

PAC PROJECT RELEASE NOTES

October 27, 2025

If you have questions or need assistance, see [“How to Get Help”](#) on page 180.

WHAT'S NEW IN PAC PROJECT R10.6000?

Released: October 23, 2025.

NOTE: You may be prompted to restart your computer to complete the installation of the software.

Change in Support for Controller Redundancy

Support for controller redundancy has been restricted to SNAP PAC S-series controllers running firmware version R10.4e or lower. Beginning with this release, you will no longer be able to create strategies that contain controller redundancy. You can continue to maintain existing strategies that have controller redundancy; however, those controllers must use firmware version R10.4e or lower.

New Features

PAC Display

An **Ignore Left-Clicks** checkbox option has been added to the Graphic Dynamic Attributes window that allows you to make non-operator-driven graphics (and any graphics behind them) from being clickable. For more information about the Ignore Left-Clicks option, see the [PAC Display User's Guide](#) (form 1702).

PAC Manager

In the Inspect Opto 22 Device window, the Analog Bank Read window has been updated as follows:

- The columns have been grouped differently. Previously, the **Value**, **Counts**, **Min Value**, and **Max Value** items each had their own sub-section in the Analog Bank Read section. Now, **Value** and **Counts** are grouped together; **Min Value** and **Max Value** are grouped together. This can save you time by not scrolling through a very long Analog Bank Read section.
- A new **Quality** column has been added for quality codes. This column is grouped with the **Value** and **Counts** columns.

For more information about the Analog Bank Read window, see the [PAC Manager User's Guide](#) (form 1704).

Enhancements

PAC Control

- Block IDs (which are unique to each chart) are now displayed on the cross-reference report. This can make it easier to differentiate blocks that may have the same name. For more information about cross-reference reports, see the [PAC Control User's Guide](#) (form 1700).
- You can now pass PID loops as parameters into subroutines. For more information about subroutines, see the [PAC Control User's Guide](#) (form 1700).
- While in Debug mode, if the I/O unit is a *groov* EPIC or *groov* RIO, the I/O Unit dialog now displays the I/O unit's serial number. This requires the controller running the PAC Control strategy to have the following firmware version (or higher):
 - *groov* EPIC: 4.0.0

- SNAP PAC: R10.5g
- You can now pass pointers as parameters into subroutines. For more information about subroutines, see the [PAC Control User's Guide](#) (form 1700).
- A new command has been added to stop an alternate host task: **Stop Alternate Host Task**. For more information about this new command, see the [PAC Control Command Reference](#) (form 1701).
- You can now copy strategy blocks from a PAC Control Basic strategy and paste them into a PAC Control Professional strategy. For more information about what elements you can copy and paste, see the [PAC Control User's Guide](#) (form 1700).
- The View/Print I/O Point Mappings dialog box now contains new options for 12-, 24-, and 64-channel modules, which are available in the *groov* I/O module family. For more instructions, see the [PAC Control User's Guide](#) (form 1700).
- Updates were made to enhance security.

PAC Display

- For the operator-driven attribute Execute Menu Item, a menu item was added: **Security/Add/Modify User**. This menu item makes it possible for operators with the correct permission to add or modify other users. For more information about the Execute Menu Item attribute, see the [PAC Display User's Guide](#) (form 1702).
- When you configure an alarm to send an email, you can now select email servers that support TLS versions 1.2 and 1.3.
- Some error messages generated by the Regenerate IO Scanner Tag Name function and subsequently stored in the `IOScannerErrorLog.txt` file have been improved to help you identify the source of the error. For more information about this function, see the [PAC Display User's Guide](#) (form 1702).
- Error messages from the OptoOPCServer have been improved to provide more information. Previously, only a hex code was provided.
- The Tag Selection window now displays the currently selected tag in the window's title area to help you remember which tag you selected as you select a new tag. For more information about this function, see the [PAC Display User's Guide](#) (form 1702).
- There is a new runtime setting that, when enabled, colors a gadget if the tag's quality code is anything other than good. The new setting is called **Enable graphic color change**, located in the new **Bad Tag Quality Graphics Options** section of the **I/O Unit Tags** tab. For more information and instructions about enabling this setting, see the [PAC Display User's Guide](#) (form 1702).
- A setting has been added to the **I/O Unit Tags** tab of the Runtime Options window so that you can specify an override value if the value of a *groov* analog input is NaN. This setting is enabled for new projects created in PAC Display 10.6. When you import an existing project into PAC Display 10.6, PAC Display requests that you specify a value for this setting. For more information and instructions about configuring this setting, see the [PAC Display User's Guide](#) (form 1702).
- Updates were made to enhance security.

PAC Manager

- PAC Manager now detects whether a controller is configured with Secure Software Download (SSD) and, if the firmware you try to download via **Install Firmware via Ethernet** does not have the SSD key, PAC Manager displays a message that the key is missing and prevents you from installing the firmware. For more information about Secure Software Download, review the PAC Terminal SSD documentation you were provided or search for "PACTERMSSD" on the Opto 22 website (www.opto22.com).
- In the Find Opto 22 MMP Devices dialog box, the information in the **Unit Type** column has been separated into two columns: **Unit Type** and **Part Number**. This may make it easier to visually scan through the list to find the device you are looking for. For more information about the Find Opto 22 MMP Devices function, see the [PAC Manager User's Guide](#) (form 1704).

- The **Status Read** area of the Inspect window now provides the **Installed RAM** information in two formats: number of bytes and number of megabytes. This is helpful when you want to know if the device you are inspecting is a SNAP-PAC-R1 or a SNAP-PAC-R1 (GEN2); a GEN2 has more memory than a pre-GEN2. For more information about the Inspect Opto 22 Devices window, see the [PAC Manager User's Guide](#) (form 1704).
- In the Install Firmware via Ethernet dialog, the G4EB2 was missing from the list for the **Install Firmware via Ethernet Connection** option, and it has now been added.

Bug Fixes

- PAC Control ([page 35](#)): 84926, 87521, 90711, 90756, 90947, 90973, 91042, 91079, 91101, 91105, 91108, 91205, 91238
- PAC Display ([page 73](#)): 89977, 90500, 90590, 90600, 90718, 90721, 90736, 90755, 90854, 90861, 90902, 91044, 91080, 91094, 91096, 91112, 91128, 91164, 91166, 91187, 91221, 91303
- PAC Manager ([page 125](#)): 90853, 90940, 91122, 91132, 91136, 91213
- OptoDataLink ([page 156](#)): 90524, 90852, 90921
- OptoOPCServer ([page 164](#)): 90457, 90765, 91057
- SoftPAC ([page 176](#)): 90759

PREVIOUS VERSIONS OF PAC PROJECT

PAC Project R10.5003

Released: December 19, 2023. Updated: January 3, 2024 and October 23, 2025.

Bug Fixes

- PAC Control ([page 36](#)): 90768, 90769, 90809
- PAC Display ([page 75](#)): 90559, 90749
- PAC Manager ([page 126](#)): 90678
- OptoDataLink ([page 157](#)): 90778, 90796, 90810
- SoftPAC ([page 177](#)): 90130, 90139, 90140, 90141, 90142

PAC Project R10.5002

Released: May 22, 2023. Updated: May 24, 2023.

Enhancements

PAC Control

Save strategy to permanent storage after download option—Beginning with this release, this option is enabled for new strategies. You can find this option by clicking **File > Strategy Options**, and then click the **Download** tab.

OptoOPCServer

Internal changes were made so that storing data to a 64-bit Integer Table Pointer Variable now works correctly.

Bug Fixes

- PAC Control ([page 36](#)): 84720, 84921, 87065, 88329, 88408, 89361, 89495, 89575, 90528, 90529, 90545, 90557, 90561

- PAC Display (page 75): 88728, 90577, 90583
- PAC Manager (page 126): 90538

PAC Project R10.5001

Released: February 9, 2023.

Bug Fixes

OptoDataLink (page 157): 90520, 90521, 90533, 90536

PAC Project R10.5000

Released: November 14, 2022. Updated: December 12, 2022 and October 23, 2025.

New Features

PAC Control

In Configure mode, you can now export variables from and import variables into your strategy. In Debug mode, you can now retrieve non-volatile variables values from the controller and later send them to the controller:

- Now you can right-click on the **Variables** folder in the strategy tree to export variables to a comma-separated values (.csv) file or import variables from a .csv file.
- While in Debug mode, click the **Control Engine** menu item to access two new actions: **Upload Non-Volatile Variables** and **Download Non-Volatile Variables**. (This new feature was also added to PAC Terminal.) When you upload these types of variables, the information is saved into a .nvf file.

IMPORTANT: This new feature requires the following firmware versions:

- groov EPIC processors: 3.5¹
- SNAP PAC controllers: R10.5²

When you configure groov energy monitoring (GRV-R7-I1VAPM-3) and power monitoring (GRV-IVAPM-3) modules, you can:

- Specify a new measurement mode that supports monitoring 3-phase loads with 2 current transformers (CT). (The default measurement mode continues to be monitoring 3-phase loads with 3 CTs.)

IMPORTANT: This feature requires firmware version 3.5 on groov EPIC processors and groov RIO modules.

- Configure the polarity of each phase. Switching the polarity configuration helps you avoid the overhead involved in physically changing the wires connected to the load.

IMPORTANT: This feature requires the following:

- With GRV-IVAPM-3 modules: firmware version 3.5 on groov EPIC processors and firmware version 1.4a on the GRV-IVAPM-3 module
- With GRV-R7-I1VAPM-3 (groov RIO EMU): firmware version 3.5.0

Enhancements

PAC Control

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1. Available early 2023.
 2. Available first half 2023.

- Now you can set the output of a PID loop to be a digital output configured with the TPO feature. Previously, you could do this only through PAC Manager and the Ethernet/IP Configurator. This requires firmware R10.5g (or higher) for SNAP PAC controllers and firmware 3.4.0 (or higher) for *groov* EPIC controllers.
- If your PAC Control strategy uses *groov* EPIC I/O units, you can now use the ON Totalization or OFF Totalization feature of *groov* digital I/O modules. This requires firmware R10.5g (or higher) for SNAP PAC controllers and firmware 3.5.0 (or higher) for *groov* EPIC controllers.
- The following commands have been added to make it more convenient to read or write to 64-bit scratchpad registers:
 - Get I/O Unit Scratch Pad Integer 64 Element
 - Get I/O Unit Scratch Pad Integer 64 Table
 - Set I/O Unit Scratch Pad Integer 64 Element
 - Set I/O Unit Scratch Pad Integer 64 Table
- You can now press CTRL-A to select all elements in a chart.
- For *groov* analog input modules, you can now set a simple moving average (SMA) when you configure a channel.
- For *groov* digital output modules, you can now get totalizer values with the following commands:
 - Get & Restart Off-Time Totalizer

IMPORTANT: *This enhancement requires firmware version 3.5 on groov EPIC processors.*

- Get & Restart On-Time Totalizer
- Get Off-Time Totalizer
- Get On-Time Totalizer

PAC Control & PAC Terminal

The Inspect Control Engine dialog box now displays more information about the strategy stored in permanent storage.

IMPORTANT: *This enhancement requires the following firmware versions:*

- *groov EPIC processors: 3.5¹*
- *SNAP PAC controllers: R10.5²*

OptoDataLink

Support for the following Microsoft databases has been added:

- Azure SQL Database
- SQL Server Express 2022 Preview
- SQL Server Express 2019
- SQL Server Express 2017
- SQL Server Express 2016

OptoOPCServer

Changes made by Microsoft to the Windows DCOM Server Security necessitated a change in instructions on how to configure DCOM. See Chapter 3, "Configuring DCOM in Windows" in the [OptoOPCServer User's Guide](#) (form 1439).

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1. Available early 2023.
 2. Available first half 2023.

Bug Fixes

- PAC Control ([page 37](#)): 86762, 86962, 90209, 90224, 90237, 90249, 90286, 90325, 90366, 90373, 90443, 90459, 90461
- PAC Manager ([page 126](#)): 90311
- OptoDataLink ([page 157](#)): 90191
- OptoOPCServer ([page 165](#)): 90208

PAC Project R10.4003

Released: February 21, 2022.

NOTE: The version number for PAC Manager was updated to indicate a change in the installer. No other changes were made to PAC Manager.

Bug Fix

PAC Control ([page 39](#)): 90199

PAC Project R10.4002

Released: February 21, 2022.

Enhancement

The bridge firmware files used by PAC Manager have been updated to version S10.4d. If you use the separate PAC Manager installer, make sure you use PAC Manager R10.4c.

PAC Project R10.4001

Released: January 31, 2022.

New Feature

OptoOPCServer

Enabling the optimization of common numeric table element requests has been changed from creating a key in the Windows Registry to creating a file. For instructions, see the [Optimizing PAC Project System Performance Technical Note](#) (form 1776).

Bug Fixes

- PAC Control ([page 39](#)): 82165, 83600, 85463, 87972, 88766, 89620, 89951, 89953, 89956, 89962, 89963, 89969, 90000, 90018, 90029, 90081, 90092
- PAC Manager ([page 127](#)): 90124

PAC Project R10.4000

Released: September 7, 2021. Updated: September 29, 2022 and October 23, 2025.

New Features

PAC Control

New operators have been added to the command line interface (CLI) to configure the Public Access attributes of variables and channels. With the new operators, you can configure the Public Access attribute as read-only or read-write, or you can clear (disable) the Public Access attribute.

Enhancements

Added support for the following channel types introduced in GRV-ITR-12 module firmware version 1.4a:

- FastADC
- Disabled

For more information about these channel types, see the [groov I/O Modules Firmware Release Notes](#).

PAC Control

- You can now configure GRV-IDCI-12 modules with the new digital channel type: 10-25 VAC. Your module must have firmware version 1.3b or higher.
- You can now configure *groov* RIO models GRV-R7-MM1001-10 and GRV-R7-MM2001-10 with a new channel type: 4 to 20 mA. Your *groov* RIO must have *groov* RIO firmware version 3.2.0 or higher.
- For the following two commands, the name of parameter 0 (“Has”) has been changed to “I/O Unit”:
 - Caused a Chart Error?
 - Caused an I/O Unit Error?
- For the following two commands, the behavior has been improved so that the commands write to a number of elements in a table equal to the number of channels on a module instead of a default of 32 elements:
 - Get Module Counters
 - Get & Clear Module Counters
- In the Add I/O Unit dialog, the default type has been changed from SNAP-PAC-R1 to GRV-EPIC-PR1.
- A new Move Module To Numeric Table command has been added, which stores the current value of each channel (digital and analog) into an element of a numeric table. For this command to work, you must have the following firmware versions installed on your controller/processor:
 - *groov* EPIC processors: 3.3.0 or higher
 - SNAP PAC controllers or SoftPAC: R10.5g or higher

PAC Project

Shortcuts have been added to the PAC Project folder located in the Windows Start menu (**Start > Opto 22 > PAC Project**) so that you can quickly find product support files. For instructions about using these files, see the “Product Support” section in any of the PAC Project user’s guides or command references.

IMPORTANT: *PAC Project no longer supports Windows 7. While you may still be able to install PAC Project and its components on Windows 7, Opto 22 is no longer testing on Windows 7.*

Bug Fixes

- PAC Control ([page 40](#)): 89127, 89634, 89649, 89695, 89807
- PAC Display ([page 75](#)): 88728, 89001, 89397, 89476, 89696
- PAC Project Installer (listed under PAC Project Tools, [page 148](#)): 89504

PAC Project R10.3003

Released: December 18, 2020.

Enhancements

- You can now configure thermistor and resistor inputs on any GRV-R7-MM1001-10 that has firmware version 3.0.0 or higher.
- New digital module commands (commands that work on the entire module, not individual points) have been added. For a list of the new commands and their descriptions, see “Chapter 9: Digital Module” in the

[PAC Control Command Reference](#) (form 1701). For these commands to work, you must have the following firmware versions installed on your controller/processor:

- For GRV-EPIC-PR1: 3.0.1 or higher
- For SNAP PAC controllers or SoftPAC: R10.4a or higher
- The Shift Numeric Table Elements command has been enhanced to accept Integer 64 Tables.
- A new command has been added: Shift String Table Elements. For more information, see the [PAC Control Command Reference](#) (form 1701).
- The average scan time displayed for simple modules in the I/O Unit dialog box (under the **Information** tab) has been recalibrated to show more accurate information.
- You can now configure Steinhart-Hart coefficients for thermistors that are not pre-defined on SNAP-AIR400K-8 modules.

Bug Fixes

- PAC Control ([page 41](#)): 60818, 87149, 87702, 88883, 89160, 89197, 89205, 89211, 89215, 89220, 89263, 89268, 89327, 89386, 89395
- PAC Display ([page 75](#)): 88845, 88886, 88931, 89250

PAC Project R10.3002

Released: August 21, 2020.

Bug Fix

PAC Control ([page 41](#)): 89203

PAC Project R10.3001

Released: August 17, 2020.

Enhancement

The strategy tree search box has been enhanced to behave the same as the Add Variable dialog (spaces are converted to underscore characters).

Bug Fixes

- PAC Control ([page 41](#)): 54208, 82489, 85993, 86403, 86581, 87394, 87786, 88057, 88638, 88712, 88987, 88992, 89027, 89076, 89082, 89097, 89114, 89162, 89182
- PAC Display ([page 76](#)): 88706, 88711, 88715, 88936, 89022
- PAC Manager ([page 127](#)): 89120
- OptoOPCServer ([page 165](#)): 88948

PAC Project R10.3000

Released: May 4, 2020.

New Feature

PAC Project now supports GRV-R7-MM1001-10, the first in the *groov* RIO family of remote I/O units. PAC Control, PAC Display, and OptoDataLink have been updated to include this support.

Enhancement

Several enhancements have been made to improve security.

OptoOPCServer

A new property has been added to the Scanner data type, FirstAltIp. Use this property to specify a backup IP address as a string value.

Bug Fixes

- PAC Control ([page 42](#)): 88858, 88889, 88937
- PAC Display ([page 76](#)): 88808
- SoftPAC ([page 177](#)): 88435

PAC Project R10.2005

Released: January 6, 2020.

Enhancement

This release adds support for GRV-IVIRMS-10, a new *groov* I/O module.

Bug Fix

PAC Display ([page 76](#)): 88739

PAC Project R10.2004

Released: October 22, 2019. Updated: December 9, 2019.

Bug Fix

PAC Control ([page 42](#)): 88633

PAC Project R10.2003

Released: October 16, 2019. Updated: December 9, 2019.

Enhancement

This release adds support for the following *groov* I/O modules (requires a *groov* EPIC processor with firmware 1.4.2 or newer): GRV-IVI-12, GRV-IRTD-8, GRV-IDCSW-12, and GRV-ITM-12.

Bug Fixes

- PAC Control ([page 43](#)): 85689, 86860, 87523, 87806, 88298, 88404, 88414, 88599
- PAC Display ([page 76](#)): 87962, 88198, 88305, 88306, 88311, 88313, 88382
- PAC Manager ([page 127](#)): 88319, 88384, 88508
- PAC Project Tools ([page 148](#)): 88297, 88486
- OptoDataLink ([page 158](#)): 88295, 88490

PAC Project R10.2002

Released: June 10, 2019.

Bug Fixes

- PAC Control ([page 43](#)): 80791, 86174, 86395, 87818, 87902, 88012, 88055, 88094, 88173, 88179
- PAC Display ([page 76](#)): 87904, 87917, 87942, 87950, 87959, 87964, 87968, 88024, 88037, 88038, 88039, 88077, 88084, 88154, 88215, 88282, 88283, 88307, 88327

- PAC Manager ([page 128](#)): 88092, 88181
- PAC Redundancy Manager ([page 155](#)): 88002
- OptoDataLink ([page 158](#)): 87947
- OptoOPCServer ([page 165](#)): 87995, 88145, 88288

PAC Project R10.2001

Released: February 5, 2019.

Bug Fix

OptoOPCServer ([page 166](#)): 87937

PAC Project R10.2000

Released: December 3, 2018.

Enhancement

PAC Control has added support for future models of *groov* I/O modules.

Bug Fixes

- PAC Control ([page 44](#)): 86962, 87830, 87855, 87895
- PAC Display ([page 77](#)): 87747, 87789, 87791, 87792, 87797, 87801, 87804, 87805, 87812, 87827, 87861, 87890, 87895
- PAC Project Tools ([page 148](#)): 86962, 87573
- OptoOPCServer ([page 166](#)): 87825

PAC Project R10.1001

Released: October 31, 2018.

Bug Fix

PAC Control ([page 43](#)): 87782

PAC Project R10.1000

Released: September 19, 2018.

New Features

PAC Control

- You can now add *groov* serial communication modules to I/O Units in PAC Control strategies.
- When the control engine is a *groov* EPIC processor (GRV-EPIC-PR1), PAC Control can automatically detect and add to the strategy *groov* serial communication modules on the same chassis as the processor. To configure *groov* serial communication modules in PAC Control, you enter a name and description, and you select the channel type (that is, RS-232 or RS-485; 2- or 4-wire; termination or no termination; biasing or no biasing). Other parameters (such as the baud rate) are configured in the COM handle.
- In addition, for SNAP devices, you can add a serial module placeholder to help you more easily identify which positions on a SNAP PAC rack hold serial communication modules. (You still must configure SNAP communication options in PAC Manager.)

PAC Display

- The **View > Reset Dialog Positions** feature now also resets the Toolbox to the position configured in **File > Configurator Options > Multiple Monitor Options**.
- The Center Dialogs feature (**File > Configurator Options > Multiple Monitor Options**) can now position all Microsoft Windows common dialog boxes except for the following: Color, Font, File Open, File Close, and Print. These dialog boxes open where they were last positioned.
- Prior to this release, if the tags you selected in the Find and Replace dialog box (**Edit > Replace**) were not of the same type, PAC Display displayed an error. Now, when you select a tag in the **Find What** field, PAC Display automatically fills the **Replace With** field with tags can be selected as replacements.

Bug Fixes

- PAC Control ([page 44](#)): 52626, 80542, 86962, 87513, 87567
- PAC Display ([page 78](#)): 86374, 87568, 87586, 87587, 87589, 87601, 87632, 87648, 87691
- PAC Project ([page 148](#)): 87571, 87739

PAC Project R10.0001

Released: July 9, 2018.

Enhancement

PAC Manager

If your SNAP PAC SB-series brain requires PAC firmware R9.5g or newer, PAC Manager now warns you when you try to downgrade the firmware to an unsupported version. For more information, see [KB87213](#).

Bug Fixes

- PAC Control ([page 44](#)): 80124, 87473, 87492, 87520, 87539, 87547, 87558, 87560
- PAC Display ([page 78](#)): 86833, 87227, 87280, 87457, 87460, 87464, 87474, 87479, 87498, 87526, 87527, 87533, 87543
- PAC Manager ([page 128](#)): 87560
- PAC Project ([page 149](#)): 87560
- OptoDataLink ([page 158](#)): 82887, 83184, 87200
- OptoOPCServer ([page 166](#)): 87560

PAC Project R10.0000

Released: May 18, 2018. Updated: July 2, 2018 and September 12, 2018.

New Features

PAC Control

- PAC Control now supports public access for I/O points and variables.
- PAC Control now supports *groov* EPIC processors and *groov* I/O.
- Quality indicators for *groov* I/O units and channels can now be displayed when inspecting *groov* I/O in Debug mode.
- In Config mode, PAC Control can automatically detect and add to the strategy *groov* I/O units and channels that are on the same network and subnet as the computer running PAC Control.
- You can now configure points and variables so that applications such as Ignition® SCADA or ones that use Cirrus Link Solutions' "*groov* EPIC and SNAP PAC Driver module" can read and write to them.
- The following new commands have been added:
 - Get I/O Channel Quality;

- Get I/O Unit Quality
- Get Number of Charts Running
- Get Redundant Controller State
- Get Redundant Controller Status
- Get Strategy Name
- Get TPO Percent
- Get TPO Period

PAC Display

When a graphic object extends beyond the borders of a draw window or (Pro only) URL window, you can now configure the window to display scroll bars. You can set this option globally (for all windows in the project) or for individual windows.

Enhancements

PAC Control

- You can now change integer variables to floats, and floats to integers.
- Before PAC Control opens a strategy that was created in an older version of PAC Control, it creates a strategy archive—including subroutines and watch windows—to preserve the original strategy for you. Likewise, PAC Control Pro archives a PAC Control Basic strategy before opening it. The strategy archive name now includes the PAC Control version, such as: `Cookies.R9.6a.Basic.Backup.D05122018.T081409.zip`, which indicates the original strategy was created in PAC Control Basic R9.6a.
- The Scaled Units string value of a *groov* analog channel is now sent to the I/O unit as part of the channel configuration data. This now allows applications such as *groov* Manage to access the data from the memory map.

PAC Display

- The Graphic Dynamic Attribute dialog box has been streamlined to make it easier and faster to assign dynamic attributes to graphic objects. If you prefer, you can set PAC Display Configurator to display the old-style way of configuring dynamic graphics. You can also switch between the two styles while deciding which one you prefer.
- The naming format for Hourly Historical Data log files now includes the 4-digit year. The format is `Rhyyyy_mmddhh.H####` (or `Rhyyyy_mmddhh.T####` for SuperTrends).

PAC Manager

- If your controller or brain has an I/O coprocessor that needs a firmware update, the **Diagnostic Messages** button (yellow exclamation mark) now appears when you open the Status Read window (**Tools > Inspect**). For more information about I/O coprocessors, see the [SNAP PAC I/O Coprocessor Firmware Readme](#). For more information about the **Diagnostic Messages** button, see “Viewing Diagnostic Messages” in the *PAC Manager User’s Guide* (form 1704).
- (Not applicable to SNAP PAC SB-series brains.) If your SNAP PAC controller or brain requires PAC firmware R9.5g or newer, PAC Manager now warns you when you try to downgrade the firmware to an unsupported version. The warning message reads “The device at address <number> requires firmware 9.5g or higher. Firmware update failed.” For more information, see [KB87213](#).

Bug Fixes

- PAC Control ([page 44](#)): 52626
- PAC Display ([page 79](#)): 86803, 86947, 87035, 87205, 87208, 87214, 87216, 87221, 87243, 87292, 87293, 87297, 87305, 87311, 87314, 87317
- OptoDataLink ([page 158](#)): 86029, 87333, 87351

PAC Project R9.6006

Released: February 21, 2018.

Bug Fixes

- PAC Display (page 80): 87077, 87081, 87082, 87106, 87107, 87109, 87110, 87111, 87112, 87117, 87119, 87126, 87130, 87134, 87141, 87188, 87190
- OptoOPCServer (page 166): 87078

PAC Project R9.6005

Released: November 27, 2017. Updated: January 11, 2018.

Bug Fixes

- PAC Control (page 45): 82545, 86967, 86983, 87044, 87066
- PAC Display (page 80): 86650, 86869, 86878, 86879, 86885, 86886, 86887, 86889, 86895, 86898, 86918, 86922, 86947, 86956, 86961, 86964, 86978, 86987, 86995, 87000, 87006, 87008, 87022, 87033, 87050, 87056

PAC Project R9.6004

Released: July 19, 2017. Updated: October 3, 2017, October 24, 2017, and April 9, 2018.

Enhancements

PAC Display

- Dates and times for records in historical data logs are once again logged in YYYY/MM/DD, HH:MM:SS.SSS format (as was the case in PAC Display R9.4e and lower). If you prefer that dates and times are logged in the MM/DD/YYYY, HH:MM:SS.SSS format (as they are in R9.5a through R9.6d), make sure to deselect the new **Use Legacy Log Date Format** option (**Configure > Runtime > General** tab).
- (Pro only) When configuring PAC Display Pro to log historical files to a database (**Configure > Historical Data Log > Add** (or **Modify**) button > **Log To > Log to Database**), Configurator now immediately opens the Database Table dialog box. (Previously, you had to click **OK** on the Historical Log Configurator dialog box to open the Database Table dialog box.)
- When an application error happens, PAC Display now displays a message with the location of the related Windows error dump (. dmp) file. Dump files are used to troubleshoot serious application errors, and the PAC Display message will ask you to email the dump file to Opto 22's Product Support Group for analysis.
- Configurator now immediately opens the Database Table dialog box.

Bug Fixes

- PAC Control (page 46): 86851, 86852
- PAC Display (page 81): 82824, 86342, 86480, 86654, 86710, 86739, 86741, 86749, 86752, 86753, 86758, 86776, 86786, 86788, 86789, 86804, 86830
- OptoDataLink (page 159): 86640

PAC Project R9.6003

Released: April 24, 2017. Updated: March 13, 2017 and April 14, 2017.

Bug Fixes

- PAC Display (page 82): 86231, 86622, 86632, 86637, 86641, 86645, 86646, 86650, 86663, 86673, 86682, 86685

- OptoDataLink (page 159): 86640

PAC Project R9.6002

Released: March 7, 2017. Updated: March 13, 2017 and April 14, 2017.

Bug Fixes

- PAC Control (page 46): 86580
- PAC Display (page 82): 86578, 86579, 86583, 86585, 86609, 86610
- PAC Manager (page 128): 86549

PAC Project R9.6001

Released: February 27, 2017. Updated: March 1, 2017 and March 7, 2017.

Bug Fixes

- PAC Control (page 46): 86576
- PAC Display (page 83): 86508, 86511, 86539, 86541, 86544, 86545, 86550, 86551, 86562
- PAC Manager (page 129): 86547, 86552
- PAC Project Installer and SoftPAC (page 149): 86569

PAC Project R9.6000

Released: February 1, 2017.

Enhancements

PAC Control

- PAC Control now provides a command-line interface (CLI) to compile a strategy to a .cdf file, add a variable to a strategy, move modules in a strategy, and move points in a strategy.
- To configure a strategy to start running at completion of the strategy download, you can now check the **Start strategy after download completes** option on the **File > Strategy Options > Download** tab.
- You can now use the new **Change Folder** button on the Subroutine Files dialog box to change a subroutine's folder.

PAC Display

- You can now control the transparency of windows and graphical objects. This is great for making windows and controls (like SuperTrends and alarm graphics) invisible or semi-transparent in Runtime. The transparency feature also lets you create non-solid (for example, dotted or dashed) lines with widths greater than 1 pixel. (Prior to R9.6000, only solid lines could be wider than 1 pixel.)
- History alarm graphics now have a new **Clear** button that Runtime operators can use to clear the list of alarms in alarm history windows.
- SuperTrends can now trend integer bits.
- The new Copy, Paste, and Merge feature (in **Edit > Security Permissions**) lets you copy a graphic's security permissions, and then apply them to a set of chosen graphics. You can also apply the permissions to all graphics in the window or to all graphics in the project.
- You now have new options for setting the position of Configurator and Runtime dialog boxes in multi-monitor environments.
 - The Z-Order function now displays thumbnails and descriptions of overlapping graphic objects so you can drag and drop an object to a different position in the stack.

- (Pro only) You can also double-click the thumbnail to open the object's Graphic Dynamic Attributes dialog box.
- (Pro only) The new User Agent Switching option lets you specify the target browser and operating system for a URL control or URL window. The option also provides the ability to set a global user agent value for all URL controls and URL windows in all of your PAC Display projects. To maximize the viewing area, you can now hide a URL window's forward and back navigation controls.
- You can now configure a custom mail server for sending alarm emails. You can also send a test email to verify that your Alarm Point Email configuration works. When an alarm alert email fails to send, the message written to PAC Display's event log is more descriptive to help you quickly find and fix the issue.
- The Project Path dialog box (**File > Project Path**) includes a new **Open Folder** button, so you can easily open the folder where the project is located.
- When a table's length exceeds the size of the window it is displayed in, you can now scroll through the rows by using the mouse's scroll wheel.

PAC Manager

- New **Next** and **Back** buttons in the Inspect window (**Tools > Inspect**) let you more easily navigate through the alphabetized list of device names.
- The five most recently inspected devices appear at the top of the alphabetized list of device names.
- You can now resize table columns in Inspect windows to more easily see their contents.

OptoDataLink

- OptoDataLink provides improved visual notification when the OptoDataLinkRuntime service is stopped. The notification stays on the screen until the service is restarted.
- When you run OptoDataLink Monitor with administrator privileges, you can use OptoDataLink Monitor's pop-up menu to start and stop the OptoDataLinkRuntime service.
- OptoDataLink automatically recognizes when a strategy includes redundant controllers, and includes information about them in the OptoDataLink project.
 - When the project runs, OptoDataLink will now detect when the active controller changes and will switch to scanning the new active controller.
 - The last five projects that were opened are now listed at the bottom of the **File** menu so you can open them again with just one click.

Bug Fixes

- PAC Control (page 46): 80566, 86311
- PAC Display (page 83): 86288, 86433, 86435, 86444, 86458, 86471, 86481, 86493, 86503

PAC Project R9.5003

Released: December 14, 2016.

Enhancements

PAC Display

Reduced the number of web page reloads used by URL controls and URL windows. This enhancement improves response time, and may prevent external websites from requesting login credentials when a user is already logged in.

SoftPAC

SoftPAC has been updated with the latest version of PAC firmware (R9.5d). If you have SoftPAC R9.5a or higher, you can now get the latest firmware by using the **Update Firmware** option in SoftPAC Monitor.

NOTE: To upgrade firmware in SoftPAC R9.4b or lower, you must first install SoftPAC R9.5a (or higher) directly from the PAC Project installation file. You can download the installer from the [Opto 22 Downloads web page](#). For details, see [KB86020](#).

Bug Fixes

- PAC Display ([page 84](#)): 86284, 86285, 86292, 86299, 86300, 86309, 86324, 86337, 86344, 86346, 86350, 86355, 86374, 86375, 86398, 86402, 86417
- PAC Control ([page 47](#)): 86325
- OptoOPCServer ([page 167](#)): 86394
- PAC Project Tools ([page 149](#)): 86910

PAC Project R9.5002-339

Released: September 27, 2016. Updated: September 28, 2016 and March 13, 2017.

Enhancements

PAC Display

You can now select **None** as an ODBC data source (**Configure > ODBC Data Source**). This feature allows you to temporarily or permanently break the internal link between PAC Display and a configured ODBC data source.

NOTE: When you select **None**, you should also reconfigure all objects configured to use the ODBC data source to instead use a file as the source or destination. This step saves the data and prevents an error message when PAC Display Runtime is unable to connect to the ODBC data source.

OptoDataLink

OptoDataLink can now write NULL float values for all supported databases.

Bug Fixes

- PAC Control ([page 47](#)): 83014, 84173, 84335, 85776, 86218, 86223
- PAC Display ([page 85](#)): 86122, 86156, 86158, 86159, 86166, 86177, 86181, 86182, 86184, 86197, 86217, 86225, 86232, 86251
- PAC Manager ([page 129](#)): 86170, 86180, 86219, 86237
- OptoOPCServer ([page 167](#)): 86148
- OptoDataLink ([page 159](#)): 86126, 86224
- SoftPAC ([page 178](#)): 86233

PAC Project R9.5001

Released: August 26, 2016. Updated: January 9, 2017 and October 3, 2017.

Enhancements

PAC Display

To make it easier to identify version and build information, the **Help > About** window now displays the software's build number in addition to its version number and build date.

OptoDataLink

Support added for Microsoft SQL Server 2014.

Bug Fixes

- PAC Control ([page 47](#)): 80379, 82105, 82216, 82614, 84834, 84884, 85615, 86130, 86143
- PAC Display ([page 86](#)): 84870, 85587, 85987, 86021, 86094, 86101, 86102, 86103, 86104, 86108, 86113, 86116, 86117, 86123, 86131, 86136, 86137, 86147, 86149
- OptoDataLink ([page 159](#)): 85982, 86133, 86140

PAC Project R9.5000

Released: July 15, 2016. Updated: July 22, 2016; November 9, 2017; and July 30, 2018.

Enhancements**Firmware**

- SNAP PAC S-series and R-series controllers with firmware R9.5a and higher include a built-in HTTP/HTTPS server and a RESTful API, so you can access data in the PAC controller using the programming language of your choice. Configuration options have been added to PAC Manager for enabling the HTTP/HTTPS server and choosing the server's port.
- Added support for direct configuration of E1 digital I/O units with standard G1, G4, or Quad Pak module part numbers, and for E2 analog I/O units with standard G1 module part numbers. (Requires E1/E2 firmware R1.2a. Also requires PAC firmware R9.5a or higher in the SNAP PAC controller.)
- Added support for the SNAP-AIRTD-8U multi-function RTD/resistance analog temperature input module.
- Added support for the SNAP-OMR6T-C mechanical power relay output module. Windows 10 and Windows 8.1 only.
- Added a new PAC Project folder to the Windows desktop for easy access to PAC Project software and tools.
- Added the version number and the designation Basic or Professional to the list of "Open with" applications so you can choose which version and release number to open a specific strategy or project with (**File Explorer** > **Open** pop-up menu).

Firmware Notes:

- **Windows XP and Windows 2000 No Longer Supported**
 - *The PAC Project Software Suite no longer supports operating systems for which Microsoft has ended support. This includes Windows XP and Windows 2000. If you attempt to install any PAC Project R9.5000 (or higher) software component on an operating system that Microsoft no longer supports, the installation software displays an error message and then ends.*
 - *Additionally, Microsoft ended support for SQL Server 2005 on April 12, 2016.*
 - *If you are using SQL Server 2005 or lower with PAC Display or OptoDataLink, you should consider upgrading.*
- **New PID Algorithms for ISA, Parallel, and Interacting**
 - *To address an issue that occurs when the input to a PID loop is supplied by the host ([KB82058](#)), new algorithms for ISA, Parallel, and Interacting were added to PAC firmware R9.4c and higher. This change does not affect the calculations for existing PID loops.*
 - *To avoid impacting existing PID loops, the original algorithms were renamed in PAC Project R9.5000; their names now include the word "Obsolete." Also, the Velocity (Type B) name now includes "Obsolete" because it was previously replaced by Velocity (Type C).*
 - *You can continue to use the obsolete algorithms. However, Opto 22 recommends you use the new algorithms when you create PID loops for new applications—especially when the input is supplied by the host. For more information, see the Opto Knowledge Base article [KB82058](#).*

PAC Control

Added nested subroutines, breakpoints inside OptoScript blocks, the ability to move entire modules as well as points, direct configuration of E1 and E2 I/O units, the ability to change I/O unit types within the strategy when upgrading processors, SSL security for outgoing (client) TCP comm handles, and a variety of other enhancements to make PAC Control easier to use.

PAC Display

- Removed dependency on OptoDisplS.exe Windows service.
- Added user groups to security, a configurable URL refresh rate, Runtime support for interactive websites, more security options for Alarm emails, the ability to adjust alarm logging column length, custom colors for alarm logging, the ability to rename the index column, align data options, and add up to 16 columns with the Table tool, the ability to view Runtime logged-in username, writing Event Log messages to a database, loading recipes to and from a database, the ability to refresh Alarm reference counts, new controls to more quickly configure tags, and many more new features and enhancements.

PAC Manager

Added support for new SNAP I/O modules, easier configuration of E1 and E2 I/O units and their I/O points, easier SSL certificate registration, and more.

OptoDataLink

Added the ability to copy columns of data from a database table to a strategy table, controller redundancy switching, enhanced error messages, the ability to store only the most recent values in a file or database table, and OptoDataLink Monitor (provides visual feedback on the status of running links).

SoftPAC

Added the ability to more quickly display the Message Queue and the controller status dialog box.

Bug Fixes

- PAC Control ([page 48](#)): 80542, 80780, 81116, 83045, 84552, 84706, 84806, 84833, 84905, 85020, 85034, 85039, 85369, 85583, 85661
- PAC Display ([page 86](#)): 81332, 83921, 84409, 84663, 84682, 84699, 84732, 84743, 84758, 84762, 84803, 84839, 84840, 84878, 84892, 84893, 84895, 84915, 85023, 85080, 85082, 85182, 85201, 85220, 85261, 85279, 85292, 85296, 85309, 85338, 85379, 85398, 85429, 85491, 85510, 85511, 85555, 85565, 85576, 85669, 85702, 85591, 85604, 85607, 85637, 85642, 85648, 85657, 85658, 85725, 85744, 85758, 85767, 85793, 85842, 85897, 85928, 85951
- PAC Manager ([page 129](#)): 84680, 84903, 85044, 85061, 85277
- OptpDataLink ([page 160](#)): 83183, 83453, 84717, 84730, 84968, 85247, 85762
- OptoOPCServer ([page 167](#)): 84681, 85046

PAC Project R9.4000

Released: September 23, 2014. Updated: October 24, 2017.

Enhancements

PAC Project files are now digitally signed. Added support for Windows 10.

PAC Control

- Added support for HART® SNAP I/O modules SNAP-AIMA-iH and SNAP-AOA-23-iH, including nine new commands.
- Added support for lead compensated point types to the SNAP-AIRTD, SNAP-AIRTD-1K, and SNAP-AIRTD-10 analog temperature input modules.
- Loading of archived strategies has been improved. Added support for Windows 8.1.

PAC Display

- The requirement to enter a Runtime user's password to delete a user has been removed. You can now configure an ODBC database for logging SuperTrend, Historic Log, and Runtime Operator Logging data files.
- Added support for the Portable Network Graphics (.png) file format. When PAC Display Runtime needs to upload or download recipe files, it now looks in two locations for the strategy tag database (.i.db) files.
- Added support for Unicode text so that you can use international characters.

OptoOPCServer

The OPC Test Client is no longer included with PAC Project.

PAC Manager

- Flash memory images can now be imported and exported for SNAP-PAC-SB1 and SNAP-PAC-SB2 serial brains.
- Added support for the SNAP-AIMA-iH analog current input module and the SNAPAOA-23-iH analog output module.
- Added support for lead compensated RTD point types for the SNAP-AIRTD, SNAPAIRTD-1K, and SNAP-AIRTD-10 analog temperature input modules.

OptoDataLink

Added the ability to replicate an entire controller table to a database table.

Bug Fixes

- PAC Project: [KB83358](#)
- PAC Control ([page 50](#)): 84606, 84656, 83725
- PAC Display ([page 92](#)): 83729, 83824, 83844, 84636, 84631, 84632, 84647, 84654, 84659
- OptoOPCServer ([page 168](#)): 83357, 83682, 83848
- PAC Manager ([page 131](#)): 83527, 83545, 83558
- OptoDataLink ([page 161](#)): 83896; ([page 160](#)): 84610
- SoftPAC ([page 179](#)): 83360, 83670
- Tools ([page 150](#)): 84700, 83725

PAC Project R9.3000

Released: November 15, 2012.

Enhancements**SoftPAC**

As a new component of PAC Project Pro R9.3, SoftPAC is a software-based programmable automation controller (PAC) designed for PC-based control. SoftPAC gives you the choice of running your control program in a Microsoft Windows environment rather than on a standalone or rack-mounted PAC.

OptoDataLink

- Support has been added for databases using ODBC drivers, and there is now support for Access 2007 & 2010, SQL Server 2008 & 2012, and MySQL 5.1.
- The tag selection interface is improved.
- There is a new pop-up menu for managing Datalinks.

- Whole or partial tables can be written to Opto 22 devices without being broken down into individual element tags.

PAC Display

PAC Display can now mimic OptoDisplay when sending discrete integer writes to integer variables.

PAC Manager

- Support for the SoftPAC PC-based controller has been added to PAC Manager.
- You can now view Scratch Pad Integers as binary values.

Bug Fixes

- PAC Display ([page 95](#)): 82377, 82389, 82418, 82419, 82434, 82430, 82442, 82449
- PAC Manager ([page 132](#)): 82402, 82101

PAC Project R9.2000

Released: March 27, 2012.

Enhancements

PAC Control

- Added support for 11 new commands.
- Added support for the G4EB2 brain board (also includes part numbers G4D32EB2 and G4D32EB2-UPG), the SNAP-SCM-CAN2B serial communications module, the SNAP-IDC-32D digital input module, and the SNAP-OMR6-A and SNAP-OMR6-C mechanical relay output modules.

PAC Display

- You can now add a control engine-driven dynamic attribute to text on a Windows button.
- The new **AutoCorrect Tags** option on the Configurator Options dialog box allows AutoCorrect Tags to either include or exclude tags inside grouped graphics (excluded by default).

PAC Manager

Added support for the G4EB2 brain (including part numbers G4D32EB2 and G4D32EB2-UPG) and the SNAP-IDC-32D, SNAP-OMR6-C, and SNAP-OMR6-A modules.

OptoOPCServer

Added new Item IDs for pulsing, point configuration, diagnostic status read area items, and SNMP.

Bug Fixes

- PAC Control ([page 52](#)): 81597, 81624, 81839, 81840, 81847
- PAC Display ([page 97](#)): 81316, 81592, 81693, 81727, 81853, 81729, 81743, 81801, and 81883
- PAC Manager ([page 133](#)): 81848
- OptoOPCServer ([page 169](#)): 81856

PAC Project R9.1000

Released: August 2, 2011.

Enhancements

PAC Display

Several enhancements include the ability to search tags within grouped graphic objects, new up and down buttons on the ComboBox Dynamic Attribute dialog, and more.

