PAC Project 8.1 Release Notes

Welcome to PAC Project 8.1

Welcome to version 8.1 of 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 (*strategies*) to automate processes, monitor equipment, and acquire data from processes and equipment.

- **PAC Display**™ for creating HMIs (human-machine interfaces) for technicians and operators to use.

- **PAC Manager**™ for configuring hardware and troubleshooting.

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 Professional can be purchased as a suite or as individual applications to suit your needs. 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 11. 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. See also, "Installation Requirements" on page 9.

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. The easiest way to find a document on our website, www.opto22.com, is to search on its form number.

- *PAC Project Software Suite Data Sheet*, Opto 22 form #1699
- *PAC Project Basic and Professional Comparison Chart*, form #1681
- *SNAP PAC System Migration Technical Note*, form #1688 (for customers moving to the SNAP PAC System with older Opto 22 hardware and software)

Notes for ioProject Customers

PAC Project is the latest in the line of Opto 22 automation software suites extending back to Cyrano® in the 1980s. PAC Control, PAC Display, and PAC Manager are very similar to the previous ioControl®, ioDisplay®, and ioManager®. These applications and the ioProject™ software suite were renamed and new features added when we introduced the SNAP PAC System in 2006.

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 8.1 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 8.1 from a version of ioProject older than 7.0, do NOT uninstall ioProject before running the PAC Project version 8.1 installation. *If you uninstall first, you will lose all configured control engines. The* PAC Project version 8.1 installer automatically saves ioProject control engines and then uninstalls ioProject versions 6.x and older.

Usage 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 8.1.

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, you should **not** upgrade to PAC Project 8.1. Instead you should continue to use PAC Project 8.0 and firmware 7.2. These older controllers and brains do not support many of the new features, nor do they support new I/O 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.

- **See also the *Legacy and Current Product Comparison and Compatibility Charts,* form 1693 to compare the features and product compatibility of the PAC Project, ioProject, and Opto 22 FactoryFloor® software suites.

New Hardware Support in PAC Project 8.1

Version 8.1 introduces support for the new SNAP-PAC-S2 programmable automation controller, two new SNAP PAC serial brains, and three new 8-channel analog I/O modules.

New SNAP-PAC-S2 Controller

A new addition to the standalone S-series PACs, the **SNAP-PAC-S2 controller** is designed to combine a serial-based control system with full Ethernet capabilities.

The SNAP-PAC-S2 provides the same features as the SNAP-PAC-S1 but offers four serial ports, each one software configurable for RS-232 or RS-485 (2-wire or 4-wire). These serial ports can be used for:

- Control of serial-based I/O units using the new SNAP PAC Serial Brains (see the next section) or with older serial brains, such as the B3000 or *mistic* bricks

- Direct communication with serial devices such as printers, scales, chart recorders, and RFID and barcode readers

- (One port only) communication over a modem using the point-to-point protocol (PPP)

The SNAP-PAC-S2 can control both serial and Ethernet-based I/O units simultaneously, plus provide Ethernet communications with computer networks. For a complete description and specifications, see form #1584, the *SNAP PAC S-Series Controller Data Sheet*.

CAUTION*: Do not use communication port connectors from a legacy OptoControl controller*. Legacy connectors will fit in a SNAP-PAC-S2, but the pin orientation is different. Instead, use the connectors supplied with the SNAP-PAC-S2 controller.*

*Legacy OptoControl Controllers

G4LC32	*G4LC32ISA-LT*	*M4RTU*
G4LC32SX	*M4*	*SNAP-LCM4*
G4LC32ISA	*M4IO*	*SNAP-LCSX/PLUS*

New SNAP PAC Serial Brains

You now have a choice of SNAP PAC brains that run on Ethernet or on serial networks. Existing SNAP PAC *EB* brains offer Ethernet connectivity; now two new SNAP PAC *SB* brains offer a serial connection. Introduced concurrently with PAC Project version 8.1, SNAP PAC SB brains connect to SNAP PAC S-series controllers on an RS-485 2-wire or 4-wire serial network.

* The **SNAP-PAC-SB1** 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-SB2** brain shares all the features of the SB1 except that it does not include high-speed digital functions.

