README: SNAP PAC Controllers and Brains Firmware, R9.5d

November 15, 2016

This readme provides release information about the following Opto 22 products:

G4EB2 brain (G4EB2)
G4D32EB2 brain (G4EB2)
G4D32EB2-UPG brain (G4EB2)
SNAP-PAC-S1 controller (PAC-S)
SNAP-PAC-S1-FM controller (PAC-S)
SNAP-PAC-S1-W controller (PAC-S)
SNAP-PAC-S2 controller (PAC-S)
SNAP-PAC-S2-W controller (PAC-S)
SNAP-PAC-R1 controller (PAC-R)
SNAP-PAC-R1-B controller (PAC-R)
SNAP-PAC-R1-FM controller (PAC-R)
SNAP-PAC-R1-W controller (PAC-R)
SNAP-PAC-R2 controller (PAC-R)
SNAP-PAC-R2-FM controller (PAC-R)
SNAP-PAC-R2-W controller (PAC-R)
SNAP-PAC-EB1 brain (PAC-EB)
SNAP-PAC-EB1-FM brain (PAC-EB)
SNAP-PAC-EB1-W brain (PAC-EB)
SNAP-PAC-EB2 brain (PAC-EB)
SNAP-PAC-EB2-FM brain (PAC-EB)
SNAP-PAC-EB2-W brain (PAC-EB)
SNAP-PAC-SB1 brain (PAC-SB)
SNAP-PAC-SB2 brain (PAC-SB)
SNAP-PAC-SIM control engine (PAC-SIM)
SOFTPAC software-based controller (SOFTPAC)

KB numbers: A number with the prefix "KB" (for example, KB49909) refers to a Knowledge Base article published by Opto 22. KB articles provide additional information about a feature or bug. To find a particular KB article, click the hyperlink in this document, or go to our website, http://www.opto22.com, and in the Search box, type **KB** and the KB article number. Note that if a number doesn't have "KB" as its prefix, an article wasn't available on our website when this readme was published.

About SoftPAC: To use the Update Firmware option in SoftPAC requires SoftPAC R9.3b or higher. To upgrade SoftPAC firmware from R9.4c (or lower) to R9.5a or higher, you must install SoftPAC from the PAC Project installation file. For details, see KB86020, Cannot use "Update Firmware" option to upgrade to R9.5a.

Version R9.5d

November 15, 2016

NOTE: To upgrade SoftPAC firmware to R9.5a (or higher), see KB86020, Cannot use "Update Firmware" option to upgrade to R9.5a.

Enhancement

PAC-R, PAC-EB, PAC-SB

- Provided OptoMMP read/write access to EtherNET/IP assembly images.

Fixed Bugs

PAC-S, PAC-R

KB85807 POSTs to REST API may return a -8 error code when the JSON string includes whitespace.

KB85817 REST API: Writing a NaN to an analog output or float writes 0 instead.

KB86071 REST API does not return -Infinity values as strings.

KB86090 After prolonged, continuous powerup, controller may lose communication via host port.

KB86142 Stopping a strategy while a chart holds a lock on a flag variable can make the controller unresponsive.

KB86240 REST API: Errors when reading or writing to tags may cause controller to reset.

KB86249 Controller acting as Modbus Slave won't accept TCP connection requests from Master.

PAC-S
KB86257 Cannot enable communication to *mistic* brain with quadrature digital input module configured.

KB86329 Can't change state of output points on Mistic I/O units after power interruption.

SoftPAC
KB86206 Unable to communicate to MMP port via UDP.

KB86212 Multiple charts heavily accessing the same communications handle can cause a -16 Bus Error.

Version R9.5c

September 2, 2016
Updated September 9, 2016

NOTE: To upgrade SoftPAC firmware to R9.5a (or higher), see KB86020, Cannot use "Update Firmware" option to upgrade to R9.5a.

Fixed Bugs

PAC-R, PAC-EB, PAC-SB
KB84561 Firmware needs to support PAC Manager in calibrating analog points that have negative scaling.

PAC-S, PAC-R
KB86193 REST API sometimes incorrectly returns "Operation failed" or "Object not found" error.

KB86150 Unexpected results when changing PID parameters in PAC Control Debug mode.

Version R9.5b

August 18, 2016
Updated August 23, 2016

Fixed Bugs

PAC-R, PAC-EB, PAC-SB
KB86139 SNAP PAC thermocouple modules running under R9.5a firmware may prematurely display high out-of-range value.

KB85797 Opening an FTP Comm Handle in PAC Control uses incorrect default timeout.

PAC-S, PAC-R
KB86078 Clearing configured breakpoints should also clear "Break On" flag.

Version R9.5a

July 21, 2016

New Features

PAC-S, PAC-R

- Added an HTTP/HTTPS server and a RESTful API (representational state transfer application programming interface) to the PAC, so you can now securely access (using HTTPS) your PAC Control strategy data using the programming language of your choice. This addition makes it easy for developers to create custom programs and implement Internet of Things (IoT) applications.
- Added SSL security at the control engine level for use in a TCP comm handle.

PAC-R, PAC-EB, PAC-SB

- Added support for the new SNAP-AIRTD-8U analog input module. This module has 8 points individually configurable for a variety of behaviors, including a fixed temperature range for nickel, platinum, or copper RTD inputs; a fixed range in ohms; or two types of auto-ranging where the module scrolls within a range (in ohms) and chooses the best resolution.
- In the Status Write Area of the memory map, added an out-of-range indicator for SNAP I/O modules that return a 32-bit value, such as the SNAP-AIRATE-HFi and SNAP-AIRTD-8U. The default value is -2,147,483,648. You can change this value if it is a valid value for your application.

