PCI-AC5, PCIe-AC5, AC5, and G4AC5 Adapter Cards

Features

❯ Provides direct connection to a wide variety of I/O mounting racks

❯ Bidirectional I/O lines allow any combination of input and output modules

❯ Includes six-foot interface cable

PCI-AC5 Adapter Card

Description

The PCI-AC5, PCIe-AC5, AC5, and G4AC5 adapter cards provide an interface between personal computers and Opto 22 digital I/O mounting racks, for direct connection to input/output points.

- The **AC5** and **G4AC5** are compatible with ISA bus-based PCs and can control up to 24 I/O points on a single mounting rack.

- The **PCI-AC5** is compatible with computers that feature a 33 MHz Peripheral Component Interconnect (PCI) bus. The **PCIe-AC5** is compatible with computers that feature a PCI Express (PCIe) 1.1 single-lane slot. Both of these adapter cards have two 50-wire ribbon cable interfaces; each card can control up to 48 I/O points (24 per rack).

The PCI-AC5 and PCIe-AC5 offer expanded operation and support for modern computers with PCI and PCIe slots. These cards are about 100 times as fast as the AC5 in accessing I/O using the free PC-Based Direct I/O SDK. The PCI and PCIe cards also have jumperless configuration and four LEDs for debugging or indicating application status.

WARNING: *Your system can be damaged if you use an incompatible rack or an improperly configured card. For details, see "Rack Compatibility" on page 2.*

Cables

Six-foot ribbon cables are supplied with each adapter card to connect the card to the I/O rack. The PCI-AC5 and PCIe-AC5 come with two 50-wire ribbon cables with header connectors. If needed, edge-connector cables are available for purchase.

The G4AC5 and AC5 part numbers include identical adapter cards but have different cables. The cable included with the G4AC5 connects the card to racks with header connectors (such as the G4PB24). The cable included with the AC5 connects the card to racks with edge connectors (such as the PB16A). For full rack compatibility information, see page 2.

LEDs

The AC5 and G4AC5 cards include one LED that flashes to indicate activity (reading from or writing to the card). The PCI-AC5 and PCIe-AC5 cards include four LEDs that can be used for debugging or indicating application status.
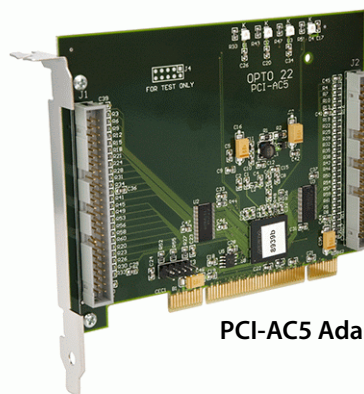
Developer SDK

Free with all four adapter cards is the PC-Based Direct I/O SDK. The SDK is included on the PC-Based Direct I/O CD (shipped with the cards) and can also be downloaded from our website, www.opto22.com.

The developer SDK includes sample applications, utility applications, and drivers used with all four cards. The SDK is two kits in one. One kit is compatible with Microsoft® Windows® 2000 and Windows XP and supports Visual Basic® 6 and Visual C++® 6. Up to 64 AC5/G4AC5 and PCI/PCIe-AC5 devices are supported by this driver. The other kit supports PCI/PCIe-AC5 cards for Windows 10, 8, 7, and Vista (32-bit and 64-bit), C#, VB.NET, and other .NET languages.

For adapter card installation instructions and detailed information on using the SDK, see form 1211, *PCI-AC5, PCIe-AC5, and AC5 User's Guide*.

Requirements

- For PC bus power requirements, see Specifications on page 2.

- For I/O, an external 5 VDC power supply is required at the I/O mounting rack. This power cannot be provided by the adapter card. Opto 22 recommends that you use an Opto 22 SNAP-PS5 or an isolated supply for this purpose.

- A software driver is required to access the adapter card.

