OPTO 22

DATA SHEET

Form 631-230124

Description

Part Number	Description
M4SARC	M4 ARCNET Adapter

** This product is OBSOLETE and no longer available. **

The M4SARC is a coaxial cable ARCNET® network interface card for Opto 22's M4 family of modular controllers. It provides the capability to construct a point-to-point or star topology ARCNET network using RG62A/U coaxial cable and BNC-style connectors. Both active and passive ARCNET hubs can be used to establish a star topology. Other Opto 22 M4 ARCNET cards, including the M4DUALARC and M4SARCF, can be installed concurrently with the M4SARC card in the same controller.
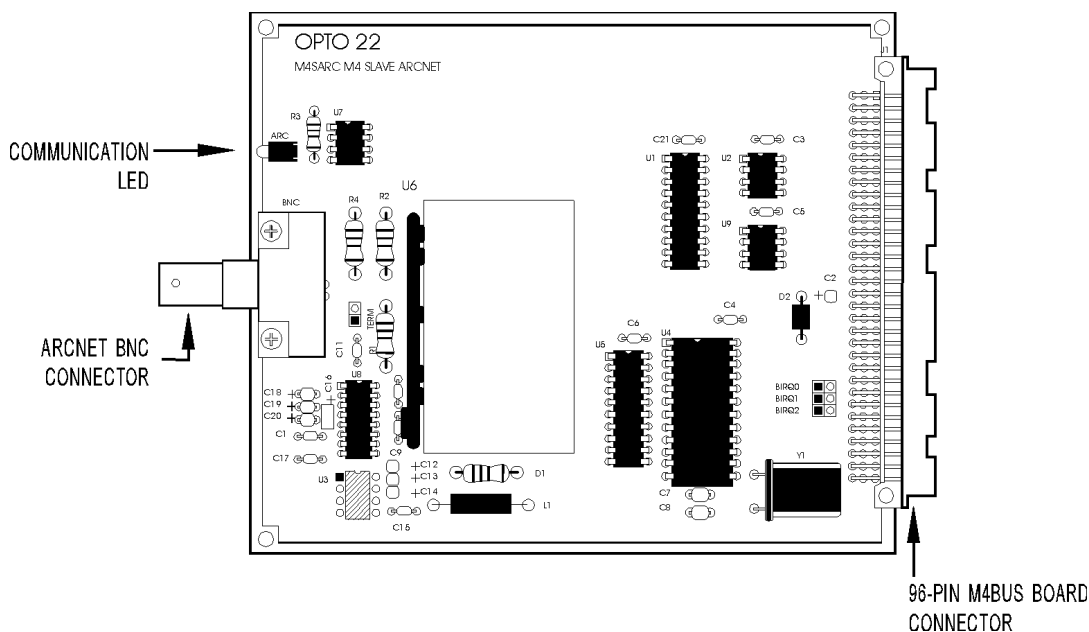
Primary Function

When installed in an Opto 22 M4-family controller, such as the SNAP-LCM4 or the M4RTU, the M4SARC interface card provides ARCNET connections to form the physical layer of an Opto 22 controller network that can be used by a PC and multiple M4-family Opto 22 controllers. One network of Opto 22 controllers can support up to 255 controllers and provides peer-to-peer communications between all controllers on the link. More than one network of Opto 22 controllers can be linked to a single PC, allowing a user to build large distributed control systems.

Using Opto 22 M4SARC, M4DUALARC, M4SARCF, and M4SARCFR ARCNET interface cards, plus the appropriate PC and active hub equipment, you can construct an extensive network of coaxial, twisted-pair, and fiber optic ARCNET for Opto 22 controllers.

M4SARC Network Interface Card

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Description (continued)

Advantages

Speed, distance, and ease of implementation are the significant advantages of an Opto 22 controller network based on coaxial ARCNET. The BNC-style connectors used for coaxial ARCNET also provide easy single-cable network installation. An Opto 22 ARCNET network transfers data at 2.5 Mbps and allows total network distances of up to 20,000 feet. (For data transfer at up to 100 Mbps, consider using an Ethernet network and Opto 22's M4SENET-100 interface card.) Using commercial hubs and repeaters, an ARCNET network of virtually any size can be created.