Enhancements

PAC-S, PAC-R, SoftPAC

- Added the ability to set breakpoints inside OptoScript blocks.
- Added nested subroutines: a subroutine can now be called from a chart or from another subroutine. Calls may not be recursive. See details in Chapter 12 of the PAC Control User's Guide, form 1700.
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PAC-S, PAC-R

- Added Equifax and Digicert root certificates to the firmware image, so you do not need to add them individually.
- Added support for loading DER format as well as PEM format CA (Certificate Authority) security certificates.
- Added configuration options for choosing the HTTP server listen port and HTTPS or HTTP. These options are used for the REST API.
- FTP now supports the SIZE command.

PAC-R, PAC-EB, PAC-SB

- Added offset, gain, and filter weight as analog input point configuration parameters.
- Added higher resolution resistance value from a SNAP-AIR400K-8 analog input module.

Fixed Bugs

PAC-R
KB85723 On a SNAP high-density digital (HDD) output module, a point that was turned off is on, or vice versa

PAC-S, PAC-R
KB85888 -2104 error when sending email from a PAC Control strategy

KB84812 Analog minimum value request in PAC Display or OptoOPCServer returns maximum value

PAC-S, PAC-R, SOFTPAC
KB84276 PAC Control "Convert IP Address String to Integer 32" command may return an invalid value

PAC-S, PAC-R, SoftPAC, PAC-EB, G4EB2
KB85914 Modbus/TCP Report Slave ID (0x11) does not return any data

PAC-R, PAC-EB, PAC-SB
KB83828 SNAP analog module loses custom scaling configuration

KB85078 SNAP-AIMV-4 module with point configured as +/- 75 mV shows incorrect default scaling

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Version R9.4c
December 10, 2015

New Feature

PAC-R, PAC-EB, PAC-SB
To support the SNAP-AIRATE-HFi module, PAC Manager now includes a new field, "Out Of Range Value (32-Bit)," in the Status Write area of the memory map. Its address is **0xF03802B0**. The default value of **-**2147483648 is returned when the input is outside of the module's input range. (For the SNAP-AIRATE-HFi module, the default value is also returned when a field signal is disconnected.)

Enhancements

PAC-EB, PAC-SB

- SNAP HART modules limit the number of preambles to a value from 5 to 20. SNAP brains now enforce this limit in the memory map.

PAC-EB

- The Nagle algorithm has been disabled on OptoMMP TCP server sockets. This improves response time when successive requests are sent to the OptoMMP port (2001) without waiting for each response.

Fixed Bugs

PAC-S
KB84885 mistic I/O is not enabled after watchdog timeout

PAC-S, PAC-R
KB84431 Files written by a strategy to a microSD card have a created date of January 1, 2012

KB84522 Controller may refuse communication requests after FTP server closes connection due to inactivity

KB84704 Controller may reset if email attachment is sent from microSD card

KB84731 Controller connection to secure server may fail

KB84898 Handshake failure sending email to SMTP server using SSL certificate with specific algorithm

KB84906 Controller resets when doing secure SMTP over PPP

KB85083 Cannot create file on microSD card (error code -417)

PAC-S, PAC-R, SOFTPAC
KB83266 Full FTP directory may not be returned by the controller

KB84196 COM handle "get.srcport" command returns the source IP address instead of its port

KB84345 Flowchart hangs when trying to access offline HART SNAP I/O

KB84472 Persistent strings are cleared when strategy is updated

KB84474 Some time zone changes not working correctly

KB84519 202 error returned after doing multiple HTTP or Send Email commands

KB84528 A strategy with a very long name may make variables lose their persistence

KB84583 Cannot access SNAP PAC controller

KB84588 Spaces in file COM handle connect string make files inaccessible

KB84608 HART preambles set to very high value

KB84702 Strategy download may fail

KB84711 Opening a communication handle may cause a controller reset (or bus error) if value is malformed

KB84719 Controller host port may become unresponsive
KB84757 Unpack String incorrectly stores 8-, 16-, and 24-bit values into Int32

KB84791 Heavy use of a file COM handle by multiple charts may cause the controller to reset

KB84858 Controller ignores mistic PID output enable options

KB85038 Persistent variables aren't retained when using background downloading

KB84951 Set Time Zone Configuration is not saved to battery-backed RAM

KB85301 Inspect window shows incorrect data for 64-bit integer tables in subroutines

PAC-R, PAC-EB, PAC-SB, G4EB2
KB84577 OptoMMP memory map Digital Point Write Turn On/Off areas write with any value

PAC-R, PAC-EB, PAC-SB

KB80394 'Get Frequency' command slow to detect 0 Hz

KB82058 Host-fed PID Velocity Type B, ISA, Parallel, and Interacting algorithms do not calculate D or P terms

KB83813 Unusually large change in PID Output or Integral

KB84243 Custom-scaled SNAP I/O modules may be reset to defaults

KB84300 Controllers & brains stop returning frequency every 72 minutes

PAC-R, PAC-EB, G4EB2
KB85035 Large data stream sizes cause corruption and/or reset

SOFTPAC, PAC-SIM
KB85276 Get Control Engine Address command returns 0.0.0.0

Version R9.4b

January 19, 2015

Enhancements

PAC-S, PAC-R, SOFTPAC, PAC-EB
Added support for the SNAP-AOVA-8 multifunction voltage/current analog output module.

PAC-S, PAC-R, PAC-EB, G4EB2
The number of concurrent Modbus/TCP connections increased from 2 to 8.

Fixed Bugs

PAC-S, PAC-R, SOFTPAC, PAC-EB
KB81195 Event Messages greater than 0 are not copied to 'Message N: Text of Most Recent Message' field.

PAC-S, PAC-R, PAC-EB, G4EB2
KB81322 Sending binary data in event message may produce unexpected output.

PAC-R, PAC-EB, PAC-SB
KB83881 Analog module point configuration not stored to flash correctly with I/O Unit Import/Copy Utility.