PAC Control

- There are eight new commands; now you can send emails, post web content, get the date and time, and more.
- Support has been added for the SNAPSCM-SSI module as an Analog Input, and the default scaling for SNAP-AIPM-3 and SNAP-AIPM-3V module has been changed.

PAC Manager

Support was added for SNAP-AITM-4i and SNAP-AIRTD-1K modules, and there is a new default scaling for the SNAP-AIPM-3 and SNAP-AIPM-3V modules.

Bug Fixes

- PAC Control ([page 54](#)): 81091, 81006
- PAC Display ([page 86](#)): 81332, 81331, 81330, 81329, 81325, 81323, 81298, 81278, 81271, 81266, 81265, 81264, 81256, 81218, 81216, 81196, 81193, 81192, 81183, 81152, 81110, 81109, 81099, 81095
- PAC Manager ([page 134](#)): 81088, 81159, 81268, 81311
- OptoOPCServer ([page 163](#)): 80298, 81229

PAC Project R9.0000

Released: June 14, 2010.

Added support for controller-level redundancy when used with the SNAP PAC Redundancy Option Kit (part number SNAP-PAC-ROK).

Enhancements

PAC Control

- Supports controller-level redundancy.
- Also, many digital features options, subroutine types, and commands previously available only in PAC Control Professional are now available in PAC Control Basic.

PAC Display

There are now two ways to display a web page in Runtime, the ability to configure many more windows than in the previous version, and a number of new alarm features.

PAC Manager

Support has been added for the SNAP-PAC-SRA (Snap Redundancy Arbiter), and microSD Op Codes have been added to the Status Write Inspect dialog.

Bug Fixes

- PAC Control ([page 56](#)): 80393, 80370, 80236, 55584
- PAC Display ([page 102](#)): 80947, 80772, 80761, 80724, 80692, 80707, 80677, 80673, 80672, 80740, 80739, 80877
- PAC Manager ([page 135](#)): 80866, 80865, 80889, 80890
- OptoDataLink ([page 163](#)): 80978

PAC Project R8.1000

Released: October 12, 2007.

Enhancements

PAC Control

- Added support for the following new Opto 22 devices:
 - SNAP-PAC-S2 controller
 - SNAP-PAC-SB1 and SB2 serial brains
- Added support for the following new SNAP I/O modules:
 - 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
- Added two new commands, Flag Lock and Flag Unlock, as well as the new ability to download a strategy in the background while the current one keeps running.

PAC Display

- Added improvements for alarm points such as the ability to export alarm points to another project.
- Includes enhancements to Global Operator Driven Permissions, and there is added support for Integer 64 type variables and tables.

OptoOPCServer

- Opto Browser Configurator can now generate PointerVariable, Integer 64 Variable, and Integer 64 Table tags from PAC Control files.
- Tag names can now contain hostnames in place of IP addresses for scanning Opto 22 devices.

PAC Manager

- Added support for SNAP-PAC-SB1 and SNAP-PAC-SB2 serial brains, SNAP-PAC-S2 controller, and the new 8-channel analog input modules.
- Support for Scratch Pad 64-Bit Integers, more choices for triggers and reactions, and improved **Analog Bank Read** in Inspect Mode to handle analog modules with more than two points.

PAC Utilities

PAC Terminal has received a significant amount of user interface improvements, including new columns of information, a new task panel, the ability to scan controllers for their current status, and more.

Bug Fixes

- PAC Control ([page 60](#)): 59258, 59467
- PAC Display ([page 109](#)): 59513, 59487, 59684, 58672, 58600

PAC Project R8.0000

Released: March 1, 2007.

This version of the Opto 22 automation software suite is now named PAC Project.

PAC Project Basic includes basic versions of PAC Control, PAC Display, and PAC Manager, which are very similar to the previous ioControl, ioDisplay, and ioManager, but with new features and support for several new modules and brains.

PAC Project Professional includes the Pro versions of the PAC Project applications as well as OptoOPCServer. In addition, PAC Project Pro now includes OptoDataLink for exchanging SNAP PAC System data with databases (including Microsoft SQL Server, Microsoft Access, and MySQL), text files, and email systems.

ioProject R7.1000

Released: March 8, 2006.

Added support for the SNAP-PAC-R1 and SNAP-PAC-R2.

NOTE: *If you run ioProject applications in Microsoft Windows XP, make sure to use the Windows Classic theme. Otherwise, a Microsoft bug related to how themes are handled may cause the system to crash.*

To correct the problem:

1. Right-click an empty part of the Desktop.
2. Select **Properties**.
3. With the **Themes** tab selected, choose the **Windows Classic** theme.
4. Restart your computer.

ioProject R7.0006

Released: January 12, 2006.

Added the ability to install both ioProject Professional and ioProject Basic on the same computer.

ioProject R7.0000

Released: December 12, 2005.

Version 7.0 of the Opto 22 ioProject software suite for industrial automation, remote monitoring, and data acquisition applications introduces two forms of the software suite: ioProject Basic and ioProject Professional. Additional major changes in this version include support for new SNAP PAC controllers.

ioProject Basic

- ioProject Basic provides ioControl Basic for developing control programs (or strategies), and ioDisplay Basic for developing operator interfaces (HMIs).
- ioManager software is also included for configuration.
- ioProject Basic comes with your purchase of a SNAP PAC or SNAP-LCE controller, or a SNAP Ultimate, SNAP Ethernet, or SNAP Simple brain. It can also be downloaded from our website www.opto22.com. Full documentation is provided in Adobe Acrobat PDF format.

ioProject Professional

- ioProject Professional includes ioControl Professional for developing control strategies, ioDisplay Professional for developing operator interfaces (HMIs), and OptoOPCServer for communicating with OLE for Process Control (OPC) 2.0 clients. ioManager software is also included for configuration.
- ioProject Professional is designed for more complex projects, especially those requiring OPC, multiple protocol, multiple network, or legacy hardware support.
- ioProject Professional 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.
- ioProject Professional can be purchased as a complete suite or as individual applications. It can be downloaded from our website for immediate use and is also shipped to you on a CD with full documentation in both PDF and printed form. Information in this Release Note applies to both versions of ioProject unless otherwise indicated.

APPLICATION VERSIONS IN PAC PROJECT RELEASES

PAC Project 10.6 Releases

PAC Project R10.6000

- PAC Control R10.6a
- PAC Display R10.6a
- PAC Manager R10.6a
- PAC Project Tools R10.6a
- PAC Redundancy Manager R10.6a
- OptoDataLink R10.6a
- OptoOPCServer R10.6a
- SoftPAC software R10.6b | SoftPAC firmware R10.6b | SoftPAC Monitor R10.6a

PAC Project 10.5 Releases

PAC Project R10.5003

- PAC Control R10.5c
- PAC Display R10.5c
- PAC Manager R10.5c
- PAC Project Tools R10.5b
- PAC Redundancy Manager R10.5b
- OptoDataLink R10.5c
- OptoOPCServer R10.5c
- SoftPAC software R10.4d | SoftPAC firmware R10.4e | SoftPAC Monitor R10.5a

PAC Project R10.5002

- PAC Control R10.5b
- PAC Display R10.5b
- PAC Manager R10.5b
- PAC Project Tools R10.5a
- PAC Redundancy Manager R10.5a
- OptoDataLink R10.5b
- OptoOPCServer R10.5a
- SoftPAC software R10.4d | SoftPAC firmware R10.4d | SoftPAC Monitor R10.5a

PAC Project R10.5001

- PAC Control R10.5a
- PAC Display R10.5a
- PAC Manager R10.5a
- PAC Project Tools R10.5a
- PAC Redundancy Manager R10.5a
- OptoDataLink R10.5b
- OptoOPCServer R10.5a
- SoftPAC software R10.4d | SoftPAC firmware R10.4d | SoftPAC Monitor R10.5a

PAC Project R10.5000

- PAC Control R10.5a
- PAC Display R10.5a
- PAC Manager R10.5a
- PAC Project Tools R10.5a
- PAC Redundancy Manager R10.5a
- OptoDataLink R10.5a
- OptoOPCServer R10.5a
- SoftPAC software R10.4d | SoftPAC firmware R10.4d | SoftPAC Monitor R10.5a

PAC Project 10.4 Releases

PAC Project R10.4003

- PAC Control R10.4c
- PAC Display R10.4b
- PAC Manager R10.4c
- PAC Project Tools R10.4a
- PAC Redundancy Manager R10.4a
- OptoDataLink R10.4b
- OptoOPCServer R10.4a
- SoftPAC software R10.4c | SoftPAC firmware R10.4c | SoftPAC Monitor R10.4a

PAC Project R10.4002

- PAC Control R10.4b
- PAC Display R10.4b
- PAC Manager R10.4b
- PAC Project Tools R10.4a
- PAC Redundancy Manager R10.4a
- OptoDataLink R10.4b
- OptoOPCServer R10.4a
- SoftPAC software R10.4c | SoftPAC firmware R10.4c | SoftPAC Monitor R10.4a

NOTE: *This release includes only an update to the installation file, not the PAC Project applications.*

PAC Project R10.4001

- PAC Control R10.4b
- PAC Display R10.4b
- PAC Manager R10.4b
- PAC Project Tools R10.4a
- PAC Redundancy Manager R10.4a
- OptoDataLink R10.4b
- OptoOPCServer R10.4a
- SoftPAC software R10.4c | SoftPAC firmware R10.4c | SoftPAC Monitor R10.4a

PAC Project R10.4000

- PAC Control R10.4a
- PAC Display R10.4a

- PAC Manager R10.4a
- PAC Project Tools R10.4a
- PAC Redundancy Manager R10.4a
- OptoDataLink R10.4a
- OptoOPCServer R10.4a
- SoftPAC software R10.4a | SoftPAC firmware R10.4c | SoftPAC Monitor R10.3a

PAC Project 10.3 Releases

PAC Project R10.3003

- PAC Control R10.3d
- PAC Display R10.3c
- PAC Manager R10.3c
- PAC Project Tools R10.3a
- PAC Redundancy Manager R10.3a
- OptoDataLink R10.3a
- OptoOPCServer R10.3b
- SoftPAC software R10.3b | SoftPAC firmware R10.3b | SoftPAC Monitor R10.3a

PAC Project R10.3002

- PAC Control R10.3c
- PAC Display R10.3b
- PAC Manager R10.3b
- PAC Project Tools R10.3a
- PAC Redundancy Manager R10.3a
- OptoDataLink R10.3a
- OptoOPCServer R10.3b
- SoftPAC software R10.3b | SoftPAC firmware R10.3b | SoftPAC Monitor R10.3a

PAC Project R10.3001

- PAC Control R10.3b
- PAC Display R10.3b
- PAC Manager R10.3b
- PAC Project Tools R10.3a
- PAC Redundancy Manager R10.3a
- OptoDataLink R10.3a
- OptoOPCServer R10.3b
- SoftPAC software R10.3b | SoftPAC firmware R10.3b | SoftPAC Monitor R10.3a

PAC Project R10.3000

- PAC Control R10.3a
- PAC Display R10.3a
- PAC Manager R10.3a
- PAC Project Tools R10.3a
- PAC Redundancy Manager R10.3a
- OptoDataLink R10.3a

- OptoOPCServer R10.3a
- SoftPAC software R10.3a | SoftPAC firmware R10.3a | SoftPAC Monitor R10.3a

PAC Project 10.2 Releases

PAC Project R10.2005

- PAC Control R10.2e
- PAC Display R10.2d
- PAC Manager R10.2c
- PAC Project Tool R10.2c
- PAC Redundancy Manager R10.2b
- OptoDataLink R10.2c
- OptoOPCServer R10.2c
- SoftPAC software R9.5h | SoftPAC firmware R10.0f | SoftPAC Monitor R10.0a

PAC Project R10.2004

- PAC Control R10.2d
- PAC Displa R10.2c
- PAC Manager R10.2c
- PAC Project Tools R10.2c
- PAC Redundancy Manager R10.2b
- OptoDataLink R10.2c
- OptoOPCServer R10.2c
- SoftPAC software R9.5g | SoftPAC firmware R10.0f | SoftPAC Monitor R10.0a

PAC Project R10.2003

- PAC Control R10.2c
- PAC Display R10.2c
- PAC Manager R10.2c
- PAC Project Tools R10.2c
- PAC Redundancy Manager R10.2b
- OptoDataLink R10.2c
- OptoOPCServer R10.2c
- SoftPAC software R9.5g | SoftPAC firmware R10.0f | SoftPAC Monitor R10.0a

PAC Project R10.2002

- PAC Control R10.2b
- PAC Display R10.2b
- PAC Manager R10.2b
- PAC Project Tools R10.2b
- PAC Redundancy Manager R10.2b
- OptoDataLink R10.2b
- OptoOPCServer R10.2c
- SoftPAC software R9.5g | SoftPAC firmware R10.0f | SoftPAC Monitor R10.0a

PAC Project R10.2001

- PAC Control R10.2a

- PAC Display R10.2a
- PAC Manager R10.2a
- PAC Project Tools R10.2a
- PAC Redundancy Manager R10.2a
- OptoDataLink R10.2a
- OptoOPCServer R10.2b
- SoftPAC software R9.5g | SoftPAC firmware R9.5g | SoftPAC Monitor R10.0a

PAC Project R10.2000

- PAC Control R10.2a
- PAC Display R10.2a
- PAC Manager R10.2a
- PAC Project Tools R10.2a
- PAC Redundancy Manager R10.2a
- OptoDataLink R10.2a
- OptoOPCServer R10.2a
- SoftPAC software R9.5g | SoftPAC firmware R9.5g | SoftPAC Monitor R10.0a

PAC Project 10.1 Releases

PAC Project R10.1001

- PAC Control R10.1b
- PAC Display R10.1a
- PAC Manager R10.1a
- PAC Project Tools R10.1a
- PAC Redundancy Manager R10.1a
- OptoDataLink R10.1a
- OptoOPCServer R10.1a
- SoftPAC software R9.5g | SoftPAC firmware R9.5g | SoftPAC Monitor R10.0a

PAC Project R10.1000

- PAC Control R10.1a
- PAC Display R10.1a
- PAC Manager R10.1a
- PAC Project Tools R10.1a
- PAC Redundancy Manager R10.1a
- OptoDataLink R10.1a
- OptoOPCServer R10.1a
- SoftPAC software R9.5g | SoftPAC firmware R9.5g | SoftPAC Monitor R10.0a

PAC Project 10.0 Releases

PAC Project R10.0001

- PAC Control R10.0b
- PAC Display R10.0b
- PAC Manager R10.0b

- PAC Project Tools R10.0b
- PAC Redundancy Manager R10.0a
- OptoDataLink R10.0b
- OptoOPCServer R10.0a
- SoftPAC software R9.5g | SoftPAC firmware R9.5g | SoftPAC Monitor R10.0a

PAC Project R10.0000

- PAC Control R10.0a
- PAC Display R10.0a
- PAC Manager R10.0a
- PAC Project Tools R10.0a
- PAC Redundancy Manager R10.0a
- OptoDataLink R10.0a
- OptoOPCServer R10.0a
- SoftPAC software R9.5g | SoftPAC firmware R9.5g | SoftPAC Monitor R10.0a

PAC Project 9.6 Releases

PAC Project R9.6006

- PAC Control R9.6e
- PAC Display R9.6g
- PAC Manager R9.6c
- PAC Project Tools R9.6a
- PAC Redundancy Manager R9.6a
- OptoDataLink R9.6c
- OptoOPCServer R9.6b
- SoftPAC software R9.5f | SoftPAC firmware R9.5f | SoftPAC Monitor R9.6a

PAC Project R9.6005

- PAC Control R9.6e
- PAC Display R9.6f
- PAC Manager R9.6c
- PAC Project Tools R9.6a
- PAC Redundancy Manager R9.6a
- OptoDataLink R9.6c
- OptoOPCServer R9.6a
- SoftPAC software R9.5f | SoftPAC firmware R9.5f | SoftPAC Monitor R9.6a

PAC Project R9.6004

- PAC Control R9.6d
- PAC Display R9.6e
- PAC Manager R9.6c
- PAC Project Tools R9.6a
- PAC Redundancy Manager R9.6a
- OptoDataLink R9.6c
- OptoOPCServer R9.6a

- SoftPAC software R9.5d | SoftPAC firmware R9.5d | SoftPAC Monitor R9.5a

PAC Project R9.6003

- PAC Control R9.6c
- PAC Display R9.6d
- PAC Manager R9.6c
- PAC Project Tools R9.6a
- PAC Redundancy Manager R9.6a
- OptoDataLink R9.6b
- OptoOPCServer R9.6a
- SoftPAC software R9.5d | SoftPAC firmware R9.5d | SoftPAC Monitor R9.5a

PAC Project R9.6002

- PAC Control R9.6c
- PAC Display R9.6c
- PAC Manager R9.6c
- PAC Project Tools R9.6a
- PAC Redundancy Manager R9.6a
- OptoDataLink R9.6a
- OptoOPCServer R9.6a
- SoftPAC software R9.5d | SoftPAC firmware R9.5d | SoftPAC Monitor R9.5a

PAC Project R9.6001

- PAC Control R9.6b
- PAC Display R9.6b
- PAC Manager R9.6b
- PAC Project Tools R9.6a
- PAC Redundancy Manager R9.6a
- OptoDataLink R9.6a
- OptoOPCServer R9.6a
- SoftPAC software R9.5d | SoftPAC firmware R9.5d | SoftPAC Monitor R9.5a

PAC Project R9.6000

- PAC Control R9.6a
- PAC Display R9.6a
- PAC Manager R9.6a
- PAC Project Tools R9.6a
- PAC Redundancy Manager R9.6a
- OptoDataLink R9.6a
- OptoOPCServer R9.6a
- SoftPAC software R9.5d | SoftPAC firmware R9.5d | SoftPAC Monitor R9.5a

PAC Project 9.5 Releases

PAC Project R9.5003

- PAC Control R9.5d
- PAC Redundancy Manager R9.5a

- PAC Display R9.5d
- OptoOPCServer R9.5c
- PAC Manager R9.5b
- OptoDataLink R9.5c
- SoftPAC software R9.5d | SoftPAC firmware R9.5d | SoftPAC Monitor R9.5a

PAC Project R9.5002-339

- PAC Control R9.5c (Build date September 28, 2016)
- PAC Redundancy Manager R9.5a
- PAC Display R9.5c
- OptoOPCServer R9.5b
- PAC Manager R9.5b
- OptoDataLink R9.5c
- SoftPAC software R9.5c | SoftPAC firmware R9.5c | SoftPAC Monitor R9.5a

PAC Project R9.5002-337

- PAC Control R9.5c (Build date September 26, 2016)
- PAC Redundancy Manager R9.5a
- PAC Display R9.5c
- OptoOPCServer R9.5b
- PAC Manager R9.5b
- OptoDataLink R9.5c
- SoftPAC software R9.5c | SoftPAC firmware R9.5c | SoftPAC Monitor R9.5a

PAC Project R9.5001

- PAC Control R9.5b
- PAC Redundancy Manager R9.5a
- PAC Display R9.5b
- OptoOPCServer R9.5a
- PAC Manager R9.5a
- OptoDataLink R9.5b
- SoftPAC software R9.5b | SoftPAC firmware R9.5b | SoftPAC Monitor R9.5a

PAC Project R9.5000

- PAC Control R9.5a
- PAC Redundancy Manager R9.5a
- PAC Display R9.5a
- OptoOPCServer R9.5a
- PAC Manager R9.5a
- OptoDataLink R9.5a
- SoftPAC software R9.5a | SoftPAC firmware R9.5a | SoftPAC Monitor R9.5a

PAC Project 9.4 Releases**PAC Project R9.4008**

- PAC Control R9.4e
- PAC Redundancy Manager R9.3a

- PAC Display R9.4g
- OptoOPCServer R9.4c
- PAC Manager R9.4c
- OptoDataLink R9.4e
- SoftPAC software R9.4b | SoftPAC firmware R9.4b | SoftPAC Monitor R9.4b

PAC Project R9.4007

- PAC Control R9.4d
- PAC Redundancy Manager R9.3a
- PAC Display R9.4f
- OptoOPCServer R9.4c
- PAC Manager R9.4c
- OptoDataLink R9.4d
- SoftPAC software R9.4b | SoftPAC firmware R9.4b | SoftPAC Monitor R9.4b

PAC Project R9.4006

- PAC Control R9.4c
- PAC Redundancy Manager R9.3a
- PAC Display R9.4f
- OptoOPCServer R9.4c
- PAC Manager R9.4c
- OptoDataLink R9.4d
- SoftPAC software R9.4b | SoftPAC firmware R9.4b | SoftPAC Monitor R9.4b

PAC Project R9.4005

- PAC Control R9.4b
- PAC Redundancy Manager R9.3a
- PAC Display R9.4e
- OptoOPCServer R9.4b
- PAC Manager R9.4b
- OptoDataLink R9.4d
- SoftPAC software R9.4b | SoftPAC firmware R9.4b | SoftPAC Monitor R9.4b

PAC Project R9.4004

- PAC Control R9.4a
- PAC Redundancy Manager R9.3a
- PAC Display R9.4d
- OptoOPCServer R9.4a
- PAC Manager R9.4a
- OptoDataLink R9.4d
- SoftPAC software R9.4a | SoftPAC firmware R9.4a | SoftPAC Monitor R9.4a

PAC Project R9.4003

- PAC Control R9.4a
- PAC Redundancy Manager R9.3a
- PAC Display R9.4c
- OptoOPCServer R9.4a

- PAC Manager R9.4a
- OptoDataLink R9.4b
- SoftPAC software R9.4a | SoftPAC firmware R9.4a | SoftPAC Monitor R9.4a

PAC Project R9.4002

- PAC Control R9.4a
- PAC Redundancy Manager R9.3a
- PAC Display R9.4b
- OptoOPCServer R9.4a
- PAC Manager R9.4a
- OptoDataLink R9.4e
- SoftPAC software R9.4a | SoftPAC firmware R9.4a | SoftPAC Monitor R9.4a

PAC Project R9.4001

- PAC Control R9.4a
- PAC Redundancy Manager R9.3a
- PAC Display R9.4a
- OptoOPCServer R9.4a
- PAC Manager R9.4a
- OptoDataLink R9.4b
- SoftPAC software R9.4a | SoftPAC firmware R9.4a | SoftPAC Monitor R9.4a

PAC Project R9.4000

- PAC Control R9.4a
- PAC Redundancy Manager R9.3a
- PAC Display R9.4a
- OptoOPCServer R9.4a
- PAC Manager R9.4a
- OptoDataLink R9.4a
- SoftPAC software R9.4a | SoftPAC firmware R9.4a | SoftPAC Monitor R9.4a

PAC Project 9.3 Releases

PAC Project R9.3004

- PAC Control R9.3c
- PAC Redundancy Manager R9.3a
- PAC Display R9.3d
- OptoOPCServer R9.3b
- PAC Manager R9.3c
- OptoDataLink R9.3d
- SoftPAC software R9.3c | SoftPAC firmware R9.3e | SoftPAC Monitor R9.3c

PAC Project R9.3003

- PAC Control R9.3c
- PAC Redundancy Manager R9.3a
- PAC Display R9.3c
- OptoOPCServer R9.3b

- PAC Manager R9.3c
- OptoDataLink R9.3d
- SoftPAC software R9.3c | SoftPAC firmware R9.3e | SoftPAC Monitor R9.3c

PAC Project R9.3002

- PAC Control R9.3b
- PAC Redundancy Manager R9.3a
- PAC Display R9.3b
- OptoOPCServer R9.3a
- PAC Manager R9.3b
- OptoDataLink R9.3c
- SoftPAC software R9.3b | SoftPAC firmware R9.3e | SoftPAC Monitor R9.3b

PAC Project R9.3001

- PAC Control R9.3a
- PAC Redundancy Manager R9.3a
- PAC Display R9.3a
- OptoOPCServer R9.3a
- PAC Manager R9.3a
- OptoDataLink R9.3b
- SoftPAC software R9.3a | SoftPAC firmware R9.3d | SoftPAC Monitor R9.3a

PAC Project R9.3000

- PAC Control R9.3a
- PAC Redundancy Manager R9.3a
- PAC Display R9.3a
- OptoOPCServer R9.3a
- PAC Manager R9.3a
- OptoDataLink R9.3a
- SoftPAC software R9.3a | SoftPAC firmware R9.3d | SoftPAC Monitor R1.0a

PAC Project 9.2 Releases

PAC Project R9.2004

- PAC Control R9.2d
- PAC Redundancy Manager R9.2a
- PAC Display R9.2e
- OptoOPCServer R9.2b
- PAC Manager R9.2e
- OptoDataLink R9.2b

PAC Project R9.2003

- PAC Control R9.2c
- PAC Redundancy Manager R9.2a
- PAC Display R9.2d
- OptoOPCServer R9.2b
- PAC Manager R9.2d

- OptoDataLink R9.2b

PAC Project R9.2002

- PAC Control R9.2c
- PAC Redundancy Manager R9.2a
- PAC Display R9.2c
- OptoOPCServer R9.2a
- PAC Manager R9.2c
- OptoDataLink R9.2b

PAC Project R9.2001

- PAC Control R9.2b
- PAC Redundancy Manager R9.2a
- PAC Display R9.2b
- OptoOPCServer R9.2a
- PAC Manager R9.2b
- OptoDataLink R9.2b

PAC Project R9.2000

- PAC Control R9.2a
- PAC Redundancy Manager R9.2a
- PAC Display R9.2a
- OptoOPCServer R9.2a
- PAC Manager R9.2a
- OptoDataLink R9.2a

PAC CONTROL

PAC Control R10.6a

PAC Project R10.6000

Released: October 23, 2025.

NOTE: *You may be prompted to restart your computer to complete the installation of the software.*

Enhancements

- Block IDs (which are unique to each chart) are now displayed on the cross-reference report. This can make it easier to differentiate blocks that may have the same name. For more information about cross-reference reports, see the [PAC Control User's Guide](#) (form 1700).
- You can now pass PID loops as parameters into subroutines. For more information about subroutines, see the [PAC Control User's Guide](#) (form 1700).
- While in Debug mode, if the I/O unit is a *groov* EPIC or *groov* RIO, the I/O Unit dialog now displays the I/O unit's serial number. This requires the controller running the PAC Control strategy to have the following firmware version (or higher):
 - *groov* EPIC: 4.0.0
 - SNAP PAC: R10.5g
- You can now pass pointers as parameters into subroutines. For more information about subroutines, see the [PAC Control User's Guide](#) (form 1700).

- A new command has been added to stop an alternate host task: **Stop Alternate Host Task**. For more information about this new command, see the [PAC Control Command Reference](#) (form 1701).
- You can now copy strategy blocks from a PAC Control Basic strategy and paste them into a PAC Control Professional strategy. For more information about what elements you can copy and paste, see the [PAC Control User's Guide](#) (form 1700).
- The View/Print I/O Point Mappings dialog box now contains new options for 12-, 24-, and 64-channel modules, which are available in the *groov* I/O module family. For more instructions, see the [PAC Control User's Guide](#) (form 1700).
- Updates were made to enhance security.

Bug Fixes

- [KB84926](#) Strategy Mismatch Download Warning related to files downloaded after the strategy in PAC Control.
- [KB87521](#) PAC Control I/O Channel Inspect and Edit dialog boxes may not open from Strategy tree after moving I/O modules.
- [KB90711](#) Deleted GRV-R7-11VAPM-3 may not be properly removed from a PAC Control strategy.
- [KB90756](#) On-Time/Off-Time options missing from Add Watch Entry dialog in PAC Control.
- [KB90947](#) The "Subtype / Feature" column in PAC Control may display incorrect channel information for GRV-IDCIFQ-12 modules.
- [KB90973](#) Unable to configure PID output using a *groov* RIO or GRV-MM1001-10 channel configured as TPO.
- [KB91042](#) Inaccurate status information in PAC Control for I/O units configured for redundant networking.
- [KB91079](#) The incorrect tag name appears in the Configure PID Loops dialog box in PAC Control.
- [KB91101](#) Consecutive variable imports using `.csv` files crash PAC Control.
- [KB91105](#) Possible strategy corruption in PAC Control after copying/pasting OptoScript block with PID loop.
- [KB91108](#) Importing a variable file (`.csv`) with pointer table parameters into a strategy fails in PAC Control.
- [KB91205](#) Using the Copy To > Fill in I/O Unit feature creates points not associated with a module and crashes PAC Control.
- [KB91238](#) PAC Control strategies may not compile after renaming variables in OptoScript blocks.

PAC Control R10.5c

PAC Project R10.5003

Released: December 19, 2023. Updated: January 3, 2024 and October 23, 2025.

Bug Fixes

- [KB90768](#) Adding GRV-MM1001-10 modules automatically in PAC Control incorrectly populates channels.
- [KB90769](#) Error when adding Get On-Time/Off-Time Totalizer commands with *groov* discrete outputs in PAC Control.
- [KB90809](#) Generate N Pulses and some Analog Totalizer commands do not allow you to select a GRV-EPIC-PR2 as the I/O unit in PAC Control.

PAC Control R10.5b

PAC Project R10.5002

Released: May 22, 2023. Updated: May 24, 2023.

Enhancement

Save strategy to permanent storage after download option—Beginning with this release, this option is enabled for new strategies. You can find this option by clicking **File > Strategy Options**, and then click the **Download** tab.

Bug Fixes

- [KB84720](#) PAC Control: Watch Window starts updating with the second element.
- [KB84921](#) PAC Control: Unable to see all algorithm data in the View PID Loop (scanning) dialog box.
- [KB87065](#) PAC Control: Values in pasted blocks may be incorrect.
- [KB88329](#) PAC Control: Should not display the View > Toolbars menu item.
- [KB88408](#) PAC Control: Archive file contains random files instead of the strategy.
- [KB89361](#) PAC Control: *mistic* I/O unit configured with PIDs imported into another strategy may be configured incorrectly or run incorrectly.
- [KB89495](#) PAC Control: Changing type of I/O unit for a subroutine parameter causes parameter to disappear and compile errors.
- [KB89575](#) PID Setpoint field turns orange while in range.
- [KB90528](#) Downloading strategy with E2 I/O unit returns -60 error.
- [KB90529](#) “Averaging Filter Weight” checkbox not checked when upgrading strategy that has “Set Value” checked.
- [KB90545](#) Parameter values incorrectly changed when pasting blocks from one strategy into another strategy.
- [KB90557](#) PAC Control: Inspect window shows incorrect value for float parameter passed into subroutine.
- [KB90561](#) PAC Control: Watch Window may behave incorrectly or display error after using Save Strategy As.

PAC Control R10.5a

PAC Project R10.5000

Released: November 14, 2022. Updated: December 12, 2022 and October 23, 2025.

New Features

In Configure mode, you can now export variables from and import variables into your strategy. In Debug mode, you can now retrieve non-volatile variables values from the controller and later send them to the controller:

- Now you can right-click on the **Variables** folder in the strategy tree to export variables to a comma-separated values (.csv) file or import variables from a .csv file.
- While in Debug mode, click the **Control Engine** menu item to access two new actions: **Upload Non-Volatile Variables** and **Download Non-Volatile Variables**. (This new feature was also added to PAC Terminal.) When you upload these types of variables, the information is saved into a .nvf file.

IMPORTANT: This new feature requires the following firmware versions:

- *groov EPIC processors: 3.5¹*
- *SNAP PAC controllers: R10.5²*

-
1. Available early 2023.
 2. Available first half 2023.

When you configure *groov* energy monitoring (GRV-R7-I1VAPM-3) and power monitoring (GRV-IVAPM-3) modules, you can:

- Specify a new measurement mode that supports monitoring 3-phase loads with 2 current transformers (CT). (The default measurement mode continues to be monitoring 3-phase loads with 3 CTs.)

IMPORTANT: *This feature requires firmware version 3.5 on groov EPIC processors and groov RIO modules.*

- Configure the polarity of each phase. Switching the polarity configuration helps you avoid the overhead involved in physically changing the wires connected to the load.

IMPORTANT: *This feature requires the following:*

- *With GRV-IVAPM-3 modules: firmware version 3.5 on groov EPIC processors and firmware version 1.4a on the GRV-IVAPM-3 module*
- *With GRV-R7-I1VAPM-3 (groov RIO EMU): firmware version 3.5.0*

Enhancements

- Now you can set the output of a PID loop to be a digital output configured with the TPO feature. Previously, you could do this only through PAC Manager and the Ethernet/IP Configurator. This requires firmware R10.5g (or higher) for SNAP PAC controllers and firmware 3.4.0 (or higher) for *groov* EPIC controllers.
- If your PAC Control strategy uses *groov* EPIC I/O units, you can now use the ON Totalization or OFF Totalization feature of *groov* digital I/O modules. This requires firmware R10.5g (or higher) for SNAP PAC controllers and firmware 3.5.0 (or higher) for *groov* EPIC controllers.
- The following commands have been added to make it more convenient to read or write to 64-bit scratchpad registers:
 - Get I/O Unit Scratch Pad Integer 64 Element
 - Get I/O Unit Scratch Pad Integer 64 Table
 - Set I/O Unit Scratch Pad Integer 64 Element
 - Set I/O Unit Scratch Pad Integer 64 Table
- You can now press CTRL-A to select all elements in a chart.
- For *groov* analog input modules, you can now set a simple moving average (SMA) when you configure a channel.
- For *groov* digital output modules, you can now get totalizer values with the following commands:
 - Get & Restart Off-Time Totalizer

IMPORTANT: *This enhancement requires firmware version 3.5 on groov EPIC processors.*

- Get & Restart On-Time Totalizer
- Get Off-Time Totalizer
- Get On-Time Totalizer

PAC Control & PAC Terminal:

The Inspect Control Engine dialog box now displays more information about the strategy stored in permanent storage.

IMPORTANT: *This enhancement requires the following firmware versions:*

- *groov EPIC processors: 3.5¹*
- *SNAP PAC controllers: R10.5²*

1. Available early 2023.
2. Available first half 2023.

Bug Fixes

- [KB86762](#) In OptoScript block, text may be deleted and may cause compiler errors.
- [KB86962](#) Strategy archive upload fails with error message: "The controller does not currently contain a strategy archive".
- [KB90209](#) Strategy stored to permanent storage is cleared after restart of control engine.
- [KB90224](#) Get I/O Unit Quality command occasionally reports a -13 error.
- [KB90237](#) PAC Control allows duplicate IP addresses when using E1, E2, and G4EB2 I/O units.
- [KB90249](#) Importing chart may cause PAC Control to crash.
- [KB90286](#) Append Character to String command results in -95 info message in the controller's message queue.
- [KB90325](#) Autorun flag toggled when *groov* Manage & PAC Control are both open.
- [KB90366](#) Editing name of variable in subroutine causes PAC Control to crash.
- [KB90373](#) Can't assign some *groov* digital input channels to Latch Set conditions.
- [KB90443](#) Moving/Copying channels on GRV-MM1001-10 module causes PAC Control crash.
- [KB90459](#) Strategy with imported .otg file causes -128 error.
- [KB90461](#) Get Counter command's parameter list does not show power total (summation) tags from energy/power monitoring modules.

PAC Control R10.4c**PAC Project R10.4003**

Released: March 21, 2022.

Bug Fix

[KB90199](#) Extra blank lines added after line comments in OptoScript blocks.

PAC Control R10.4b**PAC Project R10.4001**

Released: January 31, 2022. Updated: February 17, 2022.

New Features**OptoOPCServer**

Enabling the optimization of common numeric table element requests has been changed from creating a key in the Windows Registry to creating a file. For instructions, see the [Optimizing PAC Project System Performance Technical Note](#) (form 1776).

Bug Fixes

- [KB82165](#) Modifying a subroutine parameter generates an incomplete or incorrect "report".
- [KB83600](#) PAC Control error -139 when opening strategy from a previous version.
- [KB85463](#) PAC Control: PIDs may fail to work correctly after their analog points are moved to another rack.
- [KB87972](#) Undefined command error during download of strategy with nested subroutine that has space in filename.
- [KB88766](#) Adding a Continue Block without a destination defaults to Block-0.
- [KB89620](#) Debug mode reports incorrect point type on E2 I/O units.
- [KB89951](#) Moving a digital I/O channel from *groov* EPIC I/O unit to *groov* RIO I/O unit may cause PAC Control to crash.

- [KB89953](#) Moving a *groov* analog I/O channel to a GRV-MM1001-10 may corrupt channel's configuration.
- [KB89956](#) Adding analog I/O point to Watch Window may cause PAC Control to crash.
- [KB89962](#) In Edit Analog Point window, scaling fields become unconfigurable after selecting a non-scalable channel type.
- [KB89963](#) Reconfiguring to another scalable subtype may cause invalid channel configuration.
- [KB89969](#) The "Subtype / Feature" column may not update correctly when moving *groov* digital I/O channel to another module.
- [KB90000](#) Importing chart with *groov* I/O causes PAC Control to crash.
- [KB90018](#) Strategies created in version 10.0, 10.1, or 10.2 of PAC Control may not upgrade to 10.4 correctly.
- [KB90029](#) When renaming a variable, text in comments or string literals may also be updated.
- [KB90081](#) Some 64-bit Counter commands do not work correctly in script blocks.
- [KB90092](#) May not be able to set breakpoints in OptoScript block after certain comments.

PAC Control R10.4a

PAC Project R10.4000

Released: September 7, 2021. Updated: September 29, 2022 and October 23, 2025.

New Features

New operators have been added to the command line interface (CLI) to configure the Public Access attributes of variables and channels. With the new operators, you can configure the Public Access attribute as read-only or read-write, or you can clear (disable) the Public Access attribute.

Enhancements

- You can now configure GRV-IDCI-12 modules with the new digital channel type: 10-25 VAC. Your module must have firmware version 1.3b or higher.
- You can now configure *groov* RIO models GRV-R7-MM1001-10 and GRV-R7-MM2001-10 with a new channel type: 4 to 20 mA. Your *groov* RIO must have *groov* RIO firmware version 3.2.0 or higher.
- For the following two commands, the name of parameter 0 ("Has") has been changed to "I/O Unit":
 - Caused a Chart Error?
 - Caused an I/O Unit Error?
- For the following two commands, the behavior has been improved so that the commands write to a number of elements in a table equal to the number of channels on a module instead of a default of 32 elements:
 - Get Module Counters
 - Get & Clear Module Counters
- In the Add I/O Unit dialog, the default type has been changed from SNAP-PAC-R1 to GRV-EPIC-PR1.
- A new Move Module To Numeric Table command has been added, which stores the current value of each channel (digital and analog) into an element of a numeric table. For this command to work, you must have the following firmware versions installed on your controller/processor:
 - *groov* EPIC processors: 3.3.0 or higher
 - SNAP PAC controllers or SoftPAC: R10.5g or higher

Bug Fixes

- [KB89127](#) Strategy file vulnerability may cause PAC Control to crash.
- [KB89634](#) Strategy with "Start strategy after download completes" option does not start after downloading the Control Engine Download File (.cdf).
- [KB89649](#) PAC Control does not list supported features when configuring GRV-IDCSW-12 channels.

- [KB89695](#) PAC Control: SNAP-AOD-29 shows incorrect units and values for Full Range.
- [KB89807](#) Creating new strategy allows existing strategy to be overwritten without warning.

PAC Control R10.3d

PAC Project R10.3003

Released: December 18, 2020. Updated: July 23, 2021.

Enhancement

You can now configure Steinhart-Hart coefficients for thermistors that aren't pre-defined on SNAP-AIR400K-8 modules.

Bug Fixes

- [KB60818](#) Integer Table Ranges in PAC Control Watch Windows.
- [KB87149](#) Canceling Download of Background Strategy Can Clear Active Strategy.
- [KB87702](#) IVAL Value Does Not Update in I/O Unit Inspecting Window.
- [KB88883](#) Undefined Command Error When Downloading Strategy With Double Quotes in Strings.
- [KB89160](#) Focus on Edit Variable Dialog is Lost.
- [KB89197](#) Strategy Variables Do Not Export/Import Public Access Info.
- [KB89205](#) PAC Control Edit PID Loop Dialog Does Not Always Save Changes.
- [KB89211](#) If Strategy Download is Canceled or Has Error, Persistent Variables May Be Cleared.
- [KB89215](#) PAC Control Doesn't Autoname GRV-CSERI-4 Channels.
- [KB89220](#) I/O Unit with Digital Outputs Won't Export to I/O Unit Configuration File (.otg).
- [KB89263](#) Enable Quality Indicator Option Missing for Some Digital Channels in Edit Digital Point Window.
- [KB89268](#) Quality Indicator Disabled for All Channels Transferred Through an OTG File.
- [KB89327](#) Values for Quality May Be Incorrect or Inconsistent in Inspect Windows.
- [KB89386](#) *groov* Serial Channels and Possibly I/O Unit Missing After Import.
- [KB89395](#) Not Responding Message May Appear After Starting Strategy.

PAC Control R10.3c

PAC Project R10.3002

Released: August 21, 2020.

Bug Fix

[KB89203](#) Add Serial Channel and Add Analog Channel dialog boxes show incorrect options in Type field for *groov* modules.

PAC Control R10.3b

PAC Project R10.3001

Released: August 17, 2020. Updated: August 21, 2020.

Bug Fixes

- [KB54208](#) Find Tool in PAC Control may show incorrect results for pointer variables.
- [KB82489](#) PAC Control Find does not find OptoScript with non-standard capitalization.
- [KB85993](#) PAC Control may crash if you press Cancel while the strategy download is processing an archive.

- [KB86403](#) PAC Control leaves host port Ethernet sessions open after download canceled.
- [KB86581](#) Some I/O points show incorrect temperature unit (F/C) in report.
- [KB87394](#) Analog points do not export/import public access info.
- [KB87786](#) PAC Control appears to be stuck while regenerating reference counts.
- [KB88057](#) PAC Control auto-discovery configures incorrect default channel type for some analog input modules.
- [KB88638](#) PAC Control CLI operator `/cdf` may generate pop-up window.
- [KB88712](#) Undefined command error during strategy download.
- [KB88987](#) Edit Instructions dialog box doesn't show or save changes to variable types.
- [KB88992](#) "Undefined Command" error when entering Debug mode while OptoScript block open.
- [KB89027](#) Long delay entering Debug mode.
- [KB89076](#) Watch Window does not show whitespace characters in strings.
- [KB89082](#) PAC Control Debug mode may crash when viewing I/O Unit dialog.
- [KB89097](#) Can't switch between "5-30 VDC" and "Switch Input, Powered" on GRV-R7-MM1001-10 I/O unit.
- [KB89114](#) Some EPIC and RIO channels configured with a feature may behave incorrectly.
- [KB89156](#) Older PAC Control or OptoControl Strategies with *mistic* I/O points are incorrect in newer PAC Control.
- [KB89162](#) Error message when changing I/O unit types that support same features.
- [KB89182](#) Older PAC Control strategies with *mistic* event reactions may crash in newer PAC Control.

PAC Control R10.3a

PAC Project R10.3000

Released: April 9, 2020. Updated: May 4, 2020.

Bug Fixes

- [KB88858](#) XOR command with 64-bit integer operands returns incorrect results.
- [KB88889](#) PAC Control Debug mode: View I/O Unit displays data for empty positions.
- [KB88937](#) Move from Pointer Table Element with GRV-EPIC-PR1 I/O unit results in -69.

PAC Control R10.2e

PAC Project R10.2005

Released: January 6, 2020.

Enhancement

Support for GRV-IVIRMS-10, a new *groov* I/O module, has been added.

PAC Control R10.2d

PAC Project R10.2004

Released: October 22, 2019. Updated: December 9, 2019.

Bug Fix

[KB88633](#) Can't configure or read *groov* analog input.

PAC Control R10.2c

PAC Project R10.2003

Released: October 16, 2019.

Bug Fixes

- [KB85689](#) PAC Control File > Archive Strategy may not include unsaved changes.
- [KB86860](#) Closing a chart using the corner x while a script block is open causes PAC Control to shut down.
- [KB87523](#) PAC Control File > Archive Strategy does not include subroutines.
- [KB87806](#) Pressing Esc after stepping into OptoScript block closes PAC Control.
- [KB88298](#) With Redundant Network System Type, secondary IP address not used when set to active.
- [KB88404](#) I/O Point Mapping report shows one point in two different locations.
- [KB88414](#) PAC Control: Can't enter hex value when you configure or edit an integer variable.
- [KB88599](#) Errors or abnormal functioning with channels on GRV-IDCIFQ-12 module.

PAC Control R10.2b

PAC Project R10.2002

Released: June 10, 2019. Updated: June 13, 2019.

Bug Fixes

- [KB80791](#) Zero-Scale and Full-Scale limits in PAC Control Debug mode always show degrees C.
- [KB86174](#) Undefined Command error during download after copy/paste of blocks.
- [KB86395](#) PAC Control: Controller may reset (Timeout error) when OptoScript block contains //*.
- [KB87818](#) Strategy archive fails if Watch Window files can't be found.
- [KB87902](#) PAC Control sometimes does not show compile errors dialog for subroutines.
- [KB88012](#) PAC Control compiles all when entering Debug mode.
- [KB88055](#) Error number in Description column.
- [KB88094](#) View/Print Cross Reference menu item takes a very long time.
- [KB88173](#) PAC Control crashes when re-entering Debug mode after Online changes on Windows 7 32-bit computers.
- [KB88179](#) PAC Control: View I/O Units dialog flickers while in Debug mode.