Software

The M4SARC interface card is designed to work with FactoryFloor, Opto 22's powerful suite of 32-bit industrial automation software for Microsoft® Windows® 95, Windows 98, and Windows NT®. FactoryFloor consists of four integrated components:

- OptoControl™, a graphical, flowchart-based development environment for machine control and process applications
- OptoDisplay™, an intuitive, shared database, human-machine interface (HMI) and trending package, including alarming
- OptoServer™, a robust, OPC-compliant data server that connects the controller network with the PC network
- OptoConnect™, a bidirectional link between the Opto 22 database in the controller and Microsoft's SQL Server and Access databases.

Specifications [OBSOLETE]

Item	Specification
Transfer rate	2.5 Mbps
Termination	93 Ohms
Address range	1 to 255, 0 not used
Topology	Star
Cable	RG65A/U
Connectors	BNC
Normal signal levels	20 VPP output, 7.5 VPP input
Minimum signal levels	16 VPP output, 6.0 VPP input
Access time	Deterministic (token passing)

Distances:
  Total network
  Active hub to active hub
  Active hub to M4-series controller
  Active hub to passive hub
  Passive hub to M4-series controller
	
	20,000 ft. (6,096 m.)
	2,000 ft. (610 m.)
	2,000 ft. (610 m.)
	100 ft. (30 m.)
	100 ft. (30 m.)

Power requirement (at 5 VDC)	140 mA
Typical operating temperature	–20° C to 70° C
Storage temperature	–40° C to 85° C
Indicators	Single LED; indicates when a node on the card is addressed

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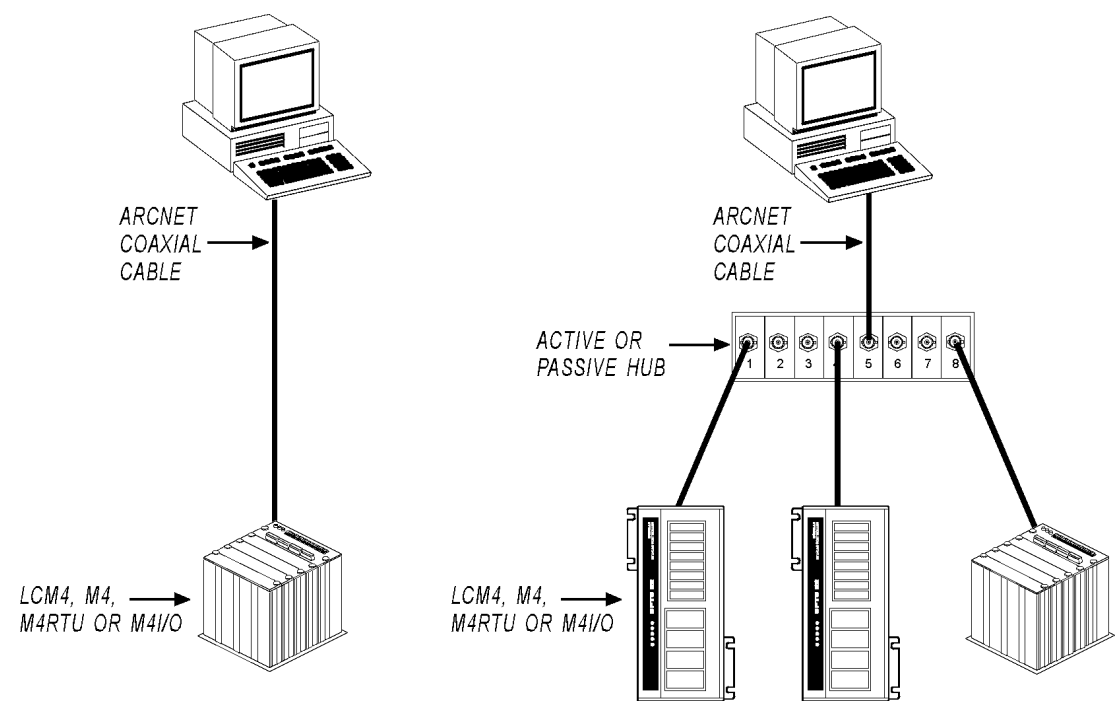**DATA SHEET**
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INTERFACES
CONTROLLERS
MODULAR

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M4SARC System Architecture

M4SARC Network Configuration

Installation

The M4SARC interface card can be installed in an M4-family controller with other Opto 22 M4 ARCNET cards such as the M4DUALARC or M4SARCF.