PAC-S, PAC-R
KB83987 Loading a strategy from microSD to controller flash memory may fail.

KB84076 Filenames longer than 31 characters on microSD card are displayed incorrectly.

KB83970 Append to file on microSD card overwrites file instead.

KB83998 Controller with microSD card inserted may fail to configure I/O on a restarted I/O unit.

KB83999 More than the maximum 31 host connections may cause controller to become unresponsive.

KB84092 Timeout error (-39) occasionally returned on SNAP PAC serial ports.

PAC-EB, PAC-SB
KB84051 SNAP PAC brain continuously resets on powerup.

PAC-R, PAC-EB

KB84102 Controller or brain resets when streaming over WLAN interface.

KB84134 Serial communication module in rack position 15 may drop a packet.

KB83796 Adding message to queue with blank description causes problem with error queue.

KB83798 Improperly formed Ethernet connection string may prevent opening a connection to the host port.

KB84262 Using SNMP, only the first 4 points of an analog module are accessible.

PAC-S, PAC-R, SOFTPAC
KB83821 Long name passed to "Get Pointer From Name" can cause controller reset.

KB83964 Email time stamp puts seconds in place of minutes.

KB83984 'setpos' command ignores the right-most character of the command.

KB84085 Unpack String command may fail without error if source string data is too short.

KB83981 Pack String/Unpack String commands may return incorrect or no data.

KB84137 Set Time Zone command may set the zone incorrectly.

KB84196 COM handle "get.srcport" command returns the source IP address instead of its port.

PAC-S
KB84020 Controller locks up when the value of a serial PID is changed while inspecting the PID in Debug mode.

KB84166 Chart or host task using command Synchronize Clock SNTP may become unresponsive.
SoftPAC
KB84017 Invalid Memory Map Address error when using SoftPAC as a Generic MMP Device with a redundant controller.

KB84041 SoftPAC Scratch Pad doesn't work with PAC Display.

Version R9.4a
June 26, 2014

Enhancements

PAC-S, PAC-R

- Added support for micro SDHC cards. Micro SDHC card support requires boot loader version R6.1a or newer.

Micro SDHC card support is compatible with the following hardware:
- SNAP-PAC-R1, SNAP-PAC-R2, SNAP-PAC-R1-W, SNAP-PAC-R2-W: All hardware versions that include a microSD card slot.
- SNAP-PAC-S1, SNAP-PAC-S2, SNAP-PAC-S1-W, SNAP-PAC-S2-W: Hardware version 6/24/2014 or newer.

- Added support for the FAT32 file system and long file names on micro SD and SDHC cards. Requires boot loader version R6.1a or newer.

PAC-S, PAC-R, SOFTPAC, PAC-EB

Support has been added for HART® SNAP I/O modules SNAP-AIMA-iH and SNAP-AOA-23-iH, including nine new commands.

Fixed Bugs

PAC-S
KB82601 Strategy in microSD card does not run if named the same as controller strategy.

KB80831 Controller configured for strategy Background Download may reset during strategy "switch" or "switch and run.

PAC-S, PAC-R
KB82163 Controller secured with SSD may reboot during startup.

PAC-S, PAC-R, SOFTPAC
KB82868 During the "initialize I/O unit" phase (just after clicking run), the "cancel" button doesn't work.

KB81888 Ethernet sessions unexpectedly closed.

KB83610 Communication to mistic I/O units erroneously disabled by error in PAC Control.

KB83648 Move Table to I/O Unit does not set digital output IVALs for 4-channel modules on disabled I/O unit.

KB83675 COM handle value can be changed while the handle is open.
KB83708 EOM terminator is ignored when receiving strings via UDP.

KB83727 Nagle's algorithm is enabled in TCP/IP communication handles.

KB83888 Controller may return a "Dictionary Full" error when memory is low.

PAC-R
KB59170 Requesting 127 Modbus TCP holding registers causes incorrect data display.

Version R9.3e
February 25, 2014

Enhancements

PAC-S, PAC-R, SOFTPAC

- Added the ability to send an email with no user account name from within the strategy.
- Added configurable timeouts to the Send Email commands.
- Added the "size" command to the FTP driver.
- Added support to HTTP Post From String Table for a 4-pass post transaction using “Expect: 100-continue”.

PAC-EB, PAC-SB

Added option to prevent period/duty cycle updates while pulse generator is running.

Fixed Bugs

PAC-S, PAC-R, SOFTPAC

KB53128 An I/O unit returns unexpected results from analog and digital I/O.

KB82768 Reading from a file on the controller opened for writing may fail.

KB83036 Email messages sent from controllers are missing the date field.

KB83110 Performing a background download while running a strategy with subroutines may cause the controller to reset.

KB83162 Server SSL certificates are not verified by the controller.

83173 SoftPAC crashes and hardware PACs return a String Too Short Error (-23) when Opening a UDP comm handle with a long URL.

KB83255 I/O is not enabled on redundant systems under certain conditions.

KB83266 Full FTP directory may not be returned by the controller.

KB83280 Digital Counter on B3000 / B3000-B is cleared whenever communication from controller to brain is enabled.

KB83303 Controller may reset when performing SNTP sync.

KB83323 Using On-Pulse or Off-Pulse as watchdog may fail.

KB83329 I/O unit Watchdog, once enabled, won't disable.

KB83346 Opening FTP sessions in multiple charts may cause controller to reset.

KB83568 controller resets.

PAC-EB, PAC-SB

80744 Incorrect value for Raw CJC Counts at OptoMMP offset 0x26 of the analog point read area.

82159 Clearing the max value via Modbus also clears the min value.

KB82160 Error returned by Modbus/TCP 'Force Multiple Coils'.

KB82443 SNAP-AIRTD Generic Input resistance (ohm) measurement needs additional calculations.

KB82705 I/O unit and I/O points power up with default settings when the I/O unit is reset.

