OPTO 22

DATA SHEET

Form 1002-010126

Part Number	Description
AC47	Two individual or a redundant pair of twisted-pair ARCNET ports for the computer ISA bus

Description

Opto 22's AC47 is a twisted-pair ARCNET network interface card for standard ISA bus computers. It provides the capability to construct a point-to-point or multidrop topology ARCNET network using twisted-pair RS-485-compatible cable.

The two nodes on this adapter card can be used as separate communication ports, or they can be configured for redundant operation. For redundant data link operation, you can use dual twisted-pair cable or two completely separate cables. Screw-type connectors are provided on a removable barrier strip, eliminating the need for special cable connections. RJ-11 modular jacks are also provided for convenience.

 In Opto 22 industrial automation systems, the primary function of the AC47 interface card is to control one or more "HA" style SNAP brains directly from a PC.

In the PC-to-brain configuration, a single twisted-pair cable is daisy-chained from the AC47 interface card to each of the brains. If shielded cable is used, the shield should be connected to the ground, or common terminal, at one end only.

The significant advantages of the Opto 22 I/O network based on twisted-pair ARCNET are speed, distance, and relative ease of implementation. The transfer rate of an Opto 22 ARCNET network is 2.5 megabits per second, with a total network distance of 1,000 feet without a repeater. Commercial hubs and repeaters permit virtually any size network.
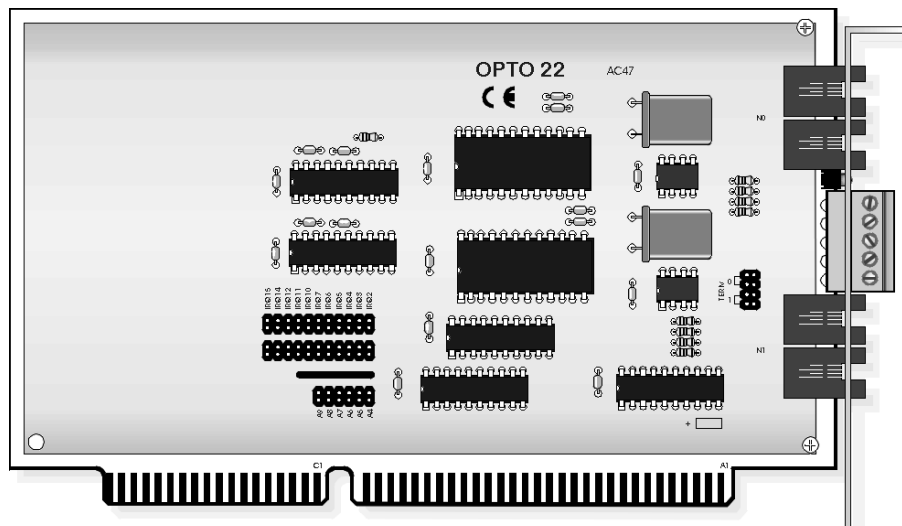
One of the AC47's ports can also be used to communicate from FactoryFloor (versions R2.1a to R3.1b only) on the PC to an OptoControl strategy running on an Opto 22 M4-family controller. However, the controller firmware does not support redundant twisted-pair ARCNET communications on the controller's host port.