Note: Before installing and activating the M4SARC, terminate all unused ARCNET nodes and nodes located at the physical end of the ARCNET network. This termination is required for the controller and the interface card to operate correctly.

Preparing the Card for Installation

The M4SARC interface card itself has built-in termination and does not need to be terminated.

Note: *Do not install a terminating jumper on the TERM jumper on the M4SARC card*. This jumper is not used, and the interface card will not operate if this jumper is terminated.
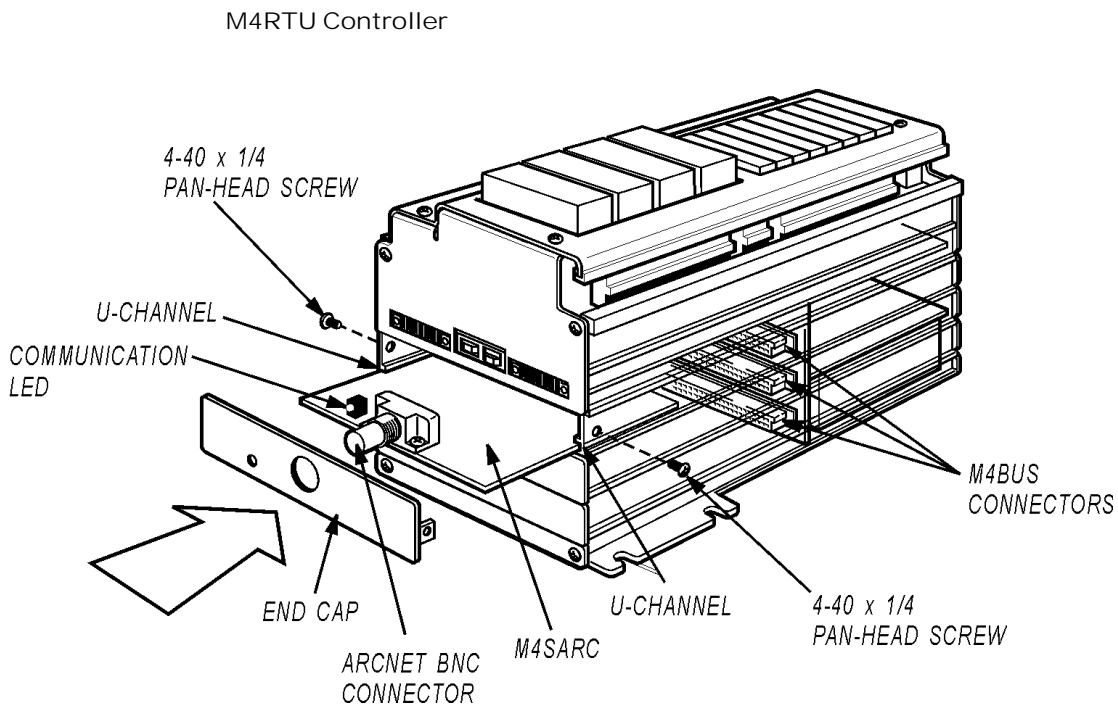
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Installation (continued)

Inserting the Card in an M4-Family Controller (except SNAP-LCM4)

1. Turn off the controller.
2. Select an unused M4BUS expansion slot and remove the end cap. End caps are located below the serial connectors, as shown in the illustration below.

   Each end cap is held in place by two screws located on the side panel, adjacent to each end cap. Save these screws after you remove them. To correctly align the interface card, you may need to remove additional end caps from the controller.
4. Align the edges of the M4SARC card with the U-channels on the sides of the selected expansion slot, and then slide the card in until it is seated firmly in the M4BUS connector.
5. Use the screws from the original end cap to attach the included M4SARC end cap to the M4-family controller.

M4RTU Controller

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Installation (continued)

Inserting the Card in a SNAP-LCM4 Controller

1. Turn off the controller.
2. Select an unused M4BUS expansion slot and remove the cover plate. Cover plates are located to the left of the serial connectors on the top of the SNAP-LCM4, as shown in the illustration below. Each cover plate is held in place by two thumbscrews. Save these thumbscrews after you remove them.