KB83163 Controller or brain continuously resets after saving large user files to flash.

KB83595 Modbus/TCP unsupported function codes return erroneous packets.

Version R9.3d

September 25, 2013

The changes in version R9.3d apply only to SoftPAC.

New Features

[SOFTPAC]
Added support for the following modules:
- SNAP-AIRATE-HFi Analog Rate Input Module
- SNAP-AOD-29-HF Dual-Channel Time-Proportional Digital Output Module

Enhancements

[SOFTPAC]
- Added the ability to configure the timeouts for email connect, transmit, and receive.

- A new option has been added to the User Name element of the server information table of the Send Email and Send Email with Attachments commands. A separate User Account name and From name can be specified by separating them with a colon. This allows you to configure either name to be blank, or to have different User Account and From names.

Fixed Bugs

[SOFTPAC]

KB82632 PC reboot causes SoftPAC or PAC Sim to lose autorun, persistent variables, and time zone.

83173 SoftPAC crashes and hardware PACs return a -23 error when Opening a UDP comm handle with a long URL.

KB83285 SoftPAC host port may become unresponsive.

83675 It is possible to change the value of a COM handle while it is open.

Version R9.3c
July 24, 2013

New Feature

Added support for the SNAP-AIR400K-8 thermistor module.

Fixed Bugs

PAC-S, PAC-R, SOFTPAC

82866 The Transmit Pointer Table command posts a -29 error (wrong object type) when passing a pointer table with an element that points to a persistent string.

83008 When the controller is set to auto run, if the strategy timing is just right, the controller will reset.

83110 Performing background download while running strategies with subroutines may cause controller reset.

83012 Sometimes the STOP button has to be clicked twice to make it stay down.

83042 Get I/O As Binary Value can return the wrong data when using background downloads with mistic I/O.

83048 The Set Communication Handle Value command can be called while the com handle is still open, which could result in a variety of errors.

SOFTPAC

82526 SoftPAC doesn't implement the FTP username and password, which are needed by iPAC and aPAC.

83047 The RMDIR command was not included in SoftPAC for the Windows low-level FTP driver.

PAC-R, PAC-EB, PAC-SB, G4EB2

KB80559 An expanded event reaction fails if the first trigger uses scratch pad bits.

KB81182 The event message email client does not include the date field in the header.

KB82682 Pulse commands may stop working.

82710 The Start on Pulse command eventually stops working on Local R1 or R2 controllers.

83071 The SNMP agent listener is enabled even though the SNMP port is configured to 0.

Version R9.3b

March 26, 2013

Enhancement

[SOFTPAC]

Support has been added to SoftPAC to allow the user to update SoftPAC firmware when firmware updates become available.

Bug Fixes

[PAC-R, PAC-S PAC-SIM, SOFTPAC]

KB82046 Passing string literal for URL in HTTP Post/Get commands may cause reset.

KB82417 Mistic PID loop may not be properly initialized.

KB82439 Controller does not enable G4D32RS I/O units.

KB82463 'Move Numeric Table to I/O Unit' may not set all output points correctly.

KB82464 Cannot enable I/O Unit and error -93 appears in queue

KB82469 Persistent string table data lost with strategy download.

KB82480 HTTP Get command returns -20 error on second and subsequent calls.

KB82492 'Write Numeric Table to I/O Unit Memory Map' command returns -3 error

KB82631 Repeated 'Start Continuous Square Wave' commands immediately restart the square wave

KB82643 Background downloading may cause unexpected behavior from controller

KB82662 PID loop 'Enable Communication' option does not work correctly

KB82765 'Move Table to I/O Unit' Turns off G4EB2 Input IVALs

[PAC-R, PAC-SB, PAC-EB]

KB82016 SNAP-AITM-4i displays intermittent or continual QNAN data.

KB82420 Unexpected count value read from SNAP-SCM-SSI

[PAC-SIM, SOFTPAC]

KB82126 Cannot FTP file from host to client PC with SNAP PAC Sim.

KB82533 HttpGet command returns error -443

KB82633 SoftPAC may crash if a large string table is viewed in Debug mode

Version R9.3a

Internal Release

Version R9.2c

September 19, 2012

Enhancements

[PAC-R, PAC-S]

- The Get Control Engine Address command now returns the address of the interface on which the request is received, whether that is the primary address, the secondary address, or the wireless address. Previously it returned the primary address.

- A message is now added to the queue if the strategy is cleared on bootup due to a CRC error.

Bug Fixes

[PAC-S]

KB82012 Redundant system cannot start up without arbiter.

KB82014 Serial I/O units on same controller port may time out.

KB82167 Some analog/digital commands ignore disabled point state.

[PAC-R]

KB82101 Updating to firmware 9.2c or newer fails on SNAP-PAC-R controllers. This has been fixed with PAC Manager R9.2d. If PAC Manager detects this problem, it automatically downloads a smaller "bridge" kernel, and then downloads the 9.2c kernel, all without user intervention.

[PAC-R, PAC-S]
KB81888 Ethernet sessions unexpectedly closed.

KB81902 PIDs not enabled on redundant systems.

KB81903 Multiple clients opening and closing sessions may cause delayed response to new sessions.

KB81908 'Send Email With Attachments' command result code may be incorrect.

KB81913 "Enable I/O Unit" overwrites replicated MMP PID tuning parameters on Redundant Systems

KB81916 Multiple tasks opening and closing serial COM handle may cause reset or chart lockup.

KB81962 HTTP commands may return wrong error when connection fails.

KB81979 Problems with NTP Time & Date commands.

KB81997 Multiple charts using Time/Date 'Set' commands may cause reset.

KB82001 'Move Numeric Table to I/O Unit' may cause controller reset.

KB82006 FTP communication handles do not support DNS.

KB82012 Redundant system cannot start up without arbiter.