PAC Control R10.2a

PAC Project R10.2000

Released: December 3, 2018. Updated: June 10, 2019.

Bug Fixes

- [KB87830](#) PAC Control may crash when stepping out of a subroutine.
- [KB87855](#) Windows File Description for PAC Control Basic shows "Professional".
- [KB87895](#) Can't search through help.

PAC Control R10.1b

PAC Project R10.1001

Released: October 2, 2018. Updated: October 31, 2018.

Bug Fix

[KB87782](#) "Unexpected file format" message in strategies that have subroutines.

PAC Control R10.1a**PAC Project R10.1000**

Released: September 17, 2018.

New Features

- You can now add *groov* serial communication modules to I/O Units in PAC Control strategies.
- When the control engine is a *groov* EPIC processor (GRV-EPIC-PR1), PAC Control can automatically detect and add to the strategy *groov* serial communication modules on the same chassis as the processor. To configure *groov* serial communication modules in PAC Control, you enter a name and description, and you select the channel type (that is, RS-232 or RS-485; 2- or 4-wire; termination or no termination; biasing or no biasing). Other parameters (such as the baud rate) are configured in the COM handle.
- In addition, for SNAP devices, you can add a serial module placeholder to help you more easily identify which positions on a SNAP PAC rack hold serial communication modules. (You still must configure SNAP communication options in PAC Manager.)

Bug Fixes

- [KB52626](#) G4A8R, G4RAX, and B200 analog points are always scaled for degrees Celsius in PAC Control/ioControl.
- [KB80542](#) "Undefined Command" on download when actual upper and lower scaling values are the same.
- [KB86962](#) Strategy archive upload fails with error message: "The controller does not currently contain a strategy archive."
- [KB87513](#) When the control engine is a *groov* EPIC PR1, PAC Control may stop responding if you click the Info, Warning, or Error button.
- [KB87567](#) PAC Control displays "Compile Error" and "Invalid IP address" when a strategy includes an E1, E2, or G4EB2 brain board.

PAC Control R10.0b**PAC Project R10.0001**

Released: July 9, 2018.

Bug Fixes

- [KB80124](#) Controller may reset when a variable in a PAC Control subroutine has the same name as another variable in the strategy.
- [KB87473](#) PAC Control R10.0a creates strategy archive files with release number "00000" in the filename.
- [KB87492](#) Chart ".\$cht contains an incorrect path" warning.
- [KB87520](#) PAC Control: "I/O point mismatch" message for strategy with *groov* digital I/O.
- [KB87539](#) After strategy upgrade, PAC Control numeric tables don't properly initialize on strategy run.
- [KB87547](#) Editing an OptoScript block containing a long string literal without spaces may cause PAC Control to crash.
- [KB87558](#) Editing an OptoScript block containing a long string literal without spaces may cause PAC Control to crash.
- [KB87560](#) Over-sized fonts, parts of text missing, blank dialog boxes, or missing dialog elements.

PAC Control R10.0a

PAC Project R10.0000

Released: May 18, 2018. Updated: January 29, 2019.

New Features

- PAC Control now supports public access for I/O points and variables.
- PAC Control now supports *groov* EPIC processors and *groov* I/O.
- Quality indicators for *groov* I/O units and channels can now be displayed when inspecting *groov* I/O in Debug mode.
- In Config mode, PAC Control can automatically detect and add to the strategy *groov* I/O units and channels that are on the same network and subnet as the computer running PAC Control.
- You can now configure points and variables so that applications such as Ignition® SCADA or ones that use Cirrus Link Solutions' "*groov* EPIC and SNAP PAC Driver module" can read and write to them.
- The following new commands have been added:
 - Get I/O Channel Quality;
 - Get I/O Unit Quality
 - Get Number of Charts Running
 - Get Redundant Controller State
 - Get Redundant Controller Status
 - Get Strategy Name
 - Get TPO Percent
 - Get TPO Period

Enhancements

- You can now change integer variables to floats, and floats to integers.
- Before PAC Control opens a strategy that was created in an older version of PAC Control, it creates a strategy archive—including subroutines and watch windows—to preserve the original strategy for you. Likewise, PAC Control Pro archives a PAC Control Basic strategy before opening it. The strategy archive name now includes the PAC Control version, such as: `Cookies.R9.6a.Basic.Backup.D05122018.T081409.zip`, which indicates the original strategy was created in PAC Control Basic R9.6a.
- The Scaled Units string value of a *groov* analog channel is now sent to the I/O unit as part of the channel configuration data. This now allows applications such as *groov* Manage to access the data from the memory map.

Bug Fixes

- [KB52626](#) G4A8R, G4RAX, and B200 analog points are always scaled for degrees Celsius in PAC Control/ioControl.
- [KB87975](#) PAC Control Debug mode may show errors or incorrect data.

PAC Control R9.6e

PAC Project R9.6005

Released: November 27, 2017.

Bug Fixes

- [KB82545](#) Unable to step out of a subroutine when debugging in PAC Control.
- [KB86967](#) PAC Control: Table data appears to be blank when you scroll using the mouse scroll wheel.

- [KB86983](#) PAC Control Debug mode: Can't clear TPO Period and TPO Percent values.
- [KB87044](#) PAC Control: "Start strategy after download completes" option may not always work.
- [KB87066](#) PAC Control: "Undefined command" error when downloading strategy.

PAC Control R9.6d

PAC Project R9.6004

Released: July 19, 2017.

Bug Fixes

- [KB86851](#) PAC Control Command-Line Interface (CLI) may display the "You are about to open a strategy" warning.
- [KB86852](#) PAC Control: Cannot add E1 or E2 or SNAP-PAC-R1-B to a strategy with controller redundancy.

PAC Control R9.6c

PAC Project R9.6002

Released: March 7, 2017.

Bug Fix

[KB86580](#) Analog points higher than the 4th point on a SNAP-PAC-R1-B I/O unit show incorrect values.

PAC Control R9.6b

PAC Project R9.6001

Released: February 27, 2017.

Bug Fix

[KB86576](#) Command Line Interface (CLI): Timers should be initialized as "Run".

PAC Control R9.6a

PAC Project R9.6000

Released: February 1, 2017.

New Features

- PAC Control now provides a command-line interface (CLI) to:
 - Compile a strategy to a .cdf file
 - Add a variable to a strategy
 - Move modules in a strategy
 - Move points in a strategy
- From a regular Command Prompt window, you can perform individual operations as well as run a series of operations from a Commands file. You can also use the CLI to load a strategy in PAC Control's graphical user interface (GUI).
- To configure a strategy to start running at completion of the strategy download, you can now check the **Start strategy after download completes** option on the **File > Strategy Options > Download** tab.

Enhancement

You can now use the new **Change Folder** button on the Subroutine Files dialog box to change a subroutine's folder.

Bug Fixes

- [KB80566](#) Cascading PID Loops may cause download errors.
- [KB86311](#) PAC Control needs to better identify point types on the SNAP-AIRTD-8U.

PAC Control R9.5d

PAC Project R9.5003

Released: December 14, 2016.

Bug Fix

[KB86325](#) Some PAC Control commands cannot be used with E1/E2 I/O units.

PAC Control R9.5c

PAC Project R9.5002-339

Released: September 27, 2016. Updated: September 28, 2016.

Bug Fixes

- [KB83014](#) PAC Control should report a compile error if you pass in an incorrect parameter when the argument is a table.
- [KB84173](#) Find Missing Connections function may incorrectly return continue blocks.
- [KB84335](#) OptoScript compiler error when directly indexing a string table from a numeric table.
- #85776 Floating-point literals may lose precision when used in an OptoScript block.
- [KB86218](#) PAC Control should not let you configure SNAP-IDC5Q for SNAP-PAC-R2s, -EB2s, or -SB2s.
- [KB86223](#) Shared subroutines can give incorrect results.

PAC Control R9.5b

PAC Project R9.5001

Released: August 26, 2016. Updated: January 9, 2017 and October 3, 2017.

Bug Fixes

- [KB80379](#) Problems with the 'Enable Communication to Mystic PID Loop' command.
- [KB82105](#) Specific characters in a communication handle's Initial Value cause issues in archived strategies.
- [KB82216](#) PAC Control variables do not show up in the Strategy Tree when copied.
- [KB82614](#) "Undefined Command" error when downloading strategy with double quotation mark (") in string variable.
- [KB84834](#) PAC Control does not scale SNAP-AIMA-iH and SNAP-AOA-23-iH (HART modules) correctly.
- [KB84884](#) Undefined Command error on download.
- [KB85615](#) If Legacy option isn't enabled, PAC Control may crash when importing a chart with a legacy I/O unit.
- [KB86130](#) OptoScript fails to set breakpoints following a single line comment starting with /*.
- [KB86143](#) Three "I/O Unit" conditions don't support E1, E2, or R1-B.

PAC Control R9.5a

PAC Project R9.5000

Released: July 15, 2016. Updated: July 22, 2016; November 9, 2017; July 30, 2018; and April 1, 2019.

Notes

- **Windows XP and Windows 2000 No Longer Supported**
 - The PAC Project Software Suite no longer supports operating systems for which Microsoft has ended support. This includes Windows XP and Windows 2000.
 - If you attempt to install any PAC Project R9.5000 (or higher) software component on an operating system that Microsoft no longer supports, the installation software displays an error message and then ends.
- **New PID Algorithms for ISA, Parallel, and Interacting**
 - To address an issue that occurs when the input to a PID loop is supplied by the host ([KB82058](#)), new algorithms for ISA, Parallel, and Interacting were added to PAC firmware R9.4c and higher. This change does not affect the calculations for existing PID loops.
 - To avoid impacting existing PID loops, the original algorithms were renamed in PAC Project R9.5000; their names now include the word "Obsolete." Also, the Velocity (Type B) name now includes "Obsolete" because it was previously replaced by Velocity (Type C).
 - You can continue to use the obsolete algorithms. However, Opto 22 recommends you use the new algorithms when you create PID loops for new applications—especially when the input is supplied by the host. For more information, see the Opto Knowledge Base article [KB82058](#).

New Features

- **Breakpoints inside OptoScript blocks.** When debugging your PAC Control strategy, you can now place breakpoints inside OptoScript blocks in your flowchart.
- **Nested subroutines.** You can call a subroutine from another subroutine, not just from a chart. (You cannot call subroutines recursively, though; that is, a subroutine cannot call itself, nor can a subroutine called by a subroutine call the original subroutine back.) Nested subroutines require SNAP PAC firmware R9.5a or higher.
- **E1 and E2 I/O units can be configured directly in PAC Control like other I/O units.** In the Add Points dialog box, you can choose G1, G4, or Quad Pak digital I/O points for an E1 brain board, or G1 analog I/O points for an E2 brain board. (Requires E1/E2 Firmware R1.2a or higher and SNAP PAC firmware R9.5a or higher.)
- **Enhanced support for SSL/TLS.** To communicate with devices that require SSL technology for secure communications, you can now open outgoing (client) SSL/TLS communication handles. (Previously, only the Send Email, HTTP Get, and HTTP Post commands supported SSL connections.)
- **New support for UDP.** Support has been added for UDP (User Datagram Protocol) to provide a lightweight alternative to TCP communications.

Enhancements

- **Move modules or points.** In addition to moving an I/O point, now you can move an entire I/O module and all its points to a different position on the same I/O unit or to an open slot on a different I/O unit.
- **Offset, gain, and filter weight.** On analog input modules, you can now set offset, gain, and average filter weight when you configure the input point. These are new options in the Configure I/O Point dialog box.
- **Go to any block.** In a large flowchart, easily find the block you want to see: right-click an empty space inside the chart and choose **Go to Block...** from the pop-up menu.
- **Advanced strategy options have been added for some customers with special requirements.** Make sure you understand the consequences before you use these options. In general, they make

changes faster in large strategies, but they may require you to fix reference counts or manually make edits so the strategy compiles. See “Advanced Options” in Chapter 7 of the *PAC Control User's Guide* (form 1700). The new advanced options are:

- Add points and variables without checking OptoScript blocks to see if they are already being used.
- Rename points and variables in the Strategy Tree without renaming them in OptoScript blocks.
- Allow points and variables with references to be deleted.
- **Changing from multiple to single monitor.** If you use multiple monitors and shift to a single monitor, all dialog boxes automatically move to the monitor in use.
- **Code block deletion warning.** When a code block is selected and you press the Delete key, PAC Control now displays a warning before deleting the block.
- **Add tags in Open OptoScript editor.** In an OptoScript block, you can use the Strategy Tree to add tags without closing the OptoScript editor.
- **Counter commands now support 64-bit integers.** These commands include Start Counter, Stop Counter, Clear Counter, Get Counter, and Get & Clear Counter.
- **The Tools menu now includes a Regenerate Reference Counts menu item.** This enhancement makes it easier to fix reference counts in your strategy.
- **Easier identification of multiple instances.** If you have multiple instances of PAC Control open at once, the strategy name and its status appear in the Windows tray so you can more easily tell them apart and choose the one you want.
- **Block IDs in title bar.** When you open a block, its ID number appears in the title bar. This enhancement helps you keep track of where you are when blocks have similar names.
- **More module support.** Support has been added for the SNAP-AIRTD-8U multi-function RTD/resistance analog temperature input module and the SNAP-OMR6T-C mechanical power relay output module.
- **More information when using “Open With.”** When you right-click a strategy database (*<strategy_name.IDB>* file in Windows Explorer and select **Open with** from the pop-up menu, the PAC Control software version and release number is now displayed next to the executable's filename. This way, you can choose which version and release number of PAC Control to open the project with.

Bug Fixes

- [KB80542](#) PAC Control: “Undefined Command” on download when actual upper and lower scaling values are the same.
- [KB80577](#) Strategy breakpoints are cleared for all charts.
- [KB80588](#) Auto-stepping unexpectedly pauses on the first block of a subroutine.
- [KB80780](#) PAC Control strategy filenames with a period cause download problems.
- [KB81116](#) PAC Control subroutine names with a space or dash generate a misleading error.
- [KB83045](#) Unable to delete a block that was referenced by multiple continue blocks.
- [KB84552](#) Windows Exception Fault when inspecting a point in PAC Control.
- [KB84706](#) Cannot configure a Communication Handle by right-clicking the folder in Strategy Tree.
- [KB84806](#) Using custom scaling with analog points on *mistic* I/O units causes error.
- [KB84833](#) OptoScript: “if-then” causes -13 overflow error when value is too large.
- [KB84905](#) Strategy Mismatch Download Warning when entering Debug mode.
- [KB85020](#) Scaled unit incorrectly appears in Actual Unit field.
- [KB85034](#) I/O Unit commands do not support SNAP-PAC-R1-B.
- [KB85039](#) Can't properly resize PAC Control dialog boxes in Windows 10.
- [KB85369](#) PAC Control R9.4 always compiles all charts when entering Debug mode.
- [KB85583](#) Undefined command error on download caused by analog point scaling.
- [KB85661](#) *mistic* I/O units cannot be imported into PAC Control.

PAC Control R9.4e

PAC Project R9.4008

Released: April 20, 2015.

Bug Fixes

- [KB84606](#) An OptoControl strategy with scaled points will not convert properly to PAC Control.
- [KB84656](#) PAC Control hangs when importing a chart with a comm handle; comm handles missing when selecting variables; subroutine parameters may be missing.

PAC Control R9.4d

PAC Project R9.4007

Released: March 31, 2015.

Bug Fixes

- [KB84652](#) New chart or subroutine files not found when creating a strategy archive or opening the strategy.
- [KB84657](#) PAC Control command UnpackString does not compile in OptoScript block.

PAC Control R9.4c

PAC Project R9.4006

Released: February 28, 2015.

Enhancements

- Added the ability to upgrade PAC I/O unit types, for example EB1 to R1, EB2 to R1 or R2, etc.
- Added the SNAP-PAC-R1-B brain I/O unit type.

Bug Fixes

- [KB84453](#) PAC Control debugger not in sync with redundant system that has switched to the backup.
- [KB84538](#) Error downloading PAC Control strategy with PID loop.
- [KB84556](#) PAC Control: Can't configure On-Latch Set? or Off-Latch Set? when I/O unit is G4EB2.

PAC Control R9.4b

PAC Project R9.4005

Released: January 21, 2015.

Enhancements

- Added support for the SNAP-AOVA-8 multifunction voltage/current analog output module.
- All point types are now scalable for analog modules that support scaling.

PAC Control R9.4a

PAC Project R9.4000

Released: September 22, 2014.

New Features

Support has been added for the SNAP-AIMA-iH and SNAP-AOA-23-iH HART® SNAP I/O modules. This includes the following new commands:

- Get HART Unique Address
- Send/Receive HART Command
- Receive HART Response
- Receive HART Burst Response
- Pack Float into String
- Pack Integer 32 into String
- Pack Integer 64 into String
- Pack String into String
- Unpack String

Enhancements

- Support has been added for lead compensated point types to the SNAP-AIRTD, SNAP-AIRTD-1K, and SNAP-AIRTD-10 analog temperature input modules.
- Loading of archived strategies has been improved. When a strategy is loaded and all of its subroutines cannot to be found in their original location—but they are all found in the Subs directory—the user is asked if PAC Control should use the subroutines in the Subs directory.
- Added support for Windows 8.1.

Bug Fix

[KB83725](#) Error (-434) when trying to read controller's message queue.

PAC Control R9.3c

PAC Project R9.3003

Released: October 15, 2013.

Enhancements

- Added support for the following modules:
 - SNAP-AIRATE-HFi Analog High-Frequency Rate Input Module
 - SNAP-AOD-29-HFi Dual-Channel High-Frequency Time-Proportional Digital Output Module
- When starting or stopping a strategy, a dialog box asks if you are sure you want to do it. These dialog boxes can be disabled.
- To integrate better with *groov*, *idb*, *txt* files are now included in strategy archives.

Bug Fix

#81893 Ctrl-Alt-Del deletes the currently selected blocks.

PAC Control R9.3b

PAC Project R9.3002

Released: April 22, 2013.

Enhancements

- Support has been added for the SNAP-AIR400K-8 thermistor module, including support for specifying extended parameters.

- Support has been added to the Table Element Bit Set and Table Element Bit Clear commands for 64-bit Integer Tables.
- OptoScript editor now warns before new OptoScript code is lost.

Bug Fix

#82732 PAC Control can crash when you drag-and-drop a strategy into it.

PAC Control R9.3a**PAC Project R9.3000**

Released: November 9, 2012.

The version number was updated to match the other applications in PAC Project R9.3000. There were no other changes.

PAC Control R9.2d**PAC Project R9.2004**

Released: September 7, 2012.

Bug Fix

[KB82326](#) Cannot add G4EB2 I/O unit to a redundant controller strategy.

PAC Control R9.2c**PAC Project R9.2002**

Released: June 8, 2012.

Bug Fix

[KB81998](#) Some OptoControl strategies cannot be imported into PAC Control.

PAC Control R9.2b**PAC Project R9.2001**

Released: April 16, 2012.

Bug Fixes

- [KB81957](#) Controller may need strategy download after power cycle or reset.
- [KB81986](#) Cannot use 'Get I/O Unit as Binary Value' command with G4D16R or G4D32RS.
- [KB81942](#) Command Help missing for new commands in PAC Control.
- #81964 A problem has been corrected with the "Bit Copy" command (The argument labels for the command were incorrect).

PAC Control R9.2a**PAC Project R9.2000**

Released: February 29, 2012.

New Features

The following commands have been added:

- Set Time Zone Configuration
- Get Time Zone Offset
- Get Time Zone Description
- Synchronize Clock SNTP
- Convert Date & Time to NTP Timestamp
- Convert NTP Timestamp to Date & Time
- Float to Int32 Bits
- Int32 to Float Bits
- Receive Numeric Variable
- Receive Numeric Variable Ex
- Bit Copy

Enhancements

- Support has been added for the following new products:
 - G4EB2 brain board (also includes part numbers G4D32EB2 and G4D32EB2-UPG)
 - SNAP-SCM-CAN2B serial communications module
 - SNAP-IDC-32D digital input module
 - SNAP-OMR6-C and SNAP-OMR6-A mechanical relay output modules
- In Strategy archives, auto-archives are now enabled on new strategies, and all archives are stored in a sub-directory named **Archives**.

Bug Fixes

- [KB81597](#) Moving an Int64 into a timer in an Action block causes reset.
- [KB81624](#) Cannot compile and download strategy when using a Windows Roaming Profile.
- [KB81839](#) Some dialog boxes in PAC Control do not display all text in Chinese Windows.
- [KB81840](#) Chinese characters in OptoScript blocks cause problems.
- [KB81847](#) Entering Chinese characters in a PAC Control tag name causes problems.

PAC Control R9.1c

PAC Project R9.1003

Released: October 14, 2011.

New Feature

Added support for the SNAP-IDC-32DN module.

Bug Fixes

- [KB81503](#) PAC Control may not open a PDF with the default PDF viewer.
- [KB81511](#) Some error messages are missing from PAC Project Software R9.1.

PAC Control R9.1b

PAC Project R9.1002

Released: September 16, 2011.

Bug Fixes

- [KB81430](#) Imported I/O points missing or behave incorrectly in strategy.
- [KB81431](#) Renaming a tag or using Find and Replace within Tag Names causes OptoScript errors.

PAC Control R9.1a**PAC Project R9.1000**

Released: July 18, 2011.

New Features

The following commands have been added:

- HTTP Get
- HTTP Post from String Table
- HTTP Post Calculate Content Length
- Send Email with Attachments
- Trim String
- Get & Restart Timer
- Get Date & Time
- Send Email

These commands require controller firmware R9.1b.

Enhancements

- Added support for the SNAP-SCM-SSI module as an Analog Input.
- Added support for the SNAP-AIRTD-1K analog temperature input module.
- Added support for the SNAP-AITM-4i thermocouple analog input module.
- Changed default scaling for SNAP-AIPM-3 and SNAP-AIPM-3V three-phase power modules. Voltage input for the SNAP-AIPM-3 module has changed from 0-250 to 0-300 V. Voltage input for the SNAP-AIPM-3V module has changed from 0-250 to 0-300 V. Current input for the SNAP-AIPM-3 has changed from 0 - 10 A to 0 - 5 A.
- PAC Control now detects when a dialog will be off the screen, either because the resolution has been reduced or because a secondary monitor is no longer in use.

Bug Fixes

- [KB81091](#) Converted OptoControl strategies have incorrect initial values for numeric variables and tables.
- [KB81006](#) Autocreate Points' configures some analog modules incorrectly.
- [KB81326](#) Editing Pointers allows Persistent initialization.

PAC Control R9.0g**PAC Project R9.0006**

Released: September 3, 2010.

Bug Fixes

- [KB81005](#) B100 I/O units cannot be imported into a strategy.
- [KB81077](#) Lost online changes and controller problems caused by 'Start Alternate Host Task' command.

PAC Control R9.0f

PAC Project R9.0004

Released: August 20, 2010.

Bug Fixes

- [KB81059](#) PAC Control connection lines disconnecting from objects.
- [KB81061](#) Some PAC Control compiler errors are not reported.

PAC Control R9.0e

PAC Project R9.0002

Released: July 22, 2010.

New Feature

Added the Clear I/O Unit Configured Flag command.

Bug Fixes

- [KB81022](#) Cannot type in negative Int32 literals in Add Instruction dialog.
- [KB81024](#) Digital reaction cannot be configured for *mistic* event/reaction.

PAC Control R9.0d

PAC Project R9.0002

Released: June 29, 2010.

Enhancement

Added scalable mode for the SNAP-AIRTD-10 module.

Bug Fixes

[KB81000](#) PAC Control may crash when regenerating reference counts.

PAC Control R9.0c

PAC Project R9.0001

Released: June 22, 2010.

Bug Fixes

- [KB80994](#) Double-clicking title bar in PAC Control does not minimize/maximize window.
- [KB80992](#) PID loop parameters are not displayed in PAC Control Watch window.
- [KB80991](#) SNAP-AIRTD-8D and SNAP-AIRTD-10 modules unknown in PAC Control.

PAC Control R9.0b

Released: June 18, 2010.

NOTE: *This release applies to PAC Control Basic only.*

Bug Fix

[KB80990](#) Problems running PAC Control Basic R9.0.

PAC Control R9.0a**PAC Project R9.0000**

Released: June 21, 2010.

New Features and Enhancements

- Many new features are included in PAC Control Professional in support of controller-level redundancy when used with the SNAP PAC Redundancy Option Kit (part number SNAP-PAC-ROK). Features include:
 - The ability to create strategies that use redundant controllers.
 - A new PAC Redundancy Manager in PAC Control manages, monitors, and commissions components in redundant controller system.
 - A Sync Block Tool allows you to insert sync blocks in a chart to synchronize redundant controllers at strategic places in a chart's logic.
- PAC Control Basic adds many subroutine types, digital features options, and commands previously available only in PAC Control Professional.
- There are three new analog simulation commands: IVAL Set Analog Filter Value, IVAL Set Analog Min Value, and IVAL Set Analog Max Value. A Start Alternate Host Task command has also been added.
- A new quick-find tool helps to quickly find items in the strategy tree.
- Points can now be created automatically in the Add Module dialog box.

For a complete list of the new features and enhancements in PAC Control, see the [PAC Project 9.0 Release Notes](#) (form 1915).

Bug Fixes

- [KB80393](#) Serial I/O units can't be inspected prior to running PAC Control strategy.
- [KB80370](#) File > View/Print > Database shows persistent variables as initialize on strategy run.
- [KB80236](#) Archived strategies may force download when using different computers.
- [KB55584](#) Large Int64 table element value partially visible in Debug mode.

PAC Control R8.2g**PAC Project R8.5000**

Released: September 4, 2009.

New Feature

In support of the new Wired+Wireless devices, you can now configure the number of times a control engine tries to communicate with an I/O unit. Previously, communications timed out after three attempts.

PAC Control R8.2f**PAC Project R8.2009**

Released: March 20, 2009.

New Features

- For the Generic OptoMMP Device type in PAC Control, added support for the following commands:

- Get I/O Unit Event Message State
- Get I/O Unit Event Message Text
- Set I/O Unit Event Message State
- Set I/O Unit Event Message Text
- For strategies stored on microSD cards, the Autorun flag can be set without storing to flash first.
- Added the following commands (requires 8.5 firmware):
 - IVAL Set Analog Filter Value
 - IVAL Set Analog Min Value
 - IVAL Set Analog Max Value
- Support has been added for the new SNAP-AIPM-3 module (requires 8.3 firmware).

Bug Fixes

- [KB80469](#) Importing a chart with legacy items may cause PAC Control to crash.
- [KB80502](#) PAC Control's Inspect I/O Unit reports incorrect values for some I/O combinations.

PAC Control R8.2e

PAC Project R8.2003

Released: September 4, 2008.

Bug Fix

[KB80219](#) Background downloaded strategy stored to flash memory may time out.

PAC Control R8.2d

PAC Project R8.2002

Released: August 1, 2008.

Bug Fix

[KB80344](#) Stored strategy archive to flash memory does not survive a power cycle (this is the same issue that was corrected in R7.1e under [KB53999](#)).

PAC Control R8.2c

PAC Project R8.2001

Released: July 10, 2008.

Bug Fixes

- [KB80296](#) Possible problems using PAC Control pointers with G4D32RS / SNAP-BRS units.
- [KB80311](#) 'TPO' digital output feature in PAC Control Basic.

PAC Control R8.2b

PAC Project R8.2001

Released: June 25, 2008.

This is a limited release.

Bug Fixes

- [KB80108](#) Possible errors when importing charts with filenames using Microsoft reserved names.
- [KB80219](#) Background downloaded strategy stored to flash memory may time out.
- [KB80222](#) Problems when modifying an 'Append String to String' command in PAC Control.
- [KB80278](#) Test Compile of OptoScript code with multiple errors may cause problems.
- [KB80307](#) PID loops configured in PAC Manager missing in strategy.
- [KB80310](#) Using 'Modify' from I/O point in Strategy Tree may cause odd behavior.

PAC Control R8.2a**PAC Project R8.2000**

Released: June 19, 2008.

New Features

- Added the following commands for use with *mistic* serial I/O units:
 - Clear I/O Unit Interrupt
 - Disable Interrupt on Event
 - Enable Interrupt on Event
 - Get Active Interrupt Mask
 - Generating Interrupt?
 - Interrupt Disabled for Event?
 - Interrupt Enabled for Event?
- A new report has been added to show information about the location and mappings of I/O points. This can be useful with some commands that use different point mappings, such as Move I/O Unit to Numeric Table Ex.
- (Pro only) Support for *mistic* ASCII mode has been added.

The following digital point feature types have been added for the SNAP-PAC-R2, EB2, and SB2. The affected commands are also listed.

- On Totalizer
 - Get & Restart On-Time Totalizer
 - Get On-Time Totalizer
 - IVAL Set On-Totalizer
- Off Totalizer
 - Get & Restart Off-Time Totalizer
 - Get Off-Time Totalizer
 - IVAL Set Off-Totalizer
- TPO
 - Set TPO Period
 - Set TPO Percent
 - IVAL Set TPO Period
 - IVAL Set TPO Percent

The following existing commands have had R2/EB2/SB2 support added:

- Generate N Pulses
- Start Continuous Square Wave
- Start On-Pulse

- Start Off-Pulse
- Get & Clear Analog Totalizer Value
- Get Analog Totalizer Value
- Set Analog Totalizer Rate

PAC Control R8.1d

PAC Project R8.1006

Released: January 11, 2008.

Bug Fix

[KB60752](#) 'Disable Communication to Point' PAC Control command cannot select *mistic* output points.

PAC Control R8.1c

PAC Project R8.1003

Released: November 16, 2007.

Bug Fixes

- [KB56685](#) Possible odd behavior from PAC Controllers if numeric literals are passed in subroutines.
- [KB51029](#) Changes from string literal to null string not saved by PAC Control and ioControl string commands.
- [KB59096](#) OptoScript allows some commands be used with I/O points on I/O units that don't support the commands.

The affected commands are:

- Generate N Pulses
 - Get & Clear Analog Filtered Value
 - Get & Clear Analog Totalizer Value
 - Get Analog Totalizer Value
 - Set Analog Totalizer Rate
 - Get Analog Filtered Value
 - Get Analog Square Root Filtered Value
 - Get Analog Square Root Value
 - Start Continuous Square Wave
 - Start Off-Pulse
 - Start On-Pulse
 - Ramp Analog Output
- [KB54676](#) Out of range float literal assignments in OptoScript could cause strategy download problems.
 - [KB58312](#) PAC Control action block names may be changed from Debug mode.

PAC Control R8.1b

PAC Project R8.1002

Released: November 2, 2007.

Bug Fix

[KB60001](#) Possible compiler errors in PAC Control if subroutine receives variable instead of a literal.

PAC Control R8.1a

PAC Project R8.1000

Released: October 8, 2007.

New Features

- Added support for the SNAP-PAC-S2 controller.
- Added support for several new I/O units:
 - SNAP-PAC-SB1
 - SNAP-PAC-SB2
- Added support for several new modules:
 - SNAP-AICTD-8
 - SNAP-AIMA-8
 - SNAP-AIV-8
- Added the following new commands:
 - Flag Lock
 - Flag Unlock
- Added the **Background Strategy Downloads** option, which is the ability to download a strategy while the current one keeps on running.
- Older Ethernet, Ultimate, and Simple I/O units can be upgraded to their PAC replacements.

Enhancements

Pointer Tables are now a possible parameter type in 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

Bug Fixes

- [KB59258](#) Some PAC Control commands under specific conditions, may cause controller problems.
- [KB59467](#) Moving an Int 64 value to a PAC Control string character causes 'Undefined command during download' error.

PAC Control R8.0f

PAC Project R8.0009

Released: June 29, 2007.

New Feature

Expanded support for 64 high-speed digital I/O points on SNAP-PAC-R1.

PAC Control R8.0e

PAC Project R8.0007

Released: May 18, 2007.

Bug Fix

[KB57575](#) The Find and Replace function in PAC Control does not work correctly for OptoScript blocks.

PAC Control R8.0d

PAC Project R8.0006

Released: May 2007.

This version supports the 7.2 firmware for Ultimate and LCE controllers.

Bug Fix

[KB57248](#) Watchdog configured in PAC Control on digital output point may not work.

PAC Control R8.0c

Released: March 21, 2007.

Bug Fix

[KB56613](#) Integer 64 and 64-point I/O units with some PAC Control block commands.

PAC Control R8.0b

Released: March 5, 2007.

Bug Fix

[KB56346](#) PAC Control strategies converted from ioControl do not allow addition of certain modules.

PAC Control R8.0a

Released: February 28, 2007.

ioControl has been renamed to PAC Control.

New Features

- Added support for the following new I/O units:
 - SNAP-PAC-EB1
 - SNAP-PAC-EB2
- Added support for the following existing modules:
 - SNAP-IDC-32
 - SNAP-ODC-32-SRC
 - SNAP-ODC-32-SNK
 - SNAP-AITM-8
- Added support for the following upcoming modules:
 - SNAP-AIMA-32

- SNAP-AIV-32
- SNAP-IAC-A-16
- SNAP-IAC-16
- Added the View I/O Units dialog in the debugger. To access it, double-click the **I/O Units** folder item.
- Added the following commands:
 - Set I/O Unit Configured Flag
 - Move I/O Unit to Numeric Table Ex
 - Move Numeric Table to I/O Unit Ex
 - IVAL Move Numeric Table to I/O Unit Ex

Enhancements

- 96 PID loops are now available on the SNAP-PAC-R1, SNAP-PAC-R2, SNAP-PAC-EB1, and SNAP-PAC-EB2.
- Analog input points on Ethernet brains can now have inverted scaling. (Requires 8.1 PAC controller firmware or higher.) Inverted scaling is not supported for analog output points.
- The Configure Variables dialog now has sortable columns.
- Debugger options are now available in the debugger. Use the **Debug > Options** menu item.
- The time it takes to add or rename a variable or I/O object has been improved.
- The OptoScript editor now supports the mouse wheel.
- Charts and subroutines now support the mouse wheel. The wheel alone scrolls the window vertically. The wheel with the Shift key scrolls the window horizontally.

ioControl R7.1e

Released: October 23, 2006.

New Features

Added the following conditions:

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

Bug Fixes

- [KB51958](#) ioControl command 'Convert Number to Formatted Hex String' returns incorrect string.
- [KB52178](#) Some OptoScript commands used with Integer 64 may cause unexpected controller behavior.
- [KB52680](#) 'Find' in running OptoControl or ioControl strategy with very large charts may cause crash.
- [KB52544](#) Memory leak in ioControl and OptoControl Find option.
- [KB53999](#) ioControl archived strategy on control engine.

ioControl R7.1d

Released: May 4, 2006.

Information in this release note applies to both versions of ioControl unless otherwise indicated.

NOTE: See the release notes for the SNAP controller firmware for changes at the firmware level.

Bug Fixes

- [KB51461](#) Saving an ioControl strategy may have unexpected results.
- #51393 A problem with exporting charts has been resolved.

Items only within OptoScript blocks were sometimes not exported. The behavior would depend upon the exact nature of the chart.

ioControl R7.1c

Released: April 20, 2006.

Bug Fixes

- (Pro only) #51055 Corrected a problem with inspecting pointer tables that were passed parameters in a subroutine
Opening the inspect dialog would cause a -12 "Invalid table index" error to be put into the control engine's message queue.
- (Pro only) [KB51159](#) Inspecting PID loops in ioControl Debug mode.

ioControl R7.1b

Released: April 7, 2006.

Bug Fixes

- (Basic only) [KB50851](#) Counters configured on SNAP-PAC-R1 and SNAP-PAC-R2 not available to ioControl commands.
- (Pro only) [KB50824](#) Problems with moving analog points on a serial B3000 in ioControl.

ioControl R7.1a

Released: March 8, 2006.

New Feature

Added support for SNAP-PAC-R1 and SNAP-PAC-R2.

Enhancement

Added the following commands:

- Set I/O Unit from MOMO Masks
- IVAL Set I/O Unit from MOMO Masks

These commands work for all I/O units that allow digital points. They replace and deprecate the following commands:

- Set Digital I/O Unit from MOMO Masks
- Set Digital-64 I/O Unit from MOMO Masks
- Set Mixed I/O Unit from MOMO Masks
- Set Mixed 64 I/O Unit from MOMO Masks
- Set Simple 64 I/O Unit from MOMO Masks
- IVAL Set Digital Binary
- IVAL Set Digital-64 I/O Unit from MOMO Masks
- IVAL Set Mixed I/O Unit from MOMO Masks
- IVAL Set Mixed 64 I/O Unit from MOMO Masks
- IVAL Set Simple 64 I/O Unit from MOMO Masks

These old commands will continue to work. They have been moved to a new group called **Deprecated**.

The generic names for I/O units have been replaced with the actual part numbers:

Old Name	New Name
SNAP Mixed Ultimate I/O	SNAP-UP1-ADS
SNAP Mixed 64 Ultimate I/O	SNAP-UP1-M64
SNAP Mixed 64 Simple I/O	SNAP-ENET-S64
SNAP Mixed Ethernet I/O	SNAP-B3000-ENET, SNAP-ENET-RTC
SNAP D64 Ultimate I/O	SNAP-UP1-D64
SNAP D64 Ethernet I/O	SNAP-ENET-D64
B3000 SNAP Digital	B3000 (Digital portion)
B3000 SNAP Analog	B3000 (Analog portion)
SNAP Remote Simple Digital	SNAP-BRS
G4 Digital Multifunction I/O Unit	G4D16R
G4 Digital Remote Simple I/O Unit	G4D32RS
G4 Analog Multifunction I/O Unit	G4A8R, G4RAX
B100 Digital Multifunction I/O Unit	B100
B200 Analog Multifunction I/O Unit	B200

Bug Fixes

- #49830 A problem has been fixed where in very rare circumstances, ioControl would crash when opening inspect windows in Debug mode.
- [KB50224](#) Renaming expanded numeric or string tables used in ioControl and OptoControl watch windows.

ioControl R7.0d

Released: January 19, 2006.

Bug Fixes

- A problem has been fixed where the Output Maximum Change for any existing PID Loops would change to 0 when opening a pre-7.0 strategy.
- A problem has been fixed where the **Replace** function would not work correctly if an OptoScript block had lines that ended with just a newline character, not the normal Windows carriage-return and newline pair. This was most likely to happen if OptoScript code was copied from another program, like an email client.
- A problem has been fixed where a chart was not marked as being modified and needing to be compiled when using the **Replace** function and changes to the chart only occurred in OptoScript blocks.

ioControl R7.0c

Released: January 1, 2006.

Bug Fix

- (Pro only) [KB49424](#) Load cell commands in ioControl change when added to a strategy.

ioControl R7.0b

Released: January 22, 2005.

Bug Fix

(Pro only) ioControl would crash when opening an OptoControl strategy that called a subroutine. When exporting I/O units, it was possible that the incorrect IP address would be written to the OTG (.otg) file. This was most likely to happen after previously importing the configuration from an ioManager-generated OTG file.

ioControl R7.0a

Released: December 19, 2005.

New Features

- (Pro only) Added the ability to import OptoControl strategies.
- (Pro only) Added support for serial *mistic* brains.
- (Pro only) Added secondary target addresses for Ethernet-based I/O units.
- (Pro only) Added I/O units, digital points, analog points, and pointer tables as possible passed-parameter types for subroutines. Pointer variables were added as a possible local variable type for subroutines.
- Added support for the following modules (see also R6.1c):
 - SNAP-AIARMS-i
 - SNAP-AIVRMS-i

Enhancements

- Added an option to control if the active block is always visible when stepping through a chart. The behavior was changed in R5.1a. This option lets you choose old or new behavior. The option is under **Configure > Options > Debugger**.
- When exporting a chart or copying blocks, items only within OptoScript blocks are now included.

Bug Fixes

- When entering Debug mode, existing breakpoints in the control engine were not being displayed in ioControl.
- [KB1428](#) The AND/OR operator option appears in an action block while in Online mode in ioControl.
- [KB48089](#) PID 'forced value' parameter may be limited by ioControl.
- [KB47922](#) ioControl allows assignment of a larger than 32-bit number to an Integer 32 variable.
- Invalid numeric literals could be entered in the Add Instruction dialog.
- ioControl would crash if an ActiveX control was not loaded.
- The dialogs affected are View PID Loop and Inspect Table, both in the debugger.
- When stepping through OptoScript blocks with 'case' statements, the 'break' keyword had incorrect line information.

ioControl R6.1c

Released: July 28, 2005.

New Features

- Added support for the following modules:
 - SNAP-AOA-23-i

- SNAP-AIMA2-i modules
- SNAP-AILC module
- Added the following commands:
 - Set Analog Load Cell Fast Settle Level
 - Set Analog Load Cell Filter Level

Enhancement

UIO now supports up to 32 PID loops.

ioControl R6.1a

Released: February 14, 2005.

New Features

- Added support for new HDD modules
- Bill of Materials tool
- Added the following commands:
 - Get HDD Module States
 - Get HDD Module On-Latches
 - Get HDD Module Off-Latches
 - Get & Clear HDD Module On-Latches
 - Get & Clear HDD Module Off-Latches
 - Get All HDD Module States
 - Get All HDD Module On-Latches
 - Get All HDD Module Off-Latches
 - Get & Clear All HDD Module On-Latches
 - Get & Clear All HDD Module Off-Latches
 - Clear HDD Module On-Latches
 - Clear HDD Module Off-Latches
 - Get HDD Module Counters
 - Get & Clear HDD Module Counters
 - Get & Clear HDD Module Counter
 - Set HDD Module from MOMO Masks
 - Turn On HDD Module Point
 - Turn Off HDD Module Point

Bug Fixes

- In the ioControl debugger, when changing the value of a string variable or string table element, strange behavior could happen if another application (such as ioDisplay) was also communicating with the control engine's host port.
- The following OptoScript for/next loop would execute once, when it should not have looped at all. This would result with x being 1 when it should be 0.

```
x = 0;
for n = 0 to -1 step 1
  x = x + 1;
next
```

ioControl R6.0b

Bug Fixes

- In the debugger, if an analog point's XVAL was out of range, it was not possible to change the IVAL. You would get an error that the XVAL was not valid. This bug was introduced in version 5.0.
- In the debugger, in binary view mode, it was not possible to change the bits of an Integer 64 variable.
- When adding or editing analog temperature points, the dialog showed their units as being Celsius, even if the I/O unit was set Fahrenheit. This was a display problem and did not affect the compiler or debugger.
- When copying a block from a chart into a subroutine, it was possible to copy types that are not allowed in subroutines. This included pointer variables, pointer tables, and PID loops. This would cause various types of strange behavior, including items showing up at the top of the strategy tree and problems when running the strategy on a device.
 - ioControl will now check for this when pasting blocks into a subroutine.
 - I/O units, points and charts were already being checked.
- The following commands did not allow points that were on a Mixed 64 I/O unit:
 - Calculate & Set Analog Gain
 - Calculate & Set Analog Offset
 - Get & Clear Analog Maximum Value
 - Get & Clear Analog Minimum Value
 - Get Analog Maximum Value
 - Get Analog Minimum Value
 - IVAL Set Analog Point
 - Set Analog Filter Weight
 - Set Analog Gain
 - Set Analog Offset
 - Set Analog TPO Period

ioControl R6.0a

Released: October 1, 2004.

New Features

- Added subroutines to allow greater flexibility in building flowcharts.
- Added the following commands:
 - Set Analog Filter Weight
 - Float Valid?
 - Get Available File Space

Enhancement

I/O units may now share an IP address if their ports are different.

Bug Fixes

- Digital points in slot #63 with the watchdog turned on no longer cause an overflow error when downloading the strategy.
- Using timers with mathematical and comparison commands now reliably returns accurate results. Some mathematic and comparison results were sometimes inaccurate when used in Action and Condition blocks with commands such as Add, Subtract, Divide, Multiply, Maximum, Minimum, Equal?, Greater Than or Equal?, Greater?, Less?, Less Than or Equal?, and Not Equal?.

- I/O unit watchdog timeout values are now sent to I/O units only when configured to do so.
- ioControl no longer negatively affects mouse behavior in other running applications as it sometimes did previously. The effect was noticed with a two-wheel mouse, but it could have caused other problems.
- A PID loop with a setpoint type coming from another PID's output is now correctly compiled.
- ioControl no longer tends to lock up while inspecting PID loops with unplugged input points. A new version of the iPlotLibrary.ocx plot control fixed the problem.
- The **Command Help** button in an OptoScript dialog box will now reliably bring up the Command Reference Help, even if the command is completely highlighted.
- The I/O Unit Inspect dialog now correctly displays all bits from the last letter in the version. For instance, an Ethernet I/O unit with a R3.0q kernel was displayed as "R3.0a".
- The following commands now compile correctly when using D64-type brains as a parameter:
 - Read Number from I/O Unit Memory Map
 - Write Number to I/O Unit Memory Map
 - Numeric Table Element Bit Test
 - Get I/O Unit as Binary Value
 - Bit Clear
 - Bit Rotate
 - Bit Set
 - Bit Test
 - Bit On?
 - Bit Off?
- The IVAL Set Analog Point command now compiles correctly when an integer is used as the source value.
- Using the AddMessageToQueue command in an OptoScript block no longer causes a download error.

ioControl R5.1b

Released: February 11, 2004.

