SoftPAC Software-based Controller for PC-based Control

Features

- Operates like an Opto 22 hardware PAC, but runs in Microsoft® Windows®
- Programmed with PAC Control, just like any SNAP programmable automation controller
- Lets you take advantage of a PC's extensive memory, file space, and speed
- Ideal for machine builders and OEMs

Description

SoftPAC™ is a software-based programmable automation controller (PAC) designed for PC-based control. SoftPAC gives you the choice of running your control program on a computer in a Microsoft Windows environment rather than on a standalone or rack-mounted PAC.

SoftPAC is ideal for machine builders or OEMs who may already have a PC in their product or want to use one for a new design. SoftPAC can provide significant savings in hardware costs for some applications.

SoftPAC is especially useful for applications requiring:

- Extended file storage
- Frequent access to files
- Math-intensive processes
- A large number of control flowcharts running at the same time. For example, industrial engineers working with gas density calculations, solar tracking, and encryption can greatly reduce calculation time.

Using SoftPAC, you can take advantage of a PC's ability to quickly read and write to files as well as its greater space for data storage. A large refrigerated warehouse, for example, may need to log gigabytes of temperature, power, compressor, and door status data. SoftPAC handles large amounts of data with ease, because file operations are limited only by the size of the PC's hard drives and the available network volumes.

Another advantage is that SoftPAC can be run as a service. When SoftPAC runs as a service, an operator does not have to log in; the controller can start when the PC is turned on.

Programming

SoftPAC is programmed using PAC Control™, part of the PAC Project™ Software Suite for industrial automation, remote monitoring, and data acquisition.

Using PAC Control, you develop a control program (called a *strategy*). You then download the strategy to an Opto 22 PAC (software-based SoftPAC, standalone S-series, or rack-mounted R-series), and the controller runs it independently. See form 2045, *SoftPAC Quick Start Guide*, for important information.

Because the same PAC Control strategy can run on both software and hardware controllers, you can even begin developing your strategy without hardware. If you decide to use a different controller later, there's no need to redevelop.

PAC Control includes all the features you need for control programming:

- A Strategy Tree that provides a graphical view of your control system, including I/O points and variables
- A set of more than 450 plain-English commands, including commands for analog process and digital sequential control, complex math, conditional branching, string handling, PID loop control, data tables, and other complex functions
- Flowchart-based programming, which lets you write control strategies visually and is easier to learn and maintain
- OptoScript™ programming, an advanced scripting language ideal for experienced control engineers who prefer a procedural approach to program development
- Subroutines for more efficient programming (especially useful for repeated tasks or processes that are used in multiple control strategies)
- A graphical debugger for stepping through a control program and its subroutines in real time

Part Numbers

Part	Description
SOFTPAC	Software-based programmable automation controller for PC-based control, with PAC Project Basic software and documentation in PDF (download)
PACPROJECTPRO	PAC Project Professional complete software suite, including SoftPAC, and documentation (download and CD)

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SoftPAC can run up to 64 flowcharts simultaneously; many more can be included in the strategy. SoftPAC allows access to 64 MB RAM and 8 MB non-volatile RAM for your PAC Control strategy (flowcharts, variables, tables, subroutines, and so on). File operations are limited only by the size of your hard drive and the volumes available on your network.

PAC Control is just one part of the PAC Project Software Suite. For more information, see *"How to Obtain SoftPAC"* below.

Compatibility

SoftPAC can be used with SNAP Ethernet-based I/O units:

SNAP-PAC-EB1 SNAP-PAC-EB1-FM SNAP-PAC-EB1-W SNAP-PAC-EB2 SNAP-PAC-EB2-FM SNAP-PAC-EB2-W	SNAP-PAC-R1 SNAP-PAC-R1-B SNAP-PAC-R1-FM SNAP-PAC-R1-W SNAP-PAC-R2 SNAP-PAC-R2-FM SNAP-PAC-R2-W

All SNAP I/O modules can be used on these I/O units, including analog, digital, and serial modules.