Part Numbers

Part	Description
PCI-AC5	PCI adapter card for direct I/O
PCIe-AC5	PCI express adapter card for direct I/O
AC5	ISA bus adapter card with 6-ft. cable to I/O rack with edge connector
G4AC5	ISA bus adapter card with 6-ft. cable to I/O rack with header connector
PC-DIRECT-SDK	PC-Based Direct I/O SDK

PCI-AC5, PCIe-AC5, AC5, and G4AC5 Adapter Cards

Specifications and System Requirements

	PCI-AC5	PCIe-AC5	AC5 or G4AC5
Interface	PCI	PCIe (1.x)	ISA
I/O points controlled	48	48	24
Computer compatibility	32-bit, 33 MHz PCI 2.1 bus	PCIe 1.1 bus	ISA bus
Power requirements for card (from the PCI or ISA bus on the PC)	Rev C card[1]: 5 VDC @ 250 mA *and* 3.3 VDC @ 250 mA Rev B card[1]: 5.0 VDC @ 600 mA	12 VDC @ 50 mA and 3.3 VDC @ 500 mA	5 VDC @ 600 mA
Compatible modules	5 VDC logic modules, such as the IDC5, ODC5, G4IDC5, G4ODC5, SNAP-IAC5, etc.[2]		
SDK compatibility	Microsoft Windows 2000 and XP (supports Visual Basic 6 and Visual C++ 6) Windows 10, 8, 7, and Vista, 32-bit and 64-bit (supports C#, VB.NET, and other .NET languages)	Microsoft Windows 2000 and XP (supports Visual Basic 6 and Visual C++ 6) Windows 10, 8, 7, and Vista, 32-bit and 64-bit (supports C#, VB.NET, and other .NET languages)	Microsoft Windows 2000 and XP (supports Visual Basic 6 and Visual C++ 6)
Jumpers	Jumperless configuration	Jumperless configuration	Used to configure base address
LEDs	Four	Four	One
Operating temperature Storage temperature	0 to 70 °C -30 to 85 °C	0 to 60 °C -30 to 85 °C	0 to 70 °C -30 to 85 °C
Agency certifications	CE, RoHS, DFARS	CE, RoHS, DFARS	CE, RoHS, DFARS
Warranty	30 months	30 months	30 months

[1] Rev C cards show **9278** on a white label; older Rev B cards show a number beginning with **8939**. Rev C cards require *both* 5.0 and 3.3 volts. These cards are not compatible with computers that supply 5 VDC only.

[2] Choose 5 VDC logic modules that are compatible with the mounting rack used.
WARNING: Do not use 15 VDC or 24 VDC modules (such as the IDC15 and IDC24). Using these modules with 15 or 24 VDC logic power can cause serious damage to the adapter card and to the computer.

Rack Compatibility

The following table lists Opto 22 racks that are compatible with the adapter cards as well as racks that can be modified to work with the cards.

WARNING: *Do not use the racks listed as NOT COMPATIBLE. Doing so may cause damage to the computer.*

AC5 Compatible (Edge Connectors)	PCI-AC5 PCIe-AC5, and G4AC5 Compatible (Header Connectors)		PCI-AC5 PCIe-AC5, and G4AC5 Compatible Only if Modified		NOT COMPATIBLE DO NOT USE
PB8	G4PB8	SNAP-D6MC	G4PB16J*	PB16J*	G4PB8H
PB16A	G4PB16	SNAP-D6MC-P	G4PB16K*	PB16K*	G4PB16H
PB16C	G4PB24	SNAP-D12M	G4PB16L*	PB16L*	G4PB16HC
PB24	PB24HQ	SNAP-D12MC	PB4H*	PB16HQ*	
PB24Q	SNAP-D6M	SNAP-D12MC-P	PB8H*	SNAP-D8M**	
			PB16H*	SNAP-D8MC**	
			PB16HC*	SNAP-D8MC-P**	