Bug Fixes

- It was not possible to add PID loops to Ethernet I/O units created in pre-5.1 versions of ioControl. This version will both fix and prevent the problem.
- A bug fix in R5.1a regarding 'for' loops with a negative step was not correct.
- The command "\Convert Number to Hex String did not work correctly for Integer 64s.

ioControl R5.1a

Released: December 1, 2003.

New Features

- PID loops
- Added support for the SNAP-ENET-S64 product, known in ioControl as SNAP Mixed 64 Simple I/O
- Added the following commands:
 - Copy Current Error to String
 - Add Message to Queue
 - Get Severity of Current Error
 - Get PID Input
 - Get PID Current Input

- Get PID Setpoint
- Get PID Current Setpoint
- Get PID Feed Forward
- Get PID Output
- Get PID Gain
- Get PID Tune Integral
- Get PID Tune Derivative
- Get PID Feed Forward Gain
- Get PID Max Output Change
- Get PID Min Output Change
- Get PID Input Low Range
- Get PID Input High Range
- Get PID Output Low Clamp
- Get PID Output High Clamp
- Get PID Scan Time
- Get PID Forced Output When Input Under Range
- Get PID Forced Output When Input Over Range
- Get PID Mode
- Get PID Configuration Flags
- Get PID Status Flags
- Set PID Input
- Set PID Setpoint
- Set PID Feed Forward
- Set PID Output
- Set PID Gain
- Set PID Tune Integral
- Set PID Tune Derivative
- Set PID Feed Forward Gain
- Set PID Max Output Change
- Set PID Min Output Change
- Set PID Input Low Range
- Set PID Input High Range
- Set PID Output Low Clamp
- Set PID Output High Clamp
- Set PID Scan Time
- Set PID Forced Output When Input Under Range
- Set PID Forced Output When Input Over Range
- Set PID Mode
- Set PID Configuration Flags
- Disable Communication to PID Loop
- Enable Communication to PID Loop
- PID Loop Communication Enabled?
- Set Simple 64 I/O Unit from MOMO Masks
- IVAL Set Simple 64 I/O Unit from MOMO Masks

Enhancements

- Info and warning messages have been added to the error queue.
- The Add Module dialog has been improved.
- Dialogs in the Configurator now know if a change has actually been made when the **OK** button is used to close the dialog. This should help prevent many cases of inadvertently making a change that would then require a download before entering Debug mode.
- In the debugger, the **Step Line** and **Step Block** buttons have been replaced with **Step In**, **Step Over**, and **Step Out** buttons.
- The **Command Help** button in the OptoScript dialog is now smarter.
- Keyboard and mouse standard shortcuts were added:
 - When a block is selected, the F2 key brings up the Name Block dialog.
 - When a flowchart window is selected, holding the CTRL key while scrolling the mouse wheel will change the zoom setting.
- While stepping through a chart, if the active step block is not visible, it will be scrolled into view.
- The ability to clamp analog output points has been added.
- When archiving a strategy to a control engine and then uploading the archive back to a PC with ioTerm, you can now go directly into Debug mode without downloading.
- Resolved several issues with idle session timeouts.

Bug Fixes

- In a flowchart, making multiple object selections with the Shift key was not working.
- Some combo boxes in the Find and Replace dialogs were not wide enough to show all of their content.
- For SNAP-AOA-23 and SNAP-AOV-25 modules, the **Custom...** scaling button was incorrectly enabled in the Edit Analog Point dialog.
- Communication Handles were not being created when Action and/or Condition blocks were pasted between strategies.
- In watch windows, pointer variables were not displaying properly.
- When opening a chart window, it was possible that it would be placed outside of the viewable area.
- String Tables with long initialization strings could cause download errors.
- String Tables using the **Initialize on strategy download** option were not being initialized correctly.
- In OptoScript blocks, some float literals were being truncated when compiled. For instance, 5.335004e-7 was being truncated to 0.000001.
- In OptoScript blocks, 'for' loops with a negative step did not work properly. They did one less iteration than they should.
- Adding I/O points on-the-fly would not work if a type-mismatch occurred.

ioControl R5.0a

Released: August 1, 2003.

New Features

- Added support for the SNAP-UP1-M64 product, known in ioControl as SNAP Mixed 64 Ultimate I/O.
- Two new communication handle drivers: "file" and "ftp".
- Added the following command(s):
 - Get Type From Name
 - Get Value From Name
 - Send Communication Handle Command

- Transfer N Characters
- Convert IP Address String to Integer 32
- Convert Integer 32 to IP Address String
- Erase Files in Permanent Storage
- Save Files To Permanent Storage
- Load Files From Permanent Storage
- Set Mixed 64 I/O Unit from MOMO Masks
- IVAL Set Mixed 64 I/O Unit from MOMO Masks

Bug Fix

In some situations, unnecessary downloads were being required when changing to Debug mode.

To reproduce:

1. Download a strategy.
2. Go to Config mode.
3. Change a chart (like adding an empty block).
4. Go to Debug mode. A normal download is performed.
5. Return to Config mode.
6. Close the strategy.
7. Reopen the strategy.
8. Go to Debug mode. A download is required even though it should not.

ioControl R1.0d

Released: April 4, 2003.

Bug Fix

Duplicate variables could be created in the strategy database when removing a variable from two or more charts and then deleting the variable.

ioControl R1.0c

Released: August 15, 2002.

New Features

- Added the following commands:
 - Get End-Of-Message Terminator
 - Set End-Of-Message Terminator
 - Clear Communication Receive Buffer
 - Compare Strings
 - Move to Numeric Table Elements
 - Move to String Table Elements
- Added the ability to make a control engine download file. This makes it easy to download a compiled strategy for a specific control engine using ioTerm.

Enhancements

- Object selection and interaction using the mouse is now much closer to Windows standards.
- In the debugger, controller busy errors will now be retried several times before posting a message.

- In the debugger, the error field in the status bar is now highlighted red and will display the Inspect Controller dialog when clicked.
- An "A_" is no longer added to the beginning of a name when naming an object. The name will be checked either when the focus has changed or the dialog is closed.
- When adding an I/O unit, Ultimate I/O is now the default instead of Ethernet I/O.
- The time it takes to record a variable or I/O name change has been decreased in large strategies that have charts without OptoScript blocks.
- The time it takes to initialize a table has been greatly improved.

Bug Fixes

- Pointer variables using the **Initialize on strategy download** option were not being properly initialized.
- In strategies that have OptoScript blocks, the Find and Replace dialogs were occasionally having problems and showing the "Could not open OptoScriptTemp.txt for the OptoScript compiler" error message.
- OptoScript blocks with unterminated comment blocks (i.e. /* and */) would cause the OptoScript lexical analyzer to enter an incorrect state and have unexpected behavior.
- When moving an I/O point referenced in an OptoScript block to a different location, the reference count for the item would become incorrect.
- The debugger's string table inspect dialog was not properly displaying tables that were wider than 127 characters.
- Focusing issues in the Add Instruction dialog have been addressed.
- The Find and Replace dialogs were not finding instances of communication handles in OptoScript blocks.
- When using the **Replace All** button in the Replace dialog to replace items in OptoScript blocks, neither the old or new items would have their reference counts updated.

ioControl R1.0b

Released: November 21, 2001.

New Features

- Added an Inspect Communication Variable dialog for inspecting communication handles in the debugger.
- Added a **Command Help** button to the OptoScript editor dialog.
- Added a **Strategy Information** menu item for displaying the open strategy's filename and path.
- Added the following commands:
 - Receive String Table
 - Receive Pointer Table
 - Transmit String Table
 - Transmit Pointer Table
 - Get Pointer From Name

Enhancements

- The Inspect Control Engine dialog has been improved. The **Persistent RAM** and **Revision Time** fields are new.
- The Inspect Control Engine dialog now uses a different method for determining the communications loop time. It now displays the time taken for one single transaction rather than several.
- The Move Numeric Table to Numeric Table command now checks for valid table lengths and indexes.
- Automatically saving a strategy to flash memory after making an online change has been enabled.

- The commands Receive Numeric Table and Transmit Numeric Table now support Integer 64 Tables.

Bug Fixes

- The **Move To** feature in the Configure I/O Points dialog was incorrectly allowing points to be moved to the wrong location.
- The Select Continue Block Destination dialog was not showing OptoScript blocks.
- Syntax errors in OptoScript code involving a table would not display the correct error line number.
- String assignments in OptoScript would not work correctly if the same item was on both sides of the assignment operator.
- It was possible to copy or import a chart with a name that already existed in the strategy database.
- Importing charts with I/O units in them could lead to multiple I/O units having the same address. An added I/O unit will now have an initial IP address of 0.0.0.0.
- When importing charts or copying block, I/O points that needed to be added were not being added in the proper location.
- When importing charts, Integer 64 variables and tables were not being matched correctly.
- In the debugger, setting a string variable or table element to be empty would cause the control engine to lock up.
- Any OptoScript or Instruction dialogs opened because of line stepping were not being automatically closed when leaving the debugger.
- The command Get Nth Character was returning a -42 error for a string with non-printable characters even though the index was valid.
- The command Convert IEEE Hex String to Number was not always returning the correct value. For example, the manual uses the example of 418E666 converting to 17.8, but the command was returning 18 instead.

Uninstallation of this Product

A utility is provided to uninstall this product. The utility removes all registry entries and files previously installed.

Exceptions to this are:

- Previously configured control engines are not removed from the registry.
- The installation directory tree is not removed if any user-created files exist in it.
- The program folder or group is not removed if any icons have been added by the user.

PAC DISPLAY

PAC Display R10.6a

PAC Project R10.6000

Released: October 23, 2025. Updated: October 27, 2025.

NOTE: You may be prompted to restart your computer to complete the installation of the software.

New Feature

An **Ignore Left-Clicks** checkbox option has been added to the Graphic Dynamic Attributes window that allows you to make non-operator-driven graphics (and any graphics behind them) from being clickable. For more information about the Ignore Left-Clicks option, see the [PAC Display User's Guide](#) (form 1702).

Enhancements

- For the operator-driven attribute Execute Menu Item, a menu item was added: **Security/Add/Modify User**. This menu item makes it possible for operators with the correct permission to add or modify other users. For more information about the Execute Menu Item attribute, see the [PAC Display User's Guide](#) (form 1702).
- When you configure an alarm to send an email, you can now select email servers that support TLS versions 1.2 and 1.3.
- Some error messages generated by the Regenerate IO Scanner Tag Name function and subsequently stored in the `IOScannerErrorLog.txt` file have been improved to help you identify the source of the error. For more information about this function, see the [PAC Display User's Guide](#) (form 1702).
- Error messages from the OptoOPCServer have been improved to provide more information. Previously, only a hex code was provided.
- The Tag Selection window now displays the currently selected tag in the window's title area to help you remember which tag you selected as you select a new tag. For more information about this function, see the [PAC Display User's Guide](#) (form 1702).
- There is a new runtime setting that, when enabled, colors a gadget if the tag's quality code is anything other than good. The new setting is called **Enable graphic color change**, located in the new **Bad Tag Quality Graphics Options** section of the **I/O Unit Tags** tab. For more information and instructions about enabling this setting, see the [PAC Display User's Guide](#) (form 1702).
- A setting has been added to the **I/O Unit Tags** tab of the Runtime Options window so that you can specify an override value if the value of a *groov* analog input is NaN. This setting is enabled for new projects created in PAC Display 10.6. When you import an existing project into PAC Display 10.6, PAC Display requests that you specify a value for this setting. For more information and instructions about configuring this setting, see the [PAC Display User's Guide](#) (form 1702).
- Updates were made to enhance security.

Bug Fixes

- [KB89977](#) Bounding box may not appear when moving graphic objects in PAC Display.
- [KB90500](#) PAC Display Configurator fails to properly load `.cwb` files and tags.
- [KB90590](#) Email notifications for triggered alarms are sent inconsistently.
- [KB90600](#) Sending test emails in PAC Display may fail or freeze the application.
- [KB90718](#) PAC Display Runtime may crash when ODBC database is unavailable.
- [KB90721](#) PAC Display Runtime may randomly crash.
- [KB90736](#) Digital output ON/OFF totalization is unsupported in PAC Display Configurator.
- [KB90755](#) On/Off-Time Totalization values from *groov* discrete outputs not updating in PAC Display Runtime.
- [KB90854](#) PAC Display Runtime may crash on exit.
- [KB90861](#) Rotated, dynamic graphic objects may not appear when initially opened in PAC Display.
- [KB90902](#) Analog channels from GRV-IVAPM-3 and GRV-R7-I1VAPM-3 not supported in PAC Display.
- [KB91044](#) Imported windows with grouped PNG objects may cause PAC Display to crash.
- [KB91080](#) Configuring users and/or groups from the Runtime Setup dialog box crashes PAC Display Configurator.
- [KB91094](#) AutoCorrect Tags results file from PAC Display fails to open in WordPad in Windows 11 version 24H2 and higher.
- [KB91096](#) Using a short relative path for SuperTrend Historical log files crashes PAC Display Runtime.
- [KB91112](#) Incorrect errors may be reported when validating recipe files in PAC Display.
- [KB91128](#) Opening a project that does not contain any windows crashes PAC Display .
- [KB91164](#) Validate Recipe File utility in PAC Display fails to report missing blank lines in recipe files.

- [KB91166](#) The Help button on the Alarm Points window in PAC Display Runtime does not launch online help.
- [KB91187](#) Duplicating graphic objects in PAC Display may fail with a misleading error message.
- [KB91221](#) The Closing Window Setup dialog in PAC Display hangs and cannot be dismissed.
- [KB91303](#) Tooltips appear incorrectly on graphics in PAC Display Runtime.

PAC Display R10.5c

PAC Project R10.5003

Released: December 19, 2023. Updated: January 3, 2024 and October 23, 2025.

Bug Fixes

- [KB90559](#) Control items in PAC Display do not fit in dialog windows.
- [KB90749](#) Transparent blinking graphic objects may crash PAC Display Runtime.

PAC Display R10.5b

PAC Project R10.5002

Released: May 22, 2023. Updated: May 24, 2023.

Bug Fixes

- [KB88728](#) PAC Display Runtime: Inconsistent refreshing of graphics and values.
- [KB90577](#) PAC Display Runtime: Crash on close after triggering and acknowledging an alarm.
- [KB90583](#) PAC Display Runtime: Crash on startup if project enables Tooltips.

PAC Display R10.4a

PAC Project R10.4000

Released: September 7, 2021.

Bug Fixes

- [KB88728](#) PAC Display Runtime: Inconsistent refreshing of graphics and values.
- [KB89001](#) Hint Text when using "carriage return" code "\r" not wrapping the text.
- [KB89397](#) PAC Display Runtime adds random characters in Operator Log File.
- [KB89476](#) PAC Display Configurator crashes while upgrading project to newer version.
- [KB89696](#) When attempting to clear bits in a 64-bit integer table, the bits are set.

PAC Display R10.3c

PAC Project R10.3003

Released: December 18, 2020.

Bug Fixes

- [KB88845](#) PAC Display Configurator's TagInfoView Utility Does Not Load.
- [KB88886](#) PAC Display: Hint Text on an Object is Incorrect.
- [KB88931](#) Hint Message for Dynamic Attribute is Visible on Invisible Graphic Object.
- [KB89250](#) PAC Display Runtime Windows May Not Update Data.

PAC Display R10.3b

PAC Project R10.3001

Released: August 17, 2020.

Bug Fixes

- [KB88706](#) PAC Display runtime crashes when you quickly switch windows.
- [KB88711](#) Control Engine driven alarm points may not function properly.
- [KB88715](#) Alarm point automatic re-alarmed time may not be accurate.
- [KB88936](#) Random blocks appear in PAC Display windows.
- [KB89022](#) PAC Display runtime crashes.

PAC Display R10.3a

PAC Project R10.3000

Released: April 9, 2020.

Bug Fix

[KB88808](#) In PAC Project Demo, PAC Display Basic Configurator does not start.

PAC Display R10.2d

PAC Project R10.2005

Released: January 6, 2020.

Bug Fix

[KB88739](#) PAC Display Runtime crashes when quickly clicking on different buttons.

PAC Display R10.2c

PAC Project R10.2003

Released: October 16, 2019.

Bug Fixes

- [KB87962](#) PAC Display Configurator becomes unresponsive when Runtime Setup > Define Default is selected.
- [KB88198](#) PAC Display Runtime: Historical SuperTrends are not updated with new data.
- [KB88305](#) PAC Display Configurator: Recipe Upload/Download buttons grayed out when creating recipe file.
- [KB88306](#) Some Windows dialog boxes do not appear correctly in PAC Display Configurator.
- [KB88311](#) PAC Display Configurator: Graphic Dynamic Attributes lets you select Fixed data Toggle when source is Prompt for data.
- [KB88313](#) PAC Display: Alarm point may appear when it shouldn't.
- [KB88382](#) Closing a PAC Display Runtime project may cause Runtime to crash.

PAC Display R10.2b

PAC Project R10.2002

Released: June 10, 2019. Updated: June 13, 2019.

Bug Fixes

- [KB87904](#) PAC Display Configurator crashes when closing Configure Trigger dialog box.
- [KB87917](#) Historical Data Log not logging to database when triggered.
- [KB87942](#) PAC Display Runtime: "Waiting for Async Operations to Complete" message; window slow to close.
- [KB87950](#) PAC Display Configurator: Digital points not listed for Control Engine Driven attributes setup by discrete.
- [KB87959](#) PAC Display Configurator: Import Window may not allow selection of control engine.
- [KB87964](#) PAC Display Runtime does not stay minimized.
- [KB87968](#) PAC Display: Database table not created when alarm triggered.
- [KB88024](#) PAC Display Runtime Operator Action Logging always records previous value as 0.0.
- [KB88038](#) Can't access some PAC Display Configurator dialogs.
- [KB88039](#) PAC Display appears frozen or can't access dialog box.
- [KB88077](#) PAC Display Runtime: File Open / Save dialogs appear distorted.
- [KB88084](#) PAC Display Runtime: Historical logging to database creates empty log file.
- [KB88154](#) PAC Display Configurator: Crashes during Save.
- [KB88215](#) PAC Display Runtime: Recipe upload hangs.
- [KB88282](#) PAC Display Runtime: Historical logs do not show hundredths of second.
- [KB88283](#) PAC Display Configurator: Able to right-click on attribute check boxes.
- [KB88307](#) PAC Display historical log will not log when triggered.
- [KB88327](#) QuickTag entry may duplicate items in list.

PAC Display R10.2a

PAC Project R10.2000

Released: December 3, 2018.

Bug Fixes

- [KB87747](#) PAC Display Configurator: Canceling Alarm Configuration window erases alarm points.
- [KB87789](#) PAC Display Configurator: Cannot unlock position for button graphic.
- [KB87791](#) PAC Display Runtime: Crash when displaying Integer64 values.
- [KB87792](#) PAC Display Configurator may crash when importing an exported historical log.
- [KB87797](#) PAC Display Configurator: Sub-attributes of Send Value, Discrete, String do not retain modified values.
- [KB87801](#) PAC Display Runtime: "Send Data: Unable to validate entry" message.
- [KB87804](#) In Quick Tag Entry mode, selecting a sub-attribute check-box unchecks both it and the parent attribute.
- [KB87805](#) Recipe downloads may cause OptoOPCServer to crash.
- [KB87812](#) Converting SuperTrend Historical Binary File to text results in a .bin file of file size 0.
- [KB87827](#) Runtime crashes when displaying graphics with Alarm Point dynamic attribute.
- [KB87861](#) Size options don't work with Alarm graphics.
- [KB87890](#) PAC Display Configurator: Configure > Runtime > Windows/Dialogs options are grayed out.
- [KB87895](#) Can't search through help.

PAC Display R10.1a

PAC Project R10.1000

Released: September 17, 2018.

Enhancements

- The **View > Reset Dialog Positions** feature now also resets the Toolbox to the position configured in **File > Configurator Options > Multiple Monitor Options**.
- The Center Dialogs feature (**File > Configurator Options > Multiple Monitor Options**) can now position all Microsoft Windows common dialog boxes except for the following: Color, Font, File Open, File Close, and Print. These dialog boxes open where they were last positioned.
- Prior to this release, if the tags you selected in the Find and Replace dialog box (**Edit > Replace**) were not of the same type, PAC Display displayed an error. Now, when you select a tag in the **Find What** field, PAC Display automatically fills the **Replace With** field with tags can be selected as replacements.

Bug Fixes

- [KB86374](#) Clicking Text > Font > TrueType causes some Beta versions of PAC Display Configurator to crash.
- [KB87568](#) Unable to switch control engines in PAC Display Runtime.
- [KB87586](#) PAC Display Runtime displays TValue "Reference Type/Actual Type =" error messages and then crashes.
- [KB87587](#) PAC Display Configurator: Graphic image may be blank when window is restored.
- [KB87589](#) PAC Display Runtime may crash when you use the Print feature.
- [KB87601](#) "Edit > Replace > Entire Project" may fail or cause PAC Display to crash when replacing "File Name From Strategy" tag.
- [KB87632](#) GIF graphic is invisible in imported PAC Display window.
- [KB87648](#) PAC Display: Dynamic Attributes window doesn't show the object's attributes.
- [KB87691](#) PAC Display requests value even though Alarm Level is set up for Tag.

PAC Display R10.0b

PAC Project R10.0001

Released: July 9, 2018.

Bug Fixes

- [KB86833](#) PAC Display Runtime Operator can access controls on a popup window before logging in.
- [KB87227](#) PAC Display Runtime: Values in table control may not update correctly after recipe downloads.
- [KB87280](#) PAC Display: "Error while reading window" message when upgrading from PAC Display R9.3d or lower.
- [KB87457](#) PAC Display Configurator won't finish loading project.
- [KB87460](#) PAC Display Runtime: Event Log entries may flow into the message box.
- [KB87464](#) Replace Tags for Entire Project misses historical log's "String Name" tag.
- [KB87474](#) Strategy Date and Strategy Time fields appear as "#" in Runtime.
- [KB87479](#) Trends sometimes flicker in PAC Display Runtime.
- [KB87498](#) "Always in memory" option ignored in PAC Display Runtime.
- [KB87526](#) PAC Display may close if you uncheck a dynamic attribute (new Graphic Dynamic Attribute dialog box).
- [KB87527](#) PAC Display: Can't configure dynamic attributes for analog input points.

- [KB87533](#) PAC Display Configurator may close when adding an “Execute Menu Item” dynamic attribute using the old-style dialog boxes.
- [KB87543](#) PAC Display Runtime can send an out-of-range value to a float variable after a period or minus sign is entered.

PAC Display R10.0a

PAC Project R10.0000

Released: May 18, 2018. Updated: February 5, 2019.

New Feature

When a graphic object extends beyond the borders of a draw window or (Pro only) URL window, you can now configure the window to display scroll bars. You can set this option globally (for all windows in the project) or for individual windows.

Enhancements

- The Graphic Dynamic Attribute dialog box has been streamlined to make it easier and faster to assign dynamic attributes to graphic objects. If you prefer, you can set PAC Display Configurator to display the old-style way of configuring dynamic graphics. You can also switch between the two styles while deciding which one you prefer.
- The naming format for Hourly Historical Data log files now includes the 4-digit year. The format is Rhyyyy_mmddhh.H#### (or Rhyyyy_mmddhh.T#### for SuperTrends).

Bug Fixes

- [KB86722](#) PAC Display Runtime: Animated graphics sometimes flicker.
- [KB86803](#) PAC Display: Can't select SuperTrend log file location after configuring Remote SuperTrend Logging.
- [KB86947](#) Values in PAC Display Runtime aren't updated while Runtime window is minimized.
- [KB87035](#) Creating an Archive Project may cause PAC Display Configurator to crash.
- [KB87205](#) PAC Display Runtime: When you edit a value in a table, sometimes the wrong element is changed.
- [KB87208](#) PAC Display Runtime: Can't edit some of the values in a table object.
- [KB87214](#) PAC Display Configurator may crash when upgrading from R9.0c or lower to R9.4a or higher.
- [KB87216](#) PAC Display Runtime Pro may display values as # or may stop updating tags.
- [KB87221](#) “Allow Multiple Instances to Run”: Closing PAC Display Runtime Pro may also close another instance.
- [KB87243](#) Saving a project may cause PAC Display Configurator Pro to hang if Primary Scanner Node field is blank.
- [KB87292](#) PAC Display Configurator does not save configured recipe directories if they are entered manually.
- [KB87293](#) PAC Display Runtime: SuperTrend scale may not match pen selection.
- [KB87297](#) PAC Display may continue to log files in Directory Path “Name” after the path has been changed to “project directory”.
- [KB87305](#) PAC Display Runtime crashes when opening a project that has a string table tag with no index.
- [KB87311](#) PAC Display Runtime crashes if Enable Alarm Point Email option is selected but email settings are not configured.
- [KB87314](#) PAC Display Runtime displays -1 priority for detailed alarm.
- [KB87317](#) PAC Display On/Off (discrete) button may not blink.

PAC Display R9.6g

PAC Project R9.6006

Released: February 21, 2018. Updated: April 9, 2018.

Bug Fixes

- [KB87077](#) PAC Display Configurator: Quick Tag Entry doesn't display values in Field drop-down list.
- [KB87081](#) PAC Display Runtime Pro: A PID's SuperTrend Pen Scale dialog box may reopen after you close it.
- [KB87082](#) PAC Display Configurator incorrectly identifies blank entries in recipe download files as "invalid".
- [KB87106](#) PAC Display Configurator: Sometimes Find and Replace does not display drop-down options for Item Name.
- #87107 New window appears behind (and may capture graphics of) changed window.
- #87109 Configuring a window's Minimize, Maximize, and Restore control handles doesn't always work.
- #87110 Configurator may distort SuperTrend graphics if you change window properties many times.
- #87111 PAC Display alarm window may not open for subsequent alarms.
- #87112 Detailed alarm window displays multiple persistence alarms for the same alarm point (and operator can't acknowledge them).
- #87117 Detailed alarm graphic incorrectly shows "warning" color and persistence timer when alarm point is not in a state with persistence.
- #87119 PAC Display Runtime may crash during startup when performing Reload History Alarms.
- #87126 A window's size and position doesn't change when you reconfigure the X-Y positions, width, or height.
- #87130 "Text > Size..." command doesn't change the font size of a TrueType font.
- #87134 Recipe uploads can take increasingly more time to complete.
- #87141 Instead of alarm point information, printed alarm logs show the characters: *.*s.
- #87188 PAC Display Runtime may hang or crash when opening a project with many JPEG graphics and alarms on the same window.
- #87190 Alarm > Priority Filter levels are always visible on the PAC Display Runtime menu bar.

PAC Display Basic R9.6f

PAC Project R9.6005

Released: November 27, 2017.

Bug Fixes

- [KB86650](#) When Runtime opens, windows may not be open or closed (as they were configured).
- [KB86869](#) PAC Display can't open user's guide ("Unable to determine the default PDF file viewer").
- [KB86878](#) PAC Display Configurator won't open the "De-encrypt Operator Log File" feature.
- [KB86879](#) PAC Display: Decrypting Runtime Operator Log file displays an "Operator Log File is invalid" message.
- [KB86885](#) PAC Display Runtime may crash when acknowledging alarms configured with sound.
- [KB86886](#) PAC Display Runtime crashes when displaying a historical alarm log file with both ANSI and Unicode records.
- [KB86887](#) PAC Display Configurator: Discrete On/Off text (Text In from Control Engine) is blank.
- [KB86889](#) On Windows 7 only, PAC Display Runtime crashes if sent an empty string.
- [KB86895](#) PAC Display Runtime: Comments for ACK alarms aren't displayed in Current or Historical Alarm graphics.

- [KB86898](#) PAC Display Runtime may crash on exit if windows contain alarm graphics.
- [KB86918](#) PAC Display may display wrong background color for SuperTrends.
- [KB86922](#) PAC Display Runtime terminates on start up when project has several SuperTrends.
- [KB86947](#) Values in PAC Display Runtime aren't updated while Runtime window is minimized.
- [KB86956](#) PAC Display Configurator may crash when you close the Send Value dialog box.
- [KB86961](#) PAC Display: "-copy" is missing from the names of imported alarm points.
- [KB86964](#) Network connections may be lost when PAC Display Runtime is running.
- [KB86978](#) PAC Display Configurator may crash if you don't save changes to an existing project, and then immediately undo edits in a new project.
- [KB86987](#) PAC Display: Index column and column titles are missing from table.
- [KB86995](#) PAC Display: "Open when there are new alarms" option doesn't work in Runtime.
- [KB87000](#) PAC Display Configurator crashes when canceling the import of a comma-delimited Historical data log.
- [KB87006](#) PAC Display Configurator may crash when you repeat an undo (or redo) after changing window properties.
- [KB87008](#) PAC Display Runtime may stop refreshing values.
- [KB87022](#) PAC Display Runtime: Active alarm may not appear in Detailed Alarm Banner in Runtime.
- [KB87033](#) PAC Display Runtime doesn't create Historical data log from imported comma-delimited file.
- [KB87050](#) PAC Display Pro: If Operator log is saved to database, can't switch to saving log to file.
- [KB87056](#) PAC Display Runtime: Buttons are missing from the bottom of historical SuperTrends.

PAC Display R9.6e

PAC Project R9.6004

Released: July 19, 2017. Updated: April 9, 2018.

Enhancements

- Dates and times for records in historical data logs are once again logged in YYYY/MM/DD, HH:MM:SS.SSS format (as was the case in PAC Display R9.4e and lower). If you prefer that dates and times are logged in the MM/DD/YYYY, HH:MM:SS.SSS format (as they are in R9.5a through R9.6d), make sure to deselect the new **Use Legacy Log Date Format** option (**Configure > Runtime > General** tab).
- (Pro only) When configuring PAC Display Pro to log historical files to a database (**Configure > Historical Data Log > Add** (or **Modify**) button > **Log To > Log to Database**), Configurator now immediately opens the Database Table dialog box. (Previously, you had to click **OK** on the Historical Log Configurator dialog box to open the Database Table dialog box.)
- When an application error happens, PAC Display now displays a message with the location of the related Windows error dump (. dmp) file. Dump files are used to troubleshoot serious application errors, and the PAC Display message will ask you to email the dump file to Opto 22's Product Support Group for analysis.
- Configurator now immediately opens the Database Table dialog box.

Bug Fixes

- [KB82824](#) Alarm point configuration may not always show digital input points.
- [KB86342](#) PAC Display: Convert SuperTrend Files dialog box doesn't list files with five-character file extensions.
- [KB86480](#) PAC Display: Exponential values are displayed with 3 digits in the exponent (instead of 2).
- [KB86654](#) PAC Display Runtime crashes when opening a SuperTrend historical log file.
- [KB86710](#) When a project is running, PAC Display Runtime may crash if you try to open another project.

- [KB86739](#) PAC Display Configurator Pro may hang or crash when you replace the configured control engine.
- [KB86741](#) PAC Display Runtime Professional sometimes fails to start.
- [KB86749](#) PAC Display Pro: Sometimes the secondary scanner field should be blank (but it's not).
- [KB86752](#) PAC Display: Graphic objects may not be updated when their window is larger than the primary monitor.
- [KB86753](#) PAC Display Pro: Clicking an unconfigured PID button may cause Runtime to crash.
- [KB86758](#) When saving a large project, PAC Display Configurator and Windows may become unresponsive.
- [KB86776](#) PAC Display Runtime Error: Server failed to add group TempGroup to OPC Server Reason: 0xc004000c.
- [KB86786](#) PAC Display Configurator crashes when importing a comma-delimited (.csv) file.
- [KB86788](#) PAC Display Configurator crashes when importing a historical data log (.hle) file.
- [KB86789](#) PAC Display may crash when you try to replace a control engine using the Entire Project option.
- [KB86804](#) PAC Display may crash when projects with transparent text are open for a long time.
- [KB86830](#) PAC Display Configurator may crash when opening a recipe file that isn't properly formatted.

PAC Display R9.6d

PAC Project R9.6003

Released: April 24, 2017.

Bug Fixes

- [KB86231](#) PAC Display: XY Plot connects last point to (0,0).
- [KB86622](#) PAC Display Runtime Professional: Project closes when a PID button is clicked.
- [KB86632](#) Unable to reopen PAC Display Runtime Professional.
- [KB86637](#) PAC Display Runtime: Can't close window containing alarms (even though none are active).
- [KB86641](#) PAC Display window may not open in Runtime when there are new alarms.
- [KB86645](#) After updating PAC Display, layered .PNG images may be incorrectly resized.
- [KB86646](#) PAC Display: Unable to apply transparency to .JPG images.
- [KB86650](#) When Runtime opens, windows may not be open or closed (as they were configured).
- [KB86663](#) Email notification isn't sent for alarm points monitoring controller status.
- [KB86673](#) Logging to a database, PAC Display Runtime Pro writes Integer 64 historical log data in an X,Y format.
- [KB86682](#) PAC Display Configurator: Issues with dynamic attributes for charts.
- [KB86685](#) PAC Display Runtime: In single monitor environments, dialog boxes don't open in the default location.

PAC Display R9.6c

PAC Project R9.6002

Released: March 7, 2017.

Bug Fixes

- [KB86578](#) PAC Display Runtime: Alarm information may disappear from alarm graphics.
- [KB86579](#) PAC Display Runtime: Alarms may not appear in Detailed or Summary alarm graphics.
- [KB86583](#) PAC Display Runtime: Runtime may crash if labels are set to display Integer 64 values as binary.

- [KB86585](#) After clicking a button, PAC Display doesn't always respond to the next object you click.
- [KB86609](#) PAC Display Runtime may crash when loading a project that creates historical logs from table data.
- [KB86610](#) PAC Display Configurator may resize windows to be smaller than configured.

PAC Display R9.6b

PAC Project R9.6001

Released: February 27, 2017.

Bug Fixes

- [KB86508](#) PAC Display Runtime doesn't display content from a *groov* web page.
- [KB86511](#) PAC Display reports ioControl/Factory Floor controllers' status as a comm failure.
- [KB86539](#) When you close Monitor-Only Runtime, it opens again (with no project loaded).
- [KB86541](#) PAC Display Runtime: Clicking a stack of windows may produce unexpected results.
- [KB86544](#) PAC Display: The Toolbox doesn't follow the rules configured for multi-monitor environments.
- [KB86545](#) PAC Display Configurator: Operator Driven Windows attribute may not show all configured windows.
- [KB86550](#) Resized bitmaps may appear partially transparent in PAC Display Runtime.
- [KB86551](#) Runtime may crash when logging Integer 64 values as binary in Historical Logs.
- [KB86562](#) PAC Display: Using mouse wheel causes table contents to roll out of table frame.

PAC Display R9.6a

PAC Project R9.6000

Released: February 1, 2017.

New Features

- You can now control the transparency of windows and graphical objects. This is great for making windows and controls (like SuperTrends and alarm graphics) invisible or semi-transparent in Runtime. The transparency feature also lets you create non-solid (for example, dotted or dashed) lines with widths greater than 1 pixel. (Prior to R9.6000, only solid lines could be wider than 1 pixel.)
- History alarm graphics now have a new **Clear** button that Runtime operators can use to clear the list of alarms in alarm history windows.
- SuperTrends can now trend integer bits.

Enhancements

- The new Copy, Paste, and Merge feature (in **Edit > Security Permissions**) lets you copy a graphic's security permissions, and then apply them to a set of chosen graphics. You can also apply the permissions to all graphics in the window or to all graphics in the project.
- You now have new options for setting the position of Configurator and Runtime dialog boxes in multi-monitor environments.
 - The Z-Order function now displays thumbnails and descriptions of overlapping graphic objects so you can drag and drop an object to a different position in the stack.
 - (Pro only) You can also double-click the thumbnail to open the object's Graphic Dynamic Attributes dialog box.
- (Pro only) The new User Agent Switching option lets you specify the target browser and operating system for a URL control or URL window. The option also provides the ability to set a global user agent

value for all URL controls and URL windows in all of your PAC Display projects. To maximize the viewing area, you can now hide a URL window's forward and back navigation controls.

- You can now configure a custom mail server for sending alarm emails. You can also send a test email to verify that your Alarm Point Email configuration works. When an alarm alert email fails to send, the message written to PAC Display's event log is more descriptive to help you quickly find and fix the issue.
- The Project Path dialog box (**File > Project Path**) includes a new **Open Folder** button, so you can easily open the folder where the project is located.
- When a table's length exceeds the size of the window it is displayed in, you can now scroll through the rows by using the mouse's scroll wheel.

Bug Fixes

- [KB86288](#) When a relative path is modified, PAC Display incorrectly adds "../" to the file path.
- [KB86433](#) PAC Display Configurator: Save Project dialog box sometimes appears if you click No when prompted to "Continue opening the project?"
- [KB86435](#) PAC Display's Relative Path feature does not save files to the correct location.
- [KB86444](#) Resetting reference counts may cause PAC Display Configurator to crash.
- [KB86458](#) PAC Display Runtime: Objects stay highlighted after cursor has been removed.
- [KB86471](#) Graphics with Send Value dynamic attributes that trigger historical logs may cause PAC Display Runtime to crash.
- [KB86481](#) Response time should improve when points used in a PAC Display project are moved from a serial I/O unit to an Ethernet I/O unit.
- [KB86493](#) PAC Display Runtime: "Error in line... of upload recipe template".
- [KB86503](#) PAC Display Configurator incorrectly creates an empty Runtime user group.

PAC Display R9.5d

PAC Project R9.5003

Released: December 14, 2016.

Enhancement

Reduced the number of web page reloads used by URL controls and URL windows. This enhancement improves response time, and may prevent external websites from requesting login credentials when a user is already logged in.

Bug Fixes

- [KB86284](#) PAC Display Configurator may crash when opening a project with initial window states configured.
- [KB86285](#) PAC Display SuperTrend "Make Path Relative to Project" check box does not retain its setting.
- [KB86292](#) PAC Display SuperTrends show only part of the historical data in a database file.
- [KB86299](#) PAC Display Configurator: Alt+A keyboard shortcut doesn't work on Alarming Setup > Options tab.
- [KB86300](#) PAC Display Runtime Pro: Historical SuperTrend graph may show date of 1/1/1601 if data source is a database.
- [KB86309](#) PAC Display: History alarms aren't reloaded if alarms are logged to a SQL Server database table.
- [KB86324](#) PAC Display Configurator may crash if you cancel when using the combo box control to configure dynamic attributes.
- [KB86337](#) PAC Display Runtime may crash when loading binary SuperTrend historical files.
- [KB86344](#) Can't select a string table and index with PAC Display's Quick Tag feature.

- [KB86346](#) Entry field displays dots instead of characters when you use PAC Display's on-screen keyboard function to enter values.
- [KB86350](#) PAC Display: Font name may be blank and the wrong font style may be selected when the Font dialog box is reopened.
- [KB86355](#) PAC Display Runtime: Error when using on-screen keyboard to browse for SuperTrend historical log files.
- [KB86374](#) Clicking Text > Font > TrueType causes some Beta versions of PAC Display Configurator to crash.
- [KB86375](#) PAC Display Configurator may crash when opening a project with a table.
- [KB86398](#) PAC Display: Unable to import a historical data log configuration file.
- [KB86402](#) PAC Display Runtime may crash after user tries to change password.
- [KB86417](#) PAC Display Runtime may not display correct values for points on E1s and E2s.

PAC Display R9.5c

PAC Project R9.5002-339

Released: September 27, 2016. Updated: September 28, 2016 and March 13, 2017.

Enhancements

You can now select **None** as an ODBC data source (**Configure > ODBC Data Source**). This feature allows you to temporarily or permanently break the internal link between PAC Display and a configured ODBC data source.

NOTE: When you select **None**, you should also reconfigure all objects configured to use the ODBC data source to instead use a file as the source or destination. This step saves the data and prevents an error message when PAC Display Runtime is unable to connect to the ODBC data source.

Bug Fixes

- [KB86122](#) PAC Display Configurator crashes when you paste text into a window.
- [KB86156](#) SuperTrends: Colors are different between trend pen and its associated value.
- [KB86158](#) PAC Display Professional may not save configuration for logging SuperTrend data to a file or database.
- [KB86159](#) PAC Display Runtime terminates if the project's ODBC data source is not available.
- [KB86166](#) PAC Display Runtime: On-screen keyboard for touch screen is distorted.
- [KB86177](#) PAC Display Professional: OptoDisplay Converter (FAC2PAC) should not try to automatically open a project.
- [KB86181](#) PAC Display: In Historical mode, the start date of binary SuperTrend log files may appear as 01/01/1601.
- [KB86182](#) PAC Display: Dynamic Attributes > View does not show the dynamic attributes.
- [KB86184](#) E2 brains don't show in the PAC Display Runtime Setup I/O Unit Tag list.
- [KB86197](#) PAC Display may crash when reopening Log To Database dialogs using MySQL.
- [KB86217](#) PAC Display: Controller becomes "< Undefined>" in imported windows.
- [KB86225](#) Pressing a key with no project open may crash PAC Display Configurator.
- [KB86232](#) Using Scale Window tool on a SuperTrend graphic may cause PAC Display Configurator to crash.
- [KB86251](#) "Play sound continuously until any alarm is acknowledged" may cause PAC Display Runtime to hang.

PAC Display R9.5b

PAC Project R9.5001

Released: August 26, 2016.

Enhancement

To make it easier to identify version and build information, the **Help > About** window now displays the software's build number in addition to its version number and build date.

Bug Fixes

- [KB84870](#) PAC Display Runtime may crash if using historical SuperTrend configured to log to ODBC database.
- [KB85587](#) PAC Display Configurator - PID button object appears to point to wrong PID.
- [KB85987](#) Graphics configured to download a recipe from a database table may cause PAC Display Runtime to crash.
- [KB86021](#) PAC Display Runtime's inactivity timeout behavior isn't consistent.
- [KB86094](#) PAC Display: Project passwords longer than 50 characters may not work.
- [KB86101](#) PAC Display Runtime: Clicking a button with Send String attribute displays error message.
- [KB86102](#) PAC Display Runtime crashes if you enter the password or click Cancel when opening a password-protected window.
- [KB86103](#) PAC Display Runtime: Unable to close "Waiting for async operations to complete" message.
- [KB86104](#) PAC Display Runtime: Layered buttons with Visibility/Blink attributes don't always display proper text.
- [KB86108](#) PAC Display text objects with multiple styles revert to Normal style (and font may change) when project is reopened.
- [KB86113](#) When graphics overlap, PAC Display Runtime should perform the action configured for the top-most graphic.
- [KB86116](#) PAC Display Runtime: Discrete alarms trigger only when the tag's value is -1.
- [KB86117](#) PAC Display Configurator doesn't retain tag order when configuring historical data log.
- [KB86123](#) PAC Display Runtime generates blank entries (separated by commas) for triggered historical logs.
- [KB86131](#) PAC Display: Export Project feature fails to export header information for Bezier curves.
- [KB86136](#) PAC Display: Existing graphics don't recognize configured digital input points and new graphics can't be configured for digital input points.
- [KB86137](#) PAC Display: Unable to configure string tables for Send String dynamic attribute command.
- [KB86147](#) In multi-monitor systems, Runtime doesn't always reopen main window on the monitor where it was closed.
- [KB86149](#) PAC Display Pro: Cannot unselect "Log to Database" when configuring Alarming Setup.

PAC Display R9.5a

PAC Project R9.5000

Released: July 15, 2016. Updated: July 22, 2016.

NOTE: Windows XP and Windows 2000 No Longer Supported

The PAC Project Software Suite no longer supports operating systems for which Microsoft has ended support. This includes Windows XP and Windows 2000. If you attempt to install any PAC Project R9.5000 (or higher) software

component on an operating system that Microsoft no longer supports, the installation software displays an error message and then ends.

New Features

- Event logs and recipes in database tables. You can now write event log messages to a database table, and you can load a recipe to and from a database.
- Runtime remembers alarm logging column widths. You can use your mouse to resize the column widths of alarm graphics in Configurator, and the columns will keep the preferred widths when Runtime starts.
- New Table tool features: you can configure up to 16 tables (the previous limit was four), and you can rename the **Index** column.
- Custom colors for alarm graphics. You can configure custom colors for alarms and warnings based on priority. There are nine priority levels, and you can customize the colors for alarms and for warnings at each level.
- Quicker tag configuration. As you configure a tag, new text fields filter the controller name, item type, and item name, based on what you type. You can then use the down-arrow key to quickly and easily select the entry you want.
- (Pro only) Support for internet interactivity: Runtime Professional now uses the Chrome browser (instead of Internet Explorer) to display websites and interactive web applications like *groov*. You can configure the refresh rate for displaying video feeds from URLs, and you can hide the browser's navigation buttons to maximize the viewing area. In Runtime, clicking a link to an external website launches the site in a new browser window.
- User groups for easier user configuration. You can now set Runtime operator permissions for operator-driven attributes at the group level, and you can override group-level permissions at the individual level. To save time, you can copy a Runtime user's permissions and assign them to a new user. Previously, you had to configure permissions point-by-point for each Runtime user. If a Runtime user tries to access a restricted graphic object, the system now displays an "access denied" message. Individual users and groups can also be global operators.
- More support for secure alarm emails. In addition to the system default email server, support has been added for AOL® Mail and Hotmail® (using TLS protocol), Yahoo Mail® (using SSL protocol), and GMail® (using either TLS or SSL). For added security, you can configure a username, password, and email server for sending alarm point emails.