SoftPAC can also be used with legacy SNAP Ethernet-based I/O units. It cannot be used with serial brains. Note that SoftPAC cannot communicate through serial ports in the PC.

SNAP PAC System Compatibility

SoftPAC can also communicate peer-to-peer with any SNAP PAC S-series or R-series controller on the network. SoftPAC includes Scratch Pad areas of the OptoMMP memory map.

System Requirements

SoftPAC and PAC Project 9.5 and higher are supported on the following Microsoft operating systems only:

- Microsoft® Windows® 10 Professional (32-bit or 64-bit)
- Windows 8.1 Professional (32-bit or 64-bit)
- Windows 7 Professional (32-bit or 64-bit)
- Windows Vista® Business (32-bit only)

A minimum of 100 MB available disk space is required.

How to Obtain SoftPAC

SoftPAC is included in your purchase of the PAC Project Professional Software Suite (version 9.3 and higher), which also includes control programming, HMI development and runtime, OptoOPCServer for OPC communications, and OptoDataLink for data exchange with SQL databases.

You can also purchase SoftPAC separately and use the free PAC Project Basic Software Suite to program it. PAC Project Basic includes control programming and HMI development and runtime.

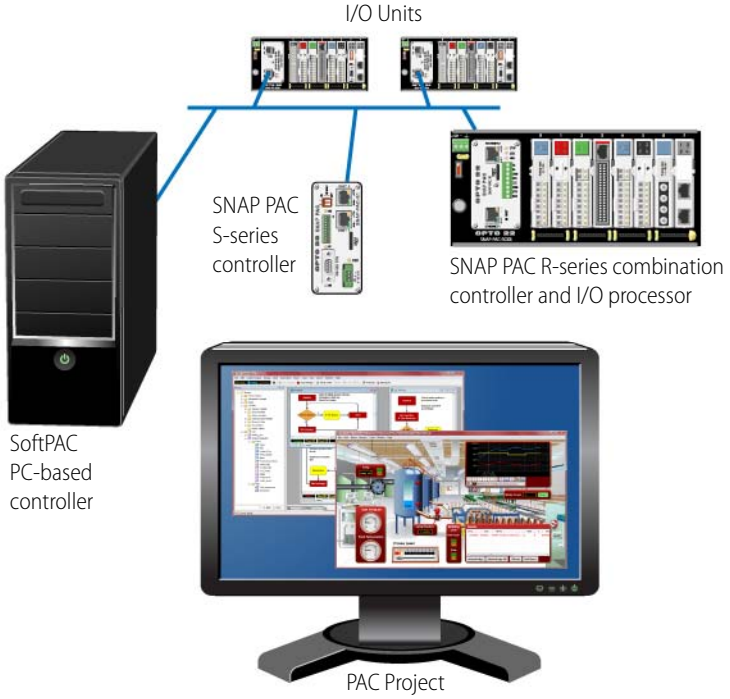
For more information about PAC Project, see form 1699, *PAC Project Data Sheet*.

Your purchase of PAC Project Professional or SoftPAC is a single-seat license (one PC). Additional licenses can be purchased separately; contact your distributor or Opto 22 Sales for information about volume discounts.

The Choice is Yours

SoftPAC extends the options for your control system. You can run your control strategy:

- On a PC running SoftPAC
- On a standalone controller
- On a combination controller and I/O unit



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Opto 22 Controller Comparison Chart

The following table compares SNAP PAC controllers using minimum version 9.5 firmware and 9.5 PAC Project software.