* Modification required to use these racks: Remove the jumpers to pins 1 and 49. (These jumpers are labeled JP1 and JP2 on racks G4PB16J, G4PB16K, and G4PB16L.) The jumpers can be de-soldered or clipped. ***WARNING: If these jumpers are not removed, then the power-on LED will be lit, regardless of the actual power status. This can result in a false power-on indication and may cause damage to the computer.***
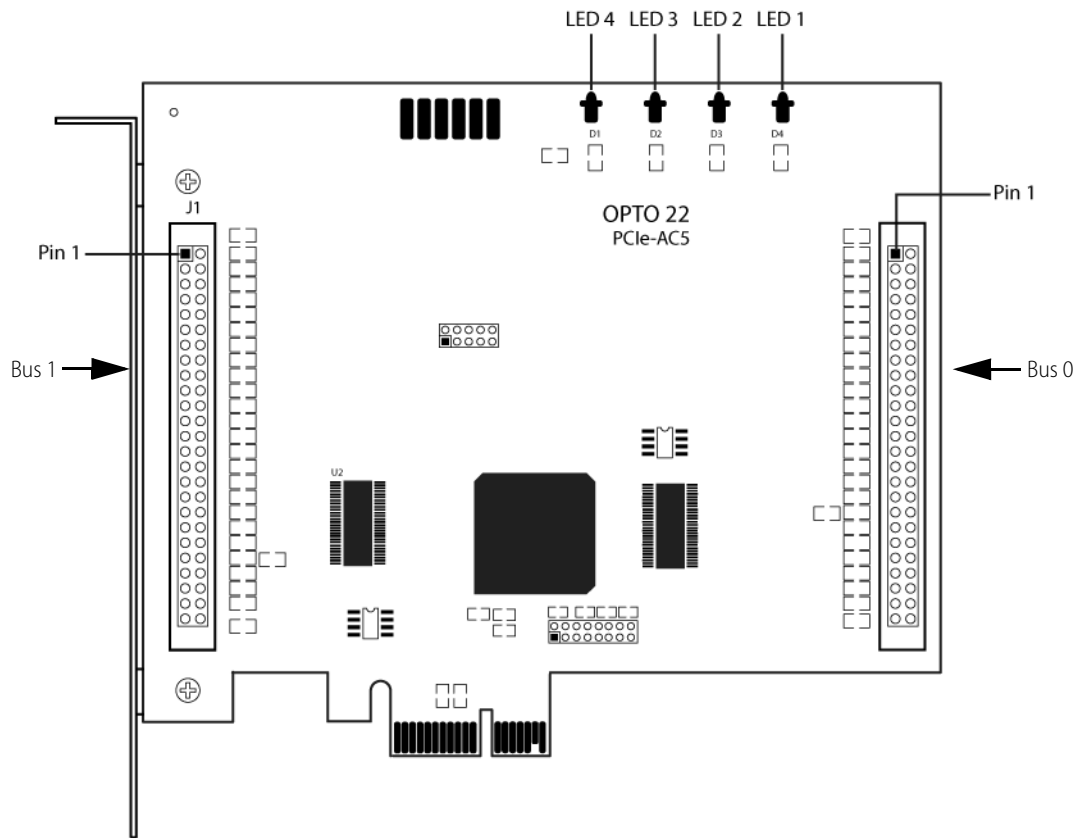** Modification required to use these racks: Remove the JP1 and JP2 jumpers. ***WARNING: Failure to remove the jumpers may cause damage to the computer.***

