

This product is obsolete.

OPTO 22

DATA SHEET

Form 990-230124

INTERFACES CONTROLLERS MODULAR

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Description

Part Number	Description
M4DUALARC	Dual twisted-pair ARCNET ports for M4 controllers

*** This product is OBSOLETE and no longer available.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

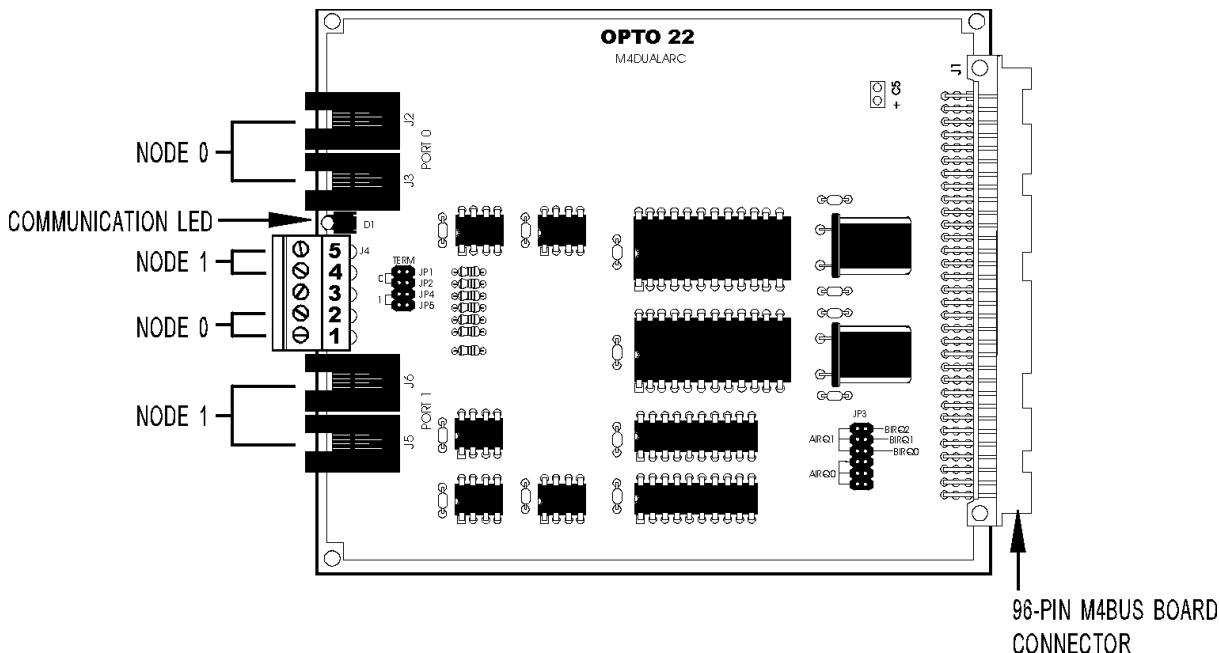
The M4DUALARC is a twisted-pair ARCNET® network interface card for Opto 22's M4 family of modular controllers. It provides the capability to construct a point-to-point or multidrop topology ARCNET network using CAT-3 or CAT-5 cable.

The two nodes on the M4DUALARC interface card can be used as separate communication ports, or they can be configured for redundant operation using Opto 22 FactoryFloor™ industrial automation software. If configured for redundant operation, you can use dual twisted-pair cable or maintain two completely separate data links. For convenience, screw-type connectors and RJ-11 modular jacks are provided, eliminating the need for special cable connections.

Primary Function

The M4DUALARC interface card controls one or more Opto 22 "HA" style SNAP brains when installed in an Opto 22 M4-family controller such as the M4RTU or the SNAP-LCM4. Other Opto 22 M4 ARCNET cards, including the M4SARC and M4SARCF, can be installed concurrently with the M4DUALARC card in the same controller. The M4-family controller connects to a SNAP brain with a single, twisted-pair cable daisy-chained from the M4DUALARC card to each SNAP brain.

