

SOFTPAC PC-BASED CONTROLLER

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 processor or controller.

SoftPAC is ideal for machine builders or OEMs who may already have a PC in their product. 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

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 when SoftPAC runs as a service, an operator doesn't have to log in; SoftPAC will start automatically when the PC boots up.

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 SoftPAC, a SNAP PAC controller, or

groov EPIC processor, 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 used in multiple control strategies)
- A graphical debugger for stepping through a control program and its subroutines in real time

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

Part Numbers

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

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

You can use SoftPAC with *groov* EPIC processors, *groov* RIO edge I/O modules, and SNAP Ethernet-based I/O units:

GRV-EPIC-PR1	SNAP-PAC-EB2-W
GRV-EPIC-PR2	SNAP-PAC-R1
GRV-R7-MM1001-10	SNAP-PAC-R1-B
GRV-R7-MM2001-10	SNAP-PAC-R1-FM
SNAP-PAC-EB1	SNAP-PAC-R1-W
SNAP-PAC-EB1-FM	SNAP-PAC-R2
SNAP-PAC-EB1-W	SNAP-PAC-R2-FM
SNAP-PAC-EB2	SNAP-PAC-R2-W
SNAP-PAC-EB2-FM	

All *groov* I/O and 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.

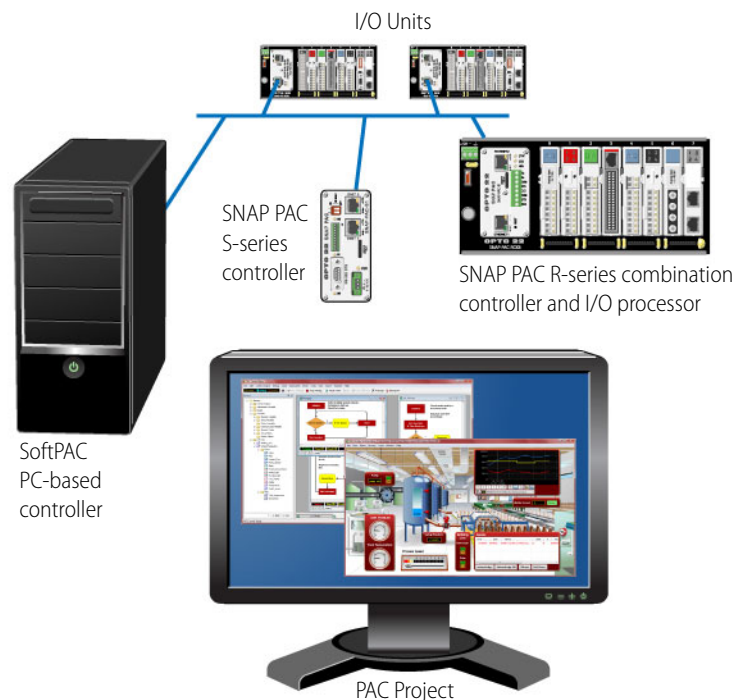
SNAP PAC System Compatibility

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

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 (*groov* EPIC without I/O, or SNAP PAC S-series)
- On a combination controller and I/O unit (*groov* EPIC with I/O, or SNAP PAC R-series)



System Requirements

SoftPAC and PAC Project R10.4 and higher are supported on the following Microsoft operating system only:

Microsoft® Windows® 10 Professional (32-bit or 64-bit)

A minimum of 10 MB available disk space is required.

HOW TO OBTAIN SOFTPAC

SoftPAC is included in your purchase of the PAC Project Professional Software Suite, 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.

OPTO 22 SNAP PAC CONTROLLER COMPARISON CHART

The following table compares SNAP PAC controllers using minimum version 10.0 firmware and 10.0 PAC Project software.

