

PAC Project 8.0 Release Notes

Welcome to PAC Project

Welcome to Opto 22's PAC Project software suite for industrial automation, remote monitoring, and data acquisition applications.

PAC Project comes in two forms: PAC Project Basic and PAC Project Professional.

PAC Project Basic

PAC Project Basic is included in your purchase of a SNAP PAC controller and can also be freely downloaded from our website, www.opto22.com.

PAC Project Basic is all you need for most monitoring and control needs. It includes three software applications:

- **PAC Control** for developing control programs (we call them *control strategies*) to automate processes, monitor equipment, and acquire data from processes and equipment. You develop the control strategy on your PC using flowcharts or scripting (or both), debug it by stepping through the graphical debugger, and then download it to your SNAP PAC controller. The strategy does all the work, running independently on the controller.
- **PAC Display** for creating HMIs (human-machine interfaces) for technicians and operators to use. The HMI you create runs on a PC and provides an easy way for an authorized technician to monitor the control process and interact with it, for example to change recipes, respond to alarms, or see trends over time.
- **PAC Manager** for assigning IP addresses on the Ethernet network and configuring hardware. If you wish, you can also use PAC Manager to test hardware in real time by reading from controllers, brains, and I/O, and writing to them.

PAC Project Professional

PAC Project Professional is designed for more complex projects, especially those requiring OLE for Process Control (OPC), database connectivity, multiple PAC Display seats, multiple protocols, multiple networks, or legacy hardware support.

PAC Project Pro is designed for use with SNAP PAC controllers and takes advantage of their features, including dual independent Ethernet network interfaces for redundant Ethernet links or segmented networking.

PAC Project Professional can be purchased as a suite or as individual applications to suit your needs. It can be downloaded from our website (password required for full installation) and is also shipped to you on a CD with complete documentation in both PDF and printed form. The suite includes the following software applications:

- **PAC Control Professional** for developing control programs

- **PAC Display Professional** for creating HMIs
- **PAC Manager** for configuration
- **OptoOPCServer**, an OPC 2.0-compliant server for serving SNAP PAC System I/O and variable data to OPC clients, including PAC Display. OptoOPCServer is strongly recommended for multiple seats of PAC Display.
- **OptoDataLink** for exchanging SNAP PAC System data with databases (including Microsoft SQL Server, Microsoft Access, and MySQL), text files, and email systems

More Information on PAC Project Basic and Pro

Free product support is included with both PAC Project Basic and PAC Project Professional. Free training and free pre-sales engineering help are also available. For product support, see [“For Help” on page 7](#). For training, see our website under Support→Training or email training@opto22.com. For pre-sales engineering, call 1-800-321-6786 or 1-951-695-3000.

All PAC Project software runs on Microsoft® Windows® 2000 and Windows XP workstations. PAC Project works with all SNAP PAC controllers, SNAP PAC brains, SNAP PAC racks, and SNAP I/O modules.

For more information about PAC Project Basic and Professional, see the following documents. Some are on the PAC Project CD, and all are available on our website. The easiest way to find a document on the website is to search on its form number.

- *PAC Project Software Suite Data Sheet*, Opto 22 form #1699 (detailed product information)
- *PAC Project Basic and Professional Comparison Chart*, form #1681 (compares features in PAC Project Basic and PAC Project Pro)
- *SNAP PAC System Migration Technical Note*, form #1684 (useful information for current customers using SNAP PAC systems with older hardware and software.)
- *FactoryFloor to PAC Project Migration Guide*, form #1692 (essential for anyone moving from the legacy FactoryFloor software to PAC Project. This document is also on the PAC Project CD.)

Notes for Current ioProject Customers

PAC Project is the latest in the line of Opto 22 automation software suites extending back to Cyrano in the 1980s. Each new suite has been built on major elements of the previous suites, but has been given a new name when product family changes were significant.

PAC Control, PAC Display, and PAC Manager are very similar to the previous ioControl, ioDisplay, and ioManager, although they add new features and support for several new modules and brains. However, we decided to rename these applications and the software suite itself for two reasons:

- First, we included OptoDataLink in the PAC Project Professional suite. OptoDataLink adds significant connectivity to popular databases.
- Second, we introduced the SNAP PAC family of controllers, brains, and mounting racks. Older Ethernet-based controllers and brains had reached their hardware limits; to provide support for new functions and I/O modules, we had to start with new hardware. This new hardware is labelled *SNAP PAC* and the software is called *PAC Project* to make it easy to choose products that work together.