Enhancements

- Logged-in Runtime user: you can now see the username of the operator logged in to Runtime (**Security > View Logged-in user**). You can configure this feature as a keyboard shortcut, so you can use it even when the menu bar is disabled in Runtime. Runtime also displays a message if no users are logged in.
- Obsolete `OptoDisPLS.exe`: PAC Display Runtime no longer requires the `OptoDisPLSWindows Service (OptoDisPLS.exe)`.
- Refresh alarm reference counts: you can use the new **Ref Count** button to recalculate the number of alarm graphics in a project (**Configure > Alarm Points**).
- You can now configure all logs (alarm logs, event logs, historical data logs, and Runtime operator logs) to be written in ASCII format instead of Unicode.
- If a controller or the strategy is not properly configured and you try to perform an operation that depends on a correct configuration (for example, **Tools > Regenerate IO Scanner Tags** or **Configure > Alarm Points**), a warning message alerts you to the problem.
- The file rollover feature (for SuperTrend logs and historical data logs) has been optimized to improve response time.
- When you right-click a project (.`טוּב`) file in Windows Explorer and select **Open with** from the pop-up menu, the PAC Display software version and release number are now displayed next to the executable's

filename. This way, you can choose which version and release number of PAC Display to open the project with.

- A new **Select All** checkbox in the **Find Tag In** area of the Find Tag dialog box lets you quickly select all of the search options (so you do not need to select them one-by-one).
- When you configure an alarm, you can adjust the column widths using your mouse or the **Column Format** button, and the columns will retain their sizes in Runtime.
- When configuring SuperTrends and Historical Logs, check marks have been added to **Log To** pop-up menus to indicate whether you selected **Log File** or **Log to Database**.
- FAC2PAC (the utility that converts OptoDisplay projects to PAC Display projects) no longer requires that the FactoryFloor controllers be configured on the PC that is used to perform the conversion.
- The **Find and Replace Tags** feature has been optimized to more rapidly update tags in bulk.

Bug Fixes

- [KB81332](#) Importing a Window with GIF graphics crashes Configurator.
- [KB83921](#) PAC Display: Combo box retains focus at runtime.
- [KB84409](#) PAC Display may not recognize the password to enter a password-protected window.
- [KB84663](#) PAC Display graphic security does not correctly check for users in Global Operator defined groups.
- [KB84682](#) SuperTrends do not start until after the first PAC Display Allowed User logs in.
- [KB84699](#) PAC Display Runtime Basic: Tags do not update from a reconnected device.
- [KB84732](#) PAC Display Runtime: Buttons and combo boxes touching other dynamic graphics may cause a crash or odd behavior.
- [KB84743](#) PAC Display Configurator may crash when configuring Recipe Managers.
- [KB84758](#) Snapshots no longer work in PAC Display Runtime.
- [KB84762](#) PAC Display Configurator may crash when configuring a "Text in from controller" dynamic attribute.
- [KB84803](#) PAC Display Runtime: non-sequentially configured tables may show incorrect data.
- [KB84839](#) PAC Display: Floating point values of 0.0 or less may cause Invalid Floating Point error.
- [KB84840](#) PAC Display: Event Log Viewer Message window may display wrong message.
- [KB84878](#) PAC Display Runtime may crash if Alarm Log files contain a mix of pre-R9.4a and post-R9.4a data.
- [KB84892](#) PAC Display alarm does not trigger email.
- [KB84893](#) PAC Display alarm email does not show alarm value; displays "f" instead.
- [KB84895](#) PAC Display Configurator: Historical Log configuration crash.
- [KB84915](#) PAC Display: Displaying values from integer tables, float tables, or historical logging may cause memory error at runtime.
- [KB85023](#) In PAC Display Supertrend, switching from historical to real-time view creates discontinuity.
- [KB85080](#) In Windows 10, PAC Display Configurator Pro may crash when saving a project.
- [KB85082](#) When you run PAC Display Runtime Pro as an administrator, it cannot connect to IO scanners.
- [KB85182](#) In PAC Display Runtime, alarm graphics show no data other than date/time.
- [KB85201](#) PAC Display may crash or become unresponsive at runtime if its project has many active and enabled alarm points.
- [KB85220](#) At runtime, PAC Display may crash when you click a graphic with a window dynamic attribute.
- [KB85261](#) PAC Display Configurator crashes when you load a project with an unnamed alarm point.
- [KB85279](#) Rapidly clicking a graphic with a Send dynamic attribute may affect other graphics.
- [KB85292](#) PAC Display: Dates for alarms, historical logs, and event logs won't appear as DD-MM-YYYY.
- [KB85296](#) PAC Display: Start Index and Num Elements fields are editable when they shouldn't be.

- [KB85309](#) PAC Display Pro doesn't automatically switch to redundant IP.
- [KB85338](#) PAC Display Beta version: Alarms are not Acknowledged in Summary alarm window.
- [KB85379](#) PAC Display Configurator might not load all strategy tags when the strategy includes SNAP-PAC-R1-B I/O units.
- [KB85398](#) PAC Display Configurator may crash when you configure table controls in projects that were last saved in pre-R9.0a versions.
- [KB85429](#) XY Plot with empty title causes PAC Display Runtime to crash.
- [KB85491](#) PAC Display Runtime may not display buttons and combo box controls when other graphic objects change state.
- [KB85510](#) PAC Display Configurator - "Control engine not found" error after importing alarm points.
- [KB85511](#) PAC Display Configurator - Importing alarm points may result in several "String Resource Not Found" messages.
- [KB85555](#) PAC Display Runtime may fail when trying to get Historical Log File name from controller string variable.
- [KB85565](#) PAC Display Runtime may crash (long message in the Event Log).
- [KB85576](#) PAC Display Runtime: Historical Logs may miss data if another trigger event occurs too quickly.
- [KB85591](#) PAC Display Trends and SuperTrends do not use correct controller's data after Window > Switch Control Engine.
- [KB85604](#) PAC Display Runtime - Recipe upload may time out and report an error in the recipe format file.
- [KB85607](#) PAC Display Configurator - Find Tags may find incorrect tag.
- [KB85637](#) PAC Display multiple Runtimes feature not working.
- [KB85642](#) PAC Display Runtime - Selected window doesn't come to front.
- [KB85648](#) PAC Display may not start on some Windows PCs.
- [KB85657](#) PAC Display Configurator and Runtime will crash if you open a very large number of windows at once.
- [KB85658](#) PAC Display Configurator - Project Export may hang or crash.
- [KB85669](#) PAC Display Runtime's View > Configuration Status crashes on a project with no controllers.
- [KB85702](#) PAC Display recipe download will not write data to a string variable if the data contains a colon.
- [KB85725](#) Runtime may crash if Cancel is pressed at password prompt.
- [KB85744](#) PAC Display Configurator, Graphic Dynamic Attributes: Cancel button saves size and position changes.
- [KB85758](#) PAC Display Runtime - Incorrect vertical position behavior when objects grouped.
- [KB85793](#) PAC Display Professional project loads slowly, may show out of memory error; project .UUI file grows to several hundred megabytes.
- [KB85842](#) PAC Display Runtime may crash if reading a very large float value.
- [KB85876](#) PAC Display Runtime B9.4h crashes with XY plots.
- [KB85897](#) PAC Display Runtime writes to Runtime Operator Log when logging is not enabled.
- [KB85928](#) In PAC Display Runtime, reloading history alarms can cause "Not responding" to appear in title bar.
- [KB85951](#) PAC Display Runtime with triggered historic logs and notifications may crash on startup.

PAC Display R9.4g

PAC Project R9.4008

Released: April 20, 2015.

Enhancement

The requirement to enter a Runtime user's password to delete a user has been removed.

Bug Fixes

- [KB84636](#) PAC Display Configurator may crash when opening older projects.
- [KB84631](#) PAC Display Runtime crashes if the Log In dialog password field is clicked and "Enable On-screen Keyboard" is selected.
- [KB84632](#) PAC Display Runtime: Global Operator Logout succeeds even if canceled.
- [KB84647](#) PAC Display Runtime may crash when using PID button.
- [KB84654](#) PAC Display Runtime may crash when acknowledging Alarm Point dialog if using conditional tags.
- [KB84659](#) PAC Display (Runtime): All operator-driven attribute (ODA) permission checks can be bypassed.

PAC Display R9.4f**PAC Project R9.4006**

Released: February 28, 2015.

Bug Fixes

- [KB84539](#) PAC Display Runtime may consume large amounts of RAM.
- [KB84471](#) PAC Display Pro may not generate correct information for redundant controllers.
- [KB84482](#) PAC Display Runtime may crash on start if Reload History Alarms option is enabled.
- [KB84440](#) PAC Display historical logging does not show configured quotes in string table log entries.
- [KB84562](#) PAC Display Configurator Export Historic Logs does not work.

PAC Display R9.4e**PAC Project R9.4005**

Released: January 21, 2015.

Bug Fixes

- [KB84327](#) PAC Display Runtime may crash on startup.
- [KB84411](#) PAC Display: Find Tag returns only the first letter of the object location.
- [KB84412](#) PAC Display: Find Tag does not find historic log items.
- [KB84424](#) PAC Display: Changing the name of a Historic Log produces a copy.
- [KB84425](#) PAC Display Configurator may crash on Find Tag dialog box.

PAC Display R9.4d**PAC Project R9.4004**

Released: December 18, 2014.

Bug Fixes

- [KB84261](#) PAC Display Configurator may crash when configuring trigger based recipes.
- [KB84263](#) PAC Display Configurator skips the table controls when updating controller references when importing windows.
- [KB84281](#) PAC Display Configurator: Cannot delete historic log.

- [KB84282](#) Window names not showing up in some PAC Display (Configurator) dialog boxes.
- [KB84170](#) PAC Display Configurator crashes when duplicating a historic log.
- [KB84183](#) Text copied from a label object in PAC Display Configurator may not correctly paste into a different application.
- [KB84200](#) PAC Display (Configurator) Bring Window to Front dialog box does not work.
- [KB84214](#) Edit > Replace feature in PAC Display Configurator does not work for table objects when Search For is set to Refresh Group.
- [KB84315](#) PAC Display Configurator may crash when copying/pasting Labels.
- (Basic only) [KB84168](#) SuperTrend historic log configuration does not retain settings in Configurator Basic.
- [KB84174](#) Non-text graphics rotated in PAC Display Runtime are not redrawn when opening an Always In Memory Window.
- [KB84250](#) PAC Display Runtime may crash if a window is closed while output dynamic attribute operations are in progress.
- [KB84231](#) Alarm Points set by Tag values not alarming with Lo/LoLo values (Runtime).
- [KB84232](#) Alarm Point Alert Window does not appear in PAC Display Runtime.
- (Basic only) [KB84217](#) PAC Display Runtime Basic not logging String Tables to Historic Log.
- (Pro only) [KB84133](#) PID Auto/Man button in the PID Viewer does not always work (Runtime).

PAC Display R9.4c

PAC Project R9.4003

Released: November 3, 2014.

Bug Fixes

Configurator

- [KB84110](#) PAC Display Configurator View > TagInfoView does not work.
- [KB84111](#) Historic Logs dialog allows multiple selections.
- [KB84112](#) SuperTrend File Logging location changes to 'Use project directory'.
- [KB84117](#) PAC Display Configurator crashes in the Configure Pop Windows dialog box.
- [KB84121](#) PAC Display Configurator strips window passwords when upgraded from 9.3 to 9.4.
- [KB84129](#) PAC Display Configurator may crash when loading tables.
- [KB84141](#) PAC Display crashes opening a project if project names are too long.
- [KB84162](#) Configurator crashes after re-configuring Discrete On or Off text.
- [KB84163](#) 'Text In from Control Engine' Discrete On and Off text fields only display first character.

Runtime

- [KB84113](#) PAC Display Runtime may show placeholder symbol (#) instead of the current Discrete on/off text.
- [KB84126](#) PAC Display Runtime may crash on exit.
- [KB84128](#) The 'Text in from the control engine' dynamic attribute may display non-text characters.
- [KB84157](#) PAC Display Runtime may only show one alarm point in an alarm graphic.
- [KB84158](#) PAC Display Runtime may crash on startup if alarm points are in alarm state.
- [KB84164](#) PAC Display Runtime may crash if a window is configured to close and there are reads / writes in progress.
- #84165 PAC Display Runtime may sometimes crash after a Send command.

Enhancements

- You can now configure the **Read/Write Timeout** in seconds on the **Control Engine** tab of the Runtime Setup dialog box in Configurator. The default is 3 seconds.
- In Runtime, read/write timeouts are now displayed in the Event Log.

PAC Display R9.4b

PAC Project R9.4002

Released: September 30, 2014.

Bug Fixes

- [KB84004](#) PAC Display Runtime Discrete Toggles fail if combined with other attributes.
- [KB84064](#) Brackets are stripped from string data when downloading recipes in PAC Display (Runtime).
- [KB84073](#) PAC Display Runtime may not handle consecutive Discrete Toggles correctly.
- (Pro only) [KB84077](#) Opening an earlier PAC Display project in Runtime R9.4a may incorrectly show 'No Data Source Configured' message (Runtime).
- [KB84078](#) PAC Display Configurator 'More Windows ...' dialog only shows the first letter of window names.
- [KB84090](#) Using the Exact Text option in the PAC Display Find and Replace dialog box may cause PAC Display (Configurator) to hang.
- [KB84091](#) When 'Exact Text' is selected on the Find and Replace Dialog Box in PAC Display Configurator, only the 'Everywhere' option is available.
- [KB84083](#) PAC Display may not correctly validate passwords.

PAC Display R9.4a

PAC Project R9.4000

Released: September 29, 2014.

New Features

(Pro only) Now you can configure an ODBC data source for logging SuperTrend, Historic Log, and Runtime Operator Logging data files. Supported databases include MySQL, Microsoft Access, and Microsoft SQL Server.

Enhancements

- Support has been added for the Portable Network Graphics (.png) file format.
- When PAC Display Runtime needs to upload or download recipe files, it now looks in the following two locations for the strategy tag database (.idb) files necessary to create the tag names sent to the OPC Server:
 - (same as previous versions): In the same location specified by **Configure > Control Engines** in Configurator
 - (new): In the PAC Display project folder (where the .PDI file resides)
- Support has been added for Unicode text so that you can use international characters in the following PAC Display items:
 - Objects created with the text tool
 - Alarm point names and comments
 - SuperTrend pen names
 - Window names
 - Historic log names and point names
 - Table control

- Refresh group names
- Recipe managers
- Window managers
- Application managers
- XY plot titles
- Button and PID button text
- Combo box control items
- View > Dynamic Attributes file
- Project export file
- Alarm point comma delimited file
- Operator Runtime logging file
- Alarm History file

Bug Fixes

- [KB83729](#) ComboBox Discrete Toggle crashes PAC Display Runtime.
- [KB83824](#) PAC Display Runtime tooltips aren't working properly on some Windows 7, 64-bit computers.
- [KB83844](#) PAC Display Runtime projects with more than 1296 SuperTrends crash when opening historic SuperTrend file list.
- [KB83940](#) PAC Display Runtime memory usage increases with historic logs.

PAC Display R9.3d

PAC Project R9.3004

Released: April 24, 2014.

Bug Fixes

Configurator

- [KB83410](#) Alarm persistence rounded down to nearest minute.
- [KB83559](#) PAC Display Configurator Pro may crash when creating a recipe file with an OptoControl strategy file (.cdb).
- [KB83561](#) PAC Display security not properly allowing Global Operator Access to dynamic attributes.
- [KB83657](#) PAC Display Configurator may crash when configuring Snapshots.
- [KB83750](#) Label text changes to all lowercase when performing a Replace Tag in PAC Display Configurator.
- [KB83751](#) PAC Display Configurator find and replace text is not case sensitive in Label graphics.
- [KB83793](#) PAC Display does not correctly open project files from version R9.0d.

Runtime

- [KB83412](#) PAC Display Runtime may become unresponsive if alarm points show message dialog.
- [KB83592](#) PAC Display Runtime crashes during or shortly after startup.
- [KB83609](#) PAC Display Runtime may not write values if Window Output Dynamic Attribute is set.
- [KB83650](#) SuperTrends are not correctly force-logging when a SuperTrend is closed or minimized.
- [KB83656](#) PAC Display Runtime SuperTrends are not correctly force-logging when in Historic Mode.
- [KB83763](#) PAC Display Runtime Windows Operator Driven attribute reverses window operation order.
- [KB83764](#) PAC Display Runtime Windows Operator Driven attribute window operation may cause crash.

PAC Display R9.3c

PAC Project R9.3003

Released: October 15, 2013.

New Features

- A project can now be exported to a text file so you can compare the details of one project to another. The TagInfoView utility has been enhanced to be compatible with this new feature.
- When searching and replacing, now you can search and replace the exact text in tag names, button text, labels, trend pens, refresh group text, combo box entries, and so on.

Enhancement

In Runtime, an option in the **View > Configuration** dialog box allows you to enable and disable logging to the Configuration Log.

Bug Fixes

Configurator

- [KB83289](#) PAC Display Configurator: Regenerate Scanner Tag command misses file rollover trigger.
- [KB83171](#) (Basic only) PAC Display Configurator Basic generates incorrect scanner tag names for IO points on serial brains.
- #83145 PAC Display Configurator PID Button dialog selects the incorrect PID.
- [KB83089](#) PAC Display 'replace table index' does not work.
- [KB83075](#) SuperTrend pen configuration dialog shows incorrect Max or Min Value.

Runtime

- [KB83187](#) Sending repeated values from PID control does not work in PAC Display Runtime.
- [KB83079](#) Historic SuperTrend dialog displays the wrong files.
- [KB83032](#) Button graphics with dynamic text may not display correctly in PAC Display Runtime.
- [KB83174](#) Multiple PID buttons may not work correctly in PAC Display Runtime.
- [KB83044](#) Multiple Send Discrete toggles on same graphic in PAC Display Runtime may cause crash or no action.
- [KB83011](#) PAC Display Runtime Historic Log may log too many entries when start trigger and number of samples are used.
- [KB82968](#) PAC Display Runtime may hang when using Alarm Point Message Dialog boxes.
- [KB83168](#) Runtime and computer can become unresponsive when Runtime cannot connect to scanner.

PAC Display R9.3b

PAC Project R9.3002

Released: April 22, 2013. Updated: April 14, 2017.

New Features

- Relative paths for recipe files.
- When a user copies a project and recipe files to a new machine, PAC Display will look in the same relative location to find the recipe files in Configurator and Runtime.
- Ability to lock the sort order for the history alarm graphics.
- The history alarm display can be locked in either ascending or descending order.

Enhancement

Longer window names are now allowed. Previously, the limit was 20 characters, and now it is 127 characters.

Bug Fixes

- [KB82499](#) Runtime scans SuperTrend at startup even if scanning is disabled.
- #82834 In PAC Display Runtime, SuperTrend historic data are not displayed correctly if the Y Axis is set to default pen scaling.
- #82527 There is a security risk under the following conditions:
If Runtime Log-in users are configured with NO mapping to a Global Access Operator; and a Global Access Operator user is configured separately; and the Global Access Operator is logged into Windows; then, even if a Runtime log-in user has no permissions, he will still be able to send operator driven attribute values to the control engine and IO.
- [KB82564](#) Windows with alarms may not be closed after a PC wakes.
- [KB82600](#) Rotating a graphic may incorrectly display a scaling message.
- [KB82603](#) ComboBox configuration does not trigger a window to open.
- [KB82611](#) Re-enabled hidden pens are not listed in the Active Pen drop-down list.
- [KB82615](#) Window open/close attributes do not work if a Send Value attribute times out.
- [KB82628](#) Trigger-based recipe uploads may fail.
- #82758 PID window values are toggle between scientific and regular notation.
- #82772 More than 1296 SuperTrends in a PAC Display project causes Runtime to crash.
- #82809 Import Window in PAC Display Configurator may not correctly assign SuperTrend pen control engines.
- #82815 FAC2PAC may hang if OptoDisplay projects contain AlarmPoint input dynamic attributes.
- #82816 PAC Display hourglass cursor disappears during Archiving.
- #82829 Send Values with Offset fail in Runtime.
- #82935 Pressing Alt-Tab while a combobox control is open causes crash.

PAC Display R9.3a

PAC Project R9.3000

Released: November 9, 2012.

New Features

- PAC Display can now mimic OptoDisplay when sending discrete integer writes to integer variables that have no bit index specified. This affects all the discrete write options: Set, Toggle, Direct, and Reverse. This new option, **Send +1 for Discrete Integer Writes**, is on the **General** tab of the Runtime Setup dialog. Select **Configure > Runtime** to open the dialog.
- Changes to Configurator.
- The following graphic types may not be scaled after they have been rotated: line, ellipse, rectangle, rounded rectangle, and bitmap.
- The graphic types that may be scaled after rotation include: polygon, polyline, bezier, metafile, and jpeg.
- PAC Display now saves archived projects to PROJECT_ARCHIVE subfolder.

Bug Fixes

- [KB82377](#) Incorrect SuperTrend Y-axis labeling.
- [KB82389](#) Imported Windows with grouped objects not assigned selected control engine (Configurator).
- [KB82418](#) Text changes to Button graphic label are not saved (Configurator).

- [KB82419](#) Opening PAC Display Basic project in Pro results in missing windows (Configurator).
- [KB82434](#) Some windows may be off-screen after switching from multiple monitors to a single monitor (Configurator).
- [KB82430](#) Rotated Bitmaps displayed incorrectly in PAC Display Runtime.
- [KB82442](#) Clicking Forward buttons on Historical SuperTrend may cause floating point exception (Runtime).
- [KB82449](#) Runtime Pop-up Tooltips disappear in PAC Display Runtime.
- [KB82409](#) Multiple 'Fixed data - Direct' dynamic attributes have no effect (Runtime).

PAC Display R9.2e

PAC Project R9.2004

Released: September 7, 2012.

New Features

The ability to export and import historic logs in binary format and comma-delimited file format has been added to Configurator.

Enhancements

Configurator

An additional level of Control Engine verification has been added when launching PAC Display Runtime from Configurator. This helps to solve a problem that can occur when a project references controllers with the same names but different IP addresses as those configured on the user's computer.

Runtime

- SuperTrend historic log plotting is faster and more responsive.
- For SuperTrends, numeric format can be configured as decimal, exponent, or a mixture of both.
- The Splash Screen can be disabled. To do this, a 0-byte file called "nosplash" (no extension, no quotes) must exist in the Runtime folder. If it's there, no splash screen appears.

Bug Fixes

- [KB82183](#) SuperTrend data is not displayed when window is opened.
- [KB82125](#) Problem with 'Get and Clear' dynamic attribute for latches in PAC Display Runtime.

PAC Display R9.2d

PAC Project R9.2003

Released: July 6, 2012.

Enhancements

- Keyboard shortcuts have been added for the following commands:
 - **File > New** (Ctrl-N)
 - **File > Open** (Ctrl-O)
 - **File > Save** (Ctrl-S)
 - **File > Save As** (Shift-Ctrl-S)
 - **Edit > Copy Dynamic Attributes** (Shift-Ctrl-C)
- The **Relative Strategy Path** checkbox now validates strategy locations during project startup.

Bug Fixes**Configurator**

- [KB82139](#) All 'Event Log Options' cannot be disabled.
- [KB82143](#) AutoCorrect Tags does not work with table objects.
- [KB82175](#) Tag Selection dialog may show incorrect default Field values.

Runtime

- [KB82141](#) Cannot send values to a controller while downloading a recipe.
- [KB82155](#) False I/O Communication Failure.

PAC Display R9.2c**PAC Project R9.2002**

Released: June 8, 2012.

Enhancements

- The behavior of Runtime's horizontal and vertical slider dynamic attributes has reverted to the way it was before R9.1a. Now values are only written when a slider is released, not while being dragged.
- You can now change the path of a control engine's strategy to be relative to the current PAC Display project. This allows the project to be more easily transferred to other PCs that do not have the exact same file structure.

Bug Fixes

- [KB82021](#) String tables are incorrectly reported as invalid by Validate Recipe File (Configurator).
- [KB82027](#) PAC Display Configurator may hang and crash when using Edit Recipe tool.
- [KB82024](#) Triggered historic logs slow down PAC Display Runtime.
- [KB82019](#) Uploading a recipe file may cause PAC Display Runtime.

PAC Display R9.2b**PAC Project R9.2001**

Released: April 6, 2012.

Enhancement

In Runtime, when you are scaling a SuperTrend pen, you can temporarily change the display to see all pens plotted at the same scaling.

Bug Fixes

- [KB81949](#) Hidden SuperTrend Pens are appearing in trend (Runtime).
- [KB81950](#) SuperTrend Pen window to Enable/Disable/Hide pens may not function correctly for non-consecutive pens (Runtime).
- [KB81973](#) PAC Display Runtime may not exit correctly from Execute Menu Item.
- [KB81977](#) PAC Display Runtime crashes using Send Discrete to Integer64 bit tag.

PAC Display R9.2a**PAC Project R9.2000**

Released: February 29, 2012.

Enhancements

- You can now add a control engine-driven dynamic attribute to text on a button.
- The new AutoCorrect Tags option on the Configurator Options dialog box allows AutoCorrect Tags to either include or exclude tags inside grouped graphics. By default, tags inside grouped objects are excluded. Since dynamic attributes inside a grouped object are not used, if they are included, you may receive irrelevant errors when AutoCorrect Tags is run. However, you can choose to include them if you wish.
- The Window Properties dialog box now has a new option to rescale the window graphics when the window size is changed in that dialog box.
- The new **Change Font** and **Multiply Runtime Height By...** configuration options allow you to change the font or spacing of text items listed in a combo box.
- A new option on the Runtime Setup dialog allows you to choose which PC to use to sync the control engine's clock.
- State changes in alarm points and fill or line color dynamic attributes are modified in name and behavior. These state changes are now affected by a Hysteresis value rather than a Deadband value. The Hysteresis value is applied when the state goes toward normal; when going away from normal, the state changes immediately.

Bug Fixes**Configurator**

- [KB81672](#) Unknown controller status after downloading to redundant controller in PAC Control.
- [KB81316](#) 'Out of service' errors reported in PAC Display.
- [KB81592](#) PAC Display project may crash when upgrading to newer version.
- [KB81693](#) New duplicated alarm point incorrectly had identical links and attributes as the original point.
- [KB81727](#) Could not Cancel from importing a window into PAC Display.
- [KB81853](#) Alarms in PAC Display did not trigger at the expected alarm limits.
- [KB81850](#) Device I.P. Address and Device Name columns missing from Configuration Status window.

Runtime

- [KB81729](#) PAC Display Runtime could not connect to remote OptoOPCServer under Windows7 and Vista.
- [KB81743](#) 'Display message box for new alarm points' option sometimes caused problems in Runtime.
- [KB81801](#) ComboBox Output Dynamic Attributes sometimes do not write values to tags.
- [KB81883](#) PAC Display Historic Logs do not log Integer64 values.
- [KB81877](#) Trigger-based Historic Data Log records data based on Refresh Time.
- [KB81878](#) Trigger-based historic data logged twice when configured to log once.
- #82893 PAC Display Configurator Copy (Ctrl+C) problem with text - missing last character.

PAC Display R9.1d**PAC Project R9.1003**

Released: October 14, 2011.

Bug Fixes**Configurator**

- [KB81438](#) AutoCorrect Tags does not update tags in Combo Boxes.
- [KB81223](#) Pen plots missing with 'Default' Y-axis Scale option in SuperTrends.

FAC2PAC Conversion Utility

[KB81512](#) OptoDisplay to PAC Display conversion utility does not correctly update alarm graphics.

Enhancements

In Runtime, a button has been added to Event Log to save Event Log data.

PAC Display R9.1c

PAC Project R9.1002

Released: September 16, 2011.

Bug Fixes

- [KB81393](#) Modified default SuperTrend pen plots are not drawn correctly (Runtime).
- [KB81382](#) PAC Display (Configurator) prints only once, cannot be restarted.

Enhancement

FAC2PAC [OptoDisplay to PAC Display Conversion Utility]

A new dialog alerts the user that the conversion process requires that all controllers in an OptoDisplay project must be configured as Ethernet controllers prior to conversion to PAC Display. The OptoDisplay controller itself does not need to be an Ethernet controller, but it must be re-configured as Ethernet in the OptoDisplay project for the conversion to succeed.

PAC Display R9.1b

PAC Project R9.1001

Released: August 17, 2011.

Bug Fixes

- [KB81363](#) Cannot paste or duplicate objects in PAC Display Configurator.
- [KB81389](#) PAC Display (Configurator) hangs when attempting to convert OptoDisplay project.
- [KB81365](#) Fourth table in Table object appears cut off.
- [KB81379](#) Scratch Pad Float Table values not displayed in Table object (Runtime).

PAC Display R9.1a

PAC Project R9.1000

Released: July 18, 2011.

Enhancements

- In Configurator:
 - A **Clear Send Dialog Input Fields** option has been added to the **Security** tab of the Runtime dialog box. When selected, previous Send Value and Send String values on subsequent appearances of the Send Value and Send String dialog boxes are not shown.
 - The **Tools > AutoCorrect Tags** command now searches tags within grouped graphic objects.
 - Table column widths are now saved and restored in Configurator and Runtime.
 - **Move Up** and **Move Down** buttons have been added to the ComboBox Dynamic Attribute dialog that move an item up or down in the list.
 - OptoDisplay Converter now converts an OptoDisplay project to the current version of PAC Display. Previously, the project was converted to an earlier version.

- If an alarm point has persistence configured and it goes into and out of alarm state before the persistence time expires, Runtime no longer logs the return to Normal state.

Bug Fixes

- [KB81110](#) PAC Display Configurator requests tag for Controller Status Alarm Point.
- [KB81263](#) PAC Display - Setting the Execute Menu Item not working correctly.
- [KB81192](#) Edit > Replace command does not make changes within a ComboBox in PAC Display.
- [KB81193](#) Problems resizing a polygon after rotating it.
- [KB81196](#) Regenerate Scanner Tags command skips tags in ComboBox control.
- [KB81218](#) PID State for Auto and Manual Modes are incorrect via the controller.
- [KB81264](#) Bit indices past 31 in Int64 table element are not changed by Edit > Replace.
- [KB81278](#) Cannot select SuperTrend log file format.
- [KB81265](#) ComboBox element change is not saved.
- [KB81316](#) 'Out of service' errors reported in PAC Display.
- [KB81323](#) Copying and pasting a bitmap results in a blank image or crash.
- [KB81329](#) Edit > Replace, Refresh Group does not work for SuperTrends.
- [KB81330](#) PAC Display Configurator: Importing AlarmPoints caused extra characters in Alarm Point List Box under Windows XP.
- [KB81331](#) View > Dynamic Attributes displays the incorrect SuperTrend Refresh Group.
- [KB81332](#) Importing a Window with GIF graphics may crash PAC Display Configurator.
- [KB82009](#) Discrete output does not turn off when mouse is released.
- [KB81227](#) PAC Display Runtime may crash when simultaneously sending multiple alarmpoint emails.
- [KB81095](#) PAC Display Runtime may hang if Alarm Point tags are disabled.
- [KB81099](#) Memory leak in PAC Display Runtime if logging String Tables in Historic Logs.
- [KB81109](#) PAC Display Historical SuperTrends do not correctly plot logarithmic Data (Runtime).
- [KB81183](#) PAC Display Runtime may crash if 'Always in memory' option selected.
- [KB81216](#) Problems in PAC Display is 'Exit Runtime' and another dynamic attribute is configured for same graphic.
- [KB81256](#) Logarithmic SuperTrends with pen Minimum scaled <0.01 may cause Runtime problems.
- [KB81266](#) Triggered historic log has mostly commas as data (Runtime).
- [KB81271](#) Discrete write to Analog/Digital I/O Unit in Runtime causes error messages (Runtime).
- [KB81298](#) Printing a window at Runtime includes Print dialog box.
- [KB81325](#) Printing at Runtime produces twice as many Copies.
- (Basic only) [KB81346](#) PAC Display (Runtime) does not switch back to Primary Controller from Backup Controller.

PAC Display R9.0f**PAC Project R9.0006**

Released: September 17, 2010.

Bug Fix

- [KB81080](#) PAC Display's 'Edit > Replace' does not replace table names in table objects (Configurator).

PAC Display R9.0e**PAC Project R9.0005**

Released: August 23, 2010.

Bug Fix

[KB81062](#) Graphics and windows problems in PAC Display R9.0d (Configurator).

PAC Display R9.0d

PAC Project R9.0004

Released: August 20, 2010.

New Features

- GIF (.gif) images may be imported.
- Hint text may be added to the Tooltips box of a basic graphic such as a line, rectangle, ellipse, or text. The Tooltips box is displayed when the mouse is hovered over the graphic in Runtime.
- When configuring floating point tables using the table control, you can specify the number of decimals for floating point tables.
- The **Windows** button control allows configuring the Visibility/Blink Control Engine Drive Dynamic Attribute.

Enhancement

In Configurator, if multiple alarm points are exported to one .ADL file, all alarm points can be re-imported. Prior to this version, only the first alarm point was imported.

Bug Fixes

- [KB81042](#) BIT suffix added to non-integer variable when using Edit > Replace, 'Bit index' Offset command (Configurator).
- [KB81023](#) Real-time SuperTrend data plots may not be updated (Runtime).
- [KB81037](#) Some Historic Log files may have incorrect data in projects with more than 21 files (Runtime).
- #81039 Multiple Send (Value, Discrete, String) attributes are not all processed if Windows attribute is also configured (Runtime).

PAC Display R9.0c

PAC Project R9.0002

Released: July 8, 2010.

New Feature

A reverse-diagonal (\) graphic fill style was added in Configurator.

Bug Fixes

- [KB80972](#) Negative Decimal Values between 0 and -1.0 not allowed for some Control Engine Driven Dynamic Attributes (Configurator).
- [KB81021](#) Problems with PAC Display Configurator when resizing Alarm Point dialog.
- [KB81009](#) ComboBox may cause unexpected results in PAC Display Runtime.
- [KB81012](#) PAC Display Runtime Historic Log does not log String Tables correctly.
- [KB81013](#) Possible problems with PAC Display tables using the Relative Offsets option (Runtime).
- [KB81020](#) Random problems with PAC Display Runtime.
- (Pro only) [KB81010](#) Possible unexpected results when closing PAC Display Runtime if PIDViewer Open.

- (Pro only) [KB81014](#) PAC Display Runtime PIDViewer may cause Floating Point Exception.
- [KB81019](#) Long delay when starting PAC Display Basic Runtime.

PAC Display R9.0b

PAC Project R9.0001

Released: June 22, 2010.

Bug Fixes

- (Pro only) [KB80995](#) PID Input scale not displayed as expected in PIDViewer.
- (Pro only) [KB80999](#) PAC Display PID Button Configuration Doesn't Allow Setpoint Min of 0.0.
- [KB80989](#) Incomplete Combo Box setup may cause problems in PAC Display Configurator.

PAC Display R9.0a

PAC Project R9.0000

Released: June 15, 2010.

New Feature

For a complete list of the new features in PAC Display, see the [PAC Project 9.0 Release Notes](#) (form 1915).

Enhancements

- Table column resizing enhancement has been removed because Runtime performs better without it.
- In Configurator, if SymbolFactory does not exist in the location specified by the registry entry, a search now looks for the SymbolFactory subfolder in the PAC Display directory.
- Global operator logins and logouts are now logged in the Runtime Operator log file that is configured from **Configure > Runtime** in Configurator.

Bug Fixes

- (Pro only) [KB80947](#) PAC Display Pro reports error at Runtime if string tables in FactoryFloor strategy are used.
- [KB80772](#) Not all SuperTrend pens may be plotted at Runtime if one pen's value is -NAN.
- [KB80761](#) Improved PAC Display Runtime User Log-in.
- [KB80724](#) Alarm state keeps occurring even after ACK in Runtime.
- [KB80692](#) The focus frame around a text graphic disappears at Runtime if the send string is empty.
- [KB80707](#) SuperTrend Y-axis labels < 1 are incorrectly displayed (Runtime).
- [KB80677](#) PAC Display Tables do not display Scratch Pad Strings (Runtime).
- [KB80673](#) Adjustable alarm points not logged correctly in Runtime Operator Log File.
- [KB80672](#) Historic Logs using Start Triggers do not initially log data (Runtime).
- [KB80740](#) Edit > Replace, Table Index 'Offset By' option causes non-table tags to appear as tables (Configurator).
- [KB80739](#) PAC Display Configurator View->Find Tag may not find some tags.
- [KB80877](#) Multiple clock synchronizations may cause Runtime problems.

PAC Display R8.2m

PAC Project R8.5000

Released: September 4, 2009.

Bug Fixes

- [KB80642](#) Rotate attribute for line object and integer tag causes problems at Runtime.
- [KB80663](#) Visibility/Blink does not work correctly for bitmap graphics (Runtime).

PAC Display R8.2L

PAC Project R8.2012

Released: July 10, 2009.

Enhancement

On the Configure Table dialog box in Configurator, there is now a button labeled **X** that deletes the configured table. This was added to resolve the problem described in [KB80591](#).

Bug Fixes

- [KB80591](#) Cannot Delete Table from Table Object in PAC Display.
- [KB80593](#) View > Dynamic Attributes may cause PAC Display to crash.
- [KB80600](#) Windows dynamic attributes aren't always displayed in PAC Display Configurator.
- [KB80590](#) Some recipes don't upload when several are triggered at nearly the same time (Runtime).
- [KB80598](#) PAC Display Runtime possibly unresponsive on exit if there are many alarms.
- [KB80616](#) HiHi alarms sometimes cannot be acknowledged in the Runtime alarm window.

PAC Display R8.2k

PAC Project R8.2011

Released: June 2, 2009.

Bug Fixes

- [KB80578](#) Migrated PAC Display project may crash due to obscure problem (Configurator).
- [KB80580](#) Some non-integer cutoff values and limits may not be evaluated correctly in PAC Display (Configurator).
- [KB80556](#) Save Project and Load Runtime may fail when Runtime is already running.
- [KB80578](#) Migrated PAC Display project may crash due to obscure problem (Runtime).

PAC Display R8.2j

PAC Project R8.2010

Released: May 1, 2009.

Bug Fixes

- [KB80555](#) Integer values >16,777,215 may cause inaccurate fill color in PAC Display (Runtime).
- [KB80568](#) On-screen keyboard isn't displayed when editing tables (Runtime).

PAC Display R8.2i

PAC Project R8.2009

Released: March 25, 2009.

This version corrects an inadvertent DLL dependency introduced in R8.2h.

Enhancement

When a user sets or modifies the project-wide password, a message warns that if the password is lost, the project cannot be opened in Configurator.

Bug Fixes

- (Basic only) [KB80536](#) Runtime text data may be incorrect if window has non-consecutive refresh groups.
- [KB80551](#) On-screen keyboard missing at Runtime.
- [KB80537](#) Can't change from SuperTrend Pen Discrete Deadband in PAC Display Configurator.

PAC Display R8.2h

PAC Project R8.2008

Released: March 20, 2009.

This version contained an inadvertent DLL dependency. Do not use this version. Use R8.2i instead.

PAC Display R8.2g

PAC Project R8.2007

Released: February 13, 2009.

Bug Fixes

- [KB80481](#) Graphics with Alarm Point dynamic attribute may display incorrect alarm state.
- [KB80482](#) Table editing remains active in PAC Display Runtime.
- [KB80496](#) SuperTrend Pen Discrete and Value Deadband logging always enabled.
- [KB80500](#) PAC Display Runtime may hang on exit.
- (Pro only) [KB80501](#) Missing parameters from PAC Display Runtime's Current Device Config window for FactoryFloor Ethernet controllers.

PAC Display R8.2f

PAC Project R8.2006

Released: December 5, 2008.

Enhancement

PAC Display Runtime now downloads recipes up to 10 times faster.

Bug Fixes

Configurator

- [KB80423](#) PAC Display crashes if Scale Window tool is selected and cursor is clicked inside window.
- [KB80441](#) Regenerate IO Scanner Tag Names skips the Append String tag for Launch Application dynamic attribute.

Runtime

- [KB80439](#) PAC Display may crash on exit.
- [KB80440](#) Obscured graphics in PAC Display Runtime.
- [KB80443](#) Narrow XY Plots drawn incorrectly.

- [KB80463](#) PAC Display Runtime does not run as expected when approaching December 31st.
- [KB80467](#) Runtime crashes if graphic is clicked before its window closes.

PAC Display R8.2e

PAC Project R8.2004

Released: October 3, 2008.

Bug Fix

[KB80403](#) Slower response from PAC Display projects with many SuperTrends (Configurator).

PAC Display R8.2d

PAC Project R8.2003

Released: September 5, 2008.

Bug Fixes

Configurator

- [KB80360](#) PAC Display reports 'AddItems failed' from converted MysticMMI or PAC Display project.
- [KB80361](#) The Save Metafile As... command would randomly fail for metafiles that had been imported into PAC Display.
- [KB80362](#) 'PID type "input" not currently supported' message from upgraded OptoDisplay project.
- [KB80389](#) Problems with 'Chosen graphics' option in PAC Display's Find and Replace window.
- [KB80390](#) Polygons and polylines do not "Undo" as expected.

Runtime

- [KB80225](#) Security User/Group login does not work as expected in PAC Display Runtime.
- [KB80176](#) SuperTrend data not updated and 'Enable Item' Event Log errors.
- [KB80368](#) Can't write to PAC Display PID tags upgraded from Mystic MMI or OptoDisplay.
- [KB80382](#) Problems with security enabled objects in PAC Display and local PC accounts.

PAC Display R8.2c

PAC Project R8.2002

Released: August 1, 2008.

NOTE: *Configurator R8.2c was an internal release only.*

Bug Fixes

- [KB80332](#) PAC Display Runtime may crash when trend is full.
- [KB80345](#) Some graphics in PAC Display (Runtime) are not updated.
- [KB80346](#) Displaying SuperTrend Binary Log Files with historic modes may cause problems.
- [KB80347](#) Alarm sound doesn't play if Persistence Time is configured.
- [KB80352](#) Cannot enter negative numbers in Table graphics.

PAC Display R8.2b

PAC Project R8.2001

Released: July 11, 2008.

Enhancements

- Redesigned the use of the new PAC Display 8.2 registry locations to accommodate users without administrative privileges who use Configurator.
- When saving a project or using the **Tools > Regenerate IO Scanner Tags** command in Configurator, if a tag error occurs, the operation will fail rather than continuing to process each tag.

Bug Fixes

- [KB80318](#) Clicking graphic only toggles once in PAC Display (Runtime).
- [KB80319](#) PAC Display Runtime may crash after modifying data in tables.

PAC Display R8.2a

PAC Project R8.2000

Released: June 19, 2008.

Enhancements

Configurator

- In the Find and Replace dialog box, you can now use a table or bit index offset to select one or several graphics and change the index easily.
- Enhanced log-in features:
 - The user permissions information may now be saved to a global location and a backup location, so that other PAC Display Configurator nodes can read in the saved information without the need to reconfigure the information again.
 - A user may be configured to allow up to four specific log-in periods.
 - A user may be configured to be automatically logged out of PAC Display Runtime if no activity has occurred for a specified amount of time.
 - A user may be configured to be required to change his or her password after a specified amount of time.
 - A user can now be required to log in when Runtime starts.
- A PAC Display project can now be archived and emailed to Opto 22 Product Support.
- Now data sent to the control engine from a table control can be password protected such that each of the four tables in a table control can be configured to require a password to be entered in Runtime to allow a write to be performed from the table control.
- Table control data can now be configured for left, center, or right-justified data. Previously, all data was left-justified.
- The new Scale Window tool allows you to resize a window and the graphics inside at the same time.
- Now you can configure Runtime to start with the Event Log hidden.

Runtime

A user may now change his or her password.

Bug Fixes

- [KB80116](#) Graphics associated with chart states may not respond as expected after PAC Display upgrade.
- [KB80306](#) Sometimes Symbol Factory does not launch from Configurator.
- (Basic only) [KB80143](#) Cannot connect to a remote OptoOPCServer from PAC Display (Runtime).
- (Basic only) [KB80147](#) OptoDisplay, ioDisplay, and PAC Display (Runtime) may have problems on PCs with dual-core processors.