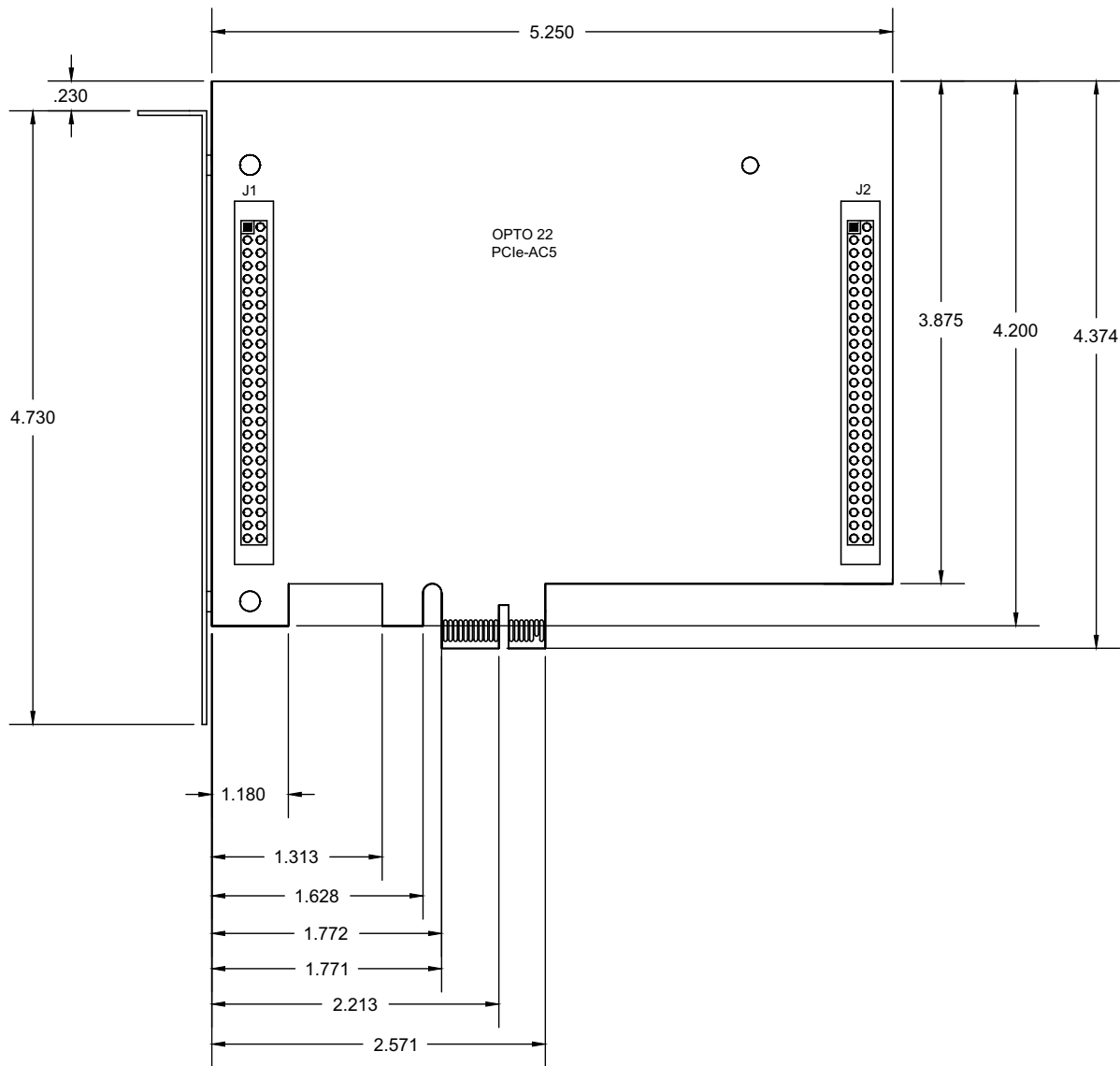# PCI-AC5, PCIe-AC5, AC5, and G4AC5 Adapter Cards

Drawings

PCIe-AC5

Note that bus numbers are reversed when compared to the PCI-AC5.
See the following page for dimensions.