Specifications

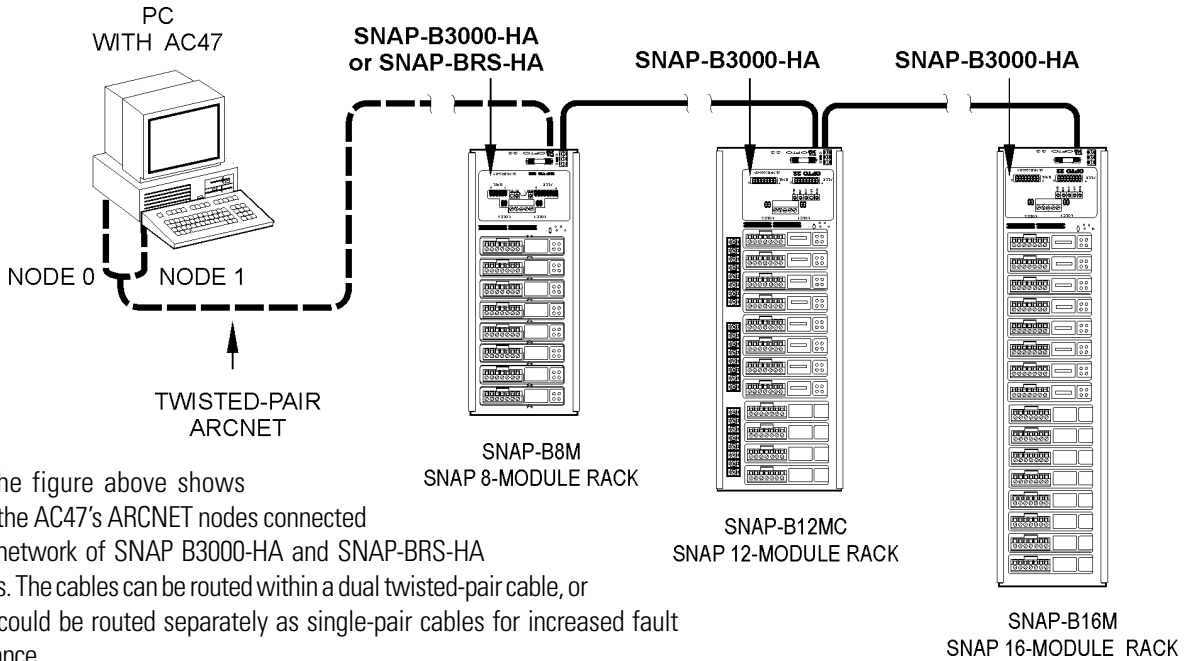|	
Transfer Rate	2.5 megabits/second
Termination	Jumper-selectable
Topology	Multidrop
Cable	CAT-3 or CAT-5 UTP
Connectors	Screw-type barrier strip and RJ-11 modular jacks
Compatible FactoryFloor Versions	R2.1a to R3.1b

LED Indicators. The AC47 has two diagnostic LEDs, one for each port. If the AC47 is mounted horizontally in the computer, the top LED is for node 0 and the bottom one for node 1. These lights come on when the processor is actively communicating on the port or during initialization after the AC47 has been reset.

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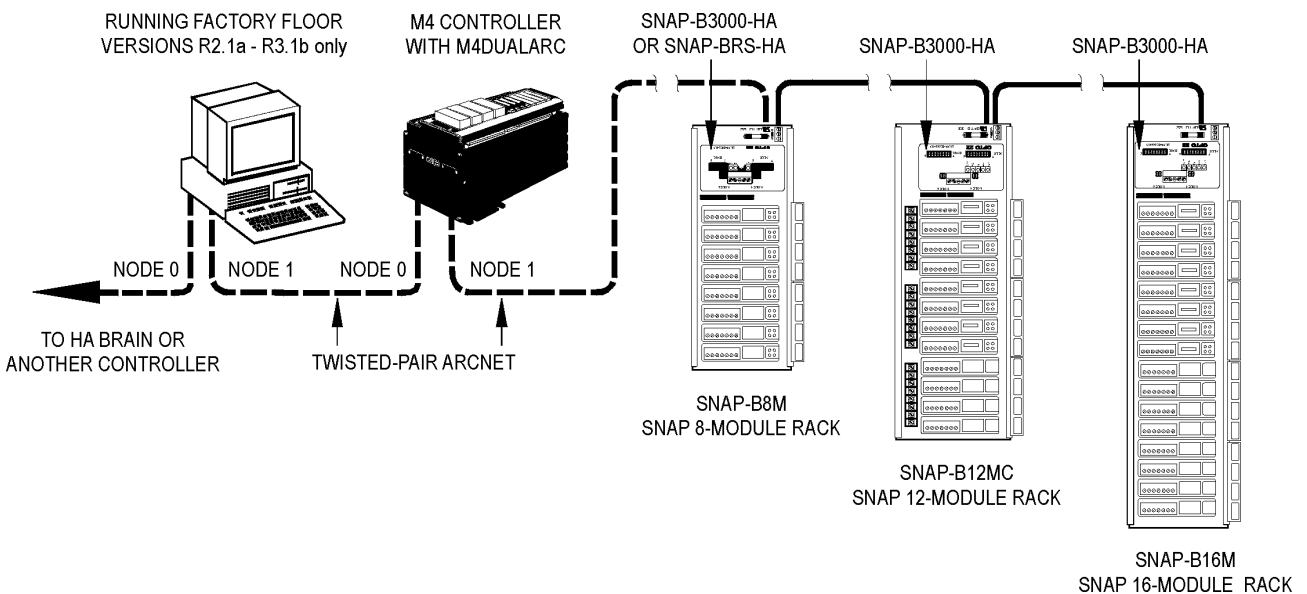# INTERFACES
TRADITIONAL
PC

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Description (continued)

AC47 NETWORK ARCHITECTURE

PC
WITH AC47

**SNAP-B3000-HA
or SNAP-BRS-HA**

SNAP-B3000-HA

SNAP-B3000-HA

NODE 0   NODE 1

TWISTED-PAIR
ARCNET

SNAP-B8M
SNAP 8-MODULE RACK

SNAP-B12MC
SNAP 12-MODULE RACK

SNAP-B16M
SNAP 16-MODULE RACK

The figure above shows both the AC47's ARCNET nodes connected to a network of SNAP B3000-HA and SNAP-BRS-HA brains. The cables can be routed within a dual twisted-pair cable, or they could be routed separately as single-pair cables for increased fault tolerance.