KB82023 'HTTP Get' command incorrectly returns HTTP error 400.

KB82028 Communication handle timeout problems.

KB82046 Passing string literal for URL in HTTP Post/Get commands may cause reset.

KB82086 The 'Get Time & Date' command always returns 0 ms.

KB82146 'Receive N Characters' returns -39 if number of characters is negative.

KB82147 'Enable/Disable I/O Unit Causing Current Error' may cause bus error.

KB82157 'Move Numeric Table To I/O Unit' only writes to position 0, high-density digital module.

KB82176 Passing string table element to subroutine with string tables may cause unexpected results.

KB82177 Setting controller FTP Username and Password may cause remote FTP connection to fail.

KB82178 Serial B3000 Event/Reaction scanning enabled only on first strategy run.

KB82227 Multiple 'Synchronize Clock SNTP' commands may fail.

KB82226 Wrong status code from 'Synchronize Clock SNTP' command.

[PAC-R, PAC-EB, PAC-SB, G4EB2]
KB82016 SNAP-AITM-4i displays intermittent or continual QNAN data

KB82221 SNAP Module Resets Causes Re-Config Storm

82224 SNAP module resets causes re-config storm

[PAC-R, PAC-S, PAC-SIM]
KB82257 Down Timers May Fail To Expire.

[PAC-SIM]
KB82106 SNAP PAC Sim may return error -59.

KB82134 'Synchronize Clock SNTP' does not work on SNAP PAC Sim.

KB82244 SNAP PAC Sim may transmit or display unexpected 32 or 64-bit values.

Version R9.2b
Internal Release

Version R9.2a
Dec 1, 2011

Enhancements

[G4EB2, PAC-R, PAC-S]
- Added support for G4EB2 brains (including part numbers G4D32EB2 and G4D32EB2-UPG).

[PAC-R, PAC-S, PAC-EB]
- Added support for the SNAP-SCM-CAN2B serial communication module, which connects to a Controller Area Network (CAN).

[PAC-R, PAC-S, PAC-EB, PAC-SB]
- Added support for the SNAP-IDC-32D high-density digital input module.
- Added support for SNAP-OMR6-A and SNAP-OMR6-C mechanical relay output modules.

[PAC-R, PAC-S]
- Added Simple Network Time Protocol (SNTP) and time zone support for new time / time zone / date commands in PAC Control. Using those commands, you can set or get time zone information for the controller, get the controller's time zone offset from UTC (in minutes), synchronize the controller's clock with an external NTP server, convert a date and time to an NTP timestamp, and convert an NTP timestamp to a date and time.
- Added support for a new bit manipulation command in PAC Control. Using this command you can copy a bit from an integer variable or integer table element to an integer variable or integer table element without affecting any other destination bits nor changing the source variable.

[PAC-SIM]
When starting PAC-Sim, it displayed a message that included the number of hours it will run, but the screen was static. The new sign-on screen states the time of day when the Simulator will time out.

Bug Fixes

[PAC-R, PAC-S]

KB81309 Emails not sent from controller and -50 error returned.

KB81351 Controller resets when table references negative index.

KB81450 Very small floating-point values are set to zero by controller.

KB81517 Chart count out of sync with actual number of running tasks on a controller.

KB81553 'Receive Numeric Table' may cause a -95 info message.

KB81674 Problems with controllers communicating to Profibus-DP slaves.

KB81707 Cannot connect with Listen and Accept Incoming Communication commands.

KB81787 Expired Up Timer not detected.

KB81790 SNAP PAC Simulator should return -36 for Send Email commands.

KB81791 'Transmit Receive String' command may time out prematurely.

KB81792 'Get Numeric Table' and 'Get String Table' may cause -95 error.

KB81800 'Send Email' commands require password.

[PAC-S]
KB81645 Redundant system I/O units don't re-enable if they are rebooted.

KB81706 Redundant systems sometimes transition to backup controller frequently.

[PAC-R, PAC-EB]

KB80773 Digital Events-Expanded triggers continuously without trigger being set.

[PAC-SB]

KB81397 Communication problems to SNAP-PAC-SB brains when updating firmware.

Version R9.1d

Dec 1, 2011

[PAC-S, PAC-R]

Enhancements

- The Get Control Engine Address command now returns the address of the controller interface on which the request was made. Previously only the primary interface address was returned. One advantage is that this allows an app to dynamically adjust its timeout settings, based on whether it is connected via a wired or a wireless connection.
- For the Get Chart Status command, which determines the current status of a specified chart, bit 17 returns a 1 if a chart is in the process of

starting or is currently running. It returns a 0 if a chart is not in the process of starting.

Bug Fixes

KB81275 Point type not displayed correctly in iPAC and aPAC.

KB81302 Problems with Ethernet communications after restoring controller Configuration Data from microSD card.

KB81349 Assigning Chr(x) to a table element does not work.

KB81355 Controller bus error or hardware reset when inspecting local subroutine variables.

KB81375 Chart appears to hang if 'Open Outgoing Communication' is sent to a disconnected device.

KB81387 SendCommunicationHandle command 'get.src' always returns zero.

KB81398 Controller sometimes reports error -11 when sending email.

KB81403 'Move I/O Unit to Numeric Table' and 'Move I/O Unit to Numeric Table Ex' commands do not write to table if I/O unit is offline.

KB81405 controller communication problem with background downloading and persistent string access.

KB81410 Serial port's baud rate not changed

KB81439 'Get Date & Time' incorrectly returns -3 error.

KB81451 An Up Timer is not working as expected.

KB81420 Get Chart Status returns error message -5.

KB81446 Writing numeric tables to a controller's microSD card is very slow.

KB81510 Blinking red STAT LED and error -63 when downloading .cdf file from microSD card.

KB81518 Task count out of sync with actual running tasks.