Drawings

PCIe-AC5 Dimensions

5.250
.230
4.730
J1
OPTO 22
PCIe-AC5
J2
3.875
4.200
4.374
1.180
1.313
1.628
1.772
1.771
2.213
2.571
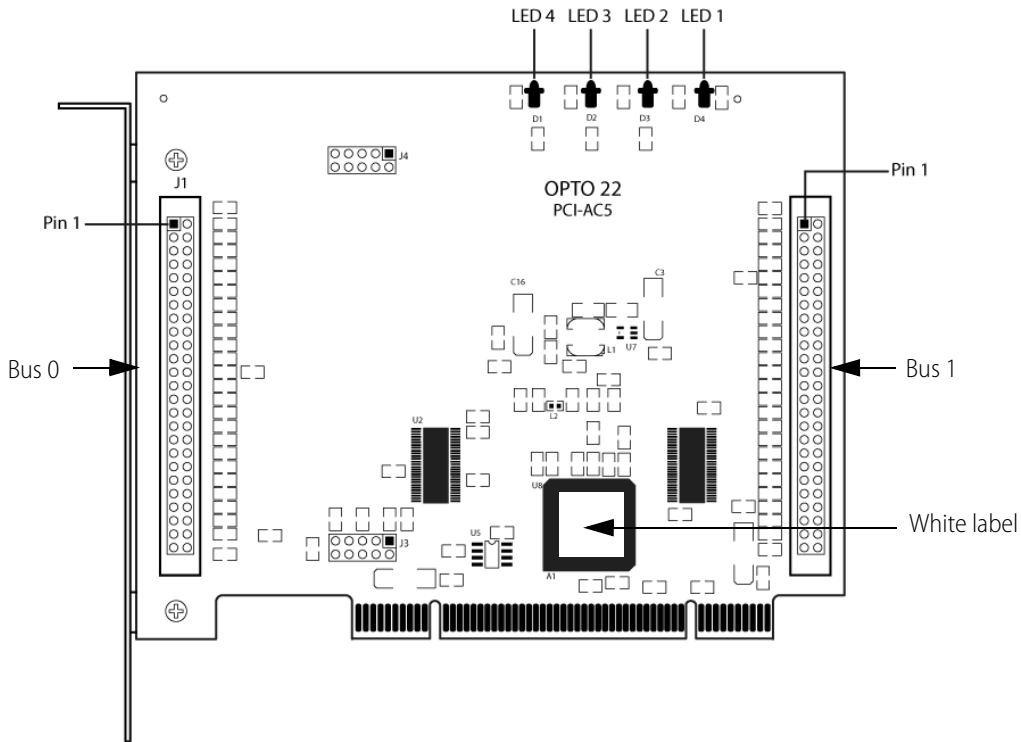
PCI-AC5, PCIe-AC5, AC5, and G4AC5 Adapter Cards