M4DUALARC Network Interface Card



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Description (continued)

FactoryFloor's multiple configuration options also let you use the M4DUALARC card for PC-to-M4 host communications. The M4DUALARC's flexibility allows peer-to-peer communication between all controllers using the twisted-pair ARCNET topology. One Opto 22 controller can use the ARCNET network to support up to 255 device addresses. (M4-family controller firmware currently does not support redundant communication with a PC or with other controllers.)

Advantages

Speed, distance, and ease of implementation are the significant advantages of an Opto 22 controller network based on twisted-pair ARCNET. An Opto 22 ARCNET network transfers data at 2.5 Mbps, and allows total network distances of up to 1,000 feet without a repeater. 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.) With commercial hubs and repeaters, an ARCNET network of virtually any size can be created.

Specifications **[OBSOLETE]**

Item	Specification
Transfer Rate	2.5 Mbps
Termination	Jumper selectable
Topology	Multidrop
Cable	CAT-3 or CAT-5 UTP
Connectors	Screw-type barrier strip and RJ-11 modular jacks
Indicators	Single LED; indicates when a node on the card is addressed

Software

The M4DUALARC 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.

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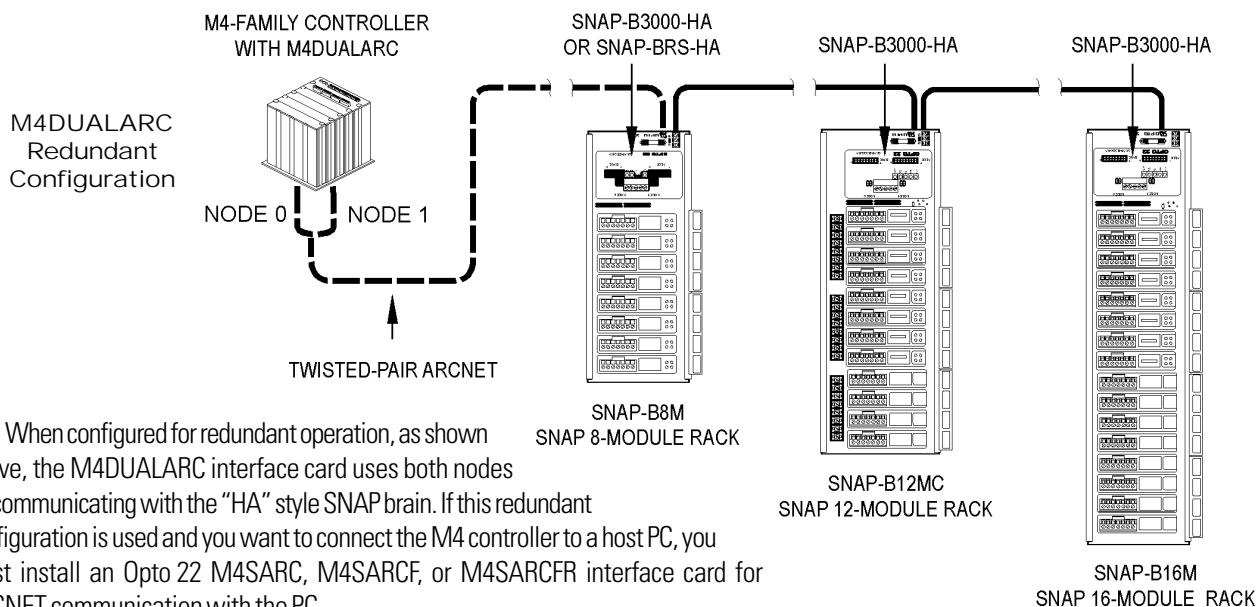
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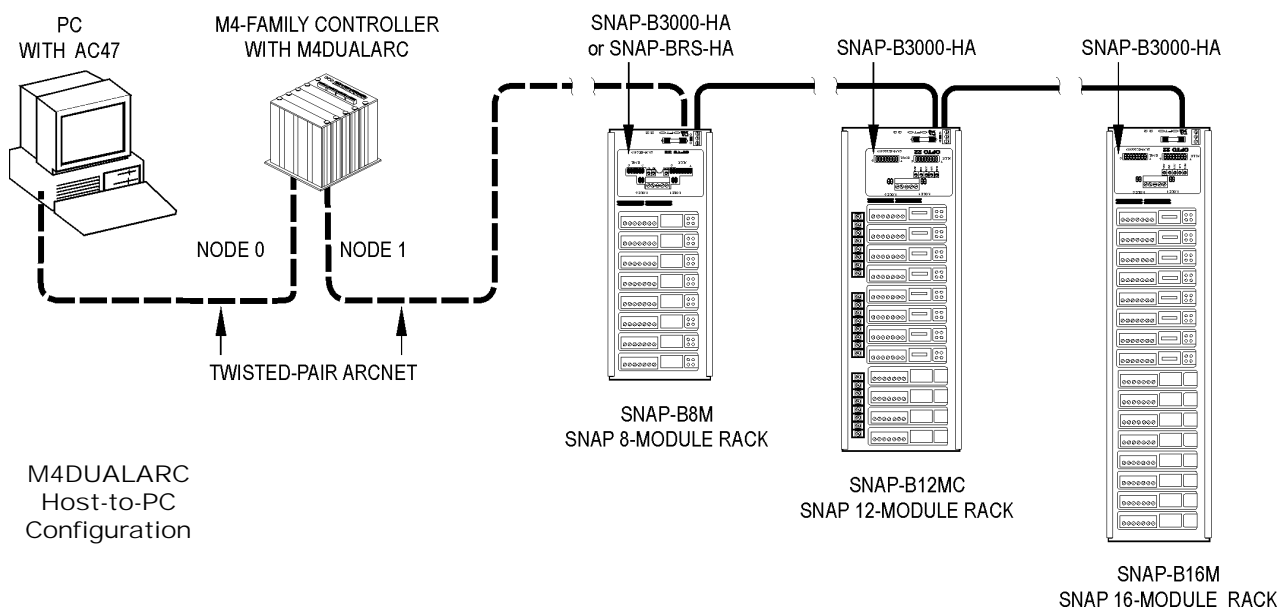
M4DUALARC System Architecture