No conversion necessary. Because PAC Control, PAC Display, and PAC Manager are so similar to their ioProject cousins, you'll already know how to use them, and they will open your ioControl strategies, ioDisplay projects, and ioManager configuration files without requiring conversion. For important information on moving to PAC Project 8.0 from ioProject, see form #1688, the *SNAP PAC System Migration Technical Note*.

Installation Notes for ioProject Customers

If you are upgrading to PAC Project 8.0 from ioProject 7.0 or 7.1, the installer will keep the ioProject versions intact. If you wish to uninstall them, you can do so using the Add or Remove Programs function on your PC.

If you are upgrading to PAC Project 8.0 from a version of ioProject older than 7.0, do NOT uninstall ioProject before running the PAC Project version 8.0 installation. *If you uninstall first, you will lose all configured control engines.* Additionally, The PAC Project version 8.0 installer automatically saves ioProject control engines and then uninstalls ioProject versions 6.x and older.

Use Notes for ioProject Customers

Please note that strategies, subroutines, and exported charts saved in PAC Control cannot be subsequently opened in any version of ioControl. Also, charts exported from a version of ioControl prior to 7.1 cannot be imported into PAC Control 8.0.

If your system includes older Ethernet-based controllers and brains (such as SNAP-LCE controllers and SNAP Ultimate, Ethernet, and Simple I/O), you can still use them with PAC Project. However, these older controllers and brains do not support many of the new features, nor do they support the new modules.

If you're working with these older systems, be sure to do the following:

- **Choose the Legacy Editions of PAC Project user's guides** to see all legacy hardware and commands.
- **Read the *SNAP PAC System Migration Technical Note***, form #1688. This technical note is on our website, www.opto22.com. The easiest way to find it is to search on the form number.

New Features in PAC Project 8.0

Version 8.0 introduces support for new SNAP PAC systems hardware, including new SNAP PAC brains, SNAP PAC racks, SNAP I/O modules, and the motion control subsystem.

New SNAP PAC Brains

PAC Project version 8.0 supports the new SNAP PAC brains. These two new brains offer greater power and additional features when compared with older Opto 22 Ethernet-based brains. Both SNAP PAC brains mount on SNAP PAC racks (see below).

The **SNAP-PAC-EB1** brain is designed for applications requiring high-speed digital functions, including high-speed counting (up to 20 kHz), quadrature counting, pulse measurement and pulse generation, and TPO.

The **SNAP-PAC-EB2** brain shares all the features of the EB1 except that it does not include high-speed digital functions.

New SNAP PAC Racks

SNAP PAC R-series controllers and SNAP PAC brains mount on SNAP PAC mounting racks, along with digital, analog, serial, and special-purpose I/O modules. The four new SNAP PAC racks all accommodate any type of SNAP I/O module in any position on the rack.

- SNAP-PAC-RCK4 holds up to 4 modules.
- SNAP-PAC-RCK8 holds up to 8.
- SNAP-PAC-RCK12 holds up to 12.
- SNAP-PAC-RCK16 holds up to 16.

New Modules

PAC Project version 8.0 supports the following new SNAP I/O modules:

| Module | Description | For more information, see... |
|--------------------|---|---|
| SNAP-AITM-8 | Analog module offering eight channels of millivolt or thermocouple input. Each channel can be configured to accept a type B, C, D, E, G, J, K, N, R, S, or T thermocouple or a -75 to +75 mV, -50 to +50 mV, or -25 to +25 mV input | Opto 22 form #1065, the <i>SNAP Analog Input Modules Data Sheet</i> |
| SNAP-AILC-2 | Analog input module that works with 3 mV/V and 4 mV/V load cells as a load cell front end. Using a separate 24 VDC power source (purchased separately), the module provides isolated 10 VDC bridge excitation for up to four 350 ohm or 415 ohm load cells. Its primary use is with high-quality 4 mV/V load cells to gather data from force measurement testing. | Form #1590, the <i>SNAP Load Cell Modules Data Sheet</i> |