Drawings

PCI-AC5—Newer Card

Manufactured November 2008 and after. Designation on white label: 9278.
Power requirements: 5.0 VDC @ 250 mA *and* 3.3 VDC @ 250 mA
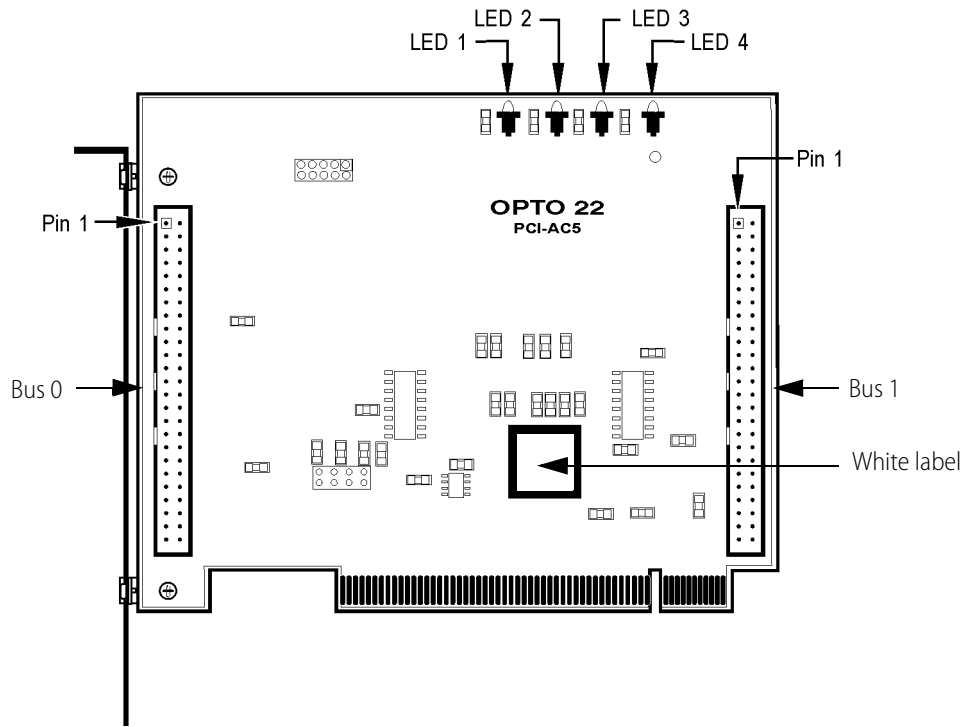Note reversed numbering of LEDs from previous card.

LED 4   LED 3   LED 2   LED 1

Pin 1

Pin 1

OPTO 22
PCI-AC5

Bus 0

Bus 1

White label

PCI-AC5_2009

OPTO 22

PCI-AC5, PCIe-AC5, AC5, and G4AC5 Adapter Cards

Drawings (continued)
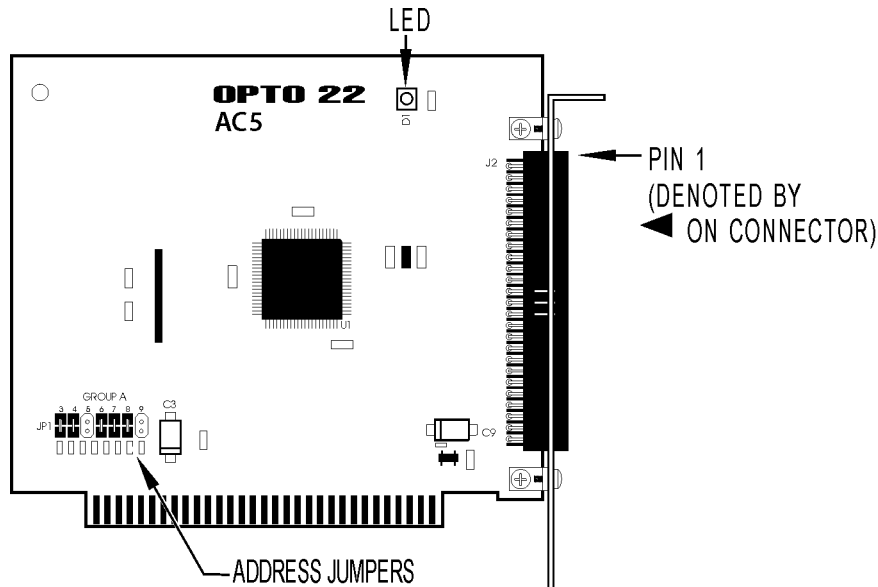
PCI-AC5—Older Card

Manufactured before November 2008. Designation on white label: 8939
Power requirements: 5.0 VDC @ 600 mA

PCI-AC5, PCIe-AC5, AC5, and G4AC5 Adapter Cards

Drawings (continued)

AC5 and G4AC5

LED

OPTO 22
AC5

PIN 1
(DENOTED BY
◄ ON CONNECTOR)

J2

GROUP A
JP1

C3

C9

ADDRESS JUMPERS

More About Opto 22

Products

Opto 22 develops and manufactures reliable, flexible, easy-to-use hardware and software products for industrial automation, energy management, remote monitoring, and data acquisition applications.

groov

groov puts your system on your mobile device. With zero programming, you can build mobile operator interfaces to monitor and control systems from Allen-Bradley, Siemens, Schneider Electric, Modicon, and many more. Web-based *groov* puts mobile-ready gadgets at your fingertips. Tag them from your existing tag database, and they automatically scale for use on any device with a modern web browser. See groov.com for more information and your free trial.

