

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

\*\*Obsolete Product, contact Opto 22 Pre-Sales engineers for more information.

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

**Other I/O units:** SoftPAC can also be used with E1 and E2 I/O units via Ethernet, as well as 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.

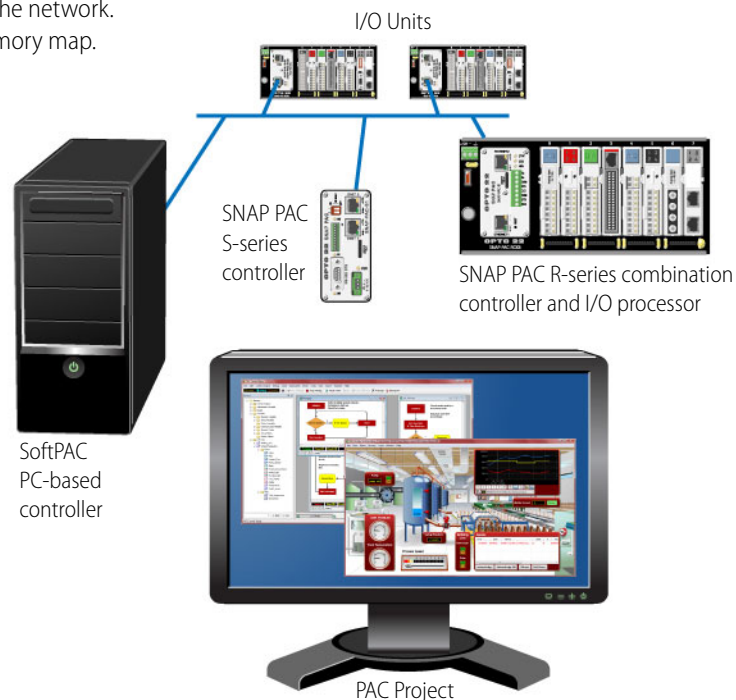
## SNAP PAC System Compatibility

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)



## COMPUTER REQUIREMENTS

To use PAC Project applications with your PC, you must have the following minimum computer configuration:

- A computer with at least the minimum processor and memory required for your version of Microsoft® Windows®, and Ethernet capability. Additional memory and a better CPU may be required for some configurations. We recommend staying away from low-end CPUs and using one of the following operating systems:
  - Microsoft® Windows® 10 Professional (32-bit or 64-bit) or Windows 11 Professional
  - (OptoOPCServer and OptoDataLink) Windows Server® 2012 R2, 2016, 2019, and 2022; however, you must install .NET Framework 4.0 prior to installing PAC Project on these operating systems

*NOTE: PAC Project cannot be installed on Windows XP or older Windows operating systems. Other versions of Windows operating systems and embedded Windows operating systems are not supported.*

- Ethernet capability
- VGA or higher resolution monitor. Minimum size: 800x600 with small fonts
- Mouse or other pointing device
- (Optional) Installed Windows printer

## 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 <sup>o</sup>	SNAP-PAC-S2	SNAP-PAC-R1 SNAP-PAC-R1-FM <sup>o</sup>	SNAP-PAC-R1-B	SNAP-PAC-R2 SNAP-PAC-R2-FM <sup>o</sup>
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	<sup>b</sup>	●	●	●	●	●
	Number of RS-485 serial ports	<sup>c</sup>	1	4 <sup>d</sup>			
	Number of RS-232 serial ports		2	4 <sup>d</sup>	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	● <sup>e</sup>	●	●	●	●	●
	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		<sup>b</sup>	●	●	●	●	●
Backup battery (recharges when controller has power) <sup>f</sup>			●	●	●	●	●
Physical RAM		<sup>b</sup>	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		<sup>g</sup>	16 MB		8 MB		
Data storage space		<sup>b</sup>	~2.5 MB		~2 MB		
Removable data storage (microSD card slot)		<sup>b</sup>	32 GB max. <sup>h</sup>		32 GB max. <sup>h</sup>		
32-bit processor		<sup>b</sup>	●	●	●	●	●
Floating-point unit (FPU)		<sup>b</sup>	●	●	●	●	●
Compatible I/O units <sup>a</sup>	SNAP PAC EB	●	●	●	●	●	●
	SNAP PAC SB		●	●			
	groov EPIC	●	●	●	●	●	●
	groov RIO	●	●	●	●	●	●
Combination controller and I/O processor <sup>m</sup>					●	●	●
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					● <sup>n</sup>	● <sup>n</sup>	●
Power requirements		<sup>b</sup>	8–32 VDC <sup>l</sup> 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 <sup>o</sup>	SNAP-PAC-S2	SNAP-PAC-R1 SNAP-PAC-R1-FM <sup>o</sup>	SNAP-PAC-R1-B	SNAP-PAC-R2 SNAP-PAC-R2-FM <sup>o</sup>
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%		

- <sup>a</sup> For compatibility with legacy Opto 22 hardware, see form 1693, [Legacy and Current SNAP Product Comparison and Compatibility Charts](#).
- <sup>b</sup> As provided by the Microsoft Windows-based computer SoftPAC runs on.
- <sup>c</sup> SoftPAC cannot communicate through serial ports on the PC.
- <sup>d</sup> Serial ports are software configurable for RS-232 or RS-485.
- <sup>e</sup> SoftPAC includes Status Read, Status Write, and Scratch Pad areas of the memory map.
- <sup>f</sup> Models manufactured before August 2007 and S1s with serial numbers 625653 and lower have 3-volt CR2032 Lithium battery.
- <sup>g</sup> Function of Flash memory is implemented via a file; size is limited only by available disk space.
- <sup>h</sup> Requires firmware 9.4a or higher and loader 6.1a or higher for 32 GB capacity; lower versions limited to 2 GB.
- <sup>i</sup> 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.*
- <sup>m</sup> I/O features vary by model. For details, see form 1677, [SNAP PAC Controller and Brain Comparison Chart](#).
- <sup>n</sup> 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.
- <sup>o</sup> OBSOLETE product, please contact Pre-Sales Engineering for more information.