KB81520 Error can leave some tags in an unknown or unexpected state

[PAC-S]

Bug Fix

KB81397 Communication problems to SNAP-PAC-SB brains when updating firmware.

[PAC-S, PAC-R, PAC-SB]

Bug Fix

KB81514 Controller or brain becomes unresponsive after communication on RS-485 serial link.

[PAC-S, PAC-R, PAC-EB (wireless versions only)]

Bug Fix

KB81303 Wireless brains and controllers may intermittently lose communication.

[PAC-R, PAC-EB, PAC-SB]

Enhancement

Support has been added for the SNAP-IDC-32DN module.

Bug Fixes

KB81390 SNAP-PAC-SB Brains may drop packets at 230.4 kBd.

KB81443 Low density SNAP-PAC digital data is old.

Version R9.1c

Oct 13, 2011

Internal Release

Version R9.1b

Jul 8, 2011

[PAC-S, PAC-R]

New Features

The following PAC Control commands have been added. Note that these commands require PAC Project 9.1 which has not yet been released.

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

* Both Send Email and Send Email with Attachments allow you to send an authenticated email from within a strategy.

Enhancements

- The Get Controller Command now returns the address of the interface on which the request is received. Previously it always returned the controller's primary address.
- Ethernet communication handles (TCP) will now accept the command get.src. The return value is the IP address from which the connection originates.
- The Point Mismatch error message (-35) now specifies in the Object field of the error message the point name, board name, module number, and point number. Previously only the point name was specified.

Bug Fixes

KB81184 Slower strategy performance.

KB81189 NULL pointer passed to command causes controller problems.

KB81190 Possible bus error (-16) or controller problems on I/O initialization.

KB81199 Calling a subroutine may cause controller problems due to string tables

KB81230 Command 'Get Pointer From Name' does not work with tables.

KB81234 'Call Chart' command may cause chart to suspend.

KB81251 'Move Numeric Table to Numeric Table' command always writes to index 0.

KB81276 I/O units with redundant Ethernet link are disabled if primary controller connection is interrupted.

KB81279 I/O unit disabled if SetAnalogTpoPeriod sent to disabled Snap-AOD-29 point.

[PAC-R, PAC-S]

Enhancement

Asymmetric RTS/CTS flow control for serial ports has been added.

Bug Fixes

KB81232 Dead or missing controller battery can cause controller problems.

KB81269, KB81270 Multiple charts using 'Copy Numeric Table to Numeric Table' to copy between tables of different types may cause strategy deadlock.
[PAC-EB, PAC-SB, PAC-SRA]

Enhancement

Added support for hardware date codes 3/10/2011 and later. Hardware date codes 3/10/2011 and later are not compatible with previous firmware versions.

Version R9.1a

Jan 11, 2011

[PAC-S, PAC-R]

Bug Fixes

KB81188 'Stack Not Empty' (-95) in error queue.

KB81803 Strategies with FTP communication handles may become unreachable via Ethernet

New Features

- Added an easy-to-use HTTP client.

- Added an easy-to-use SMTP client.
- DNS can now be used to open COM handles.
- A timer's value can now be retrieved and the timer re-started simultaneously, with a single command.
- New string manipulation words have been added to do things such as trim white SOFTPACe from the beginning or end of a string, do a reverse character search on a string, tokenize a string, etc.
- The controller will now start if any Ethernet interface is configured, Eth1, Eth2, or wireless. Previously, the controller would continuously Boot-P, waiting for an IP address to be assigned, until the primary Ethernet interface was configured.
- The new HTTP and SMTP clients support the use of hostnames in addition to IP addresses.
- The RAM file system store-to-flash and load-from-flash commands have been enhanced to support sub-directories and file compression.

[PAC-R, PAC-EB]

Bug Fix

KB81078 SNAP PAC EB brains may reset with repeated writes to a microSD card.

New Features

- Support added for the SNAP-AITM-4i module.
- Support added for the new SNAP-AIRTD-1K module.

Version R9.0c

Jan 11, 2011

Bug Fixes

[PAC-S, PAC-R]

KB81093 Slower strategy, error -539 reported by wireless controller when WAP cycles power.

KB81115 Controller serial ports are always set to Parity=None.

KB81135 Controller FTP transfers a maximum of 1167 characters.

KB81153 Modified strategy downloaded from flash may cause controller problems.

KB81173 'Wrong Object Type' error returned when assigning value to pointer table.

KB81174 Setting a string table element from Debug mode may cause unexpected controller behavior.

Version R9.0b

Sep 17, 2010

New Feature

- Added code to blink the STAT LED green / orange on the backup of a redundant controller pair when the strategy is running, to allow the user to easily see which controller is backup and which is active.

On a redundant system, when the strategy is running, the backup controller's STAT LED blinks green / amber, (the active controller has a solid green LED, as always), so you can see at a glance which controller is which.

- Added the ClearConfiguredFlag command to allow the user to force configuration commands to be sent to I/O units.

Bug Fixes

[PAC-S]
KB81053 Backup redundant controller may not be established.

[PAC-S, PAC-R]

KB81004 Possible 'Wrong object type' reported to message queue for subroutine variable.

KB81008 VELOCITY C PID does not calculate Term_P and Term_D

KB81054 Strategy does not autorun from the microSD card.

KB81055 'Store microSD to flash and Restart Device' command fails.

KB81058 File in controller's MicroSD card root directory cannot be deleted.

KB81064 Reading the available memory on a microSD card on older SNAP PACs causes problems.

KB81074 Online change in strategy with alternate host tasks may cause controller problems.

KB81075 Controller may reset when making an online change

KB81083 Error -95 returned from subroutine with a Case or IF statement.

[PAC-S, PAC-R, PAC-SIM]

KB81002 PAC Simulator appears to run strategy, but logic is not executing.

[PAC-R, PAC-SB, PAC-EB]

KB81008 Host fed Velocity C PID does not calculate Term_P.