SNAP PAC System

Designed to simplify the typically complex process of selecting and applying an automation system, the SNAP PAC System consists of four integrated components:

- SNAP PAC controllers
- PAC Project™ Software Suite
- SNAP PAC brains
- SNAP I/O™

SNAP PAC Controllers

Programmable automation controllers (PACs) are multifunctional, modular controllers based on open standards.

Opto 22 has been manufacturing PACs for over two decades. The standalone SNAP PAC S-series, the rack-mounted SNAP PAC R-series, and the software-based SoftPAC™ all handle a wide range of digital, analog, and serial functions for data collection, remote monitoring, process control, and discrete and hybrid manufacturing.

SNAP PACs are based on open Ethernet and Internet Protocol (IP) standards, so you can build or extend a system easily, without the expense and limitations of proprietary networks and protocols. Wired+Wireless™ models are also available.

PAC Project Software Suite

Opto 22's PAC Project Software Suite provides full-featured, cost-effective control programming, HMI (human machine interface) development and runtime, OPC server, and database connectivity software for your SNAP PAC System.

Control programming includes both easy-to-learn flowcharts and optional scripting. Commands are in plain English; variables and I/O point names are fully descriptive.

PAC Project Basic offers control and HMI tools and is free for download on our website, www.opto22.com. PAC Project

Professional, available for separate purchase, adds one SoftPAC, OptoOPCServer, OptoDataLink, options for controller redundancy or segmented networking, and support for legacy Opto 22 serial *mistic*™ I/O units.

SNAP PAC Brains

While SNAP PAC controllers provide central control and data distribution, SNAP PAC brains provide distributed intelligence for I/O processing and communications. Brains offer analog, digital, and serial functions, including thermocouple linearization; PID loop control; and optional high-speed digital counting (up to 20 kHz), quadrature counting, TPO, and pulse generation and measurement.

SNAP I/O

I/O provides the local connection to sensors and equipment. Opto 22 SNAP I/O offers 1 to 32 points of reliable I/O per module, depending on the type of module and your needs. Analog, digital, and serial modules are all mixed on the same mounting rack and controlled by the same processor (SNAP PAC brain or rack-mounted controller).
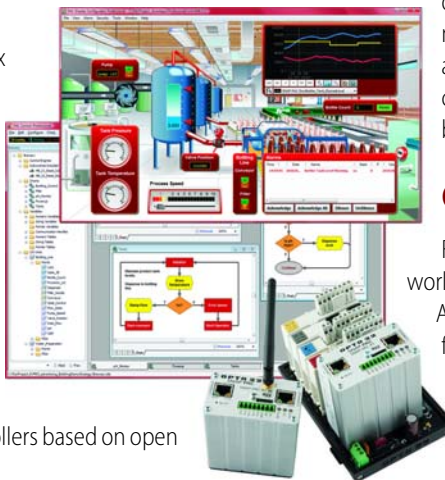
Quality

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 only testing a sample of each batch, we can 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, comprehensive technical support for Opto 22 products. Our staff of support engineers represents 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.

Additional support is always available on our website: how-to videos, OptoKnowledgeBase, self-training guide, troubleshooting and user's guides, and OptoForums.

In addition, hands-on training is available for free at our Temecula, California headquarters, and you can register online.

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 951-695-3000, or visit our website at www.opto22.com.

www.opto22.com