		SNAP PAC Controllers									
		Software	Standalone				Rack-mounted				
		SoftPAC	SNAP-PAC-S1 SNAP-PAC-S1-FM	SNAP-PAC-S2	SNAP-PAC-S1-W	SNAP-PAC-S2-W	SNAP-PAC-R1 SNAP-PAC-R1-FM	SNAP-PAC-R1-B	SNAP-PAC-R2 SNAP-PAC-R2-FM	SNAP-PAC-R1-W	SNAP-PAC-R2-W
Works with PAC Project software		●	●	●	●	●	●	●	●	●	●
Runs PAC Control strategies		●	●	●	●	●	●	●	●	●	●
Maximum PAC Control charts running at once (plus host task)		64	32	32	32	32	16	16	16	16	16
Compatible brains[a]	SNAP PAC EB brains	●	●	●	●	●	●	●	●	●	●
	SNAP PAC SB brains		●	●	●	●					
	Onboard I/O processor (brain)						●	●	●	●	●
Controller-to-brain communication	Ethernet (UDP/IP, 10/100 Mbps)	●	●	●	●	●	●	●	●	●	●
	Wireless LAN (802.11a, b, or g)	[b]			●	●				●	●
	Serial (RS-485)		●	●	●	●					
Controller-to-PC communication	Runs on PC	●									
	Ethernet (TCP/IP, 10/100 Mbps)	[b]	●	●	●	●	●	●	●	●	●
	Wireless LAN (802.11a, b, or g)	[b]			●	●				●	●
	PPP over dial-up modem, with hardware handshaking		●	●	●	●	●	●	●	●	●
Two independent Ethernet network interfaces (two IP addresses)		[b]	●	●	●	●	●	●	●	●	●
Wireless LAN interface (802.11a, b, or g)		[b]			●	●				●	●
Total number of RS-232 serial ports		[c]	2	4[d]	2	4[d]	1	1	1	1	1
Number of RS-232 serial ports usable for PPP (on dial-up modem)		[c]	1[e]	1[e]	1[e]	1[e]	1[e]	1[e]	1[e]	1[e]	1[e]
Total number of RS-485 serial ports		[c]	1	4[d]	1	4[d]	-0-	-0-	-0-	-0-	-0-
EtherNet/IP™ (Allen-Bradley® RSLogix® systems and others)			●	●	●	●	●	●	●	●	●
Modbus®/TCP (slave)			●	●	●	●	●	●	●	●	●
OPC driver support		●	●	●	●	●	●	●	●	●	●
RESTful API			●	●	●	●	●	●	●	●	●
HTTP/HTTPS			●	●	●	●	●	●	●	●	●
OptoMMP memory-mapped protocol		●[f]	●	●	●	●	●	●	●	●	●
SNMP (network management)			●	●	●	●	●	●	●	●	●
Direct access to file system (hard drive plus network)		●									
FTP server, file system			●	●	●	●	●	●	●	●	●
FTP client		●	●	●	●	●	●	●	●	●	●
PPP (for use with dial-up modems)			●	●	●	●	●	●	●	●	●
Email (SMTP client with authentication and attachments)		●	●	●	●	●	●	●	●	●	●

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	SNAP PAC Controllers									
	Software	Standalone				Rack-mounted				
	SoftPAC	SNAP-PAC-S1 SNAP-PAC-S1-FM	SNAP-PAC-S2	SNAP-PAC-S1-W	SNAP-PAC-S2-W	SNAP-PAC-R1 SNAP-PAC-R1-FM	SNAP-PAC-R1-B	SNAP-PAC-R2 SNAP-PAC-R2-FM	SNAP-PAC-R1-W	SNAP-PAC-R2-W
Scratch Pad area for peer-to-peer data (bits, floats, 32-bit integers, 64-bit integers, and strings)	●	●	●	●	●	●	●	●	●	●
Security for wireless network (WPA2-AES, WPA-TKIP, WEP)	[b]			●	●				●	●
Security for wired Ethernet network (IP filtering, port access)	[b]	●	●	●	●	●	●	●	●	●
Real-time clock	[b]	●	●	●	●	●	●	●	●	●
Backup battery (recharges when controller has power)[g]		●	●	●	●	●	●	●	●	●
Physical RAM RAM available for Strategy Non-volatile or Battery-backed RAM Flash memory	[b] 64 MB 8 MB [h]	32 MB 16 MB 8 MB 16 MB		128 MB 64 MB 8 MB 16 MB		16 MB 4 MB 2 MB 8 MB			32 MB 10 MB 2 MB 8 MB	
32-bit processor	[b]	●	●	●	●	●	●	●	●	●
Floating-point unit (FPU)	[b]	●	●	●	●	●	●	●	●	●
Data storage space	[b]	approx. 2.5 MB				approx. 2 MB				
Removable data storage (microSD card slot)	[b]	2 GB max.				2 GB max.				
Power requirements	[b]	8–32 VDC[i] 10 W–11.3 W max[k]				5.0 to 5.2 VDC @ 1.2–1.5 A[k]				
Operating Temperature in degrees C Storage Temperature in degrees C	[b]	-20 to 60 -40 to 85				-20 to 60 -40 to 85				
Humidity (non-condensing)	[b]	0–95%				0–95%				
Uses SNAP PAC mounting rack (4, 8, 12, or 16 modules)	n/a	n/a				●		●	●	●
Uses SNAP B-series mounting rack (4, 8, 12, or 16 modules)							●			
Combination controller and I/O processor[m]						●	●	●	●	●
Maximum number of modules allowed on largest rack: Any mix of 16 digital, 16 analog, and 8 serial						●[n]	●[n]	●	●	●