Version R9.0a

Jun 15, 2010

New Features

[PAC-S, PAC-R]
Support has been added for controller-level redundancy. For information on controller redundancy, system requirements, and how to obtain a SNAP PAC Redundancy Option Kit, see form 1901, the SNAP PAC Redundancy Option Data Sheet.

The following analog simulation commands have been added:
IVAL Set Analog Filter Value
IVAL Set Analog Min Value
IVAL Set Analog Max Value

Bug Fixes

[PAC-S, PAC-R]

KB80857 MoveNumTableToNumTable command returns -29 with Int64 tables.

Version R8.5e

January 14, 2011

Enhancements

[PAC-S, PAC-R]

- A strategy can now be loaded from the SD card in a running redundant system.
- Once a wireless unit is commissioned and wireless communication is enabled, the address for port 0 can be cleared.

Bug Fixes

[PAC-S, PAC-R]

KB81040 PAC Display cannot read digital TPO output point's period and percentage from Mistic brains.

KB81084 Subroutines from Case or IF statement may have unexpected results.

KB81094 FTP Communication Handle timeout is not applied.

KB81135 Controller FTP transfers a maximum of 1167 character.

KB81153 Modified strategy downloaded from flash may cause controller problems.

KB81173 'Wrong Object Type' error returned when assigning value to pointer table.

Version R8.5d

July 21, 2010

Bug Fixes

[PAC-S, PAC-R]

KB81004 Possible "Wrong object type" reported to message queue for subroutine variables.

[PAC-R, PAC-EB, PAC-SB]

KB81007 Snap-AIRTD-10 readings are incorrect.

Version R8.5c

May 5, 2010

Bug Fixes

The following problems have been fixed:

[PAC-S, PAC-R]

KB80928 Strategy from microSD card does not Autorun.

KB80896 Strategy on microSD card with Comment (Single Line) command stops executing.

KB80884 Incorrect results from various string commands.

KB80817 Possible problems downloading large strategy to controller with R8.5a.

KB80790 MoveNumericTableToIOUnit command may cause incorrect points to flash LEDs.

KB80743 High latency network (modems) may cause controller to I/O unit communication problems.

KB80730 STAT LED remains turned off if Scanner flag used to stop strategy.
KB80728 Inserting microSD chip may cause controller to Reset.

KB80687 Controller in background download mode fails to autorun strategy on inserted microSD card.

KB80678 Increased ARP cache size on controllers helps decrease number of ARP broadcasts.

KB80664 Controllers talking to Ethernet I/O units on high-latency networks may randomly lock up.

KB80621 Opening a UDP connection too soon in a strategy may return error -443.

KB80569 SNAP PAC devices receiving long 802.1Q VLAN broadcasts may have communication failures.

[PAC-S]

KB80623 Serial brains cannot communicate simultaneously via the controller and another application using Ethernet Pass-Through mode.

[PAC-R]

KB80574 Downloading a large Ethernet/IP configuration file may reset a brain. (Ethernet/IP is used with Opto 22's IO4AB products.)

KB80480 Points 4 through 7 on a Snap-AICTD-8 always report °C.

[PAC-SIM]

KB80380 Inspection window may display incorrect SNAP PAC Sim IP address.

Version R8.5b
Internal Release

Version R8.5a
Sep 14, 2009

New Features and Enhancements

[PAC-S, PAC-R, PAC-EB]
New Wireless+Wired controllers and brains have been introduced:

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

These Wired+Wireless devices support wireless local area networking (WLAN, also known as Wi-Fi or wireless Ethernet), as well as wired Ethernet.

[PAC-S, PAC-R]
Three new analog simulation commands have been added:
- IVAL Set Analog Filter Value
- IVAL Set Analog Min Value
- IVAL Set Analog Max Value

[PAC-R, PAC-EB, PAC-SB]
The PAC brains also have the following enhancements:

- Event Messages that do mem map copies now have UDP as an option.
- Event Messages that do mem map copies can now handle > 4 bytes.
- Higher frequency pulsed output generation is now allowed.
- A memory map location was added to display the number of bytes free on the microSD card.
- The SNAP-AILC module is now supported for use with EtherNet/IP, which is used with Opto 22's IO4AB products.
- The SNAP-AITM8D module is now supported.

Bug Fixes
The following problems have been corrected:

[PAC-S, PAC-R]
KB80397 Changing a point's state should cancel pulse, square wave, and TPO commands.

KB80473 The IVAL Set Frequency command doesn't work with the mistic brains.

KB80558 “Dictionary full error” from online changes to strategies with subroutines.

KB80594 Controller unresponsive after burning SSD strategy to flash memory.

KB80602 Repeated Listen for Incoming Communication on port 502 prevents connection to controller.

KB80626 Problems with Ethernet IP multicast address algorithm for implicit connections and multiple interfaces.

KB80629 Controllers accessing Ethernet brains via high-latency radio network may reset.

[PAC-S, PAC-R, PAC-EB]
KB80617 Event messages with string plug-ins are truncated.

KB80625 Ethernet IP multicast address algorithm for implicit connections is not correct.

[PAC-R, PAC-EB, PAC-SB]
KB80589 Quadrature counter point B stays at 0 counts regardless of input.

[PAC-EB]
KB80597 FTP 'ls' or 'dir' command causes brain to reboot.

Version R8.4a
Mar 6, 2009

New Feature

[PAC-S, PAC-R]

SNAP PAC controllers manufactured in November 2008 and later have a microSD card slot in the top of the controller's case. Cards up to 2 GB capacity with the microSD logo can be used in this slot. Using the microSD card with FTP, you can read the card at 380 kB/s and write to it at 231 kB/s.