| Module | Description | For more information, see... |
|----------------------|---|---|
| SNAP-AIV-32 | Analog input module with 32 channels of voltage input, -10 to +10 VDC or -5 to +5 VDC | Form #1065, the <i>SNAP Analog Input Modules Data Sheet</i> |
| SNAP-AIMA-32 | Analog input module with 32 channels of current input, -20 to +20 mA | Form #1065, the <i>SNAP Analog Input Modules Data Sheet</i> |
| SNAP-IAC-16 | Digital input module with 16 isolated channels of AC or DC voltage input, 90–140 VAC/VDC | Form #1556, the <i>SNAP High-Density Digital Modules Data Sheet</i> |
| SNAP-IAC-A-16 | Digital input module with 16 isolated channels of AC or DC voltage input, 180–280 VAC/VDC | Form #1556, the <i>SNAP High-Density Digital Modules Data Sheet</i> |
| SNAP-IDC-16 | Digital input module with 16 isolated channels of DC or AC voltage input, 10–32 VDC/VAC | Form #1556, the <i>SNAP High-Density Digital Modules Data Sheet</i> |

New Motion Control Subsystem

The new SNAP PAC Motion Control Subsystem, which consists of the SNAP-SCM-MCH16 host communication module, SNAP-SCM-BB4 breakout board, and OptoMotion command set, provides an integrated hardware and software toolset for controlling multi-axis stepper motors.

A single SNAP-SCM-MCH16 module, mounted on an I/O unit and connected to a breakout board, allows a SNAP PAC controller running a PAC Control programming strategy to control up to 16 stepper motors. Each SNAP-SCM-BB4 breakout board is equipped with a Magellan™ processor chip set that outputs pulse and direction signals for up to four stepper motor systems.

The OptoMotion library of motion commands supports many of the Magellan Motion Processor commands and gives you the ability to define and acquire motion process data such as position, velocity, acceleration, breakpoints, interrupts, and time intervals. In addition, you can execute motion-related actions such as smooth stops, stepping, and position adjustments.

OptoDataLink

A new software application has been added to the PAC Project Professional software suite: OptoDataLink. OptoDataLink makes it easy to share data from SNAP PAC systems with commonly used databases, including Microsoft SQL Server, Microsoft Access, and MySQL, as well as text files.

The easy-to-use interface in OptoDataLink makes setup and configuration simple. The I/O points and strategy variables already created in your PAC Control strategy are automatically available for OptoDataLink to use for data exchange.

For more information on OptoDataLink, see form #1705, the *OptoDataLink User's Guide*, or form #1662, the *OptoDataLink Data Sheet*.

Installation

CAUTION: *If you are upgrading to version 8.0 from a version of ioProject older than 7.0, do NOT uninstall ioProject before running the PAC Project version 8.0 installation. If you uninstall first, you will lose all configured control engines. The PAC Project version 8.0 installer automatically saves ioProject control engines before uninstalling old versions of the software.*

Installation Requirements

Here's what you need to install and run PAC Project 8.0 software:

- A computer with at least the minimum processor required for your version of Microsoft Windows (1 GHz Pentium®-class or better recommended) and Ethernet capability
- VGA or higher resolution monitor (Super VGA recommended). Minimum size: 800x600 with small fonts.
- Mouse or other pointing device
- Installed Windows printer (optional)
- Microsoft Windows XP (with Service Pack 2) or Windows 2000® (with Service Pack 4) workstation operating system. Microsoft Windows server and 64-bit versions of Windows workstation operating systems are not supported.
- At least 256 MB RAM (512 MB RAM or more is recommended)
- Available hard disk space as shown in the following table:

| Application | PAC Project Professional | PAC Project Basic |
|---------------|--------------------------|-------------------|
| PAC Control | 47 MB | 47 MB |
| PAC Display | 52 MB | 48 MB |
| OptoOPCServer | 19 MB | (not included) |
| OptoDataLink | 7 MB | (not included) |
| PAC Manager | 22 MB | 22 MB |
| PAC Utilities | 7 MB | 7 MB |
| Total | 154 MB | 124 MB |

Important Note for Windows XP Users

Due to a Microsoft bug involving how Themes are handled in Windows XP (either with Service Pack 2 or with no Service Pack), a resource leak may eventually cause PAC Project applications to crash.

