# OPTO 22

## 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

> Takes advantage of your 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 does not have to log in; SoftPAC starts 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*), and then you download the strategy to SoftPAC, a SNAP PAC controller, or *groov* EPIC processor. The controller then runs it independently. See the SoftPAC Quick Start Guide (form 2045) 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 is 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

### 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 |

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SoftPAC can run up to 64 flowcharts simultaneously; many more can be included in the control 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" on page 3*.

## I/O Compatibility

You can use SoftPAC with these *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 (sales@opto22.com) 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 includes Scratch Pad areas of the OptoMMP memory map and can communicate peer-to-peer with any *groov* EPIC processor or SNAP PAC S-series or R-series controller on the network.

### The Choice is Yours

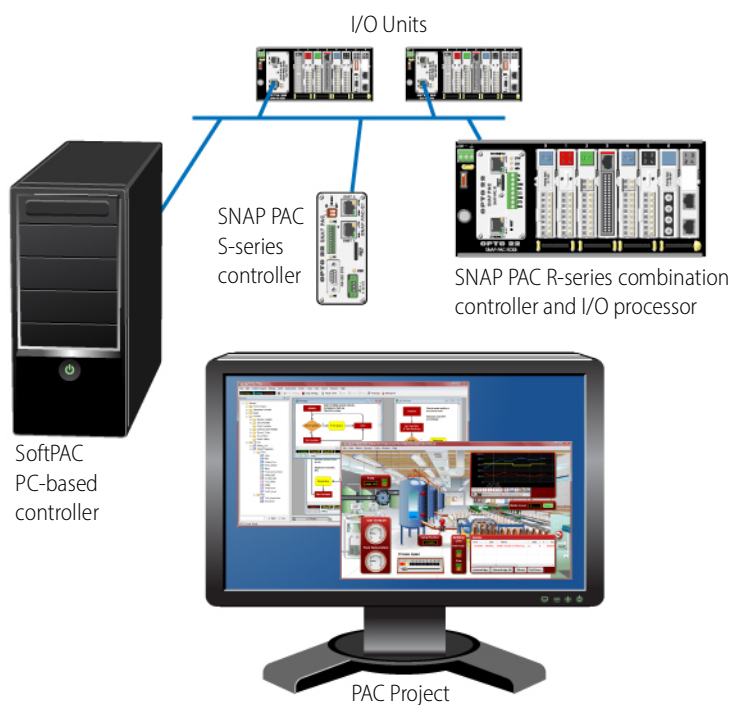SoftPAC extends the options for your control system. You can run your control strategy:

- 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)



I/O Units

SNAP PAC S-series controller

SNAP PAC R-series combination controller and I/O processor

SoftPAC PC-based controller

PAC Project

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## SYSTEM REQUIREMENTS

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

- Computer operating system:
  - Recommended: Microsoft Windows® 11 (Professional or Enterprise)
  - Minimum: Microsoft Windows® 10 (Professional or Enterprise)
  - Microsoft .NET Framework 4.8 or higher must be installed
  - (OptoOPCServer and OptoDataLink) Windows Server® 2025, 2022, 2019, and 2016

  *NOTE: Ensure you use the latest 64-bit version of the operating system and keep it up to date. 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.*

- Processor (CPU):
  - Recommended: Intel® Core™ i7 / AMD® Ryzen™ 7 at 3.0 GHz or higher
  - Minimum: Intel® Core™ i5 / AMD® Ryzen™ 5 at 2.0 GHz or higher
- Memory (RAM):
  - Recommended: at least 16 GB (or more if paging occurs)
  - Minimum: 16 GB
- Storage:
  - Recommended: 20 GB or more of free disk space and Solid State Drive (SSD) for significantly faster file read/writes
  - Minimum: at least 10 GB of free disk space and 7200 RPM (or faster) Hard Disk Drive (HDD)
- Display monitor:
  - Recommended size: 1280 × 720 or higher
  - Minimum size: 800 x 600 with small fonts
- Networking capability
- 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 the PAC Project Data Sheet (form 1699).

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: SoftPAC · Standalone: SNAP-PAC-S1 / SNAP-PAC-S1-FM°, SNAP-PAC-S2 · Rack-mounted: SNAP-PAC-R1 (GEN2), SNAP-PAC-R1 (Pre-GEN2), SNAP-PAC-R1-FM°, SNAP-PAC-R1-B°, SNAP-PAC-R2° / SNAP-PAC-R2-FM°

| Category | Feature | SoftPAC (Software) | SNAP-PAC-S1 / S1-FM° | SNAP-PAC-S2 | SNAP-PAC-R1 (GEN2) | SNAP-PAC-R1 (Pre-GEN2) | SNAP-PAC-R1-FM° | SNAP-PAC-R1-B° | SNAP-PAC-R2° / R2-FM° |
|---|---|---|---|---|---|---|---|---|---|
| | Maximum PAC Control charts running at once (plus default host task) | 64 | 32 | 32 | 32 | 16 | 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 (256 MB for GEN2) | | | | |
| | RAM available for Strategy | 64 MB | 16 MB | | 5 MB (64 MB for GEN2) | | | | |
| | Non-volatile or Battery-backed RAM | 8 MB | 8 MB | | 2 MB | | | | |
| | Flash memory | [g] | 16 MB | | 8 MB (16 MB for GEN2) | | | | |
| | User file storage space | [b] | ~2.5 MB | | ~2 MB (~30 MB for GEN2) | | | | |
| | 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 | ● | ● | ● | ● | ● | ● | ● | ● |

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| | | SNAP PAC Controllers | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Software | Standalone | | Rack-mounted | | | | | |
| | SoftPAC | SNAP-PAC-S1 / SNAP-PAC-S1-FM° | SNAP-PAC-S2 | SNAP-PAC-R1 (GEN2) | SNAP-PAC-R1 (Pre-GEN2) | SNAP-PAC-R1-FM° | SNAP-PAC-R1-B° | SNAP-PAC-R2° | SNAP-PAC-R2-FM° |
| Combination controller and I/O processor[m] | n/a | n/a | | ● | | | ● | ● | |
| Mounts on SNAP PAC I/O mounting rack | | | | ● | | | | ● | |
| Mounts on SNAP B-series I/O mounting rack | | | | | | | ● | | |
| 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[i] 10 W–11.3 W max | | 5.0 to 5.2 VDC @ 1.2–1.5 A | | | | | |
| 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% | | | | | |

[a] For compatibility with legacy Opto 22 hardware, see Legacy and Current SNAP Product Comparison and Compatibility Charts (form 1693).

[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 non-rechargeable 3-volt CR2032 Lithium battery.

[g] Function of Flash memory is implemented via a file; size is limited only by available disk space.

[h] For SNAP-PAC-R1 (GEN2): Requires firmware R10.5g or higher and loader R6.0d. It does not support lower versions.
For SNAP-PAC-R1 (Pre-GEN2), SNAP-PAC-R1-FM, SNAP-PAC-R1-B, SNAP-PAC-R2, and SNAP-PAC-R2-FM: Requires firmware R9.4a or higher and loader R6.1a 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 SNAP PAC Controller and Brain Comparison Chart (form 1677).

[n] For SNAP-PAC-R1s with serial numbers lower than 600,000 and all SNAP-PAC-R1-Bs: 4-channel digital modules are limited to eight per rack and they must be in slots 0-7.

[o] OBSOLETE product, please contact Pre-Sales Engineering for more information.

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