4. Align the edges of the M4SARC card with the U-channels on the sides of the selected expansion slot, and then slide the card in until it is seated firmly in the M4BUS connector.
5. Use the thumbscrews from the original cover plate to attach the included M4SARC cover plate to the SNAP-LCM4 controller.
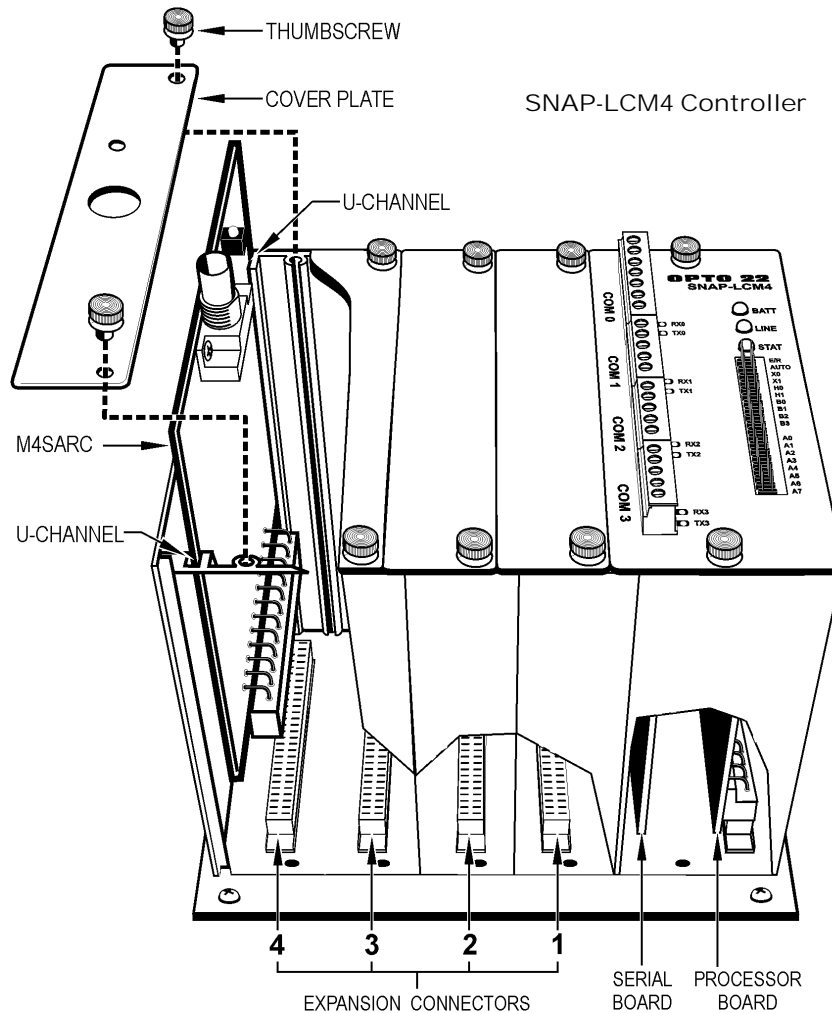
SNAP-LCM4 Controller

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Installation (continued)

Connecting the Controller to a Network

To connect the M4-family controller to an Opto 22 controller network, attach the appropriate RG62A/U coaxial cable to the M4SARC card's BNC-style connector.

Setting ARCNET Host Port Jumpers

To configure your controller to use the M4SARC interface card, change controller jumper settings to match those shown in the table below.

Warning: Jumpers must be set correctly for the M4SARC card to operate. Verify your jumper settings carefully before turning on the controller.

The host jumpers on the controller determine which host port is used for ARCNET communication when the controller is powered up or reset. Only the lowest numbered ARCNET port in the controller can be a host port. For example, if an M4SARC coaxial ARCNET card and an M4DUALARC twisted-pair card are both installed in a controller (with host port jumpers set for ARCNET), the coaxial ARCNET port on the M4SARC card will be the host port because it has the lowest ARCNET port number (4).

If an M4-family controller has jumper settings configured for ARCNET, but an ARCNET card is not installed, COM0 will be the host port by default.

Setting an ARCNET Node Address

To communicate on an ARCNET network, each M4-family controller on the network must have a unique node address between 1 and 255. The node address is set using the controller's address jumpers. See the user's guide for your controller for specific information on configuring address jumpers.

Recommended ARCNET Networking Hardware

Opto 22 recommends ARCNET cards and networking components from the following manufacturer:

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

Phone: (630) 963-7070
FAX: (630) 963-0109

E-mail: info@ccontrol.com
Web: www.ccontrol.com (or www.ccontrols.com)

See Opto 22 form 1294 for more information about using Contemporary Control Systems' ARCNET equipment with Opto 22 products, or contact Opto 22 Product Support. Contact information appears at the bottom of the page.