To resolve this problem, you can set the Windows XP Desktop Theme to Windows Classic or use a workaround provided by Microsoft. See Opto 22 KB49838 for details. KB49838 is a KnowledgeBase article on our website; the fastest way to find it is to search on the article number.

Obtaining Updated Firmware

New firmware is strongly recommended for SNAP PAC controllers and brains that will be used with PAC Project 8.0. To find new firmware, go to www.opto22.com. Click the Support tab, click Downloads at the upper left, click Firmware, and enter the part number for your controller or brain in the search field.

Opto 22 hardware is shipped with the most recent firmware, but you should check the website for additional updates that may be available. *Firmware should match the hardware and the PAC Control version.* Look for "8.0" in the firmware filename, and choose the firmware file for your hardware.

For complete information on changes and updates to firmware, see the README files available for download with the firmware on the Opto 22 website.

NOTE: If you are using PAC Project 8.0 with older controllers and brains, such as SNAP-LCE, SNAP Ultimate, SNAP Ethernet, or SNAP Simple I/O, firmware remains at 7.1. See form #1688, the SNAP PAC System Migration Technical Note, for important information.

For Help

If you have any difficulty using software, documents, or firmware, contact Opto 22 Product Support by email or phone:

Phone: 800-TEK-OPTO (835-6786)
951-695-3080
(Hours are Monday through Friday,
7 a.m. to 5 p.m. Pacific Time)

Fax: 951-695-3017

Email: support@opto22.com

Opto 22 website: www.opto22.com

NOTE: Email messages and phone calls to Opto 22 Product Support are grouped together and answered in the order received.

In addition, the **OptoSupport Blog** provides the latest information on support issues and workarounds. Visit www.opto22.com and click on the Support tab for more information.

Check the Opto 22 Website for Product Updates

Opto 22 software, firmware, and documentation are continually updated and improved. Check the Support→Downloads section of the Opto 22 website at www.opto22.com regularly to see if new releases or patches are available for your system.

Also, we recommend signing up at my.opto22.com to receive news about Opto 22 products.

New Features and Enhancements

PAC Control Basic and Professional

PAC Control version 8.0 adds the following new features and improved functionality compared to ioControl version 7.1:

- In Debug Mode, a new View I/O Units dialog box lists current status information for all the I/O units.
- Additional proportional integral derivative (PID) loops have been added for SNAP-PAC-R1 and SNAP-PAC-R2 I/O units. You can now configure up to 96 PID control loops on each of these I/O units. SNAP-PAC-EB1 and SNAP-PAC-EB2 I/O units also have 96 PID loops available per I/O unit.
- You can now configure and name each point on high-density digital modules. In addition, if you configure a point on a high-density digital module as a counter, you can use the standard PAC Control counter commands (such as Get and Clear Counter) with these points.
- Legacy Options have been added for customers using older Opto 22 hardware. New strategies show only SNAP PAC hardware and commands. If you are using older hardware, see form #1688, the *SNAP PAC System Migration Technical Note*, for information on legacy options.
- The Inspect I/O Unit dialog box has been redesigned with tabs showing detailed and compact views of point information, PID loops, and general information.
- To make it easier to work with I/O modules that have more than four points, all I/O points are now referenced by both their module position on the rack and the point's position on the module, rather than just by a point number.
- The Configure Variables dialog box now allows you to sort by columns such as Name, Type, and Initial Value by clicking the column header button.

- The Debugger performance slider previously available in Configure mode is now available in Debug mode as well. The debugger performance slider slows down the debugger by increasing the time delay between debugging calls to the controller, therefore leaving more processing time for other tasks.
- Analog input points on Ethernet brains can now have inverted scaling. This means the low scale can be greater than the high scale. For instance, lower value could be 10 and the upper value could be -10.
- The time it takes to add or rename a variable or I/O object has been improved.

IMPORTANT: *Strategies, subroutines, and exported charts saved in PAC Control Professional cannot be subsequently opened with PAC Control Basic. In addition, you cannot copy and paste items between the two applications.*

Also note that strategies, subroutines, and exported charts saved in PAC Control cannot be subsequently opened in any version of ioControl. Also, charts exported from a version of ioControl prior to 7.1 cannot be imported into PAC Control 8.0.

New and Changed Commands

Six new commands are in PAC Control 8.0 that were not in ioControl 7.1.