When configured for redundant operation, as shown above, the M4DUALARC interface card uses both nodes for communicating with the "HA" style SNAP brain. If this redundant configuration is used and you want to connect the M4 controller to a host PC, you must install an Opto 22 M4SARC, M4SARCF, or M4SARCFR interface card for ARCNET communication with the PC.

The use of a single twisted-pair node to talk to brains is also supported. The example below shows node 0 used for host-to-controller communication, and shows node 1 used to talk to "HA" style SNAP brains. (M4-family controller firmware currently does not support redundant communication with the host.)

Note: M4DUALARC card nodes are designated 0 and 1, but these should not be mistaken with the node IDs. Each ARCNET node in the controller has a node ID; it is the same as the controller's address.



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Installation

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

Note: Before installing and activating the M4DUALARC, terminate all unused ARCNET nodes and nodes located at the physical end of the twisted-pair ARCNET network. This is required for the controller and the interface card to operate correctly.

To configure and install an M4DUALARC interface card, perform the steps in each of the following sections:

Preparing the Card for Installation

If required, install ARCNET termination jumpers on the interface card. Since the two ports on the M4DUALARC can be used independently or configured as a redundant pair, you can configure node termination individually for node 0 and node 1. Install ARCNET termination jumpers as follows:

- For node 0, install TERM jumpers JP1 and JP2.
- For node 1, install TERM jumpers JP4 and JP5.
- Do not install jumpers for nodes in the middle portion of the ARCNET network.

Note: Do not install IRQ jumpers on the M4DUALARC card. Although there are several interrupt jumpers labeled AIRQ and BIRQ, interrupt functions are not used.