- [KB80285](#) SuperTrend historic log file's date may show 01/02/1601 during Runtime.
- [KB80224](#) Pressing 'Cancel' from Enter User Credential, may crash PAC Display Runtime.
- [KB59384](#) PAC Display (Runtime) does not update if 'QNAN' is in recipe file.
- [KB80110](#) Alarm point's persistence time may be reduced in PAC Display (Runtime).
- [KB80076](#) 'Enable Auto Synchronization' does not work in PAC Display (Runtime).

PAC Display R8.1i

PAC Project R8.1008

Released: March 7, 2008.

Bug Fixes

- [KB80028](#) Copy and paste problems with polygon type graphics in PAC Display (Configurator).
- [KB80066](#) Digital input points not listed in Control Engine Driven Attributes in PAC Display Configurator.
- [KB80029](#) Historic logging not starting up in PAC Display (Runtime).

PAC Display R8.1h

PAC Project R8.1007

Released: February 1, 2008.

Enhancements

- When configuring a discrete controller driven dynamic attribute, Configurator no longer requires a bit index to be set for integer variables.
- Scratchpad variables are now accessible for any SNAP-PAC-R1 or SNAP-PAC-R2 configured in a PAC Control strategy.

Bug Fixes

- [KB61229](#) Incorrectly displayed X-Y plots in PAC Display (Configurator).
- [KB61232](#) Unexpected windows opened by PAC Display (Runtime) default window configuration.

PAC Display R8.1g

PAC Project R8.1006

Released: January 11, 2008.

Bug Fix

[KB60829](#) Leap year 2008 affects dates recorded by PAC Display and ioDisplay SuperTrends (Configurator).

PAC Display R8.1f

PAC Project R8.1005

Released: December 14, 2007.

Enhancement

Configuring a graphic with the **Controller Status** Controller Driven Dynamic Attribute, no longer changes the fill color of the graphic to the default **Attached** color. The graphic will display the appropriate color in Runtime.

Bug Fixes

- [KB60564](#) PAC Display (Configurator) notification windows incorrectly permit latches and counts.
- [KB60546](#) PAC Display (Runtime) hot keys may cause problems.
- [KB60521](#) Canceled recipe in PAC Display (Runtime) still sends notification.

PAC Display R8.1e

PAC Project R8.1004

Released: November 30, 2007.

Enhancement

For Operator Action, Alarming Setup, Historic, and SuperTrend log files, there is now an option to log the time in hundredths of a second.

Bug Fixes

- #60228 A problem has been corrected where a wrong error message displayed when PAC Display (Configurator) attempted to open up a newer project.
- [KB60436](#) Configuring graphic's security in PAC Display or ioDisplay (Configurator) may not work as expected.
- [KB49822](#) Alarm Point notification option's Enabled checkbox becomes grayed out (Configurator).

PAC Display R8.1d

PAC Project R8.1003

Released: November 16, 2007.

Enhancement

When configuring an alarm point in Configurator, if the **Play Sound When Alarmed** option is selected on the **Setup** tab of the Alarm Point dialog, but no global sound file has been configured, a new message box allows you to proceed without configuring a global sound file or to stop and configure the global sound file before proceeding. The old message box required you to configure a global sound file before proceeding. A similar message box is provided in the **Configure >Alarming Setup** dialog if no global sound is configured (or a previously configured sound is cleared), and any alarm point has the **Play Sound When Alarmed** option selected. Previously, if no sound file was configured, you had to make sure no alarm point had the **Play Sound When Alarmed** option selected.

Bug Fixes

- [KB60244](#) Comment markers in recipe format file may interfere with PAC Display (Runtime) upload.
- [KB60280](#) Problems with 'Prompt for name' in PAC Display Recipe Upload Manager (Runtime).

PAC Display R8.1c

PAC Project R8.1002

Released: November 2, 2007.

Bug Fixes

- #59932 A problem has been corrected where attempting to change the Bit Index value to a value greater than 13 caused an error message to appear in PAC Display Configurator.
- [KB59832](#) Grouped graphic objects with polylines may have sizing problems in PAC Display (Configurator).

- [KB59789](#) Changes to PAC Display project may cause problems if loaded during Runtime.

PAC Display R8.1b

PAC Project R8.1001

Released: October 19, 2007.

Bug Fixes

- [KB59775](#) Changes to PAC Display (Configurator) windows properties affects newly added graphics' visibility.
- [KB5978 2](#) Clicking 'Export' button in PAC Display (Configurator) alarm points window may display two unexpected messages.
- Modification in Runtime: The unused tag referencing IP address of 1.2.3.4 has been removed from the `_O22Heartbeat_` group that is added to the OPC Server for heartbeat verification.

PAC Display R8.1a

PAC Project R8.1000

Released: October 8, 2007.

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 instead of having to select it.
- (Pro only) You can now find and replace refresh groups in the Find and Replace dialog box.
- 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 be able 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 the reading and 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

- 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, Integer 64 table elements may be directly written using the table tool.

Bug Fixes

- (Pro only) [KB59513](#) Historic data logging does not resume after reconnecting to PAC Display (Runtime) scanner.
- (Pro only) [KB59684](#) "Uploading Recipe to File..." message never finishes PAC Display (Runtime) recipe upload.
- [KB59487](#) Append String option in PAC Display Application Manager may fail at Runtime.
- [KB58672](#) Numeric recipe table indices are reset when >2047 (Runtime).
- [KB58600](#) "Can't find Format File" message in PAC Display (Runtime) from recipe upload.

PAC Display R8.0k**PAC Project R8.0010**

Released: July 27, 2007.

Bug Fixes

- [KB58574](#) PAC Display (Configurator) recipe file formatting allowing >2048 consecutive table elements may cause problems.
- [KB58575](#) Downloading a recipe file with more than 2048 consecutive table elements causes problems (Runtime).
- [KB58576](#) Upload recipe files with table indices >2047 may crash PAC Display (Runtime).

PAC Display R8.0j**PAC Project R8.0010**

Released: July 20, 2007.

Bug Fixes

- [KB58369](#) Control Engine Status attribute may not indicate current control engine status.
- (Pro only) [KB58374](#) Switching primary and secondary servers may truncate older, SuperTrend pen data in PAC Display.

Enhancement

In Configurator, an **Allow Edit** checkbox has been added to the Configure Table dialog box that allows you to control whether or not an operator can edit a table in Runtime.

PAC Display R8.0i

Internal release only.

PAC Display R8.0h**PAC Project R8.0008**

Released: June 8, 2007.

Bug Fixes

- [KB57440](#) PAC Display (Configurator) error at Runtime if analog points setup for direct I/O unit read.
- [KB57683](#) Unable to select Bit Index in required field for Notification setup in PAC Display (Configurator).
- [KB57625](#) PAC Display (Runtime) historic logging may fail the first time the log file is written to.
- [KB57748](#) Table data in historic log is replaced by another table's data in PAC Display (Runtime).
- [KB57870](#) Online Help not available from PAC Display (Runtime) Event Log Viewer.

Enhancement

In Runtime, better support was added for displaying Japanese, Chinese, and other DBCS character sets when obtaining data from the OptoOPCServer.

PAC Display R8.0g

PAC Project R8.0007

Released: May 18, 2007.

Bug Fixes

- (Pro only) [KB57527](#) 'Unable to load Board Objects' message when regenerating I/O scanner tags in PAC Display (Configurator).
- [KB57572](#) PAC Display (Runtime) alarm log may not record alarm point's return to normal state.

PAC Display R8.0f

PAC Project R8.0006

Released: May 7, 2007.

Bug Fixes

- [KB56759](#) Table objects in PAC Display Runtime appear to not be selectable.
- #57342 A problem has been fixed in Configurator where Find | Replace did not work when replacing control engine for selected graphics on an item with Control Engine Status dialog.
- [KB57143](#) Network computers not available for PAC Display (Configurator) SuperTrend Remote Logging.
- [KB57385](#) Auto Synchronization of controller time to PC time may be off by 12 hours in PAC Display Runtime.
- [KB57387](#) Window appears to not open when configured graphic selected in PAC Display (Configurator).
- [KB57401](#) PAC Display (Runtime) historical log file entry may only have commas.
- [KB57406](#) Filename from string tag may fail for trigger-based event in PAC Display
- [KB57405](#) Message box for new alarm points in PAC Display (Runtime) may not appear.
- [KB57306](#) Rapidly changing PAC Display/ioDisplay (Runtime) alarm point states may have unexpected results.

PAC Display R8.0d

Released: April 7, 2007.

Bug Fixes

- [KB57145](#) Runtime Operator Logging not recording some 'Send Discrete' functions correctly in PAC Display/ioDisplay.

- [KB57146](#) Trigger based historic logging may record data once instead of using stop trigger conditions (Runtime).
- There are no bug fixes or changes in this version of Configurator. The version number was changed to R8.0e only to keep the version number the same as Runtime.

PAC Display R8.0d

Released: April 7, 2007.

Bug Fixes

- [KB56759](#) Table objects in PAC Display Runtime appear to not be selectable.
- [KB56849](#) Some ioDisplay to PAC Display (Configurator) migrations may not be completed.
- [KB56851](#) PAC Display (Runtime) historic logs may not log string data as expected.
- [KB56852](#) Alarm sound may play continuously in PAC Display (Runtime).
- [KB56854](#) Alarm sound may not restart if PAC Display (Runtime) point goes back into alarm.

PAC Display R8.0c

Released: March 23, 2007.

Enhancements

In Runtime, the alarm log no longer logs the following:

- Alarm points that are in an Unknown state.
- Alarm points that are not in alarm when Runtime starts.

Bug Fixes

- #56620 A problem has been corrected in the **Synchronize Control Engine Clocks to PC Clock** section on the **Configure > Runtime > Control Engine** tab in Configurator. You can now set the time from 12:00 - 12:59 PM. The time would always revert to AM previously.
- [KB56566](#) PAC Display Runtime 'Always in memory' windows option may not update data.
- [KB56567](#) Control engine clock may not sync with PC from PAC Display (Runtime).

PAC Display R8.0b

Released: March 9, 2007.

Enhancements

Runtime has been enhanced to reduce round-trip network traffic to and from the Scanner when opening and closing windows.

Bug Fixes

- (Pro only) [KB56431](#) Problems when saving an imported ioDisplay project in PAC Display (Configurator).
- [KB56429](#) Control engines deleted from PAC Display (Configurator) project may cause errors.
- [KB56430](#) Recorded operators in 'Runtime Operator Log File' for security enabled objects in PAC Display.

PAC Display R8.0a

Released: March 1, 2007.

New Features

- In Runtime, you can now 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.
- In Configurator:
 - When configuring the 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.
 - A single Historic Log point cannot only log integer and float table ranges, but now also string table ranges.
 - A new deadbanding feature is now available for combined SuperTrends that results in smaller, more manageable log files.

Bug Fixes

Configurator

- [KB54082](#) Changes to XY-plot graphic in ioDisplay Configurator.
- [KB55259](#) ioDisplay project configured for on-screen keyboard, requests password from regular keyboard.
- [KB55618](#) Duplicated metafile graphic not visible in ioDisplay.
- [KB55747](#) 'Add item' returned from ioDisplay if I/O point is not supported.
- [KB55840](#) Security enabled graphic in ioDisplay allows most users to activate it in non-English Windows operating systems.
- [KB55854](#) ioDisplay may terminate unexpectedly when no windows are open and an empty area of the toolbox is clicked.

Runtime

- [KB53303](#) ioDisplay alarm points are truncated in alarm window.
- [KB53707](#) ioDisplay 'Synchronize at Runtime startup' settings may not work for different user.
- [KB55253](#) Canceling password window closes calling window in ioDisplay.
- [KB55302](#) ioDisplay stops updating windows when float values reach +3.4e38 or -3.4e38.
- (XP only) A problem has been fixed where if a user was configured as **ALLOWED** in the security settings for an Output Dynamic Attribute, it made no difference. Anyone could access the Output Dynamic Attribute as long as their username and password were valid.

ioDisplay R7.1j

Released: December 18, 2006.

Bug Fix

#55256 In Configurator, a problem inadvertently introduced in ioDisplay 7.1i has been corrected where functions that had to write to the hard drive would fail. This included historic logs, SuperTrends, alarms, etc.

ioDisplay R7.1i

Released: December 11, 2006.

Enhancement

In Runtime, added an enhancement where if alarm points are in a Normal state at Runtime startup, they are *not* added to the History alarm. The Normal state now only appears in the History alarm once the alarm point returns from an alarmed state.

Bug Fixes**Configurator**

- [KB55175](#) X-Y Plot 'Show Legend in Runtime' option in ioDisplay is always selected.
- [KB55016](#) Alarm state priority in ioDisplay kept if all alarm states are set.

Runtime

- [KB55177](#) ioDisplay alarms not always showing correct state when using Condition tag.
- [KB55178](#) ioDisplay alarm point configured to a Value 'Tag', does not indicate alarm condition.
- [KB54490](#) Alarm sound may not activate if ioDisplay launched with PC shortcut.

ioDisplay R7.1h

Released: November 22, 2006.

Internal release only.

ioDisplay R7.1g

Released: October 23, 2006.

Bug Fixes

- [KB51157](#) ioDisplay (Configurator) unresponsive from corrupt Symbol Factory graphic.
- [KB51758](#) The Send Value 'Offset' feature in ioDisplay (Configurator) not working as expected.
- [KB52368](#) ioDisplay Configurator may crash when SuperTrends are configured for very low scaling and refresh rates.
- [KB52200](#) ioDisplay (Runtime) Trend graphic without configuration causes problem at Runtime.

ioDisplay R7.1f

Released: August 15, 2006.

Internal release only.

ioDisplay R7.1e

Released: May 18, 2006.

Bug Fix

[KB51612](#) Continuous alarm sound in ioDisplay (Runtime).

ioDisplay R7.1d

Released: May 4, 2006.

Enhancements

- (Pro only) In Configurator:

- A problem has been corrected where the **I/O Unit Tags** tab of **Configure > Runtime** was not adding D64 I/O units.
- A problem has been corrected where the **I/O Unit Tags** tab of **Configure > Runtime** was adding pointer types.
- A new **Uncheck All / Check All** button has been added to the **I/O Unit Tags** tab of **Configure > Runtime**.
- The **I/O Unit Tags** tab of **Configure > Runtime** has been enlarged.
- In Runtime:
 - Upload Recipe Results file no longer has square brackets around indexes.
 - Upload Recipe Results file no longer has trailing space after last entry for a table.

Bug Fixes

- [KB51184](#) Windows metafile graphics may disappear in ioDisplay Configurator.
- [KB51157](#) ioDisplay (Configurator) unresponsive from corrupt Symbol Factory graphic.
- In Runtime, a problem has been corrected where the Alarm Log file was not including the year.

ioDisplay R7.1c

Released: April 20, 2006.

New Features

- In Configurator, configuring automatic syncing of control engines to PC time has been added in the **Configure > Runtime** dialog under the **Control Engines** tab.
- (Pro only) There is now an option in the Execute Menu Item Operator-Driven Dynamic Attribute to display the Configuration Status dialog in Runtime.

Bug Fixes

Configurator

- The Preserve OptoDisplay compatibility checkbox in the Trend dialog has been removed. It was nonfunctional. To make trends display as they did in OptoDisplay, use **Trend Backward Compatibility** in the Runtime Setup dialog (**Configure > Runtime**).
- [KB51150](#) Corrected a problem where metafiles were disappearing for two reasons:
 - Once the Undo buffer limit was reached, the oldest redo item was deleted. If this redo item contained a reference to a metafile, the metafile was deleted;
 - Symbol Factory graphics dragged, dropped, and then modified, may disappear in ioDisplay Configurator.

Runtime

- Corrected a problem where the sync control engine to PC time command would sometimes fail.
- Corrected a problem where on startup, occasionally there were erroneous messages stating that "AddItems failed" but no item names were shown.
- [KB51005](#) ioDisplay alarm points may ignore discrete tag values.
- Corrected a problem where if Alarm Points were configured to use conditional tags, and the alarm point was triggered, and then the condition went false, the alarm point was not removed from the alarm graphics.
- Corrected a problem where if a Text Color attribute was set for a graphic, and then the text was changed (either by the strategy or a Send String command), the text was displaying as black rather than retaining the previous color.

- Corrected a problem where the Alarm Graphics were not displaying the year when alarm points were added.

ioDisplay R7.1b

Released: April 7, 2006.

New Features

- In Configurator, multiple alarm points may now be deleted at one time.
- The **Configure > Runtime** dialog in Configurator now has two new options:
 - **Format Value Data With Commas** now allows the user to choose whether commas are displayed for value data. This option is selected by default.
 - **Trend Backward Compatibility** displays Trend (not SuperTrend) data the same as OptoDisplay. OptoDisplay graphed Trend data as if the **Y-Axis** Label Position had been set to **None** even if labels were present. Selecting this option displays ioDisplay Trends the same way. This option is disabled by default.

Bug Fixes

Configurator

- [KB50840](#) Windows clipboard locks when attempt to paste graphic into ioDisplay window fails.
- Corrected a problem where the **Tools > Regenerate IO Scanner Tags** command was not generating tags for the Upload Recipe Destination File tag if **Mistic String** was selected.
- Fixed a problem where clicking **Cancel** while the **Tools > Regenerate IO Scanner Tags** command was running would cause Configurator to hang.

Runtime

- A problem has been corrected where on rare occasions, if a project contained large numbers of alarm points, not all of the alarm points were being added to the OPC Server.
- (Pro only) A problem has been fixed where the **Window** menu would occasionally still display closed windows as being open, and vice versa.
- (Pro only) A problem has been corrected where the **View > Configuration Status** dialog was not showing all I/O units.
- (Pro only) A problem has been corrected where some Windows tags were not being added to the scanner when they belonged to the same group as other tags in the same window.

ioDisplay R7.1a

Released: March 8, 2006.

Information in this release note applies to both Basic and Professional versions unless otherwise indicated.

New Feature

Added support for SNAP-PAC-R1 and SNAP-PAC-R2 in both Configurator and Runtime.

Bug Fixes

- In Configurator, a problem has been remedied where High Density Digital I/O Scanner Tags were being generated incorrectly.
- (Pro only) When selecting an element of a string scratchpad table, Configurator now correctly limits the maximum element to 63. Previous versions allowed selecting elements up to 10,239.

ioDisplay R7.0d

Released: February 2, 2006.

Bug Fixes

- (Pro only) [KB49885](#) ioDisplay Runtime and the Enable SuperTrend Pen window.
- (Pro only) A problem has been corrected where ioDisplay Runtime would either fail to connect to the backup server, or randomly crash. This would occur if a redundant OPC Server had been configured, and the primary OPCServer was not available at Runtime startup.
- [KB49872](#) Trends in ioDisplay Runtime Basic may appear to freeze when data is constant.

Enhancements

- In Runtime, trend scaling has now been modified as follows:
 - If the Y-Axis **Label Position** is set to **None**, all pens are displayed and are scaled proportionally to the height of the Trend graphic; if the **Label Position** is set to any other setting, only pen data falling in the Y-Axis **Label Range** of values is displayed.
- (Pro only) In Runtime, failure to remove groups or items from the OPCServer now only displays error messages in the Event Log if ioDisplay is able to communicate with the server.

ioDisplay Professional R7.0d | ioDisplay Basic R7.0c

Released: January 26, 2006.

New Features

- (Pro only) In Configurator, the **Sync All Control Engines to PC Time** option is now available under the **Execute Menu Item** Operator-Driven Dynamic Attribute.

NOTE: This command syncs all controllers/control engines to the time of the PC that is running the OPCServer, not the PC that is running ioDisplay Runtime (if different). Also, this command is not available in `ioDsrX.pro.exe`.

- In Runtime, A menu item under the **View** menu allows syncing all control engines to the PC time.

NOTE: This command syncs all controllers/control engines to the time of the PC that is running the OPCServer, not the PC that is running ioDisplay Runtime (if different). Also, this command is not available in `ioDsrX.pro.exe`.

Bug Fixes

- In Configurator, a problem has been fixed where tags in table controls were not getting properly updated when executing the **Tools > Regenerate IO Scanner Tags** command.
- In Runtime, the **Sync All Control Engines to PC Time** Operator-Driven Dynamic Attribute now works correctly when multiple control engines are configured.
- (Pro only) [KB49757](#) Incomplete alarm time displayed in ioDisplay Professional.

ioDisplay Professional R7.0c | ioDisplay Basic R7.0b

Released: January 19, 2006.

Enhancement

In Configurator, the AutoCorrect Tags feature now uses substantially less memory and GDI resources.

Bug Fixes

- [KB50630](#) AutoCorrect Tags tool in ioDisplay Configurator occasionally omits tags.

- Displaying negative numbers in Configurator Basic would sometimes add an extra comma before the number.
- [KB50631](#) 'TValue::Get' message from ioDisplay Runtime if Send Discrete and Send Value are configured for same graphic.

ioDisplay Professional R7.0b | ioDisplay Basic R7.0a

Released: January 12, 2006.

Enhancements

- Metafile drawing code has been enhanced to minimize the appearance of random lines appearing on some metafiles.
- For ioDisplay Professional, the application executables have been renamed to:
 - ioDisC.pro.exe
 - ioDisR.pro.exe
 - ioDsrX.pro.exe
- (Pro only) Performing a Operator Driven Discrete Set now mimics previous versions of ioDisplay in setting an integer value where no bit index was specified to a +1 instead of a -1.
- For ioDisplay Basic, the application executables have been renamed to:
 - ioDisC.basic.exe
 - ioDisR.basic.exe
 - ioDsrX.basic.exe

Bug Fix

A problem has been resolved where the message "Unable to Load PID Objects" would appear when configuring tags in certain projects in ioDisplay Configurator Basic.

ioDisplay Professional (R7.0a) | ioDisplay Basic (R6.2a)

Released: December 8, 2005.

ioDisplay software is now available in two versions: ioDisplay Basic and ioDisplay Professional. Information in this release note applies to both versions unless otherwise indicated.

For information about the differences between Basic and Professional versions of ioProject software applications, see [ioProject Professional 7.0 Release Notes](#) (form 1599). This document is included with all ioProject software and can also be downloaded from the Opto 22 website at www.opto22.com.

New Features

The new features in this release only apply to ioDisplay Professional:

- Support for Ethernet link redundancy using the dual Ethernet network interfaces on SNAP PAC controllers. You can designate primary and secondary control engines; if the primary is not available, ioDisplay Pro will switch to the secondary control engine. For maintenance or testing, you can also manually switch control engines.
- Conversion of OptoDisplay projects to ioDisplay projects.
- Connection to FactoryFloor controllers running OptoControl strategies. (SNAP-LCM4 with M4SENET-100 adapter card only.)
- Ability to read and write I/O unit data through the control engine as well as directly from the I/O unit itself. This ability means you can set up segmented networks using a SNAP PAC controller, with one Ethernet interface used for the control network and one to communicate with hosts. (ioDisplay Basic, in contrast, must talk directly to I/O units.)

- Primary and secondary scanners. As with control engines, if the primary is not available, ioDisplay Pro will switch to the secondary. You can also manually switch scanners.
- Real-time overview of control engine and I/O unit status.
- Access to Scratch Pad bits, integers, floats and strings; pointer variables; PIDs; event/reactions; and limited support for Integer 64 variables.
- The ability to replace controllers, item names, table and bit indices for windows, alarm points, historic logs, sounds, triggers, and so on, for the entire project.

Enhancement

ioDisplay Basic is very similar to the previous ioDisplay version 6.1, with the addition of support for new SNAP PAC controllers.

Bug Fixes

- Digital input and output points are visible and can now be added to a Historic Data Log.
- ioDisplay will not unexpectedly terminate for some Runtime windows containing Windows metafile graphics (.wmf or .emf).
- Some bitmaps were focus-frame and beep-enabled inadvertently; this problem has been fixed.
- RAM used for a SuperTrend is now correctly shown in kilobytes (KB) rather than megabytes (MB).
- Negative values in ioDisplay windows are correctly shown. (Previously, some had an extra comma.)
- Lo alarms associated with a tag under **Setup By Current Value** are triggered correctly.
- Historic logging works correctly. (The problem occurred when a new control engine was used and the log filename was created from a String Name.)
- An erratic good/bad data state associated with a 64-bit integer tag or a 64-bit integer table element has been fixed.

ioDisplay Software R6.1a

Released: May 31, 2005.

Enhancements

- Support for SNAP high-density digital input and output modules:
 - SNAP-IDC-32
 - SNAP-ODC-32-SRC
 - SNAP-ODC-32-SNK

Each of these modules provides 32 digital input (SNAP-IDC-32) or 32 digital output (SNAP-ODC-32-SRC and SNAP-ODC-32-SNK) points for a total of up to 512 digital points on a 16-module mounting rack. Features differ from those in standard digital modules; for details, see the [SNAP High-Density Digital Module Data Sheet](#) (form 1556).

- There is a new operator-driven **Read and Clear** dynamic attribute for reading a tag value and then clearing (resetting) it. The following values can be read and cleared:
- Counts (returns an integer value and then clears counts)
 - On time total
 - Off time total
 - Latch (ON)
 - Latch (OFF)
 - On pulse measure
 - Off pulse measure
 - Period

- In the operator-driven **Send Value** dynamic attribute, values can now be formatted as hexadecimal numbers.
- A SuperTrend object's Y-axis can now be scaled logarithmically.
- An individual draw window in an ioDisplay project can now be exported, saved as a file, and then imported into another ioDisplay project. The exported window file contains all the objects and tags that were in the original window. Exporting and importing draw windows is a convenient way to reuse the same window in different ioDisplay projects.
- Each drawing tool in the toolbox now has a shortcut key associated with it to make selecting and switching between tools easier and faster. To choose a tool, press the corresponding key on the keyboard. Hold the cursor over a tool to find out which shortcut key is associated with it.
- Added **Regenerate IO Scanner Tags** item to the **Tools** menu.
- Space and NULL characters are now removed from an Upload Recipe results file.
- Vertical and horizontal spacing of objects has been improved.
- The "Disk Full" error message is now more specific. This error is now also reported in the Event Log.

Bug Fixes

- ioDisplay Configurator would crash if the user security group(s) and/or user(s) specified in the project were not present on the local domain.
- Alarm points were not always correctly added to the Runtime scanner.
- If an alarm sound was removed from an alarm and **Play until Acknowledged** was selected, the sound removed still played for that alarm.
- The Alarmpoint Controller Status tag is now sent to the Runtime scanner.
- For a PID loop, the IP address and port can now be configured correctly.
- Incorrect PID Item Names were being generated occasionally.
- For a PID loop, the Out Hi Clamp and Out Lo Clamp values were being sent to Input Under Range and Input Over Range.
- The auto/manual flag for a PID loop was not toggleable or settable.
- The "opening window" message is now only displayed if Runtime is the active application.
- When logging value changes, the operator action log file would incorrectly indicate that the "previous value" was always zero.
- In Configurator, the **Save Metafile As** command did not correctly save metafiles to disk.
- String writes with space or NULL strings were not working.
- SymbolFactory location is now predefined to reduce possible installation problems.
- Autocorrect tags now checks for available display resources on the computer.
- Historic log triggers were not added to the correct scanner group.
- Historic logs did not perform an initial scan when a trigger event occurred. Subsequent scans functioned correctly.
- Selecting and moving a large number of metafiles (usually 50 or more) on screen sometimes caused display problems.

ioDisplay Software R6.0a

Released: October 1, 2004.

Enhancements

- An expanded testing regimen has improved both the reliability and performance of the software over the previous version, ioDisplay 5.1. In particular, ioDisplay Runtime now opens and starts large ioDisplay projects much faster than before.

- Recipes now support up to 2048 entries per table.
- Numeric table objects now support up to 500 elements per table.
- When configuring a SuperTrend, the estimated amount of memory the SuperTrend will use is now shown.
- When using an ioDisplay project in Runtime, individual SuperTrend pens can now be either hidden or disabled.

Bug Fixes

Configurator

- Fixed a problem in the Configure Tag dialog box where if the backspace key was pressed when the cursor was in the **Element** field, the **Start Index** and **Number of Elements** fields would become active. This would allow table ranges to be entered where they are not allowed.
- Corrected an error that occurred where a duplicate control engine ID was sometimes used when a new control engine was added to an ioDisplay project.
- Fixed a bug where trigger names sometimes did not appear in dialog boxes.
- Fixed a problem in the Configure Dynamic Attributes dialog box where when using the Tab key to move between the location fields, objects would move around on the screen.
- Corrected a problem where AutoCorrect tags did not include cleared tags that were imported from a project created in ioDisplay 1.0.
- Fixed a bug where column widths for numeric table controls were not saved correctly.

Runtime

- Corrected the following problems in using recipes:
 - Float tables in a recipe download did not work.
 - Recipe downloads and uploads would fail if ioDisplay was not monitoring any tags for the control engine specified in the recipe file.
 - When uploading and downloading recipes, a control engine string could not be used for the name of the destination file.
 - Notifications were not working after uploading or downloading a recipe.
 - Recipes were not working if comment lines were embedded throughout the file. In the upload results file, any comment lines were written at the top of the file before the actual data instead of in their correct locations.
 - An uploaded file could not be subsequently downloaded if brackets [] were used around indices.
 - A blank line at the end of a file could cause Runtime to freeze.
- Fixed the Silence/Unsilence alarm feature to operate correctly.
- Corrected a problem where alarm sounds did not work correctly when combined with the Silence/Unsilence alarm feature.
- Fixed the Offset feature to operate correctly.
- Fixed the alarm point notifications to operate correctly.
- Corrected a problem where historic logging did not work correctly when choosing the **From Strategy** option.
- Fixed a bug where historic logs would sometimes display only commas for data, and display data at twice the refresh time or faster.
- Fixed a problem when triggering an external application that used an appended string in the command line (for example, `C:/notepad.exe myfile.txt`).
- Corrected a problem where a backup controller would sometimes not operate.
- Corrected a problem where the **Toggle Discrete** dynamic attribute would not work correctly when the object also had other dynamic attributes configured.

- Fixed a problem where notifications were not working correctly for the Application Manager and Historic Logs.
- Fixed a bug where SuperTrend historic logs started with the date 1601.
- Fixed a bug where XY plots did not correctly display graphed data.
- Corrected a problem with color text in a graphic where if the text was changed but the **Color** dynamic attribute for the text was not changed, the new text would display in default Configurator black.

Known Issue

Some customers set up ioDisplay Runtime to run automatically on a technician's PC with no other applications available. In some cases, Windows operating services that must run on the PC before ioDisplay Runtime opens may take too long to launch. If this happens, a dialog box appears stating that a necessary service is unavailable, and ioDisplay does not open. If this situation occurs, you need to add a delay to the ioDisplay launch.

To add the delay:

1. Right-click the ioDisplay Runtime icon in the **Startup** menu or folder.
2. Choose **Properties** from the pop-up menu.
3. In the Properties dialog box, add a delay in seconds at the end of the **Target** field (outside the quotation mark) in the format `<space><delay value>`.

For example, to add a 20-second delay, you would type a space and then 20 as shown below:

```
C:\Program Files\ . . \ioDispR.exe 20
```

4. Check how Runtime launches to make sure the delay is the right length, and adjust the delay value if necessary.

ioDisplay Software R5.1d

Released: June 23, 2004.

IMPORTANT: *ioDisplay R5.1d is distributed as a software patch, not as a standalone installation program. To use this patch, ioDisplay 5.1b must already be installed on your computer. See the following instructions for more information.*

Installing ioDisplay R5.1d if ioDisplay R5.1b is Already Installed

1. Exit ioDisplay Configurator and ioDisplay Runtime applications if they are currently running.
2. Download the file `ioDisplay_patch_R51d.zip` from the Opto 22 website at the following link:
<http://www.opto22.com/support/softwareDrillDown/softwaredrilldown.aspx?SoftwareID=84>

NOTE: *Contact Opto 22 Product Support for current information about this download.*

3. Uncompress the ZIP archive using WinZip or a similar program. The three `.exe` files in this archive replace three older files (R5.1b) with the same filenames.
4. Now find the ioDisplay directory on your computer. By default, ioDisplay is installed in the following location: `c:\Program Files\Opto22\ioProject Software\ioDisplay`
5. Drag or copy the three files you uncompressed into the ioDisplay directory. When a prompt asks if you want to replace existing files, click **Yes**.
This completes the ioDisplay R5.1d installation.

Installing ioDisplay R5.1d if ioDisplay R5.1b is Not Installed

1. Exit ioDisplay Configurator and ioDisplay Runtime applications if they are currently running.
2. Install ioDisplay R5.1b on your computer. If necessary, download the installer from the Opto 22 website at the following link:

<http://www.opto22.com/support/softwareDrillDown/softwareDrillDown.aspx?SoftwareID=4>

NOTE: Contact Opto 22 Product Support for current information about this download.

Additionally, you must purchase and register ioDisplay software if you have not already done so. Once registered, you can request a password from the Opto 22 Product Support group at support@opto22.com.

3. Download the file `ioDisplay_patch_R51d.zip` from the Opto 22 website at the following link:
<http://www.opto22.com/support/softwareDrillDown/softwareDrillDown.aspx?SoftwareID=84>
NOTE: Contact Opto 22 Product Support for current information about this download.
4. Uncompress the ZIP archive using WinZip or a similar program. The three `.exe` files in this archive replace three older files (R5.1b) with the same filenames.
5. Find the ioDisplay directory on your computer. By default, ioDisplay is installed in the following location:
`c:\Program Files\Opto22\ioProject Software\ioDisplay`
6. Drag or copy the three files you uncompressed into the ioDisplay directory. When a prompt asks if you want to replace existing files, click **Yes**.
This completes the ioDisplay R5.1d installation.

Bug Fixes

Configurator

- Corrected a “duplicate control engine ID” error that occurred when a control engine was added to an ioDisplay project.
- Corrected a problem where tags that had been cleared were not included when using AutoCorrect Tags on a project imported from ioDisplay R1.0.
- Fixed a bug that caused trigger names to sometimes be displayed incorrectly in dialog boxes.
- Corrected a problem in the Tag Configuration dialog box where pressing the Backspace key when the cursor was in an element field would make the **Start Index** and **Number of Elements** fields active. This allowed table ranges to be configured even if the tag being configured was not a table.
- Fixed a bug in the Configure Dynamic Attributes dialog box that occurred when using the Tab key to move between controls.

Runtime

- Multiple fixes to recipe handling:
 - Corrected a problem where recipe float tables were not downloaded correctly to the control engine running the ioControl strategy.
 - Fixed a bug where recipe downloads and uploads would fail if ioDisplay was not currently monitoring tags for the control engine specified in the recipe file.
 - Corrected a problem where uploading recipes with did not work correctly if the option **Filename from String Name** was selected.
 - Fixed a problem where notifications did not work after uploading or downloading a recipe.
 - Increased the number of table entries that can be used in a recipe to 2048 per table.
 - Corrected a problem where an uploaded recipe file could not be subsequently downloaded if brackets [] were used around table indices.
 - Fixed a problem where recipe files would not work if comment lines were used throughout the file.
- Corrected a problem where historic logging did not work correctly if the option **Filename from String Name** was selected.
- Fixed a problem where alarm point notifications did not work correctly with Application Manager and Historic Logs.

- Corrected an error with toggling discrete tags that occurred when the tag was configured with another dynamic attribute.
- Fixed a problem where the Offset feature did not work on the **Send Value** dynamic attribute.
- Corrected an error where a window state could not be configured by appending a string in a command line.
- Fixed a bug where historic logs would sometimes display only commas for data and sometimes display data at twice the refresh rate or faster.
- Corrected a problem where historic SuperTrends no longer start with the "1601" date.
- Corrected a problem where alarm sounds did not work when used in conjunction with the Silence/Unsilence Alarm feature.

ioDisplay Software R5.1c

Released: April 27, 2004.

ioDisplay software R5.1c was made available briefly as a beta version to a small number of testers, but this version was never formally released.

ioDisplay Software R5.1b

Released: February 27, 2004.

Enhancements

- In ioDisplay Runtime, multiple "not connected" and similar error messages appear when an ioDisplay project starts. You can now choose whether to have these initial messages displayed. To hide or show these error messages, select **Configure > Scanner Location** in ioDisplay Configurator and then select or deselect the **Enable Bad Quality/Not Connected Errors** check box.
- In the Scanner Location dialog box, the location **This computer** is now selected by default.

Bug Fixes

- On digital points configured as counters, counters are now displayed correctly.
- Correct Windows Help files for this version of ioDisplay are now installed.
- Corrected error when a Historic Log is configured to get the filename from the controller. The Historic Log would not be created and a scan error (undefined) would be displayed.
- Fixed problems in the **View > Control Engines** dialog box. Previously, it still showed reenable times. Also, if a control engine was not connected, it still said **Attached** even if no physical control engine existed.
- If a control engine was not initially attachable, graphics for that control engine were not correctly displaying the "Detached on Error" color.
- A trigger is no longer required to start or stop historic logs. Before, if a historic log was configured with no triggers, nothing would get logged.
- Strings can now be written to string tables.
- Recipes containing chart commands now work correctly.
- Corrected problem when a window had the **Always in memory** checkbox checked in Configurator and then was closed in Runtime. Previously, the data was still being scanned; now the group is disabled on the server so that no scanning takes place until the window is re-opened.
- Fixed an error when trying to import an invalid metafile.
- Graphic color changes for **Last Known Value** or **Comm Error** now occur as the graphic objects are being scanned instead of occurring all at once.

- When multiple control engines must be monitored, selecting the **Control Engine Status** input dynamic attribute now shows the control engine that has the most critical status. A control engine's status, however, can only be monitored if the control engine is already referenced elsewhere in the ioDisplay project, and the referenced item is in an active ioDisplay window.

ioDisplay Software R1.0b

Released: February 1, 2002.

Enhancement

The ioDsrX version of Runtime now has the **View > Controllers** menu option available.

Bug Fixes

- Selecting integer and float table ranges when configuring tags is only allowed if configuring an XY Plot or Historic Data Log points.
- The **Play sound continuously** option now works correctly when using alarm points that are not inserted into an alarm graphic.
- Deadbands for floats now work when configuring **Text In From Controller** Dynamic Attributes.
- The **Switch Control Engines** menu option now appears correctly in Runtime.
- Sending Discrete values to bits 0 through 31 of Integer 64 types now works correctly in Runtime.
- Metafiles are now properly pasted after being copied.
- Repeatedly sending discrete values no longer locks the controller.

ioDisplay Software R1.0a

Released: October 15, 2001.

Known Issue

When running ioDisplay Configurator under the Windows 2000 operating system, the font used to format text in a text box may change as you edit or change the text box. This problem does not occur when the ioDisplay project is run in ioDisplay Runtime.

PAC MANAGER

PAC Manager R10.6a

PAC Project R10.6000

Released: October 23, 2025.

NOTE: You may be prompted to restart your computer to complete the installation of the software.

New Features

In the Inspect Opto 22 Device window, the Analog Bank Read window has been updated as follows:

- The columns have been grouped differently. Previously, the **Value**, **Counts**, **Min Value**, and **Max Value** items each had their own sub-section in the Analog Bank Read section. Now, **Value** and **Counts** are grouped together; **Min Value** and **Max Value** are grouped together. This can save you time by not scrolling through a very long Analog Bank Read section.

- A new **Quality** column has been added for quality codes. This column is grouped with the **Value** and **Counts** columns.

For more information about the Analog Bank Read window, see the *PAC Manager User's Guide* (form 1704).

Enhancements

- PAC Manager now detects whether a controller is configured with Secure Software Download (SSD) and, if the firmware you try to download via **Install Firmware via Ethernet** does not have the SSD key, PAC Manager displays a message that the key is missing and prevents you from installing the firmware. For more information about Secure Software Download, review the PAC Terminal SSD documentation you were provided or search for "PACTERMSSD" on the Opto 22 website (www.opto22.com).
- In the Find Opto 22 MMP Devices dialog box, the information in the **Unit Type** column has been separated into two columns: **Unit Type** and **Part Number**. This may make it easier to visually scan through the list to find the device you are looking for. For more information about the Find Opto 22 MMP Devices function, see the *PAC Manager User's Guide* (form 1704).
- The **Status Read** area of the Inspect window now provides the **Installed RAM** information in two formats: number of bytes and number of megabytes. This is helpful when you want to know if the device you are inspecting is a SNAP-PAC-R1 or a SNAP-PAC-R1 (GEN2); a GEN2 has more memory than a pre-GEN2. For more information about the Inspect Opto 22 Devices window, see the *PAC Manager User's Guide* (form 1704).
- In the Install Firmware via Ethernet dialog, the G4EB2 was missing from the list for the **Install Firmware via Ethernet Connection** option, and it has now been added.

Bug Fixes

- [KB90853](#) PAC Manager may not accept a 12-digit IP address and subnet mask for the ETHERNET 2 Interface.
- [KB90940](#) Firmware updates for SNAP PAC R-Series controllers configured for Secure Strategy Distribution (SSD) fail.
- [KB91122](#) ENET2 disabled after firmware update.
- [KB91132](#) Configured PID loops do not appear correctly in PAC Manager.
- [KB91136](#) SNAP-AITM and SNAP-AITM-i modules are misidentified in PAC Manager.
- [KB91213](#) Updating module firmware in PAC Manager may fail if firmware filename contains a parenthesis.

PAC Manager R10.5c

PAC Project R10.5003

Released: December 19, 2023. Updated: January 3, 2024 and October 23, 2025.

Bug Fix

[KB90678](#) PAC Manager cannot confirm reboot of E1 or E2 brain boards when installing firmware.

PAC Manager R10.5b

PAC Project R10.5002

Released: May 22, 2023. Updated: May 24, 2023.

Bug Fix

[KB90538](#) PAC Manager: On Generic Read/Write page, error when using write-only address or navigating with Tab key.

PAC Manager R10.5a

PAC Project R10.5000

Released: November 14, 2022.

Bug Fix

[KB90311](#) Incorrect websites/browser launched from Help menu and dialog boxes.

PAC Manager R10.4c

PAC Project R10.4003

Released: March 21, 2022.

The PAC Manager version number was updated to reflect an update to the installer. There were no other changes.

PAC Manager R10.4b

PAC Project R10.4001

Released: January 31, 2022. Updated: February 17, 2022.

Bug Fix

[KB90124](#) Pulsed Output feature cannot be selected for digital outputs on some I/O Units.

PAC Manager R10.4a

PAC Project R10.4000

Released: September 7, 2021.

The PAC Manager version number was updated to match the other applications in PAC Project R10.4000. There were no other changes.

PAC Manager R10.3b

PAC Project R10.3001

Released: August 17, 2020.

Bug Fix

[KB89120](#) Updating firmware with PAC Manager may fail.

PAC Manager R10.3a

PAC Project R10.3000

Released: April 9, 2020.

PAC Manager R10.2c

PAC Project R10.2003

Released: October 16, 2019.

Bug Fixes

- [KB88319](#) In PAC Manager, watchdogs for digital outputs cannot be enabled.
- [KB88384](#) Uploading Configuration file to E1 or E2 I/O unit configures first point only.
- [KB88508](#) Secondary or WiFi IP address can conflict with Primary IP address.

PAC Manager R10.2b

PAC Project R10.2002

Released: June 10, 2019.

Bug Fixes

- [KB88092](#) Some PAC Control Maintenance commands give timeout errors.
- [KB88181](#) PAC Manager: Load option in I/O Unit Maintenance dialog merges old and new list.

PAC Manager R10.0b

PAC Project R10.0001

Released: July 9, 2018.

Enhancement

If your SNAP PAC SB-series brain requires PAC firmware R9.5g or higher, PAC Manager now warns you when you try to downgrade the firmware to an unsupported version. For more information, see [KB87213](#).

Bug Fix

[KB87560](#) Over-sized fonts, parts of text missing, blank dialog boxes, or missing dialog elements.

PAC Manager R10.0a

PAC Project R10.0000

Released: May 18, 2018. Updated: July 2, 2018.

Enhancements

- If your controller or brain has an I/O coprocessor that needs a firmware update, the **Diagnostic Messages** button (yellow exclamation mark) now appears when you open the Status Read window (**Tools > Inspect**). For more information about I/O coprocessors, see the [SNAP PAC I/O Coprocessor Firmware Readme](#). For more information about the **Diagnostic Messages** button, see "Viewing Diagnostic Messages" in the [PAC Manager User's Guide](#) (form 1704).
- (Not applicable to SNAP PAC SB-series brains.) If your SNAP PAC controller or brain requires PAC firmware R9.5g or newer, PAC Manager now warns you when you try to downgrade the firmware to an unsupported version. The warning message reads "The device at address <number> requires firmware 9.5g or higher. Firmware update failed." For more information, see [KB87213](#).

PAC Manager R9.6c

PAC Project R9.6002

Released: March 7, 2017.

Bug Fix

[KB86549](#) On networks without a DHCP server, PAC Manager may be unable to assign IP addresses to E1 and E2 brains.

PAC Manager R9.6b

PAC Project R9.6001

Released: February 27, 2017.

Bug Fixes

- [KB86547](#) PAC Manager correctly configures only the first module on E1 and E2 brains.
- [KB86552](#) For some modules on a G4EB2, PAC Manager may incorrectly configure TPO and Pulsed Output.

PAC Manager R9.6a

PAC Project R9.6000

Released: February 1, 2017.

