computer. Make sure the port's OptoTerm settings are correct and match those tested by the PCI20 Locator.

Error	Remedy
My application keeps reporting a -103 error.	<p>This problem may indicate a bad ARCNET connection. The computer is communicating with the PCI board but cannot find other nodes in the ARCNET network.</p> <p>Try replacing the ARCNET cable.</p> <p>Try testing a controller with a private local ARCNET connection (a direct cable connection from the PC to the controller).</p> <p>Reseat the PCI-ARCNET card and retest for operation.</p>
The PCI20_Locator can't locate any cards.	<p>Make sure the PCI-ARCNET cards are properly seated in the PCI connector.</p> <p>The PCI Locator identifies Contemporary Controls PCI20 PCI-ARCNET adapters that are supported by FactoryFloor. Check the list of supported adapters on page 1.</p> <p>The PCI20 Locator requires a driver layer that is included automatically with the installation of FactoryFloor 3.1c or newer. The application will not operate correctly if this driver layer is missing. Try to start the driver by running the following command (requires Administrator privileges for NT): <code>C:\>wdreg start</code></p> <p>If PCI20_Locator still cannot locate the card, try to install and start the driver by running the following command (requires Administrator privileges for NT): <code>C:>wdreg install</code> (For Windows 9x, reboot the system.) If the problem remains, contact Opto 22 Product Support.</p>