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

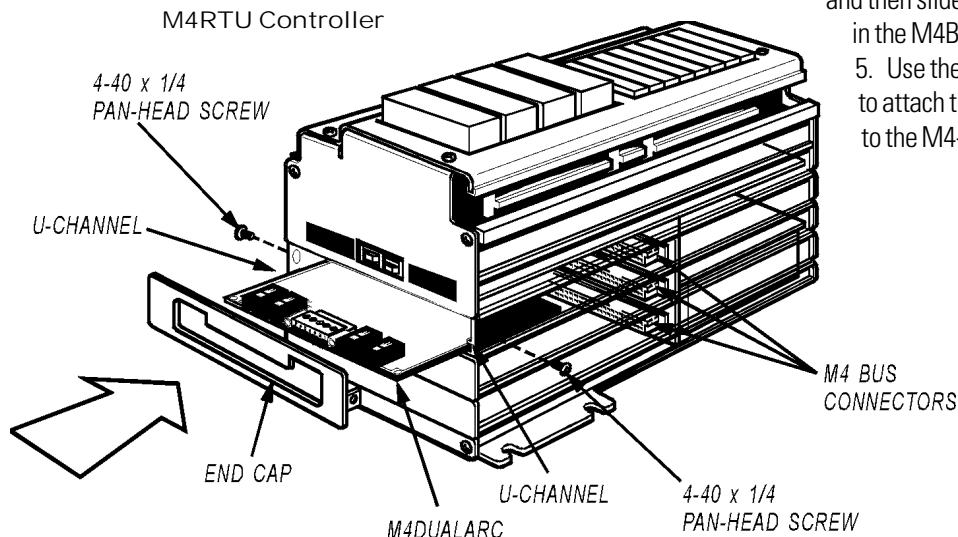
1. Turn off the controller.
2. Select an unused M4BUS expansion slot. Port numbers for the two ports on the M4DUALARC card are set automatically when the card is inserted in the controller. Port numbers for all M4-family controllers except the SNAP-LCM4 are shown below:

M4 Expansion Slot	Controller Port Numbers
Top	12 and 13
Center	14 and 15
Bottom	16 and 17

3. Remove the end cap of the expansion slot you selected. 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 M4DUALARC 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 M4DUALARC end cap to the M4-family controller.



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Installation (continued)

Inserting the Card in a SNAP-LCM4 Controller

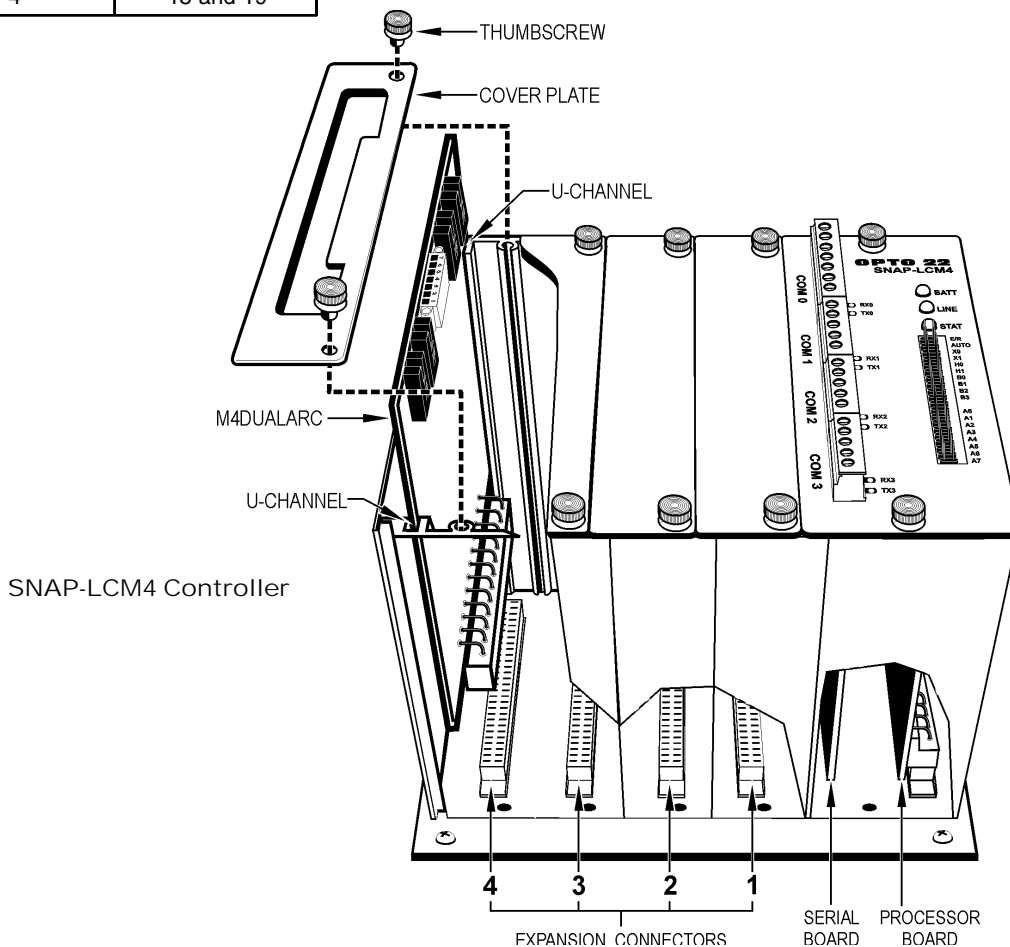
1. Turn off the controller.
2. Select an unused M4BUS expansion slot. Port numbers for the two ports on the M4DUALARC card are set automatically when the card is inserted in the controller. Port numbers for the SNAP-LCM4 are shown below.