Two of the new commands extend existing functionality to numeric table elements:

- Bit Off in Numeric Table Element?
- Bit On in Numeric Table Element?

Three new commands add support for high-density points:

- IVAL Move Numeric Table to I/O Unit Ex
- Move I/O Unit to Numeric Table Ex
- Move Numeric Table to I/O Unit Ex

These commands include a new Points per Module parameter that lets you specify the number of points required. For example, if you are using 32-channel modules, you would specify 32. But if you are only using 8-channel modules, you could specify 8 instead. This more efficient method allows table sizes to be as small as possible.

One additional new command, Set I/O Unit Configured Flag, is provided for PAC Control applications using serial *mistic* brains where the control system has a primary controller and a secondary controller both wired to the same serial *mistic* I/O units.

PAC Display Basic and Professional

PAC Display 7.2 adds new features for managing tables and recipe files, SuperTrend log files and more.

Runtime

Now you can use a table control to manage string tables, as well as integer and float tables. Individual integer, float, and string table values can be changed directly.

Configurator

- When configuring Operator Driven Dynamic Attribute, Read and Clear, two additional analog point attributes, Minimum and Maximum, have been added to the Actions drop-down list.
- String tables are now configured in the table control the same way as integer and float tables.
- New recipe file utilities provide an easier way to create, edit, and validate recipe files.
- The Delete Window dialog box now allows deleting multiple windows.
- When configuring Historic Logs or SuperTrend logs, a Weekly rollover period may now be selected. The File dialog box now has an option for the day of the week.
- Now a single Historic Log point can not only log integer and float table ranges, but also string table ranges as well.
- A new deadbanding feature is now available for combined SuperTrends that results in smaller, more manageable log files.

OptoOPCServer

OptoOPCServer 8.0 is part of PAC Project Professional only; it is not included in PAC Project Basic. This version adds the following items to the features in version 7.1:

- I/O points can now be accessed through the control engine (indirectly) as well as directly from the I/O unit.
- High-density digital points can now be generated from .idb files.
- Added new tags for .idb files and .cdb files.
- The Browser Configurator now recognizes SNAP PAC devices and high-density points from PAC Manager, and it generates tags compatible with the expanded and standard memory map.

PAC Manager

PAC Manager 8.0 includes the following new features and improved functionality compared to ioManager 7.1:

- As in ioControl, all I/O points are now referenced by both their module position on the rack and the point's position on the module, rather than just by a point number. This change makes it easier to work with modules that have more than four I/O points.

- High-density digital modules (modules with more than four points) are now configured just like 4-point digital modules. Although counters on HDD points are automatic, you should configure these points as counters (just as you would on a 4-point module) so you can use the standard PAC Control counter commands (such as Start Counter and Get and Clear Counter) with them.
- Inspect mode Point Configuration, Digital Point, and Analog Point dialog boxes have also been changed to accommodate up to 32 points per module.
- You can now configure up to 96 PID control loops on each SNAP-PAC-R1 and SNAP-PAC-R2 I/O unit, and up to 32 PID control loops on each SNAP-PAC-EB1 and SNAP-PAC-EB2 I/O unit.
- You can now set up an FTP username and password for greater security when sending files via FTP to and from an Opto 22 controller or brain that has file capability. The username and password can be set up in the Network Security dialog box either in a configuration file or in Inspect mode.
- In Inspect mode, the following items have been added to the Status Read page for troubleshooting:
 - Module x - Times Discovered—For analog, high-density digital, or serial modules; may indicate if a module is resetting.
 - Milliseconds Per Analog Scan—Average length of time the processor takes to scan all analog and high-density digital points on the rack, or indication that the scanner is not running.
 - Milliseconds Per Digital Scan—Average length of time the processor takes to scan all digital points on the rack, or indication that the scanner is not running.

Bug Fixes

Several bug fixes have been made in the 8.0 version of PAC Project. For a complete list, see the PAC Project Readme file or the Readme file for individual products (PAC Control, PAC Display, and so on). Product Readme files are installed in each application's directory.

In addition, see the Readme file for your control engine or brain firmware, available on our website at www.opto22.com. Click the Support tab.

OptoSupport Blog—The OptoSupport Blog on our website provides the latest information about bug updates and workarounds. To view or subscribe to this blog, visit www.opto22.com. Click on the word *Blogs* at the bottom of any page.