Both new brains mount on SNAP PAC racks—the same racks used by Ethernet-based SNAP PAC EB brains—and support all SNAP I/O analog and digital modules, including high-density modules, plus the SNAP-AIPM power monitoring module. Modules can be mixed in any location on the rack.

For specifications and a detailed feature comparison chart, see form #1689, the *SNAP PAC Brains Data Sheet*.

New Analog Input Modules

PAC Project version 8.1 supports the following new SNAP I/O modules. These modules are higher-density versions of some of our most popular analog input modules and have been developed in response to customer requests.

* **SNAP-AIMA-8**—8-channel analog current input, -20 to +20 mA

* **SNAP-AIV-8**—8-channel analog voltage input, -10 to +10 VDC or -5 to +5 VDC

* **SNAP-AICTD-8**—8-channel analog temperature input, ICTD

Higher-density modules save cabinet space and are less expensive per point. Since field devices are wired directly to the top of the module, a breakout rack is not required.

For more information on the new modules, see form #1065, the *SNAP Analog Input Modules Data Sheet*.

New Features and Enhancements

PAC Control Basic and Professional

PAC Control version 8.1 adds the following new features and improved functionality compared to PAC Control version 8.0:

- The new **Background Downloading feature** allows you to download a strategy to a controller while the strategy currently on the controller continues to run. With two different strategies downloaded to the controller you can switch rapidly from one strategy to the other. This allows you to download a new or updated strategy to the controller and then run it with minimal downtime, or download and test a new or updated strategy but still keep the original strategy available.

- Support was added for the **new SNAP-PAC-S2 controller**. The PAC S2 includes four general purpose serial ports that can be software configured to RS-232 or RS-485. The RS-485 modes support *mistic* brains, the new PAC SB1 and SB2 serial brains, and general purpose communication.

- Support was also added for the **new SNAP-PAC-SB1 and SB2 serial brains**, which are similar to the SNAP-PAC-EB1 and EB2 brains except that they use a serial network.

- Now you can change I/O unit types within PAC Control to allow older Ethernet I/O units to be upgraded to newer PAC I/O units.

New and Changed Commands

- Two new commands, Flag Lock and Flag Unlock, allow an Integer 32 variable to be used as a synchronization object. This allows you to craft a strategy in such a way to give a task exclusive access to one or more objects—such as a tables, integers, or I/O units—until the task is complete.

- The following commands now support analog points on SNAP-PAC-R1 controllers and SNAP-PAC-EB1 and SB1 brains:

  – Get & Clear Analog Totalizer Value

  – Get Analog Totalizer Value

  – Set Analog Totalizer Rate

- The Ramp Analog Output command now supports analog output points on the SNAP-PAC-R2, SNAP-PAC-EB2, and SNAP-PAC-SB2.

- The following digital features have been added for digital points on SNAP-PAC-R1, SNAP-PAC-EB1, and SNAP-PAC-SB1:

    – Off-Time Totalizer

    – On-Time Totalizer

    – Frequency Measurement

    – Pulse Measurement

- Several digital features, including Frequency, Period, On-Time Totalizer, and Off-Time Totalizer are now supported in the following commands for the SNAP-PAC-R1, SNAP-PAC-EB1, and SNAP-PAC-SB1:

    – Get & Restart On-Time Totalizer

    – Get & Restart Period

    – Get Off-Time Totalizer

    – Get On-Time Totalizer

    – IVAL Set Off-Totalizer

    – IVAL Set On-Totalizer

    – Get Frequency

    – IVAL Set Frequency

    – Get Period

    – Get Period Measurement Complete Status

    – IVAL Set Period

- Pointer Tables were added as possible parameter types to the following commands:

    – Move Numeric Table to Numeric Table

    – Move I/O Unit to Numeric Table

    – Move I/O Unit to Numeric Table Ex

    – Move Numeric Table to I/O Unit Ex

    – Move Numeric Table to I/O Unit

    – IVAL Move Numeric Table to I/O Unit

    – IVAL Move Numeric Table to I/O Unit Ex

PAC Display Basic and Professional

PAC Display 8.1 has the following new features:

Configurator

- Alarm points may now be exported from one project and imported into another project.

- When configuring or editing tags for dynamic attributes, notifications and triggers, you can now manually type in a tag name rather than selecting it.