In less critical installations, a single node on the AC47 can be used for communication with SNAP brains, freeing the other node for other purposes. The figure below shows the second node connecting to an Opto 22 M4-family controller with an ARCNET interface card. Note that redundant communication is not possible to the controller because the controller firmware does not support redundant communication with the host.

RUNNING FACTORY FLOOR
VERSIONS R2.1a - R3.1b only

M4 CONTROLLER
WITH M4DUALARC

SNAP-B3000-HA
OR SNAP-BRS-HA

SNAP-B3000-HA

SNAP-B3000-HA

NODE 0   NODE 1   NODE 0   NODE 1

TO HA BRAIN OR
ANOTHER CONTROLLER

TWISTED-PAIR ARCNET

SNAP-B8M
SNAP 8-MODULE RACK

SNAP-B12MC
SNAP 12-MODULE RACK

SNAP-B16M
SNAP 16-MODULE RACK

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Installation

Installing the AC47 involves four steps:

1. **Set the I/O Port Address Jumpers.** Jumpers A4 through A9 determine the I/O port address for the AC47. Be sure to check your computer for unused I/O port addresses before setting it. The factory default setting is 240 hex. The diagram at right shows the default and some other possible addresses. (If alternate settings are required, contact Opto 22 Product Support.)

   The AC47 uses a range of 16 addresses, for example 240–24F. Node 0 corresponds to the base I/O port address, in this example 240, and node 1 corresponds to the base I/O port address plus eight, in this example 248.

   > Note: Nodes on the AC47 are designated as 0 and 1, but these numbers are not the node IDs. Node IDs are set by software. Valid node ID settings are 1–255. (Node 0 is reserved.)
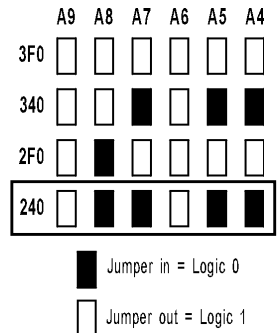
2. **Set the Node Termination Jumpers.** •Terminate all unused ARCNET nodes and nodes at both physical ends of the ARCNET data link. Do not install jumpers for nodes in the middle of the data link.
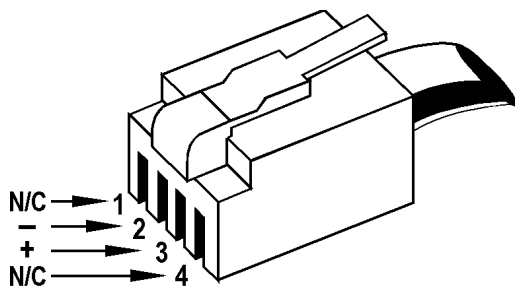
   Install the TERM jumpers labeled 0 for Node 0 and install jumpers labeled 1 for Node 1. The factory default is all node termination jumpers installed.

   > Note: AC47 has several interrupt jumpers labeled IRQ15 through IRQ2. However, current Opto 22 drivers do not use interrupt functions. **Do not install** any IRQ jumpers when using Opto 22 jumpers.
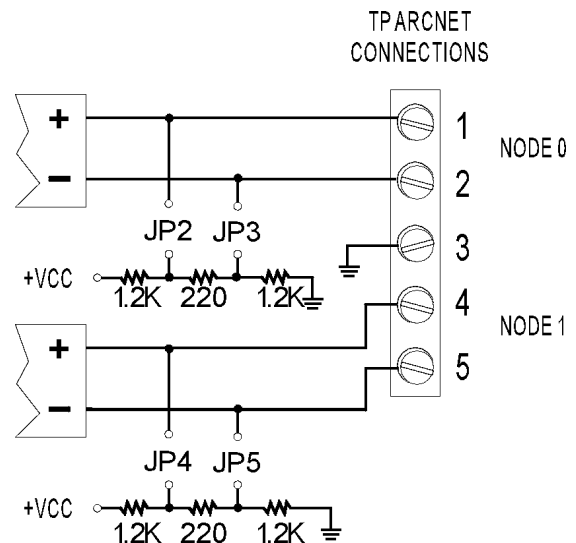
3. **Install the AC47 in any unused ISA-bus slot in your PC.**

4. **Connect twisted-pair wiring to the screw terminals** or RJ-11 modular jacks, as shown in the diagrams at the bottom of this page.