a For compatibility with legacy Opto 22 hardware, see form 1693, *Legacy and Current SNAP Product Comparison and Compatibility Charts*.
b As provided by the Microsoft Windows-based computer the software runs on.
c SoftPAC cannot communicate through serial ports on the PC.
d Serial ports are software configurable for RS-232 or RS-485.
e One port on SNAP-PAC-S1 supports DTR, DSR, and CD signals and bidirectional flow control on RTS and CTS. All ports on SNAP-PAC-S2 support DTR and DCD signals and bidirectional flow control on RTS and CTS. The port on SNAP-PAC-R1 and -R2 supports DTR and CD signals, and bidirectional flow control on RTS and CTS.
f SoftPAC includes Status Read, Status Write, and Scratch Pad areas of the memory map.
g Models manufactured before August 2007 and S1s with serial numbers 625653 and lower have user- replaceable backup batteries. See original user guide.
h Function of Flash memory is implemented via a file; size is limited only by available disk space.
i Units with serial numbers lower than 500,000 have an 8–24 VDC input voltage rating. *Verify voltage on the unit's faceplate before applying power*.
k Higher requirement applies to -W models.
m I/O features vary by model. For details, see form 1677, *SNAP PAC Controller and Brain Comparison Chart*.
n SNAP-PAC-R1-Bs, and SNAP-PAC-R1s with serial numbers lower than 600,000, are limited to eight 4-channel digital modules per rack.

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More About Opto 22

Products

Opto 22 develops and manufactures reliable, easy-to-use, open standards-based hardware and software products deployed worldwide.

Industrial automation, process control, building automation, industrial refrigeration, remote monitoring, data acquisition, Industrial Internet of Things (IIoT), and information technology applications all rely on Opto 22.

groov

Monitor and control your equipment from anywhere using your smartphone or tablet with groov. Build your own mobile app easily—just drag, drop, and tag. No programming or coding. Visit groov.com for more information and your free trial.

SNAP PAC System

Developer- and IIoT-ready, the SNAP PAC System connects physical assets to databases and applications using open standards. 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

SNAP PAC programmable automation controllers handle a wide range of digital, analog, and serial functions for data collection, remote monitoring, process control, and discrete and hybrid manufacturing.

For IIoT applications and easier integration with company systems, standalone and rack-mounted SNAP PACs include a built-in HTTP/HTTPS server and **RESTful API** (application program interface). The REST API gives you secure, direct access to I/O and variable data using your choice of programming languages. No middleware, protocol converters, drivers, or gateways needed.

Based on open Ethernet and Internet Protocol (IP) standards, SNAP PACs make it easier to build or extend a system without the expense and limitations of proprietary networks and protocols.

PAC Project Software Suite

Opto 22's PAC Project Software Suite offers full-featured, cost-effective control programming, HMI (human machine interface), OPC server, and database connectivity software.

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 software-based controller, 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, local PID loop control, watchdog, totalizing, and much more.

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. Analog, digital, and serial modules are mixed on one mounting rack and controlled by a SNAP PAC brain or rack-mounted PAC.

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 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.

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.

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