- (Pro only) You can now find and replace refresh groups in the Find and Replace dialog box.

- In order to capture operator driven actions in the Runtime Operator Action Log, PAC Display can now be configured for users to log in and out.

- Alarm Points may now be configured to play a unique sound, and may be individually configured to play, or not play, a sound when in alarm state in Runtime.

- Individual Alarm Points may now be configured to show or not show the alarm dialog when the alarm point goes into an alarmed state in Runtime.

- Global Operator Driven Permissions can now be configured to allow globally configured users to access any security-configured operator driven dynamic attribute without the need to be specifically configured for that attribute.

- A new Allow Runtime Tooltips feature enables the user to place the cursor over a graphic in Runtime that has a controller driven dynamic attribute and display the current values in a pop-up tooltip.

- The following support has been added for Integer 64 type variables and tables:

    – Recipe Download and Upload files may now contain Integer 64 tables.

    – Historic Logs now log Integer 64 variables and tables.

    – Table controls now support both reading writing of Integer 64 table values.

- The Configure→Control Engines dialog box now shows the IP address of the control engine and the strategy file that is being referenced.

Runtime

- In order to capture operator driven actions in the Runtime Operator Action Log, there is a new top-level Security menu for logging in and out.

- In the SuperTrend Historic Log Files dialog box it is now possible to browse to a different folder and display SuperTrend historic files located in that folder.

- When enabled, values for all controller-driven tags are displayed in a pop-up tooltip when you place the cursor over a graphic configured with a controller driven dynamic attribute.

- If configured to allow editing, elements in an Integer 64 table may be directly written using the table tool.

PAC Manager

PAC Manager 8.1 includes several new features and improved functionality.

Device Names

Controllers and brains in PAC Manager can now be referenced by device name, not just by IP address, so it is easier to be certain of the device you are reading or writing to. We recommend using the same name in PAC Manager as you used in PAC Control when configuring the controller or I/O unit.

Support for New Serial Brains

A number of dialog boxes have changed to add support for the new SNAP PAC SB brains, which use a serial network rather than an Ethernet network.

PAC Manager can communicate with SNAP PAC SB brains by two methods:

- Through the SNAP PAC S-series controller. The PC running PAC Manager communicates with the controller over Ethernet; the controller communicates with the brain over serial. Using this method, data passes through the controller, and the brain does not have to be connected to the PC.

- Directly from the PC running PAC Manager to the serial brain. This method requires that the PC be equipped with an RS-485 converter, such as an Opto 22 PCI-AC48 adapter card. A serial cable runs from the adapter card directly to the brain's serial port.

Both methods are equally suited to loading new firmware, configuring features, and testing or troubleshooting the SB brain using PAC Manager.

Other Enhancements

High-density digital (HDD) modules can now be configured with watchdogs and used with expanded digital events. Digital events and reactions can include the on/off state of a point or the state of an on-latch or off-latch on an HDD module.

A new **Expanded Digital Events** section adds the HDD capability and also incorporates the older Timer Events functions into a more flexible, easier-to-use format. The older Digital Events section still works for 4-channel digital modules, but the newer expanded section works for both 4-channel and HDD modules.

The new **64-Bit Integers** area has been added to the Scratch Pad for all SNAP PAC controllers and brains.

Bug Fixes

Several bug fixes have been made in the 8.1 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.

OptoKB Article Search—Go to Support➝Downloads➝KB Search/Browse on our website to search the Opto 22 Knowledge Base for any available articles by Article No, Article Title keywords, Article Text keywords, or even by Product application.

Installation

CAUTION: If you are upgrading to version 8.1 from a version of ioProject older than 7.0, do NOT uninstall ioProject before running the PAC Project version 8.1 installation. If you uninstall first, you will lose all configured control engines. The PAC Project version 8.1 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 8.1 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*

 * Installing both Pro and Basic requires a total of 192 MB of hard disk space.

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

For PAC controllers and brains, use 8.1 firmware with PAC Project 8.1. 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 "8.1" 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 older controllers and brains, do not upgrade to PAC Project 8.1. Use PAC Project 8.0 instead. For SNAP-LCE and SNAP Ultimate controllers, use 7.2 firmware. For SNAP Ethernet and SNAP Ethernet I/O, use 7.0 firmware.

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.

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