		SNAP PAC Controllers					
		Software	Standalone		Rack-mounted		
		SoftPAC	SNAP-PAC-S1 SNAP-PAC-S1-FM	SNAP-PAC-S2	SNAP-PAC-R1 SNAP-PAC-R1-FM	SNAP-PAC-R1-B	SNAP-PAC-R2 SNAP-PAC-R2-FM
Maximum PAC Control charts running at once (plus default host task)		64	32	32	16	16	16
Communication	Ethernet (UDP/IP, 10/100 Mbps)	●	●	●	●	●	●
	Two independent Ethernet network interfaces	^b	●	●	●	●	●
	Number of RS-485 serial ports	^c	1	4 ^d			
	Number of RS-232 serial ports		2	4 ^d	1	1	1
Protocols	EtherNet/IP™ (Allen-Bradley® RSLogix® systems, others)		●	●	●	●	●
	Modbus®/TCP (slave)		●	●	●	●	●
	OPC driver support	●	●	●	●	●	●
	RESTful API		●	●	●	●	●
	HTTP/HTTPS		●	●	●	●	●
	OptoMMP memory-mapped protocol	● ^e	●	●	●	●	●
	SNMP (network management)		●	●	●	●	●
	FTP server, file system		●	●	●	●	●
	FTP client	●	●	●	●	●	●
	Email (SMTP client with authentication and attachments)	●	●	●	●	●	●
Supports Node-RED via SNAP-PAC nodes and RESTful API			●	●	●	●	●
Direct access to hard drive & network drives (Dropbox®, etc.)		●					
Real-time clock		^b	●	●	●	●	●
Backup battery (recharges when controller has power) ^f			●	●	●	●	●
Physical RAM		^b	32 MB		16 MB		
RAM available for Strategy		64 MB	16 MB		4 MB		
Non-volatile or Battery-backed RAM		8 MB	8 MB		2 MB		
Flash memory		^g	16 MB		8 MB		
Data storage space		^b	~2.5 MB		~2 MB		
Removable data storage (microSD card slot)		^b	32 GB max. ^h		32 GB max. ^h		
32-bit processor		^b	●	●	●	●	●
Floating-point unit (FPU)		^b	●	●	●	●	●
Compatible I/O units ^a	SNAP PAC EB	●	●	●	●	●	●
	SNAP PAC SB		●	●			
	groov EPIC	●	●	●	●	●	●
	groov RIO	●	●	●	●	●	●
Combination controller and I/O processor ^m					●	●	●
Mounts on SNAP PAC I/O mounting rack					●		●
Mounts on SNAP B-series I/O mounting rack		n/a	n/a			●	
Maximum number of modules allowed on largest rack: Any mix of 16 digital, 16 analog, and 8 serial					● ⁿ	● ⁿ	●
Power requirements		^b	8–32 VDC ^l 10 W–11.3 W max		5.0 to 5.2 VDC @ 1.2–1.5 A		

	SNAP PAC Controllers					
	Software	Standalone		Rack-mounted		
	SoftPAC	SNAP-PAC-S1 SNAP-PAC-S1-FM	SNAP-PAC-S2	SNAP-PAC-R1 SNAP-PAC-R1-FM	SNAP-PAC-R1-B	SNAP-PAC-R2 SNAP-PAC-R2-FM
Operating Temperature in degrees C	b	-20 to 60		-20 to 60		
Storage Temperature in degrees C		-40 to 85		-40 to 85		
Humidity (non-condensing)	b	0–95%		0–95%		

- 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 SoftPAC 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 SoftPAC includes Status Read, Status Write, and Scratch Pad areas of the memory map.
- f Models manufactured before August 2007 and S1s with serial numbers 625653 and lower have 3-volt CR2032 Lithium battery.
- g Function of Flash memory is implemented via a file; size is limited only by available disk space.
- h Requires firmware 9.4a or higher and loader 6.1a or higher for 32 GB capacity; lower versions limited to 2 GB.
- 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.*
- m I/O features vary by model. For details, see form 1677, [SNAP PAC Controller and Brain Comparison Chart](#).
- n All 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.

PRODUCTS

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

groov EPIC® System

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

groov EPIC I/O

groov I/O connects locally to sensors and equipment with up to 24 channels on each I/O module. 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 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.

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 or on a monitor connected via the HDMI or USB ports.

groov EPIC Software

Software included in the *groov EPIC* processor:

- PAC Control engine to run PAC Control and PAC Display
- CODESYS Runtime engine to run IEC61131-3 compliant programs built with CODESYS Development System
- Optional access to the Linux operating system through a secure shell (SSH) to download and run custom applications
- *groov View* for building your own device-independent HMI, viewable on the touchscreen, PCs, and mobile devices
- Node-RED for creating simple logic flows from pre-built nodes
- Ignition Edge® from Inductive Automation®, with OPC-UA drivers to Allen-Bradley®, Siemens®, and other control systems, and MQTT communications with Sparkplug for efficient IIoT data transfer

groov RIO®

groov RIO revolutionizes remote I/O by offering a single, compact, PoE-powered industrial package with web-based configuration, commissioning, and flow logic software built in, plus support for multiple OT and IT protocols.

Standing alone, it meets the needs of small, variable I/O count applications, especially those that require data logging or data communications, commonly found in IIoT applications. *groov RIO* can also be used with a Modbus/TCP master or as remote I/O for a *groov EPIC* system.

Older products

From solid state relays (our first products) to world-famous G4 and SNAP I/O, to SNAP PAC controllers, older Opto 22 products are still supported and still doing the job at thousands of installations worldwide. You can count on us to give you 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, 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.

Support is always available on our website, including [free online training](#) at OptoU, how-to [videos](#), [user's guides](#), the Opto 22 KnowledgeBase, troubleshooting tips, and [OptoForums](#). In addition, instructor-led, hands-on [Premium Factory Training](#) is available 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 **+1-951-695-3000**, or visit our website at www.opto22.com.