   When connecting devices on an ARCNET network, be sure to connect the positive terminal of one device to the positive terminal of the next device, and the negative terminal of one device to the negative terminal of the next device.

A9 A8 A7 A6 A5 A4

Jumper in = Logic 0
Jumper out = Logic 1

PINOUTS FOR RJ-11 MODULAR JACKS

N/C → 1
— → 2
+ → 3
N/C → 4

TP ARCNET CONNECTIONS

NODE 0
NODE 1

JP2 JP3
+VCC 1.2K 220 1.2K

JP4 JP5
+VCC 1.2K 220 1.2K

Products

Opto 22 produces a broad array of reliable, flexible hardware and software products for industrial automation, remote monitoring, enterprise data acquisition, and machine-to-machine (M2M) applications.

SNAP Ethernet Systems

Based on the Internet Protocol (IP), SNAP Ethernet systems offer flexibility in their network connectivity and in the software applications they work with. The physical network may be a wired Ethernet network, a cellular wireless network, or a modem. A wide variety of software applications can exchange data with SNAP Ethernet systems, including:

- Opto 22's own ioProject™ suite of control and HMI software
- Manufacturing resource planning (MRP), enterprise management, and other enterprise systems
- Human-machine interfaces (HMIs)
- Databases
- Email systems
- OPC client software
- Custom applications
- Modbus/TCP software and hardware.

SNAP Ethernet system hardware consists of controllers and I/O units. Controllers provide central control and data distribution. I/O units provide local connection to sensors and equipment.

SNAP OEM Systems

Opto 22 SNAP OEM I/O systems are highly configurable, programmable processors intended for OEMs, IT professionals, and others who need to use custom software with Opto 22 SNAP I/O modules.

Linux® applications running on these systems can read and write to analog, simple digital, and serial I/O points on SNAP I/O modules using easily implemented file-based operations. Applications can be developed using several common development tools and environments, including C or C++, Java, and shell scripts.

M2M Systems

Machine-to-machine (M2M) systems connect your business computer systems to the machines, devices, and environments you want to monitor, control, or collect data from. M2M systems often use wireless cellular communications to link remote facilities to central systems over the Internet, or to provide monitoring and control capability via a cellular phone.

Opto 22's Nvio™ systems include everything you need for M2M—interface and communications hardware, data service plan, and Web portal—in one easy-to-use package. Visit nvio.opto22.com for more information.

Opto 22 Software

Opto 22's ioProject and FactoryFloor® software suites provide full-featured and cost-effective control, HMI, and OPC software to power your Opto 22 hardware. These software applications help you develop control automation solutions, build easy-to-use operator interfaces, and expand your manufacturing systems' connectivity.

Quality

In delivering hardware and software solutions for worldwide device management and control, Opto 22 retains the highest commitment to quality. We do no statistical testing; each product is made in the U.S.A. and is tested twice before leaving our 160,000 square-foot manufacturing facility in Temecula, California. That's why we can guarantee solid-state relays and optically-isolated I/O modules *for life*.

Product Support

Opto 22's Product Support Group offers comprehensive technical support for Opto 22 products. The staff of support engineers represents years of training and experience, and can assist with a variety of project implementation questions. Product support is available in English and Spanish from Monday through Friday, 7 a.m. to 5 p.m. PST.

Opto 22 Web Sites

- www.opto22.com
- nvio.opto22.com
- www.internetio.com (live Internet I/O demo)

Other Resources

- OptoInfo CDs
- Custom integration and development
- Hands-on customer training classes.

About Opto 22

Opto 22 manufactures and develops hardware and software products for industrial automation, remote monitoring, enterprise data acquisition, and machine-to-machine (M2M) applications. Using standard, commercially available Internet, networking, and computer technologies, Opto 22's input/output and control systems allow customers to monitor, control, and acquire data from all of the mechanical, electrical, and electronic assets that are key to their business operations. Opto 22's products and services support automation end users, OEMs, and information technology and operations personnel.

Founded in 1974 and with over 85 million Opto 22-connected devices deployed worldwide, the company has an established reputation for quality and reliability.