Enhancements

- New **Next** and **Back** buttons in the Inspect window (**Tools > Inspect**) let you more easily navigate through the alphabetized list of device names.
- The five most recently inspected devices appear at the top of the alphabetized list of device names. (Note that these new features are not visible until you've configured at least six devices.)
- You can now resize table columns in Inspect windows to more easily see their contents.

PAC Manager R9.5b

PAC Project R9.5002-339

Released: September 27, 2016.

Bug Fixes

- [KB86170](#) PAC Manager Configuration file doesn't retain Fahrenheit setting for E2 brains.
- [KB86172](#) Updating to newer firmware may fail in R1, R1-B, and R2 controllers with microSD card slot.
- [KB86180](#) Newer firmware files may not install properly when a microSDHC card is in the controller.
- [KB86219](#) PAC Manager should not let you configure SNAP-IDC5Q for SNAP-PAC-R2s, -EB2s, or -SB2s.
- [KB86237](#) PAC Manager: Install Firmware via Ethernet may fail with certain controllers (Could not access 'response' file).

PAC Manager R9.5a

PAC Project R9.5000

Released: July 15, 2016. Updated: July 22, 2016.

Notes

- **Windows XP and Windows 2000 No Longer Supported**
 - The PAC Project Software Suite no longer supports operating systems for which Microsoft has ended support. This includes Windows XP and Windows 2000.

- If you attempt to install any PAC Project R9.5000 (or higher) software component on an operating system that Microsoft no longer supports, the installation software displays an error message and then ends.
- **New PID Algorithms for ISA, Parallel, and Interacting**
 - To address an issue that occurs when the input to a PID loop is supplied by the host ([KB82058](#)), new algorithms for ISA, Parallel, and Interacting were added to PAC firmware R9.4c and higher. This change does not affect the calculations for existing PID loops.
 - To avoid impacting existing PID loops, the original algorithms were renamed in PAC Project R9.5000; their names now include the word “Obsolete.” Also, the Velocity (Type B) name now includes “Obsolete” because it was previously replaced by Velocity (Type C).
 - You can continue to use the obsolete algorithms. However, Opto 22 recommends you use the new algorithms when you create PID loops for new applications—especially when the input is supplied by the host. For more information, see the Opto Knowledge Base article [KB82058](#).

New Features

- Support for SNAP PAC REST API. SNAP PAC S-series and R-series controllers with firmware R9.5a and higher include a built-in HTTP/HTTPS server and a RESTful API, so you can access data in the PAC controller using the programming language of your choice. Configuration options have been added to PAC Manager for enabling the HTTP/HTTPS server and choosing the server's port.
- An out-of-range indicator is now available for SNAP I/O modules (such as the SNAP-AIRATE-HFi and SNAP-AIRTD-8U analog input modules) that return a 32-bit value. (Many other SNAP I/O modules return a 16-bit value.) The default out-of-range value is -2,147,483,648. If this value could be a legitimate value for your application, you can use the Status Write area in PAC Manager to change the default.
- Simpler configuration for E1s and E2s. Added support for direct configuration of E1 digital I/O units with standard G1, G4, or Quad Pak module part numbers, and for E2 analog I/O units with standard G1 module part numbers. (Requires E1/E2 firmware R1.2a. Also requires PAC firmware R9.5a or higher if you are using a SNAP PAC controller to communicate with the E1 or E2.)

Enhancements

- Easier CA Root certificate installation. A command has been added to PAC Manager's Maintenance window to register a CA root certificate for use with PAC Control's Send Mail command, HTTPS comm handles, or SSL comm handles. This command simplifies the certificate installation process.
- Multiple display management. If you use multiple monitors and shift to a single monitor, all dialog boxes will automatically move to the monitor in use.
- Version and release indicators. When you right-click an I/O Unit configuration (.otg) file in Windows Explorer and select **Open with** from the pop-up menu, the PAC Manager software version and release number are now displayed next to the executable's filename. This way, you can choose which release number of PAC Manager to open the project with.
- Added support for SNAP-AIRTD-8U multifunction RTD/resistance analog temperature input module.
- Added support for SNAP-OMR6T-C mechanical power relay output module.

Bug Fixes

- [KB84680](#) Windows Exception Fault when inspecting a point in PAC Manager.
- [KB84903](#) PAC Manager - Negative number in Add Memory Map Values dialog box generates error.
- [KB85044](#) Can't properly resize PAC Manager dialog boxes in Windows 10.
- [KB85061](#) In PAC Manager, SNAP-AICTD module scaling values are configured incorrectly.
- [KB85277](#) PAC Manager times out almost immediately when attempting to install firmware.

PAC Manager R9.4c

PAC Project R9.4006

Released: February 28, 2015.

Enhancements

- Added the SNAP-PAC-R1-B brain I/O unit type.
- Added the ability to display module firmware version.

PAC Manager R9.4b

PAC Project R9.4005

Released: January 21, 2015.

Enhancements

- Added support for the SNAP-AOVA-8 multifunction analog output module.
- All point types are now scalable for analog modules that support scaling.
- Added serial ports to the Add New Device dialog box for configuring a direct connection to a serial device. There are now 256 ports.
- Added baud rates 14400 and 28800 to the Add New Device dialog box for configuring a serial device connection.

PAC Manager R9.4a

PAC Project R9.4000

Released: September 22, 2013.

Enhancements

- Flash memory images can now be imported and exported for SNAP-PAC-SB1 and SNAP-PAC-SB2 serial brains.
- Added support for the SNAP-AIMA-iH analog current input module and the SNAP-AOA-23-iH analog output module. These HART® SNAP I/O modules provide communication with other Highway Addressable Remote Transducer (HART) current loop devices.
- Added support for lead compensated RTD point types for the SNAP-AIRTD, SNAP-AIRTD-1K, and SNAP-AIRTD-10 analog temperature input modules.

Bug Fixes

- [KB83527](#) Configuring trigger #2 on the Digital Events Expanded page doesn't stick.
- [KB83545](#) Inspecting Digital Point or Point Config Pages and using Auto Refresh may eventually cause PAC Manager to crash.
- [KB83558](#) Can't enter IP Address with 3 digits when configuring Event Message.

PAC Manager R9.3c

PAC Project R9.3003

Released: October 15, 2013.

Enhancements

- Added support for the following modules:

- SNAP-AIRATE-HFi Analog High-Frequency Rate Input Module
- SNAP-AOD-29-HFi Dual-Channel High-Frequency Time-Proportional Digital Output Module
- The Expanded Digital Events configuration area has been enhanced so that the first and second triggers have all the trigger choices, and the first and second reactions have all the reaction choices.

Bug Fixes

- [KB82958](#) PID loop output data destination incorrect if TPO point is used.
- [KB83015](#) PAC Manager - Incorrect output point in list of PIDs.
- [KB83003](#) PAC Manager two-point analog calibration doesn't work with all points on some modules.

PAC Manager R9.3b**PAC Project R9.3002**

Released: April 22, 2013.

New Feature

Support has been added for the SNAP-AIR400K-8 thermistor module, including support for specifying extended parameters.

Bug Fixes

- #82547 In Configure Mode, the menu item to configure a scratchpad 32-bit integer would display an incorrect message and not display the dialog.
- #82592 The dialog to configure Digital Outputs was not properly resizing when TPO of Pulsed Output was chosen.
- [KB82661](#) Incorrect error message when attempting to upload firmware to an unresponsive IP address.
- [KB82676](#) Modbus Calculator Error in PAC Manager.
- #82871 When editing the name of a point or module, names in the tag tree view would not update.

PAC Manager R9.3a**PAC Project R9.3000**

Released: November 9, 2012.

Enhancements

- Added support for SoftPAC PC-based controller.
- Added **FPGA Version** to the **Status Read** Inspect mode dialog.
- Added the ability to view Scratch Pad Integers as binary values.

Bug Fixes

- [KB82402](#) Modbus Calculator Register address is incorrect.
- [KB82101](#) Updating to firmware 9.2c or higher may fail on SNAP-PAC-R units.

PAC Manager R9.2e**PAC Project R9.2004**

Released: September 2012.

Bug Fix

[KB82356](#) Cannot type in a full MAC Address in PAC Manager.

PAC Manager R9.2d

PAC Project R9.2003

Released: July 6, 2012.

Enhancements

- Added the ability to install firmware when the RAM file system does not have enough space. This change is related to [KB82101](#).
- Improved the progress messages displayed while doing maintenance operations such as firmware installations.
- In the Loader Mode Firmware Update utility, the number of serial ports that can be selected increased to 256.

PAC Manager R9.2c

PAC Project R9.2002

Released: June 7, 2012.

Enhancements

- Added two-point method for calibrating analog input points in Inspect mode.
- Added the ability to configure the DNS Resolver memory map area.
- Added support for the SNAP-SCM-ST2 module.
- Allow the Inspect Mode dialog to re-size horizontally.

PAC Manager R9.2b

PAC Project R9.2001

Released: April 6, 2012.

Bug Fix

[KB81976](#) Import/Copy I/O Unit window does not allow IP addresses with more than two digits.

PAC Manager R9.2a

PAC Project R9.2000

Released: February 29, 2012.

Enhancements

- Added support for G4EB2 brain (also includes part numbers G4D32EB2 and G4D32EB2-UPG).
- Added support for SNAP-IDC-32D module.
- Added support for the SNAP-OMR6-C and SNAP-OMR6-A modules.

Bug Fix

[KB81848](#) Some text truncated in PAC Manager when running under Chinese version of Windows.

PAC Manager R9.1c

PAC Project R9.1003

Released: October 14, 2011.

Enhancements

- Added support for modules SNAP-SCM-CAN2B and SNAP-IDC-32DN.
- Added a warning about the possible consequences of updating firmware on controllers and brains.

PAC Manager R9.1b

PAC Project R9.1002

Released: September 16, 2011.

Enhancements

- Values can now be automatically refreshed on Inspect mode dialogs.
- Firmware can now be sequentially upgraded on multiple SNAP-PAC-SB devices using pass-through mode. Previously, if there were multiple SB brains on the same RS-485 link, the firmware could only be updated one unit at a time. You can now enter the addresses of all the SB-series brains on the same RS-485 link, execute the update, and they will all be updated automatically.

PAC Manager R9.1a

PAC Project R9.1000

Released: July 18, 2011.

Enhancements

- Added support for SNAP-AITM-4i and SNAP-AIRTD-1K modules.
- Changed the default scaling for the SNAP-AIPM-3 and SNAP-AIPM-3V modules.

Bug Fixes

- [KB81088](#) Incorrect microSD card function message in PAC Manager.
- [KB81159](#) Cannot copy I/O units with PIDs in PAC Manager.
- [KB81268](#) PAC Manager allows more than 24 data bits for SNAP-SCM-SSI module.
- [KB81311](#) 'High Density Digital Input Module #' incorrectly displayed for Event in Configure Mode.

PAC Manager R9.0c

PAC Project R9.0006

Released: September 3, 2010.

Enhancement

The Scratchpad Integers Inspect mode dialog has been enhanced to behave the same as the Scratchpad Floats dialog. When an item is modified, it is marked automatically as changed.

Bug Fix

[KB81079](#) 'Send Configuration to I/O Unit' dialog PAC Manager showing erroneous message in Log.

PAC Manager R9.0b

PAC Project R9.0002

Released: June 29, 2010.

Enhancement

Added support for the SNAP-AIPM-3V module.

PAC Manager R9.0a

PAC Project R9.0000

Released: June 15, 2010.

Enhancements

- Added microSD Op Codes to the **Status Write** Inspect dialog.
- Added the ability to Enable/Disable the EtherNet/IP protocol in the Network Security dialog.
- Added Scratch Pad Triggers to the Configuration mode Event Messages dialog.
- Moved the location of initialization files from the "Install" directory to the "ProgramData" directory.
- Added support for SNAP-PAC-SRA (Snap Redundancy Arbiter).
- Improved the labels and prompts in the Configure SSI Modules dialog to make it easier to use.

Bug Fixes

- #80889 Network Key field for Wireless LAN might not be wide enough in PAC Manager.
- [KB80890](#) 'Address of value to check field' in Alarm Events dialog may be cleared.
- [KB80866](#) Large Fonts affects screen displays in PAC Manager.
- [KB80865](#) SNAP-UP1-D64 and SNAP-ENET-D64 not listed when adding I/O units in PAC Manager.

PAC Manager R8.5b

PAC Project R8.5001

Released: February 17, 2010.

Enhancement

Added support for the SNAP-SCM-SSI module.

Bug Fixes

- [KB80796](#) Upper Scaled Units incorrect for SNAP-AIRTD-10 Generic Point Type in PAC Manager.
- [KB80795](#) PAC Manager's Find OptoMMP Devices dialog displays incorrect IP address for wireless device.
- [KB80698](#) SNAP-AIPM-3 module channels 12 and 13 incorrectly displayed in PAC Manager.
- [KB80693](#) SNAP-IDC-32N input states not displayed in PAC Manager.
- [KB80794](#) A configuration (.otg) file with a Generic OptoMMP Device crashes PAC Manager.

PAC Manager R8.5a

PAC Project R8.5000

Released: September 4, 2009.

The version is now 8.5 to match the firmware version of the Wireless LAN devices.

Enhancements

Support has been added for the following SNAP-PAC Wired+Wireless LAN devices:

- SNAP-PAC-S1-W and SNAP-PAC-S2-W
- SNAP-PAC-R1-W and SNAP-PAC-R2-W
- SNAP-PAC-EB1-W and SNAP-PAC-EB2-W

Bug Fix

[KB80657](#) SNAP-Custom-AI points are not scaled correctly by PAC Manager.

PAC Manager R8.2f

PAC Project R8.2010

Released: May 1, 2009.

Enhancements

- Added support for the SNAP-IDC-32N digital input module.
- The **Status Read** page in Inspect mode now monitors several device settings and displays a warning icon if their value is out of the ordinary.

Bug Fix

[KB80561](#) Unexpected results from PAC Manager's 'Digital Events - Expanded'.

PAC Manager R8.2e

PAC Project R8.2009

Released: March 19, 2009.

Enhancements

- Added support for analog input module AIPM-3.
- Added new PID Loop algorithm, Velocity - Type C.
- Added the ability to change the number that is displayed when a value is determined to be out of range. The **Out Of Range Value** field can be edited on the Inspect mode Status Write dialog.
- Added the ability to display the raw counts measured from an analog point. This is the number of counts before any linearization or cold junction compensation is applied. This value is available on the Inspect mode Analog Point dialog.

Bug Fix

[KB80550](#) Changes to some PAC Manager Status Write items not saved.

PAC Manager R8.2d

PAC Project R8.2005

Released: December 1, 2008.

Enhancements

- Increased the number of serial ports that can be set for **Turn Around Delay**.
- Added file compatibility with EtherNet/IP Configurator to facilitate data interchange between the two programs.

- Added support for the SNAP-IAC-K-16 and SNAP-IDC-HT-16 digital input modules.

Bug Fixes

- [KB80324](#) PAC Manager may crash if no IP addresses are configured.
- [KB80420](#) When 'Change IP Settings' does not set IP address to 0.0.0.0.
- [KB80461](#) SNAP-CUSTOM-AI analog point options missing in PAC Manager.
- #80665 Extra communication ports displayed in PAC Manager.

PAC Manager R8.2c

PAC Project R8.2003

Released: September 4, 2008.

Enhancement

The B3000-B serial brain has been added to the Loader Mode Firmware Update Utility.

PAC Manager R8.2b

PAC Project R8.2002

Released: July 31, 2008.

Bug Fixes

- [KB80098](#) Importing PAC Manager configuration file with Ethernet I/O may cause problems in PAC Control.
- [KB80355](#) FTP login attempt may fail.

PAC Manager R8.2a

PAC Project R8.2001

Released: July 10, 2008.

Bug Fixes

- [KB80072](#) Expanded digital events on I/O unit may not work as expected when configured from a PAC Manager .otg file.
- [KB80247](#) PAC Manager incorrectly displays 64-bit scratchpad hex integers.

PAC Manager R8.1f

PAC Project R8.2000

Released: June 19, 2008.

Enhancements

- Added the ability to modify 64-bit Integers in the Generic Read/Write dialog of Inspect mode.
- Made **Digital Events - Expanded** much more flexible by allowing digital and scratchpad triggers and reactions to be on both the first or second trigger or reaction.

PAC Manager R8.1f

PAC Project R8.1008

Released: March 7, 2008.

Enhancements

- Increased the number of COM ports to choose from when directly accessing an SB1 or SB2 brain.
- When installing firmware, made the detection of error messages during the download more robust to handle firmware/hardware mismatches.

Bug Fix

[KB80052](#) Ethernet devices may not respond as expected because of duplicate subnets on SNAP PACs.

PAC Manager R8.1e

PAC Project R8.1007

Released: February 1, 2008.

Enhancements

- Added a timeout field to the **Ethernet** tab of the Loader Mode Firmware Update utility.
- Changed the display format of the **Seconds Since Powerup** item on the **Status Read** page in Inspect mode.

Bug Fixes

- [KB61226](#) Configured PID loops incorrectly displayed by PAC Manager.
- [KB80068](#) Timeouts or duplicate device names remotely possible in PAC Manager.

PAC Manager R8.1d

PAC Project R8.1006

Released: January 11, 2008.

Enhancements

- Added **Seconds Since Powerup** to the **Status Read** page.
- When assigning an IP address to an Opto 22 device, PAC Manager will now attempt to ping that address first to see if another device already has that IP address.
- On the Serial Modules, Wiegand Modules, Profibus Modules and Motion Modules dialogs in Inspect mode, the module type description is now displayed instead of just displaying the module type.

Bug Fix

#60554 A problem has been corrected where in the SNMP Inspect mode dialog, the SNMP Trap Version was not being checked for out of range values.

PAC Manager R8.1c

PAC Project R8.1004

Released: November 30, 2007.

Enhancement

Implemented a new compressed HTML Help system to replace the old WinHelp system.

Bug Fixes

- [KB60177](#) 'Import/Copy IO Unit Image' in PAC Manager may cause error message.
- [KB60219](#) 'View as Hex' in PAC Manager shows Int32 scratchpad area values incorrectly.

PAC Manager R8.1b

PAC Project R8.1002

Released: November 2, 2007.

Bug Fixes

- [KB54410](#) Downloading firmware from PAC Manager / ioManager to multiple devices may not complete successfully.
- [KB60031](#) Moving I/O points on an I/O unit in PAC Manager may cause an error.
- #60032 Corrected a problem where when installing firmware, and the Sync Device Time To PC Time check box was selected, an unnecessary Power-Up Clear dialog box message would be displayed.

PAC Manager R8.1a

PAC Project R8.1000

Released: October 8, 2007.

Enhancements

- Added support for SNAP-PAC-SB1 and SNAP-PAC-SB2 serial brains, which includes the ability to inspect data through a direct serial connection from a PC to the device, or passing through a SNAP-PAC-S1 or SNAP-PAC-S2 controller's serial port to reach the device.
- Added support for the SNAP-PAC-S2 controller.
- Added support for analog 8-point input modules AIV-8, AIMA-8, and AICTD-8.
- Added support for Scratch Pad 64-bit integers.
- Renamed **Timer Events** to **Digital Events - Expanded**, and provided more choices for triggers and reactions that include on/off latch, high-density digital points, and scratch pad 64-bit integers.
- High-Density Digital points can now be configured for Watchdog.
- Added a fourth port to the Communication Port Control dialog to account for the four serial ports on a SNAP-PAC-S2 controller. Each port can be configured for RS-232 or RS-485.
- Improved **Analog Bank Read** in Inspect mode to handle analog modules with more than two points.

PAC Manager R8.0f

PAC Project R8.0009

Released: June 29, 2007.

Bug Fix

[KB57925](#) PAC Manager Port number >32767 displays negative number when inspecting I/O unit.

PAC Manager R8.0e

Released: June 8, 2007.

Enhancements

- Added sorting of IP addresses on the Maintenance dialog. Enhanced sorting on the Find Opto Devices dialog.
- Improved the status messages when executing commands on the Status Write dialog.

Bug Fix

[KB57775](#) PAC Manager error when I/O Unit Image file does not match the analog modules installed on brain.

PAC Manager R8.0d

Released: May 4, 2007.

Enhancements

- Added three items to **PPP Configuration: Connection Establishment Timeout, Echo Request Period, and Echo Request Retries.**
- Improved the wording in the Calibration dialogs for clarity.

Bug Fixes

- [KB57202](#) Some 'Status Write' commands in PAC Manager may not work.
- [KB57247](#) PAC Manager Inspect window information may be truncated.
- [KB57243](#) Creating new I/O unit from image source in PAC Manager does not work for SNAP-UP1-M64 or SNAP-ENET-S64.

PAC Manager R8.0c

Released: April 20, 2007.

Enhancements

- The Inspect mode dialog is now resizable.
- Pressing the Enter key in the Inspect mode dialog initiates a **Refresh.**
- Holding down the Shift key while entering Inspect mode bypasses the initial attempt to read data.
- Added a link on the Maintenance dialog to get the latest firmware.

Bug Fixes

- [KB57139](#) 'Switch to Loader Mode' command in PAC Manager is not supported by all Ethernet I/O units.
- [KB57140](#) I/O unit configuration not created with PAC Manager on PAC units.
- #57141 The number of points per address for the legacy devices SNAP-UP1-ADS, SNAP-UP1-M64, and SNAP-ENET-S64 is now correctly set at 64.
- [KB57142](#) 'Write Only' Generic Read/Write fields in PAC Manager cannot be modified.

PAC Manager R8.0b

Released: March 23, 2007.

Bug Fixes

- #56503 A problem has been corrected where when a point was given a name that was longer than 15 characters, and that configuration was sent to an I/O unit with the legacy memory map, the point name appeared to have garbage characters at the end.
- #56607 A problem has been fixed where the Inspect mode High Density Digital dialog would not recognize the new IDC-16 module.
- [KB54041](#) ioManager port configuration produces message 0xFFFFFFFF3.

PAC Manager R8.0a

Released: March 1, 2007.

Enhancements

- Added support for new modules AITM-8, AIV-32, AIMA-32, IAC-16, IAC-A-16, IDC-16, and the Motion Module.
- Inspect mode Point Config, Digital Point, and Analog Point dialogs can now handle up to 32 points per module.
- (CR 53048) Added **FTP Username** and **FTP Password** to the Network Security dialog.
- Added items to the Inspect mode **Status Read** page:
 - Number of Times an Analog Module Has Been Discovered
 - Milliseconds Per Analog & High Density Digital Scan
 - Milliseconds Per 4-Channel Digital Scan

Bug Fixes

- [KB52719](#) Inactive Browse button for 'Download file from I/O Unit' command in ioManager.
- #53351 The Find Opto MMP Devices dialog was displaying devices that did not have Opto's MAC address prefix.
- [KB53350](#) ioManager incorrectly displays negative counts for SNAP-IDC5Q.
- [KB54102](#) 'Edit PID has a bad format' message in ioManager when copying and pasting I/O unit configurations.
- [KB55767](#) ioManager not assigning Gateway IP on M4SENET-100 and some Ethernet I/O units.

ioManager R7.1c

Released: December 11, 2006.

Bug Fixes

- [KB51899](#) Unable to set SNAP-AILC parameters from ioManager.
- [KB53373](#) Calibration of analog inputs from ioManager may not take effect.
- A problem has been corrected where Configuring SNMP Trap Version was possible for all I/O Unit types when it should have only been possible for certain I/O Unit types.
- Changed labeling of SNMP v2 Notification to SNMP v2 Trap.

ioManager R7.1b

Released: May 18, 2006.

Enhancement

Changed references to **IP Ports** to just **Ports**, and **IP Security** to **Network Security**.

Bug Fixes

- [KB51648](#) Attempts to read flash memory on the SNAP-PAC controllers.
- [KB51463](#) File time from ioManager for a file stored on an Ultimate I/O unit.
- A problem has been corrected where the Point Config Inspect mode dialog was not setting Load Cell Filter Weight and Fast Settle Level correctly.
- The Read Filenames From I/O Unit command on the Maintenance dialog no longer returns the wrong time for each file.
- A problem has been corrected on the I/O Unit Import/Copy dialog where the primary IP address was getting duplicated into the IP address list of the Edit I/O Unit dialog when the Image Destination was to Create a New I/O Unit.
- The SNMP Trap Version - Notification is no longer causing an error to be reported when configuration information is sent to a SNAP-B300-ENET.

ioManager R7.1a

Released: March 8, 2006.

Enhancement

Added support for SNAP-PAC-R1 and SNAP-PAC-R2.

Bug Fix

[KB50210](#) Testing IP address assignment in ioManager.

ioManager R7.0d

Released: February 2, 2006.

Enhancements

- **PPP Commands** in the PPP Status Inspect mode dialog can now be used with UIO and LCE devices.
- **Control Engine port** has been added to the IP Security Inspect mode dialog. The default value is 22001. A value of 0 will disable the control engine.
- **Trap Version** has been added to the SNMP Agent configuration. v1 Trap and v2 Notification are the supported settings.
- An informational dialog is now displayed before attempting to install firmware via a serial connection.
- The Previous Command info has been removed from the Status Read page.
- All **Compatible File Types** is now the default mask when installing firmware on the Maintenance dialog.

Bug Fixes

- [KB50639](#) ioManager and Current Value of Input and Current Value of Setpoint for PID Loops.
- #50638 A problem has been corrected where extremely high counter values were being displayed as negative numbers in the Inspect mode Digital Point and Digital Bank dialogs.
- [KB50636](#) Inspecting PID loops on some SNAP-B3000-ENET I/O units with ioManager.

ioManager R7.0c

Released: November 11, 2005.

Enhancements

- Increased Scratchpad Floats and Integers by 7168 to 10240 elements.
- Added PPP Commands to the PPP Status Inspect mode dialog for the SNAP-PAC.
- Added the ability to access Comm Port Control data for the third serial port on SNAP-PAC controllers.
- Added the ability to set the Secondary Interface IP information on SNAP-PAC controllers to the Status Write Inspect mode dialog.

ioManager R7.0b

Released: September 29, 2005.

Enhancements

- SNAP-AIMA2-i, SNAP-AIVRMS-i, SNAP-AIARMS-i modules now supported.
- Added the ability to copy information to the clipboard in the Find Opto 22 MMP Devices dialog.

ioManager R7.0a

Released: July 28, 2005.

Enhancements

- The Assign IP Address dialog box now supports DHCP devices such as E1 and E2 brain boards as well as BootP devices like EIO and UIO.
- Added the ability to find all OptoMMP (memory-mapped) devices on the network and list their MAC and IP addresses, firmware versions, and types.
- Added the ability to use hostnames instead of IP addresses in Inspect mode. **Host Name** and **Domain Name** were added to the Status Write dialog box.
- Load Cell (SNAP-AILC), Profibus (SNAP-SCM-PROFI), and SNAP-AOA-23-iSRC modules are now supported.
- Added **Scanner Flags** setting to the Inspect mode Status Write dialog box.
 - 1 = process alarms in digital scanner
 - 2 = stop analog scanner
 - 4 = stop digital scanner
 - 8 = stop control engine
- 32 PID Loops now available on SNAP Ultimate I/O Units with analog capability.

Bug Fixes

- IP Addresses that were very similar could sometimes be incorrectly resolved in Inspect mode. Each IP address now has a port and timeout associated with it.
- When installing new firmware in the Maintenance dialog box, ioManager now confirms that the device has restarted after the firmware is installed.
- **Save to Flash** is now the default in the Send Configuration dialog box.
- SNAP-AIRTD module now has a generic resistance mode point type.

ioManager R6.1a

Released: March 1, 2005.

Enhancements

- Added support for High-Density Digital Input and Output modules.
- Added "Is Event Occurring?" flag to the memory map for Digital Events.

- Added items to the Status Read dialog for diagnostic purposes:
 - TCP Idle Session Timeout Count
 - Arcnet Transmit Attempts Since Powerup
 - Arcnet ACKs
 - Arcnet Timeouts
 - Arcnet Other (node not found, etc)
 - Arcnet Timeout Value (msec.)
 - Arcnet Receive Interrupts
 - Digital Interrupt Failures Since Powerup

ioManager R6.0b

Released: January 17, 2005.

Bug Fixes

- PPP Incoming Password string in Configuration Mode is now being written to the correct memory map address.
- PPP Modem Initialization strings can now have embedded commas.

ioManager R6.0a

Released: October 1, 2004.

Enhancements

- Added hotkeys to the **Turn On** and **Turn Off** points in the Inspect Mode Digital Point dialog box.
- Clarified menu options for installing firmware via Ethernet or serial connection.
- Organized common communications into one button in Inspect and in Configuration modes.
- Added **Timeout** fields to the I/O Unit Import/Copy dialog.
- Modified the Modbus Address Conversion graphic to make it easier to understand.
- Added **Milliseconds Since Powerup**, **Ethernet MAC Resets Since Powerup**, and **Digital Output Points Resets Since Powerup** to Inspect Mode Status Read dialog.
- Inspect Mode now remembers the Timeout setting.

Bug Fixes

- Scratch Pad String Inspect dialog box now guards against invalid length values.
- Installing firmware to multiple devices in the Maintenance dialog no longer results in an erroneous "Could not open local file" log message.
- The Inspect Mode Point Configuration and Analog Point dialog boxes now display all AIPM module channels correctly.
- ioManager will now allow you to save an empty file, including a file from which all I/O units have been deleted.
- ioManager is now stable when reading OTG files with Digital Events.
- You can now write to the PID module data in Inspect Mode.
- PPP Status - Status Result for LCE devices now returns the correct status codes.
- Data Logging Configuration in Inspect Mode now reads and writes to all points correctly.
- Changing the Point Type in the Point Configuration dialog box in Inspect Mode now updates the scaling values, ensuring that subsequent calibrations to the updated point are scaled correctly.

- Connections with latency between ioManager and the device no longer time out when attempting to read after a powerup.

ioManager R5.1c

Released: April 27, 2004.

Enhancements

- Added **Sync I/O Unit to PC Time** feature to the Maintenance dialog.
- Added SNAP-pH/ORP analog input module.
- Modified the Modbus Address Conversion picture to make it easier to understand.

Bug Fixes

- All 128 digital events can now be accessed on ENET-D64, UP1-D64, and UP1-M64.
- The memory map location of Incoming PPP Password is now F03E60B0. The PPP Phone Number can now have embedded commas and the Link Always Connected setting is now being saved to disk correctly.
- The AIV2-i and pH/ORP modules did not display proper choices for Point Type in Inspect Mode.
- The main window will now remember its size and position.
- All Event Dialogs in Inspect mode are now properly disabled when accessing SNAP-LCE.

ioManager R5.1b

Released: December 18, 2003.

Bug Fixes

- Serial Module Parity in Inspect mode can now be set to **Even** without it switching back to **Odd** when the **Apply** button is pressed. Also, added **Mark** and **Space** to the list of parity choices.
- The Modbus memory map address calculator now correctly supports the full range of memory map addresses as shown in the picture.

ioManager R5.1a

Released: November 14, 2003.

Enhancements

- Added Configuration and Inspect dialogs for PID Loops.
- Added support for Simple I/O (SNAP-ENET-S64).
- Added Configuration and Inspect dialogs for M2M functionality.
- **Current Local IP Address** was added to the display of PPP Status.
- Login and Password strings in PPP Config were lengthened to 64 characters.

Bug Fixes

- Serial Module Config no longer clears the Hardware Flow Control byte.
- The extended Scratch Pad areas for integers and floats now have the correct MemMap addresses in the Configuration and Inspect dialogs.

ioManager R5.0b

Released: September 15, 2003.

Enhancements

- Added Flash Tech Config and Status dialogs.
- Added **M2M** section to Event Messages Inspect dialog.
- Scratch Pad floats and integers expanded to 3072 items from 1024 items.
- **Switch To Loader Mode** command added to Status Write dialog.
- Improved Maintenance dialog is now resizable, have colored text in the results list, and can copy a portion of a result line to the clipboard.
- Added Ethernet Physical Link dialog.
- In Inspect Mode, added "used" markers in the event/message number combo box to indicate which events/messages are currently configured.

Bug Fixes

- Commas are now stripped from Point Descriptions as they are written to disk.
- Alarm Events, Digital Events, Serial Events, Timers, Wiegand Events, Event Messages, Serial Modules, Wiegand Modules, Point Config, PPP and Status Write handle partial reads/writes of the memory map.
- The Maintenance Dialog no longer allows duplicate IP addresses, and the **Copy** button is correctly enabled when a result line is selected.

ioManager R5.0a

Released: July 30, 2003.

Enhancements

- Added the ability to configure Analog Events, Digital Events, Serial Events, Timer Events, Wiegand Events, Wiegand Modules, PID Modules, Scratch Pad Bits, Scratch Pad Integers, Scratch Pad Floats, Scratch Pad Strings, IP Security, Date and Time, Data Logging, Modbus, Status Write, and Wireless I/O Unit.
- Added Inspect Mode, which gives the ability to inspect and/or change any memory mapped value on an Ethernet I/O unit that can be reached over an Ethernet connection.
- Added Maintenance Mode, which gives the ability to perform various operations on one or more Ultimate I/O units. Operations include Install Firmware, Install Module Firmware, Upload File, Download File, Read Files From Flash, Write Files To Flash, and Clear Flash Files.
- Added the ability to change the IP Address, Subnet Mask, Gateway Address, and DNS Address of an Ethernet I/O unit.
- Added support for the SNAP-UP1-M64 I/O unit, which allows analog and digital I/O on all 64 points.

Bug Fixes

- Ultimate I/O D64 brains were not being recognized when trying to read flash memory images.
- Changed the way that the address for where the Flash Memory Image begins is determined. Removed reliance on reading the unit type.

ioManager R1.0c

Released: September 12, 2002.

Enhancement

Detailed error and diagnostic messages are reported when an I/O Unit image is sent using the I/O Unit Import/Copy dialog.

Bug Fixes

- Some strings were not being null terminated correctly when sent to an I/O unit. All strings in the memory map have a specified maximum length, so the strings must be truncated to one less than that maximum length to allow for a trailing null character. The problem could only occur on strings that were longer than the field length. Point Name, FROM E-mail Address, TO E-mail Address, E-mail Subject, SNMP Community string, and SNMP Host Community string were all incorrect. SNMP Sysname, SNMP Syslocation, and SNMP Syscontact were actually being truncated to 16 bytes when the field is 32 bytes. Modem Initialization string, Modem Hangup string, Incoming Login, Incoming Password, Modem Listen string, Outgoing Login, Outgoing Password, and Phone Number were technically incorrect but their lengths were being handled properly in the ioManager dialogs, so it was highly improbable to have an error with these strings.
- When sending I/O Unit images to Ultimate I/O units, an error occurs if there are modules that exist in the image that are not present on the I/O unit. This error was causing the operation to be aborted. Now, the operation continues, and errors are logged and displayed at the end of the operation.
- When reading an I/O Unit image from a file, the number of characters to be read in was not being checked against the number of characters that were actually read in. If these two numbers are different, it indicates a corrupt I/O Unit image file. This error is now reported.
- The I/O Unit Import/Copy dialog would sometimes allow the **Create I/O Unit** radio button to be selected even though other choices on the dialog had disabled that button.

ioManager R1.0b

Released: November 12, 2001.

Bug Fixes

- Removed calls that were causing computers without Microsoft Office installed to display error messages when reading and sending brain images.
- Changed how analog point information is sent. No scaling is sent for non-scalable points. Gain and Offset are no longer sent since it might wipe out previous calibration.
- Fixed PPP Configuration strings, which were not being cleared correctly before being initialized by ioManager. This resulted in random characters at the end of strings in the PPP Configuration.
- Gateway and DNS addresses were not being sent correctly to Ultimate I/O brains in the Assign IP Address dialog box.

PAC PROJECT TOOLS

The PAC Project Tools, formerly known as PAC Utilities, includes OptoVersion, OptoDisplay Converter, PAC Message Viewer, PAC Sim, and PAC Terminal. Changes to PAC Project Installer are also listed in this section.

Tools, PAC Project R10.6a

PAC Project R10.6000

Released: October 23, 2025.

No new features, enhancements, or bug fixes.

NOTE: You may be prompted to restart your computer to complete the installation of the software.

Tools, PAC Project R10.5a

PAC Project R10.5000

Released: November 14, 2022. Updated: December 12, 2022.

Enhancement

PAC Terminal

The Inspect Control Engine dialog box now displays more information about the strategy stored in permanent storage.

IMPORTANT: *This enhancement requires the following firmware versions:*

- *groov EPIC processors: 3.5¹*
- *SNAP PAC controllers: R10.5²*

Tools, PAC Project R10.4a

PAC Project R10.4000

Released: September 7, 2021.

Bug Fix

[KB89504](#) PAC Project installs only on C: drive.

Tools, PAC Project R10.2c

PAC Project R10.2003

Released: October 16, 2019.

Bug Fixes

- [KB88297](#) With Redundant Network System Type, secondary IP address not used when set to active.
- [KB88486](#) PAC Term uses wrong address when system type changed from Redundant to Standard.

Tools, PAC Project R10.2a

PAC Project R10.2000

Released: December 3, 2018.

Bug Fixes

- [KB86962](#) Strategy archive upload fails with error message: "The controller does not currently contain a strategy archive".
- [KB87573](#) During install, "mfc120.dll was not found" message.

Tools, PAC Project R10.1a

PAC Project R10.1000

-
1. Available early 2023.
 2. Available first half 2023.

Released: September 17, 2018.

Bug Fixes

- [KB87571](#) PAC Terminal shows wrong system type for redundant networks and redundant controllers.
- [KB87739](#) "Store to Flash" sometimes fails.

Tools, PAC Project R10.0b

PAC Project R10.0001

Released: July 9, 2018.

Bug Fix

[KB87560](#) Over-sized fonts, parts of text missing, blank dialog boxes, or missing dialog elements.

Tools, PAC Project R10.0a

PAC Project R10.000

Released: May 18, 2018.

Version numbers were updated to match the other applications in PAC Project R10.0000. There were no other changes.

Tools, PAC Project R9.6001

Released: February 27, 2017. Updated: March 1, 2017.

Bug Fix

[KB86569](#) SoftPAC fails to start because ControllerDefs.dll and IOSNIF.dll are missing.

Tools, PAC Project R9.6000

Released: February 1, 2017.

Version numbers were updated to match the other applications in PAC Project R9.6000. There were no other changes.

Tools, PAC Project R9.5003

Released: December 14, 2016. Updated: August 28, 2017.

Bug Fix

[KB86910](#) OptoScript Editor loses color coding after uninstalling previous version of PAC Project.

Tools, PAC Project R9.5000

Released: July 15, 2016. Updated: July 22, 2016 and August 26, 2016.

NOTE: Windows XP and Windows 2000 No Longer Supported

The PAC Project Software Suite no longer supports operating systems for which Microsoft has ended support. This includes Windows XP and Windows 2000. If you attempt to install any PAC Project R9.5000 (or higher) software

component on an operating system that Microsoft no longer supports, the installation software displays an error message and then ends.

There are no other changes to PAC Project Tools in this version of PAC Project.

Tools, PAC Project R9.4008

Released: April 20, 2015.

Bug Fix

PAC Terminal

[KB84700](#) Invalid Address message when modifying a controller definition.

Tools, PAC Project R9.4006

Released: February 28, 2015.

In PAC Terminal, you can now use either a hostname or an IP address for the name of a control engine.

Tools, PAC Project R9.4005

Released: January 21, 2015.

Bug Fix

[KB84189](#) Message Viewer > Clear All button displays error in PAC Control and PAC Terminal.

Tools, PAC Project R9.4000

Released: June 23, 2014.

Bug Fix

PAC Terminal and PAC Control

[KB83725](#) Error (-434) when trying to read controller's message queue.

Tools, PAC Project R9.2002

Released: June 8, 2012.

Bug Fix

OptoVersion

[KB81946](#) Many "Access denied" error messages from OptoVersion.

Tools, PAC Project R9.2000

Released: April 3, 2012.

PAC Terminal and PAC Message Viewer versions are updated to R9.2a but have no changes from 9.1.

PAC Utilities R9.1b

Released: October 12, 2011.

Bug Fixes

- [KB81320](#) The Message Queue window has trouble on slow or poor networks.
- [KB81511](#) Some error messages are missing from PAC Project Software R9.1.

PAC Utilities R9.0a

Released: June 14, 2010.

Support for redundant controllers was added.

PAC Utilities R8.2a

Released: May 29, 2008.

To better support PAC Terminal's graphical user interface (GUI) and command line interface (CLI) modes, they are now separate programs:

- `Term.exe` provides the GUI version of PAC Terminal.
- `TermCL.exe` provides the CLI version of PAC Terminal.

In addition, a new version of PAC Terminal, called PAC Terminal SSD, provides Secure Strategy Distribution (SSD) capability, which allows strategies to be downloaded and stored on a controller in a secure manner using encryption:

- `TermSSD.exe` provides the GUI version of PAC Terminal SSD.
- `TermCLSSD.exe` provides the CLI version of PAC Terminal SSD.

PAC Terminal SSD is available for purchase from the Opto 22 website or a member of the worldwide network of Opto 22 authorized distributors and partners.

PAC Utilities R8.1a

Released: October 10, 2007.

PAC Terminal has received a significant amount of user interface improvements. Highlights of the improvements include:

- The main window's list of controllers adds several columns of information, including primary and secondary addresses and current status. Also, the columns are now sortable.
- The main window now has a task panel for common operations.
- The main window can now scan controllers for their current status.
- The View Message Queue window now has a **Refresh** button to quickly refresh the list of messages. Also, the new **Copy All** button copies all of the messages into the clipboard.
- The Terminal window has been cleaned up.
- The Inspect Controller window has been cleaned up and now supports **Background Strategy Downloads**. Also, the communication loop time is now much more accurate.

ioUtilities R7.1c

Released: May 18, 2006.

ioCom.dll is now version R7.1c.

In the Inspecting Control Engine dialog, a field was added to show how many charts are currently running.

Bug Fix

[KB50320](#) Charts with names 35 characters or longer in ioControl, OptoControl, ioTerminal, and OptoTerm.

ioUtilities R7.1b

Released: April 7, 2006.

Bug Fix

[KB51140](#) OptoVersion does not scan Professional and Basic executables.

ioUtilities R7.1a

Released: February 15, 2006.

Bug Fix

[KB49973](#) Opening OptoEnetSniff data log files for analysis.

ioUtilities R7.0b

Released: January 19, 2006.

- When using one of ioTerm's command line options, it now returns an error code to indicate success or failure. It also provides a `-q` option to prevent any dialog boxes from being shown.
- In the Inspect Control Engine dialog box, added user confirmation to the **Run** and **Stop** buttons.

ioUtilities R7.0a

Released: December 11, 2005.

- ioTerm now supports the secondary network interface found on SNAP PAC products.
- ioMessageViewer is now more responsive when logging to a file and the screen at the same time.

ioUtilities R6.0a

Released: October 1, 2004.

- ioTerm no longer includes the **Clear ioDisplay Words** option, which is obsolete for ioDisplay versions R5.1 and higher.
- ioMessage Viewer (formerly `ioSniff.exe`) now supports logging to multiple files. Multiple files can be helpful when sniffing for longer periods of time. Filenames are automatically generated and stored in a subdirectory based on the date and time logging begins.
- ioMessage Viewer now allows you to disable on-screen updates while logging.
- Disabling on-screen updates reduces the resource usage so the sniffing itself will have less impact on the behavior you are recording (see **File > Settings**).
- OptoEnetSniff is now included as part of ioUtilities for the R6.0a release.

Enhancements

OptoEnetSniff R6.0a

- Added an option in OptoEnetSniff to specify the number of buffers to save (as a file to the hard drive). This avoids unintentional overwriting by creating a folder for the new multiple files created. Folder and

files are named according to time and date. For example:

2004.09.01_09.48.45\netmon2004.09.01_09.48.48-2.1og

- Increased allowable buffer size to 256 MB.
- OptoENETSniff now remembers your preferences for adapter card selected, display colors, and buffer settings.
- Added menu keyboard shortcuts for easier navigation without a mouse.
- Increased the maximum number of characters in the **Name** field to allow IP addresses to be used as names.
- The adapter selection is more flexible. It now allows the user to select a 0.0.0.0 IP address. (0.0.0.0 appears as "unknown.")

Bug Fixes

OptoEnetSniff R6.0a

- Corrected bug that caused the application to crash when no IPs were selected for filtering.
- Adapter card information is now read more reliably.
- Corrected red error indicator that incorrectly appeared in logs opened after a log with an error. The indicator incorrectly showed up on the same row as the previous log's error, even though no errors occurred on the frame in the new log.
- Corrected bug that sometimes occurred after clicking the **Stop Capture** button. The bug caused the message "Error in function Loadfile. Invalid log file. Error code:9" to appear.
- Corrected bug that sometimes occurred if the **Stop Scan** button was clicked while attempting to capture packets. The bug caused the message "Error in function Loadfile. Invalid log file. Error code: 0" to appear if no packets were captured.

ioUtilities R5.0a

Released: July 29, 2003.