Controller Jumper Settings for ARCNET Host Port

	All M4-Family Controllers	
	Jumpers	
	H0	H1
COM0	In	In
COM1	Out	In
ARCNET	In	Out
Ethernet	Out	Out

More about Opto 22

PRODUCTS

Opto 22 develops and manufactures reliable, easy-to-use, open standards-based hardware and software products. Industrial automation, process control, remote monitoring, data acquisition, and industrial internet of things (IIoT) applications worldwide all rely on Opto 22.

groov RIO®

groov RIO edge I/O offers a single, compact, PoE-powered industrial package with web-based configuration and IIoT software built in, support for multiple OT and IT protocols, and security features like a device firewall, data encryption, and user account control.

Standing alone, *groov* RIO connects to sensors, equipment, and legacy systems, collecting and securely publishing data from field to cloud. Choose a universal I/O model with thousands of possible field I/O configurations, with or without Ignition from Inductive Automation®, or a RIO EMU energy monitoring unit that reports 64 energy data values from 3-phase loads up to 600 VAC, Delta or Wye.

You can also use *groov* RIO with a Modbus/TCP master or as remote I/O for a *groov* EPIC system.

groov EPIC® System

Opto 22's *groov* Edge Programmable Industrial Controller (EPIC) system gives you industrially hardened control with a flexible Linux®-based processor with gateway functions, guaranteed-for-life I/O, and software for your automation and IIoT applications.

groov EPIC Processor

The heart of the system is the *groov* EPIC processor. It handles a wide range of digital, analog, and serial functions for data collection, remote monitoring, process control, and discrete and hybrid manufacturing.

In addition, the EPIC provides secure data communications among physical assets, control systems, software applications, and online services, both on premises and in the cloud. No industrial PC needed.

Configuring and troubleshooting I/O and networking is easier with the EPIC's integrated high-resolution color touchscreen. Authorized users can manage the system locally on the touchscreen, on a monitor connected via the HDMI or USB ports, or on a PC or mobile device with a web browser.

groov EPIC I/O

groov I/O connects locally to sensors and equipment. Modules have a spring-clamp terminal strip, integrated wireway, swing-away cover, and LEDs indicating module health and discrete channel status. *groov* I/O is hot swappable, UL Hazardous Locations approved, and ATEX compliant.

groov EPIC Software

The *groov* EPIC processor comes ready to run the software you need:

- Programming: Choose flowchart-based PAC Control, CODESYS Development System for IEC61131-3 compliant programs, or secure shell access (SSH) to the Linux OS for custom applications
- Node-RED for creating simple IIoT logic flows from pre-built nodes
- Efficient MQTT data communications with string or Sparkplug data formats
- Multiple OPC UA server options
- HMI: *groov* View to build your own HMI viewable on touchscreen, PCs, and mobile devices; PAC Display for a Windows HMI; Node-RED dashboard UI
- Ignition or Ignition Edge® from Inductive Automation (requires license purchase) with OPC-UA drivers to Allen-Bradley®, Siemens®, and other control systems, and MQTT communications

Older products

From solid state relays, to world-famous G4 and SNAP I/O, to SNAP PAC controllers, older Opto 22 products are still supported and working hard at thousands of installations worldwide. You can count on us for the reliability and service you expect, now and in the future.

QUALITY

Founded in 1974, Opto 22 has established a worldwide reputation for high-quality products. All are made in the U.S.A. at our manufacturing facility in Temecula, California.

Because we test each product twice before it leaves our factory rather than testing a sample of each batch, we can afford to guarantee most solid-state relays and optically isolated I/O modules for life.

FREE PRODUCT SUPPORT

Opto 22's California-based Product Support Group offers free technical support for Opto 22 products from engineers with decades of training and experience. Support is available in English and Spanish by phone or email, Monday–Friday, 7 a.m. to 5 p.m. PST.

Support is always available on our website, including free online training at OptoU, how-to videos, user's guides, the Opto 22 KnowledgeBase, and OptoForums.

PURCHASING OPTO 22 PRODUCTS

Opto 22 products are sold directly and through a worldwide network of distributors, partners, and system integrators. For more information, contact Opto 22 headquarters at **800-321-6786** (toll-free in the U.S. and Canada) or **+1-951-695-3000**, or visit our website at www.opto22.com.

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