SNAP-LCM4 Expansion Slot	Controller Port Numbers
1	12 and 13
2	14 and 15
3	16 and 17
4	18 and 19

3. Remove the cover plate of the expansion slot you selected. 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 M4DUALARC 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 M4DUALARC cover plate to the SNAP-LCM4 controller.



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Installation (continued)

Setting ARCNET Host Port Jumpers

To configure your controller to use the M4DUALARC interface card, change jumper settings to match those shown in the table below.

Warning: Jumpers must be set correctly for the M4DUALARC 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 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.

Connecting the Controller to a Network or to SNAP Brains

To connect the M4-family controller to an Opto 22 controller network or to one or more SNAP "HA" style brains, attach twisted-pair ARCNET cable to either the screw-type connectors or the RJ-11 modular jacks on the M4DUALARC card. The screw-type connectors and RJ-11 modular jacks are illustrated below.

Warning: Connect the unused pairs (wires) to ground at one end only.

Warning: When you connect devices on a twisted-pair ARCNET network, be careful to connect the positive terminal of one device to the positive terminal of the next device on the network. Likewise, connect the negative terminal of one device to the negative terminal of the next device. Connecting terminals incorrectly may prevent the network from operating correctly. If you are not sure of a terminal's polarity, check it with a voltage meter.

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

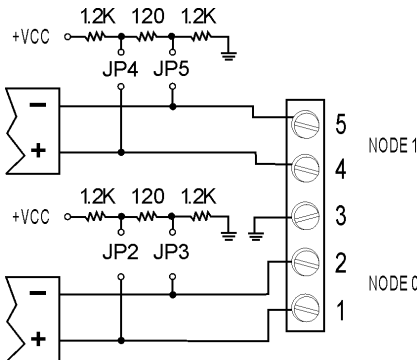
Web: www.ccontrol.com (or www.ccontrols.com)

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.

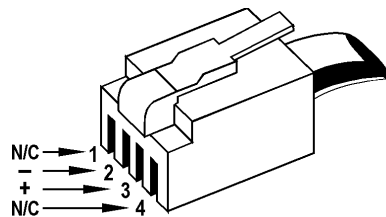
Controller Jumper Settings for ARCNET Host Port

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

Screw-Type Connector ARCNET Connections



Pinouts for RJ-11 Modular Jacks



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.