- ioTerminal displays the date, time, and strategy object associated with any error or notification message.
- ioTerminal no longer includes the **Clear ioDisplay Words** option, which is obsolete for ioDisplay versions R5.1 and higher.

ioUtilities R1.0c

Released: August 16, 2002.

- Each line in an ioMessageViewer log now has a unique line number.
- Added filtering to ioMessageViewer.
- In ioMessageViewer, the client's name is now included on each line.
- Added a timestamp to mark when logging to a file has started or stopped.
- Added support to ioTerminal for ioControl's new Control Engine Download File feature.
- Added command line arguments to ioTerminal for adding a control engine, downloading a file, and running and stopping a strategy.
- Made a few GUI tweaks to make ioTerminal easier to use with a keyboard. The control engine inspect dialog now has a close button that is the default. Also, selecting a control engine and pressing the Enter key will now open the inspect dialog rather than close ioTerminal.

ioUtilities R1.0a (002)

Released: September 7, 2001.

- The Inspect Control Engine dialog in `ioCom.d11` has a new look. It also has two new fields: **Revision Time** and **Persistent RAM**.
- The Inspect Control Engine dialog in `ioCom.d11` now uses a different method for determining the communications loop time. It now displays the time taken for one single transaction rather than several.
- OptoVersion was not scanning directories that had the archive, hidden, compress, or hidden flags set.

Included in ioUtilities

The following executables are included in ioUtilities:

- `ioTerm.exe`
- `ioMessageViewer.exe`
- `OptoVersion.exe`
- `OptoENETSNIff.exe`

ioTerminal (`ioTerm.exe`)

ioTerminal may be used to create and test communications to control engines. When it starts, it displays a list of control engines configured on your computer. ioTerminal is used to:

- view a status dialog for a control engine
- interactively 'talk' to a control engine for diagnostic purposes
- add and configure control engines

ioMessage Viewer (`ioMessageViewer.exe`)

ioMessage Viewer is used to monitor communications at various levels in the communications drivers. Normally, ioMessage Viewer is used with the help of the Opto 22 Product Support Group personnel. Select **View/monitor levels** to enable or disable various monitor levels.

OptoVersion (`OptoVersion.exe`)

OptoVersion is a quick utility that is useful when you are talking with the Opto 22 Product Support Group personnel. OptoVersion searches your local hard drives and reports back all the Opto 22 `.d11` and `.exe` files that you have, including their versions and paths. If Product Support needs to see the list, the utility sets it up for easy emailing.

OptoEnetSniff (`OptoEnetSniff.exe`)

OptoENETSNIff is a network communication analysis tool that captures Ethernet frames and stores them in a log for analysis. You can capture a log manually or use an automatic timer. Additional features are:

- Advanced scripting for Visual Basic users
- Display options
- Tracing routes

PAC REDUNDANCY MANAGER

PAC Redundancy Manager R10.6a

PAC Project R10.6000

Released: October 23, 2025.

NOTE: You may be prompted to restart your computer to complete the installation of the software.

Change in Support

Beginning with this release, controller redundancy is no longer supported. You can no longer create new strategies with controller redundancy, but you can continue maintaining existing strategies that have it.

PAC Redundancy Manager R10.4a

PAC Project R10.4000

Released: September 7, 2021.

The PAC Redundancy Manager version number was updated to match the other applications in PAC Project R10.4000. There were no other changes.

PAC Redundancy Manager R10.2b

PAC Project R10.2002

Released: June 10, 2019.

Bug Fix

[KB88002](#) PAC Redundancy Manager may crash when installing firmware on a running system.

PAC Redundancy Manager R10.0a

PAC Project R10.0000

Released: May 18, 2018.

The PAC Redundancy Manager version number was updated to match the other applications in PAC Project R10.0000. There were no other changes.

PAC Redundancy Manager R9.6a

PAC Project R9.6000

Released: February 1, 2017.

The PAC Redundancy Manager version number was updated to match the other applications in PAC Project R9.6000. There were no other changes.

PAC Redundancy Manager R9.5a

PAC Project R9.5000

Released: July 15, 2016. Updated: July 22, 2016.

NOTE: Windows XP and Windows 2000 No Longer Supported

The PAC Project Software Suite no longer supports operating systems for which Microsoft has ended support. This includes Windows XP and Windows 2000. If you attempt to install any PAC Project R9.5000 (or higher) software component on an operating system that Microsoft no longer supports, the installation software displays an error message and then ends.

There are no other changes to PAC Redundancy Manager in this version of PAC Project.

PAC Redundancy Manager R9.4a

PAC Project R9.4000

Released: September 22, 2013.

The PAC Redundancy Manager version number was updated to match the other applications in PAC Project R9.4000. There were no other changes.

PAC Redundancy Manager R9.3a

PAC Project R9.3000

Released: November 9, 2012.

The PAC Redundancy Manager version number was updated to match the other applications in PAC Project R9.3000. There were no other changes.

PAC Redundancy Manager R9.2a

PAC Project R9.2000

Released: February 29, 2012.

Bug Fix

[KB81672](#) Unknown controller status after downloading to redundant controller in PAC Control.

PAC Redundancy Manager R9.0b

PAC Project R9.0003

Released: July 22, 2010.

Bug Fix

[KB81026](#) 'Incorrect device type' incorrectly reported by PAC Redundancy Manager.

OPTODATALINK

OptoDataLink R10.6a

PAC Project R10.6000

Released: October 23, 2025.

NOTE: *You may be prompted to restart your computer to complete the installation of the software.*

Bug Fixes

- [KB90524](#) Uninstalling one version of OptoDataLink may disrupt another installed version of OptoDataLink.
- [KB90852](#) Using OptoDataLink with Microsoft SQL Server 2022 may result in an error.
- [KB90921](#) Configured System Data Source Name (DSN) does not appear in drop-down list in OptoDataLink.

OptoDataLink R10.5c

PAC Project R10.5003

Released: February 9, 2023.

Bug Fixes

- [KB90778](#) Unhandled Exception error when stopping all links in OptoDataLink.
- [KB90796](#) OptoDataLink SQL database transaction fails due to "Incorrect syntax" error from NULL data values.
- [KB90810](#) "About" page of OptoDataLink Monitor reports incorrect patch version.

OptoDataLink R10.5b

PAC Project R10.5001

Released: February 9, 2023.

Bug Fixes

- [KB90520](#) OptoDataLink links may fail to start.
- [KB90521](#) OptoDataLink service may crash when stopping links.
- [KB90533](#) Erratic behavior or computer restarts while running OptoDataLink links.
- [KB90536](#). OptoDataLink projects configured with SQL Server 2012 - 2014 display blank area in Configurator.

OptoDataLink R10.5a

PAC Project R10.5000

Released: November 14, 2022.

Enhancement

Support for the following Microsoft databases has been added:

- Azure SQL Database
- SQL Server Express 2022 Preview
- SQL Server Express 2019
- SQL Server Express 2017
- SQL Server Express 2016

Bug Fix

[KB90191](#) OptoDataLink: Unhandled Exception error on some Windows computers.

OptoDataLink R10.4a

PAC Project R10.4000

Released: September 7, 2021.

The OptoDataLink version number was updated to match the other applications in PAC Project R10.4000. There were no other changes.

OptoDataLink R10.2c

PAC Project R10.2003

Released: October 16, 2019.

Bug Fixes

- [KB88295](#) OptoDataLink does not create new files when rollover option is set.
- [KB88490](#) OptoDataLink: Data links do not start.

OptoDataLink R10.2b

PAC Project R10.2002

Released: June 10, 2019. Updated: June 14, 2019.

Bug Fix

[KB87947](#) OptoDataLink may not transfer data if links contain a large number of tags.

OptoDataLink R10.0b

PAC Project R10.0001

Released: July 9, 2018.

Bug Fixes

- [KB82887](#) OptoDataLink won't log any data for a link that has an invalid tag or IP address.
- [KB83184](#) OptoDataLink connection error: The ConnectionString property has not been initialized.
- [KB87200](#) OptoDataLink: Selecting "Send Unique Id" without selecting "Single Sample" fails on Access databases.

OptoDataLink R10.0a

PAC Project R10.0000

Released: May 18, 2018. Updated: May 22, 2018.

Bug Fixes

- [KB86029](#) OptoDataLink stops processing links; error log shows "Error in link... Reason 0x800706BA".
- [KB87333](#) OptoDataLink Beta version B9.6d Build 0010 may duplicate records.
- [KB87351](#) OptoDataLink: "Database INSERT transaction failed/Number of values and fields not the same" when Single Sample option isn't selected.

OptoDataLink R9.6c

PAC Project R9.6004

Released: July 19, 2017.

Bug Fix

[KB86743](#) After a reboot, sometimes OptoDataLink stops sending data to the control engine.

OptoDataLink R9.6b

PAC Project R9.6003

Released: April 24, 2017.

Bug Fix

[KB86640](#) OptoDataLink doesn't write Int64 values to database.

OptoDataLink R9.6a

PAC Project R9.6000

Released: February 1, 2017.

Enhancements

- OptoDataLink provides improved visual notification when the OptoDataLinkRuntime service is stopped. The notification stays on the screen until the service is restarted.
- When you run OptoDataLink Monitor with administrator privileges, you can use OptoDataLink Monitor's pop-up menu to start and stop the OptoDataLinkRuntime service.
- OptoDataLink automatically recognizes when a strategy includes redundant controllers, and includes information about them in the OptoDataLink project.
 - When the project runs, OptoDataLink will now detect when the active controller changes and will switch to scanning the new active controller.
 - The last five projects that were opened are now listed at the bottom of the **File** menu so you can open them again with just one click.

OptoDataLink R9.5c

PAC Project R9.5002-339

Released: September 27, 2016.

Enhancement

OptoDataLink can now write NULL float values for all supported databases.

Bug Fixes

- [KB86126](#) OptoDataLinkRuntime won't start ("Unable to start OptoDataLinkRuntime" error message).
- [KB86224](#) OptoDataLink 9.5 does not cycle through database rows like 9.4 did.

OptoDataLink R9.5b

PAC Project R9.5001

Released: August 26, 2016.

Enhancement

Added Support for Microsoft SQL Server 2014.

Bug Fixes

- [KB85982](#) OptoDataLink may crash if a data link's source or destination becomes unavailable.
- [KB86133](#) OptoDataLink doesn't write empty string values from database tables to strategy tables.

- [KB86140](#) OptoDataLink doesn't send data when "depending on" condition is reactivated.

OptoDataLink R9.5a

PAC Project R9.5000

Released: July 15, 2016. Updated: July 22, 2016 and August 26, 2016.

NOTE: Windows XP and Windows 2000 No Longer Supported

The PAC Project Software Suite no longer supports operating systems for which Microsoft has ended support. This includes Windows XP and Windows 2000. If you attempt to install any PAC Project R9.5000 (or higher) software component on an operating system that Microsoft no longer supports, the installation software displays an error message and then ends.

New Features

- Added ability to:
 - Copy a column of data from a database table to a controller table.
 - When uploading data, overwrite data currently in the destination file or database table so that only the most recent values of data are stored.
 - Transfer data from files and from database tables to integer, float, and string controller tables.
- Added OptoDataLink Monitor, a new feature that provides visual feedback on the status of links running with OptoDataLink.

Enhancement

Enhanced error messages to more clearly explain the issue and to display error codes (when available). When you try to delete a link, a warning message is displayed.

Bug Fixes

- [KB83183](#) OptoDataLink doesn't work with DSN (Data Source Name).
- [KB83453](#) When OptoDataLink is set up to log one time, it logs at the interval time.
- [KB84717](#) OptoDataLink: Unable to get a single element from a table into MySQL.
- [KB84730](#) OptoDataLink conditions stop working.
- [KB84968](#) OptoDataLink may create duplicate database and file records.
- [KB85247](#) OptoDataLink cannot transfer rows of data to individual tags.

OptoDataLink R9.4e

PAC Project R9.4008

Released: April 20, 2015.

Enhancement

Added the ability to replicate an entire controller table to a database table.

Bug Fix

[KB84610](#) Vulnerability in OPC Test Client.

OptoDataLink R9.4d

PAC Project R9.4004

Released: December 18, 2014.

Enhancement

OptoDataLink now stops all previously running links when running a new configuration file.

Bug Fix

[KB84293](#) OptoDataLink crashes on data change with error code 80070006.

OptoDataLink R9.4b

PAC Project R9.4001

Released: September 24, 2014.

Bug Fix

[KB84074](#) OPC triggers and sinks don't update values to an Opto 22 device.

OptoDataLink R9.4a

PAC Project R9.4000

Released: July 8, 2014.

Bug Fix

[KB83896](#) OptoDataLink stops logging data if the scanner stops functioning.

OptoDataLink R9.3d

PAC Project R9.3003

Released: October 15, 2013.

Enhancements

- Error Reporting has been enhanced.
 - The error dialog is now bigger for easier reading.
 - By default, the last 100 error messages are displayed instead of the errors that occurred in the last 10 minutes. In addition, you can choose to display all errors from past 10 minutes, or the last hour, day, or week.
- Nuisance error messages such as "Quality problem reading from Opto22 device 0x00000001", and "False values in cache" no longer appear when a data link is started.
- Several keyboard shortcuts have been added, including:
 - Ctrl-O to open an existing data link
 - Ctrl-N to open a new data link
 - F3 to stop a link
 - F5 to start a link
 - F2 to rename a link

Bug Fixes

- [KB82904](#) OptoDataLink intermittently stops recording data.
- [KB83190](#) Project will not load if a link contains an invalid file path.

OptoDataLink R9.3c

PAC Project R9.3002

Released: April 22, 2013.

Bug Fixes

- [KB82635](#) One time trigger in OptoDataLink continues to record data.
- [KB82550](#) Up and down arrow buttons cause OptoDataLink to crash.

OptoDataLink R9.3b

PAC Project R9.3001

Released: November 19, 2012.

Bug Fix

#82528 The bug fix reported in [KB82404](#) has been reversed. Table names and columns with spaces are no longer supported in OptoDataLink.

OptoDataLink R9.3a

PAC Project R9.3000

Released: November 9, 2012.

New Feature

Database connectivity is handled via ODBC drivers. In addition to those with built-in support, any installed ODBC driver may now be used to connect to a destination database.

Bug Fixes

- [KB82274](#) Blank Data Source Name (DSN) drop-down list.
- [KB82305](#) The 'Tab' key moves through the OptoDataLink dialog backwards.
- [KB82320](#) Problems saving OptoDataLink files to network drive.
- [KB82362](#) Incorrect or missing messages if an OptoDataLink database connection fails.
- [KB82404](#) Spaces in column and table names in OptoDataLink cause problems.
- [KB82476](#) The 'depending on' Database value not always detected.

Enhancements

- Access 2007 & 2010, SQL Server 2008 & 2012, and MySQL 5.1 are now supported.
- Tag selection for Opto 22 devices has a new interface with support for multiple selection and reordering.
- Datalinks have a right-click menu that allows for duplication, renaming, and deletion.
- Whole or partial tables can be written to Opto 22 devices without being broken down into individual element tags.
- There is now smoother loading of projects with a large number of data links.

OptoDataLink R9.2b

PAC Project R9.2001

Released: April 16, 2012.

Bug Fix

[KB81917](#) OptoDataLink sometimes crashes after exiting Runtime.

OptoDataLink R9.1a

PAC Project R9.1000

Released: July 18, 2011.

Bug Fixes

- [KB80298](#) OptoDataLink data update may fail with quick strategy tag updates.
- [KB81229](#) Data Link stored late to Destination by OptoDataLink.

OptoDataLink R9.0a

PAC Project R9.0000

Released: June 17, 2010.

Bug Fix

[KB80978](#) OptoDataLink does not exchange data if 'depending on Combination' is selected.

OptoDataLink R8.2b

PAC Project R8.2003

Released: September 5, 2008.

Enhancements

- When you click the play or stop button in Configurator, OptoDataLink will start the Runtime service if it is not already started. Previously, this would result in a confusing error message.
- The Edit dialog box where you choose a strategy variable now only shows read-only or write-only tags when they are appropriate. For example, since tags used in the Opto 22 Device Destination must be able to be written to, read-only tags do not appear in the tag tree dialog.

OptoDataLink R8.1a

PAC Project R8.1000

Released: October 8, 2007.

The OptoDataLink version number was updated to match the other applications in PAC Project R8.1000. There were no other changes.

OptoDataLink R8.0d

PAC Project R8.0010

Released: July 20, 2007.

Bug Fixes

- [KB58201](#) Frequent OptoDataLink data exchanges at unexpected 'Time of Day'.
- [KB58200](#) When 'Time of Day' is met, OptoDataLink may continually exchange data.

- [KB58482](#) Multiple data links using 'Opto 22 Device' condition are not detected in OptoDataLink.

OptoDataLink R8.0c

Released: March 23, 2007.

New Feature

The error viewing window now supports saving the errors to a text file.

Enhancements

- Connections to the controller are pooled if multiple sources, destinations, and conditions need to communicate with devices.
- The Database source, destination, and condition reconnect to the database if the connection stops working. The connection may stop working if the database is stopped, or a network connection goes away.
- Fixed memory leaks when data links are running.

OptoDataLink R8.0b

Released: March 9, 2007.

Bug Fix

[KB56343](#) When the Opto 22 Device data remains the same and OptoDataLink doesn't exchange data.

OPTOOPCSERVER

OptoOPCServer R10.6a

PAC Project R10.6000

Released: October 23, 2025.

NOTE: You may be prompted to restart your computer to complete the installation of the software.

Bug Fixes

- [KB90457](#) Tags added to server through OptoBrowser Configurator not immediately available to client.
- [KB90765](#) OptoOPCServer Indirect (CONT) method unable to scan *groov* discrete outputs with On/Off-Time Totalizer features.
- [KB91057](#) Random OptoOPCServer errors and/or PAC Display Runtime crashes.

OptoOPCServer R10.5c

PAC Project R10.5003

Released: December 19, 2023.

The OptoOPCServer version number was updated to match the other applications in PAC Project R10.5003. There were no other changes.

OptoOPCServer R10.5b

PAC Project R10.5002

Released: May 22, 2023. Updated: May 24, 2023.

Enhancement

Internal changes were made so that storing data to a 64-bit Integer Table Pointer Variable now works correctly.

OptoOPCServer R10.5a

PAC Project R10.5000

Released: November 14, 2022.

Enhancement

Changes made by Microsoft to the Windows DCOM Server Security necessitated a change in instructions on how to configure DCOM. See Chapter 3, "Configuring DCOM in Windows" in the [OptoOPCServer User's Guide](#) (form 1439).

Bug Fix

[KB90208](#) Accessing PID loops on *groov* RIO causes "Device Failure" messages.

OptoOPCServer R10.4a

PAC Project R10.4000

Released: September 7, 2021.

The OptoOPCServer version number was updated to match the other applications in PAC Project R10.4000. There were no other changes.

OptoOPCServer R10.3b

PAC Project R10.3001

Released: August 17, 2020.

Bug Fix

[KB88948](#) Opto Browser Configurator may not start.

OptoOPCServer R10.3a

PAC Project R10.3000

Released: April 9, 2020.

OptoOPCServer R10.2c

PAC Project R10.2002

Released: June 10, 2019. Updated: June 13, 2019.

Bug Fixes

- [KB87995](#) QDigital feature tags from GRV-EPIC-PR1 show "Not Scanned".
- [KB88145](#) Opto Browser Configurator: Displays wrong Scratchpad tags or missing tags.
- [KB88288](#) Data in PAC Display project windows does not update when accessing backup controller.

OptoOPCServer R10.2b

PAC Project R10.2001

Released: March 13, 2019.

Bug Fix

[KB87937](#) OPC server: connection or performance issues.

OptoOPCServer R10.2a

PAC Project R10.2000

Released: December 3, 2018.

Bug Fix

[KB87825](#) OPC client reports a communication failure.

OptoOPCServer R10.0b

PAC Project R10.0001

Released: July 9, 2018.

Bug Fix

[KB87560](#) Over-sized fonts, parts of text missing, blank dialog boxes, or missing dialog elements.

OptoOPCServer R10.0

PAC Project R10.000

Released: May 18, 2018.

The OptoOPCServer version number was updated to match the other applications in PAC Project R10.0000. There were no other changes.

OptoOPCServer R9.6b

PAC Project R9.6006

Released: February 21, 2018.

Bug Fix

[KB87078](#) Browser Configurator: E1 and E2 brains read and write to the wrong points.

OptoOPCServer R9.6a

PAC Project R9.6000

Released: February 1, 2017.

The OptoOPCServer version number was updated to match the other applications in PAC Project R9.6000. There were no other changes.

OptoOPCServer R9.5c

PAC Project R9.5003

Released: December 14, 2016.

Bug Fix

[KB86394](#) Opto Browser Configurator doesn't display E1, E2, or SNAP-PAC-R1-B I/O units.

OptoOPCServer R9.5b

PAC Project R9.5002-339

Released: September 27, 2016.

Bug Fix

[KB86148](#) Loss of floating point precision in OptoOPCServer and PAC Display.

OptoOPCServer R9.5a

PAC Project R9.5000

Released: July 15, 2016. Updated: July 22, 2016.

NOTE: Windows XP and Windows 2000 No Longer Supported

The PAC Project Software Suite no longer supports operating systems for which Microsoft has ended support. This includes Windows XP and Windows 2000. If you attempt to install any PAC Project R9.5000 (or higher) software component on an operating system that Microsoft no longer supports, the installation software displays an error message and then ends.

Bug Fixes

- [KB84681](#) OptoOPCServer: Tag qualities can change erratically.
- [KB85046](#) Can't properly resize Opto Browser Configurator dialog boxes in Windows 10.

OptoOPCServer R9.4c

PAC Project R9.4008

Released: April 20, 2015.

The OPC Test Client is no longer included with PAC Project. Instead, the Prosys Test Client is available as a free download from the Opto 22 FTP site. This is a standalone OPC client application that can be used to test OptoOPCServer and the browser databases you create. For more information, see the [OptoOPCServer User's Guide](#) (form 1439).

OptoOPCServer R9.4c

PAC Project R9.4006

Released: February 28, 2015.

Bug Fix

[KB84434](#) Heap buffer overrun vulnerability In OptoOPCServer may allow remote code execution.

OptoOPCServer R9.4b

PAC Project R9.4005

Released: October 25, 2018.

This version of `OptoOPC.exe` processes all the async transactions in a group before moving on to the next group. In previous releases, it would only process one async transaction before moving on to the next group.

OptoOPCServer R9.4b

PAC Project R9.4005

Released: January 21, 2015.

Enhancements

- The diagnostic logging capabilities have been improved.
- Added a limit to the number of asynchronous transactions that can be pending.

OptoOPCServer R9.4a

PAC Project R9.4000

Released: July 8, 2014.

Bug Fixes

- [KB83357](#) Items added to a group as inactive might have VT_EMPTY for the data type when activated.
- [KB83682](#) OptoOPCServer high CPU usage.
- [KB83848](#) OptoOPCServer is not scanning TPO_PERCENT and TPO_PERIOD.
- [KB83546](#) Extended Device Failure Event.

OptoOPCServer R9.3b

PAC Project R9.3000

Released: October 15, 2013.

Bug Fixes

- [KB83133](#) Triggered Historic logs scan very slowly.
- [KB83135](#) OptoOPCServer crashes when using OPC 1.0 interface.
- [KB83172](#) AsyncRead of tables or strings causes OptoOPCServer to crash when using the OPC 1.0 interface

OptoOPCServer R9.3a

PAC Project R9.3000

Released: June 8, 2012.

Bug Fix

[KB82158](#) OptoOPCServer clients fail after adding new tags.

OptoOPCServer R9.2b

PAC Project R9.2002

Released: June 8, 2012.

Bug Fix

[KB82059](#) Slow I/O updates in PAC Display when scanning many I/O units.

OptoOPCServer R9.2a

PAC Project R9.2000

Released: February 29, 2012.

Enhancement

Added new Item IDs for pulsing, point configuration, diagnostic status read area items, and SNMP.

Bug Fix

[KB81856](#) Unable to connect to remote OptoOPCServer.

OptoOPCServer R9.1a

PAC Project R9.1000

Released: July 18, 2011.

Bug Fixes

- [KB81316](#) 'Out of service' errors reported in PAC Display.
- [KB81087](#) OptoOPCServer Item ID tag names are not displayed for PID items.
- [KB81218](#) PID State for Auto and Manual Modes are incorrect via the controller.

OptoOPCServer R9.0b

PAC Project R9.0002

Released: June 22, 2010.

Bug Fix

[KB81001](#) Long start-up delay for PAC Display on Windows Vista and Windows 7.

OptoOPCServer R9.0a

PAC Project R9.0001

Released: June 17, 2010.

Enhancement

Added support for Controller Redundancy in the OptoOPCServer scanners.

OptoOPCServer R8.2c

PAC Project R8.2009

Released: March 20, 2009.

Enhancement

The internal scanning interval of data from Opto devices has been changed to coincide with the interval requested from OPC clients. Previously, the scan interval was half of the requested interval. In other words, it was scanning twice as often as requested.

Bug Fixes

- [KB80553](#) Pointer variable tags reference the wrong tag in Browser Configurator.
- [KB80240](#) Numerous writes by an OPC client may delay data updates.

OptoOPCServer R8.2b

PAC Project R8.2006

Released: December 15, 2008.

Bug Fix

[KB80429](#) Cannot read IOUNIT;ENABLE OptoOPCServer status.

OptoOPCServer R8.2a

PAC Project R8.2000

Released: June 19, 2008.

Bug Fixes

- [KB80120](#) PAC Display Runtime clients may not switch to backup control engine.
- [KB80229](#) Possible Opto Browser Configurator problems if tag file pathname includes an '!'.
The '!' character is a valid character in tag names and can cause the configurator to fail to load the tag file.
- [KB80258](#) OptoOPCServer stops updating data tag group when invalid memory map address is accessed.

OptoOPCServer R8.1e

PAC Project R8.1008

Released: March 7, 2008.

Bug Fixes

- [KB80042](#) SyncRead in OPCCache mode causes OptoOPCServer memory leak.
- [KB80043](#) OptoOPCServer's Opto Easy OPC Forms VB example does not compile.

OptoOPCServer R8.1d

PAC Project R8.1007

Released: February 1, 2008.

Bug Fix

[KB61230](#) SNAP-IDC5Q counter item IDs not displayed in OptoBrowser Configurator.

OptoOPCServer R8.1c

PAC Project R8.1005

Released: December 14, 2007.

Bug Fixes

- [KB58657](#) Simultaneous "Sync Read" on multiple Ethernet I/O may cause OptoOPCServer crash.
- [KB60509](#) Possible incorrect status codes if OptoOPCServer writes to multiple items IDs.

OptoOPCServer R8.1b

PAC Project R8.1004

Released: November 30, 2007.

Enhancements

- The number of items that the server can add is no longer limited to 128K.
- Increased the initial size of item arrays and the size by which they will grow to decrease memory thrashing.

Bug Fixes

- [KB58925](#) OptoOPCServer may crash if client uses OptoOPCAuto.dll.
- [KB60298](#) Unable to view more than 16 PID loops on SNAP PAC brains.

OptoOPCServer R8.1a

PAC Project R8.1000

Released: October 9, 2007.

Enhancements

- Opto Browser Configurator can now generate Pointer Variable, Integer 64 Variable, and Integer 64 Table tags from PAC Control files.
- Tag names can now contain hostnames in place of IP addresses for scanning Opto 22 devices.

OptoOPCServer R8.0d

PAC Project R8.0009

Released: June 29, 2007.

Bug Fixes

- [KB58125](#) OptoOPCServer Browser Configurator gets error 0x80004005 if OptoControl strategy with *mistic* I/O is opened.
- A problem has been fixed where OptoOPCServer would occasionally crash when a client would disconnect.

OptoOPCServer R8.0c

Released: April 20, 2007.

Bug Fixes

- [KB56892](#) SNAP-PAC-EB1 and SNAP-PAC-EB2 tags not available in OptoOPCServer Browser Configurator.
- [KB56847](#) OptoOPCServer returns erratic tag quality if OPC client refers to data item incorrectly.
- [KB57015](#) Erratic tag quality from OptoOPCServer if custom client uses tag name with trailing spaces.

OptoOPCServer R8.0b

Released: March 23, 2007.

Bug Fix

[KB56458](#) Opened window in PAC Display may show older data until refreshed by OptoOPCServer.

OptoOPCServer R8.0a

Released: March 1, 2007.

Bug Fix

[KB55105](#) CPU usage may increase when OptoOPCServer accesses I/O tags.

Enhancements

- To Browser Configurator:
 - Tags can now be generated that allow indirect access to I/O Unit data through the controller.
 - When reading `.otg` files, tags can now be generated that allow access to the expanded memory map on SNAP PAC devices. Also, High-Density Digital points will be recognized and complete tags generated.
- When reading `.idb` files, the following new tags can be generated:
 - Controller
 - Memory, Time, Date, SyncDateTime, StrategyName, ErrorCount, and LastError
 - Event Reactions
 - ScanEnable, IsOccurring, and HasOccurred
 - PID (*mistic*)
 - Input, Output, Setpoint, Gain, Integral, Derivative, SetpointTrackInput, OutputTrackInput, OutputEnable, Auto, and Active
 - PID (Ethernet)
 - Input, Output, Setpoint, Gain, Integral, Derivative, Auto, and ScanRate
 - I/O Unit
 - Enable
 - Digital Input
 - OnLatch, OnLatchGetClear, OffLatch, OffLatchGetClear, Counter, CounterEnable, CounterGetClear, QuadCounter, QuadCounterEnable, QuadCounterGetClear, OnTimeTotalizer, OnTimeTotalizerGetRestart, OffTimeTotalizer, OffTimeTotalizerGetRestart, OnPulse, OnPulseGetRestart, OffPulse, OffPulseGetRestart, Period, PeriodGetRestart, PulsePeriodComplete, and Frequency
 - Digital Output
 - TPOPeriod and TPOPercent
 - Analog Input
 - Min, Max, MinGetClear, and MaxGetClear
- When reading `.cdb` files, the following new tags can be generated:

- Controller
- Memory, Time, Date, SyncDateTime, StrategyName, ErrorCount, and LastError
- Event Reactions
- ScanEnable, IsOccurring, and HasOccurred
- PID
- Input, Output, Setpoint, Gain, Integral, Derivative, SetpointTrackInput, OutputTrackInput, OutputEnable, Auto, and Active
- I/O Unit
- Enable
- Digital Input
- OnLatch, OnLatchGetClear, OffLatch, OffLatchGetClear, Counter, CounterEnable, CounterGetClear, QuadCounter, QuadCounterEnable, QuadCounterGetClear, OnTimeTotalizer, OnTimeTotalizerGetRestart, OffTimeTotalizer, OffTimeTotalizerGetRestart, OnPulse, OnPulseGetRestart, OffPulse, OffPulseGetRestart, Period, PeriodGetRestart, PulsePeriodComplete, and Frequency
- Digital Output
- TPOPeriod and TPOPercent

OptoOPCServer R7.1a

Released: April 7, 2006.

Bug Fixes

- A memory leak was fixed that could occur when large numbers of string variables were continually added and removed from the server.
- [KB50037](#) Accessing string variables or string table elements with ioDisplay or OPC Client may cause error.
- A problem has been corrected where occasional "out of service" errors could occur while rapidly adding and removing groups.

OptoOPCServer R7.0c

Released: February 2, 2006.

Bug Fix

[KB49807](#) OPC clients accessing unavailable string tag types, may affect updates in OptoOPCServer.

OptoOPCServer R7.0b

Released: January 26, 2006.

Bug Fix

[KB49750](#) Easy OPC VB Forms may cause OptoOPCServer problems.

OptoOPCServer R7.0a

Released: December 19, 2005.

OptoOPCServer software is now available as part of the ioProject Professional software suite. You can also purchase OptoOPCServer separately. For more information, see [ioProject Professional 7.0 Release Notes](#)

(form 1599). This document is included with all ioProject software and can also be downloaded from the Opto 22 website at www.opto22.com.

Enhancements

- Added support for redundant Ethernet links using the two Ethernet interfaces of SNAP PAC controllers. OptoOPCServer offers the ability to designate primary and secondary controllers. If the primary controller is not available, OptoOPCServer will use the secondary controller.
- Can obtain I/O data through a SNAP PAC controller rather than having to talk directly with the I/O unit.
- Since OptoOPCServer does not require an Ethernet connection to I/O units, a segmented control network can be created using the SNAP PAC's two network interfaces.
- Support has been added for FactoryFloor controllers running OptoControl strategies, so that OPC clients can now work with data on these legacy control systems.

Known Issue

When an ioDisplay project is configured to use redundant OptoOPCServers, ioDisplay or OptoOPCServer may stop operating or otherwise become unavailable. Contact Opto 22 Product Support for current information about this problem.

OptoOPCServer R6.1a

Released: May 25, 2005.

Enhancement

Added support for High-Density Digital modules.

Bug Fix

The Browser Configurator will again allow editing of array type Item IDs.

OptoOPCServer R6.0a

Released: October 1, 2004.

Enhancements

- Digital point states and analog point engineering units can now be read from Ethernet-based controllers that are running OptoControl strategies.
- Added ability select all items in the log by pressing Ctrl-A.
- Added the number of items to the Group Information tooltip that is displayed when hovering over a group in the tree view.

Bug Fixes

- Sync Write now converts from types other than the canonical type.
- Items added to an inactive group are not scanned until the group becomes active.
- When using IDataObject for subscription callbacks, float values now update correctly.
- Transferring a very large browser database from the Browser Configurator to the server no longer fails.
- The Browser Configurator is now able to open .otg files whose first point is an analog output.
- Sync Write no longer has difficulty with empty BSTRs being represented by a NULL pointer.
- Response times are not affected if groups are continually added and removed.

OptoOPCServer R5.1b

Released: February 26, 2004.

Bug Fix

Reading very large data requests from UIO controllers would sometimes cause some elements of the data to change value for one scan cycle.

OptoOPCServer R5.1a

Released: December 12, 2003.

Enhancements

- Added support for new devices: SNAP LCE controllers and SNAP Simple I/O brains.
- Added support for PID Loops for the SNAP Ethernet devices that have added that new feature.
- Added support for OptoControl variables: Integers, Floats, Strings, and their corresponding table types.
- Scratch Pad Bits can now be accessed on SNAP Ethernet brains.
- The extended Scratch Pad Integers and Scratch Pad Floats areas on Ultimate I/O can now be accessed by the exact index of the element.

Bug Fix

Updates of array elements in the upper portion of the array would not always occur at the proper time.

OptoOPCServer R5.0b

Released: August 22, 2003.

Bug Fix

Attempting to load Browser Item files that resided in very long pathnames would result in strange and unpredictable behavior in the Browser Configurator.

OptoOPCServer R5.0a

Released: July 28, 2003.

Enhancements

- Added support for Ultimate I/O brains and controllers.
- Added a Browser Configuration utility that gives greater control of the tags that are available in the OPC Server's browser interface.

Bug Fixes

- Performing asynchronous writes using the older IDataObject interface would result in memory leaks.
- When removing a group, the corresponding data callback interface would sometimes not be released in the correct order, resulting in the server hanging.
- When the server was remotely activated and a second client would connect, the server would crash if the log view was being written to. In this situation, the server is invisible and there is no need to write to the log view.
- Changed the initial quality of items that have not been scanned yet to "Not Connected" instead of "Bad".
- When items were added to an inactive group, the group would be marked as active after the operation of adding items.

- The server would crash if there was no group selected in the user interface and the **Show Items** menu item was chosen.
- In AsyncIO::Read and AsyncIO::Write (as opposed to AsyncIO2::Read and AsyncIO2::Write), the server is supposed to return S_FALSE when any of the item handles are invalid. Also, no transaction should be queued up at this point. These functions were behaving like their AsyncIO2 counterparts, which allow some item handles to be invalid and the remaining items would be included in a transaction that would result in a callback.
- The number of lines displayed in the message log has now been limited to prevent overflows that could in some situations cause a memory leak.

OptoOPCServer R2.0b

Released: November 14, 2001.

Bug Fixes

- String array items were being updated at every subscription interval instead of only when there was a change in the string data.
- IOPCShutdown could not be Advised by clients, meaning that this interface was not available to clients.
- Using Generic Tags to specify access to memory map information would result in mixed up results (such as information for the second tag would be returned for the first tag).
- Writing to the Scratch Pad Bits area of the memory map was not working correctly.
- Transferring BSTR and all SAFEARRAY data on IDataObject (ver 1.0) subscriptions did not work correctly.

OptoOPCServer R9.3b

Windows NT Installation Notes

Windows NT users must have write access to the registry and the WinNT\System32 directory to successfully install and use this product.

Uninstallation of this Product

A utility is provided to uninstall this product. The utility removes all registry entries and files previously installed with the following exceptions:

- The installation directory tree is not removed if any user-created files exist in it.
- The Win95/Win98 program folder or Windows NT program group is not removed if any icons have been added by the user.

SOFTPAC

SoftPAC software R10.6b | SoftPAC firmware R10.6b | SoftPAC Monitor R10.6a

PAC Project R10.6000

Released: October 23, 2025.

NOTE: You may be prompted to restart your computer to complete the installation of the software.

Bug Fixes

[KB90759](#) Updating firmware through SoftPAC Monitor may leave SoftPAC unstable.

SoftPAC software R10.4d | SoftPAC firmware R10.4e | SoftPAC Monitor R10.5a**PAC Project R10.5003**

Released: December 19, 2023. Updated: January 3, 2024 and October 23, 2025.

Bug Fixes

- [KB90130](#) Send Communication Handle Command returns incorrect status code when sending file to an FTP server.
- [KB90139](#) Sending multiple files in quick succession to a remote FTP server may cause issues.
- [KB90140](#) When attempting to access a file retrieved from an FTP server, you may see -408 or -417 errors.
- [KB90141](#) Content of local copy of file retrieved multiple times from a remote FTP server may be incorrect.
- [KB90142](#) SoftPAC deletes local file if file with same name on remote FTP server doesn't exist.

SoftPAC software R10.4a | SoftPAC firmware R10.4c | SoftPAC Monitor R10.3a**PAC Project R10.4000**

Released: September 7, 2021.

The SoftPAC software version number was updated to match the other applications in PAC Project R10.4000. There were no other changes.

SoftPAC software R10.3a | SoftPAC firmware R10.3a | SoftPAC Monitor R10.0a**PAC Project R10.3000**

Released: May 4, 2020.

Bug Fix

[KB88435](#) SoftPAC ICS Security Issues.

SoftPAC software R9.5g | SoftPAC firmware R9.5g | SoftPAC Monitor R10.0a**PAC Project R10.0000**

Released: May 18, 2018.

The SoftPAC software version number was updated to match the other applications in PAC Project R10.0000. There were no other changes.

SoftPAC software R9.5f | SoftPAC firmware R9.5f | SoftPAC Monitor R9.6a**PAC Project R9.6005**

Released: November 27, 2017.

The SoftPAC version number was updated to R9.5f, and the SoftPAC Monitor version number was updated to R9.6a. There were no other changes.

SoftPAC software R9.5d | SoftPAC firmware R9.5d | SoftPAC Monitor R9.5a**PAC Project R9.6001**

Released: February 27, 2017. Updated: March 1, 2017.

[KB86569](#) SoftPAC fails to start because ControllerDefs.dll and IOSNIF.dll are missing (Note: The SoftPAC version number did not change because the resolution was related to PAC Project Installer.)

SoftPAC software R9.5d | SoftPAC firmware R9.5d | SoftPAC Monitor R9.5a

PAC Project R9.6000

Released: February 1, 2017. Updated: March 1, 2017 and March 7, 2017.

The version numbers for SoftPAC (firmware) and SoftPAC Monitor were not incremented in R9.6000.

SoftPAC software R9.5d | SoftPAC firmware R9.5d | SoftPAC Monitor R9.5a

PAC Project R9.5003

Released: December 14, 2016.

Enhancement

SoftPAC has been updated with the latest version of PAC firmware (R9.5d). If you have SoftPAC R9.5a or higher, you can now get the latest firmware by using the **Update Firmware** option in SoftPAC Monitor.

NOTE: To upgrade firmware in SoftPAC R9.4b or lower, you must first install SoftPAC R9.5a (or higher) directly from the PAC Project installation file. You can download the installer from the [Opto 22 Downloads web page](#). For details, see [KB86020](#).

SoftPAC software R9.5c | SoftPAC firmware R9.5c | SoftPAC Monitor R9.5a

PAC Project R9.5002-339

Released: September 27, 2016.

Bug Fix

[KB86233](#) SoftPAC Installer does not have the proper R9.5c firmware version.

SoftPAC software R9.5b | SoftPAC firmware R9.5b | SoftPAC Monitor R9.5a

PAC Project R9.5001

Released: August 26, 2016.

The SoftPAC software version number was updated to R9.5b to match the other applications in PAC Project R9.5001. There were no other changes.

SoftPAC software R9.5a | SoftPAC firmware R9.5a | SoftPAC Monitor R9.5a

PAC Project R9.5000

Released: July 15, 2016. Updated: July 22, 2016.

NOTE: Windows XP and Windows 2000 No Longer Supported

The PAC Project Software Suite no longer supports operating systems for which Microsoft has ended support. This includes Windows XP and Windows 2000. If you attempt to install any PAC Project R9.5000 (or higher) software component on an operating system that Microsoft no longer supports, the installation software displays an error message and then ends.

Enhancement

Clicking the number of messages in the SoftPAC Monitor Overview now displays the Message Queue, and clicking the **Chart Running** message now displays the controller status dialog box.

Known Issue

[KB86020](#) SoftPAC: Cannot use "Update Firmware" option to upgrade to R9.5a (or higher)

SoftPAC software R9.4b | SoftPAC firmware R9.4b | SoftPAC Monitor R9.4b

PAC Project R9.4005

Released: January 21, 2015.

Bug Fix

[KB84339](#) SoftPAC Monitor always reports 0 charts running and 0 messages.

SoftPAC software R9.4a | SoftPAC firmware R9.4a | SoftPAC Monitor R9.4a

PAC Project R9.4000

Released: June 23, 2014.

Bug Fixes

- [KB83360](#) SoftPAC Monitor does not auto-display when configured to do so on Windows 8.
- [KB83670](#) SoftPAC Monitor doesn't auto-start on Windows 8.

SoftPAC software R9.3c | SoftPAC firmware R9.3e | SoftPAC Monitor R9.3c

PAC Project R9.3003

Released: October 15, 2013.

New Feature

SoftPAC Monitor now includes the **Update Firmware** feature for installing new SoftPAC firmware.

Enhancement

The appearance of SoftPAC Monitor has been updated to use the Opto 22 HTML theme.

Bug Fix

[KB82989](#) SoftPAC: Error received, "A referral was returned from the server".

SoftPAC software R9.3b | SoftPAC firmware R9.3e | SoftPAC Monitor R9.3b

PAC Project R9.3002

Released: March 22, 2013.

SoftPAC Monitor now includes the **Update Firmware** feature for installing new SoftPAC firmware.

SoftPAC software R9.3a | SoftPAC firmware R9.3e | SoftPAC Monitor R9.3a

PAC Project R9.3001

Released: November 19, 2012.

The version number for SoftPAC Monitor has been changed from R1.0a to R9.3a to match SoftPAC R9.3a. Also, the icons were improved, and a “Wait” cursor now appears when you click the **Start/Stop** button.

SoftPAC software R9.3a | SoftPAC firmware R9.3e | SoftPAC Monitor R1.0a

PAC Project R9.3000

Released: November 9, 2012.

For additional release information about SoftPAC, see the [SNAP PAC Controllers and Brains Firmware Release Notes](#).

New for PAC Project 9.3, SoftPAC is a software-based programmable automation controller (PAC) designed for PC-based control. SoftPAC gives you the choice of running your control program in a Microsoft Windows environment rather than on a standalone or rack-mounted PAC.

Just as with S-series and R-series controllers, SoftPAC is programmed using PAC Control. Because the same PAC Control strategy can run on both software and hardware controllers, you can begin developing your strategy without hardware.

Windows NT Installation Notes

Windows NT users must have write access to the registry and the WinNT\System32 directory to successfully install and use this product.

Uninstallation of this Product

A utility is provided to uninstall this product. The utility removes all registry entries and files previously installed with the following exceptions:

- The installation directory tree is not removed if any user-created files exist in it.
- The Win95/Win98 program folder or Windows NT program group is not removed if any icons have been added by the user.

HOW TO GET HELP

If you have any questions about an Opto 22 product, you can call or email Opto 22 Product Support:

Phone: 800-TEK-OPTO (800-835-6786 toll-free in the U.S. and Canada)
951-695-3080
Monday through Friday, 7 a.m. to 5 p.m. Pacific Time

Email: support@opto22.com

Website: www.opto22.com

When calling for technical support, be prepared to provide the following information about your system to the Product Support engineer:

- Software product and version (available by clicking **Help > About** in the application’s menu bar). When contacting us, please send a screen capture of the **Help > About** dialog box.
- Opto 22 hardware part numbers or models that you are using.
- Firmware version (available in PAC Manager by clicking **Tools > Inspect**).
- Specific error messages you saw.
- Version of your computer’s operating system.