You can use the microSD cards to do the following things:

- To store data or files, which you can access using commands or an FTP client.
- To update firmware on the controller or on a serial communication module on the controller's rack.
- To boot the controller from firmware on the microSD card rather than from the firmware in the controller, for example to test new firmware.
- To update, run, or test new strategies. This is useful if the controller is not on the network, if PAC Control isn't available, or if you want to test a new strategy without erasing the existing one.

Bug Fix

[PAC-S, PAC-R]

The following problem has been corrected:

KB80503 Controllers report incorrect values for some I/O combinations in 'Inspect I/O Unit'

Version R8.3a
Dec 1, 2008

New Features

[PAC-S, PAC-R, PAC-EB]

EtherNet/IP protocol server for UCMM unconnected, Class 3 connected messaging (Explicit messaging) and Class 1 connected messaging (I/O, Implicit messaging). (Ethernet/IP is used with Opto 22's IO4AB products.)

[PAC-R, PAC-EB, PAC-SB]

Support for SNAP-IAC-K-16 and SNAP-IDC-HT-16 modules.

Bugs Fixes

The following problems have been corrected:

[PAC-S]

KB80313 SNAP-PAC-S serial ports having trouble communicating at slower baud rates on half-duplex links.

KB80316 Local I/O Unit not enabled when using SNAP-UP1-M64 as Generic OptoMMP Device.

KB80365 Writing to Mistic PID output has no effect on the analog output.

KB80427 Mistic I/O unit is disabled after flash is cleared and PID is inspected

[PAC-S, PAC-EB]

KB80177 Some SNMP initial traps not sent as expected.

[PAC-S, PAC-R]

KB80357 Disabled I/O unit incorrectly reported as enabled.

[PAC-S, PAC-R, PAC-EB]

KB80336 Event message emails may include extra characters.

[PAC-S, PAC-R, PAC-EB, PAC-SB]

KB80377 Problems storing older Image file to PAC Brain with newer firmware.

[PAC-R, PAC-EB, PAC-SB]

KB80328 Point features not stored after power cycle on SNAP PAC I/O unit.

KB80374 'Get & Restart Period' command returns zero for period measurement.

[PAC-R, PAC-EB]

KB80367 Disabled I/O unit not reported in point's Inspect window.

KB80241 Cannot send data out serial module port via SNMP.

Version R8.2a

Jun 25, 2008

New Features

See the PAC Project 8.2 Release Notes for more detail.

[PAC-S, PAC-R]

controller firmware support for Interrupt charts for mistic serial brains. An Interrupt chart handles interrupts from mistic serial brains specially wired to a SNAP PAC S-series controller for critical events requiring immediate action.

controller firmware support for the mistic ASCII protocol for serial I/O communication so that a SNAP PAC S-series controller can talk to all I/O units on that port in the mistic ASCII mode.

controller firmware support for Secure Strategy Distribution which allows strategies to be downloaded and stored in a secure manner using encryption.

[PAC-R2, PAC-EB2, PAC-SB2]

The following digital point feature types have been added: On Totalizer, Off Totalizer, TPO, and Pulse Generation.
Bugs Fixes

The following problems have been corrected:

[PAC-S, PAC-R, PAC-EB, PAC-SB]

KB60473 Rollover problem with 'Seconds since powerup' after 49.71 days

KB80010 Plugins yielding binary data truncate data after '00' sequence

[PAC-S, PAC-R, PAC-EB]

KB59290 Unexpected SNMP cold start traps from Ethernet Devices

KB80025 'Always Bootp/DHCP on Powerup' does not work

KB80041 Excessive I/O unit timeouts possible if communication bursts overwhelm Ethernet network

KB80171 SNMP community settings for Read or Write permissions may behave incorrectly

KB80281 TPO period incorrectly set for SNAP-AOD-29

[PAC-R, PAC-EB, PAC-SB]

KB80013 Possible momentary off pulse if digital output is already on

KB80117 Changing the PID setpoint may cause a jump in the PID output

[PAC-S, PAC-R]

KB54622 TransmitPtrTable and ReceivePtrTable commands may return corrupt data when used with Int64 vars

KB54982 Problems with very high/low controller error queue values and GetErrorCodeOfCurrentError()

KB60359 'Convert # to Hex String' command pads extra 0's in front of Integer 64 value

KB60697 Disabled I/O units are not detected by 'Error on I/O Unit?' command

KB60930 Ethernet I/O units disabled if watchdogs are configured

KB62241 Possible 'Invalid address' errors, or no response from I/O unit

KB80073 Interrupting a strategy download may result in a controller -9 timeout

KB80103 controller port 22001 may become unresponsive if bootup is interrupted

KB80123 Copy Date to String commands may cause unexpected controller behavior

KB80260 'Set Analog Offset' command limits offset values

[PAC-R, PAC-EB]

KB54782 (R1 and EB1 only)- Analog TPO Period setting is not stored to flash on Ethernet devices

KB60572 SNMP v2 traps may cause a management system crash

[PAC-S]

KB60378 'Move Numeric Table to I/O Unit' command does not work with mistic I/O Units

KB61524 Persistent variables lost on power cycle when using 'Background' download option on SNAP PAC

KB80216 mistic digital input IVALs not cleared by the 'Clear Counter' command

KB80232 Some 'Move Table to I/O Unit' commands don't work as expected with mistic I/O

KB80248 Some SNAP-PAC-S1/S2 controllers may reset on power-up

KB80275 mistic brain totalizer rates truncated by 'Set Analog Totalizer Rate' command

KB80280 mistic digital input IVALs not cleared by the 'Clear Counter' command

KB80282 mistic digital input with 'Period' feature always displays 0

Version R8.1a

Oct 12, 2007

IMPORTANT: Before installing version R8.1a firmware on a SNAP-PAC-S1, first install the special boot loader update firmware S8.0g.

To download the S8.0g bootloader and for detailed instructions, see OptoKB_KB59233 <http://www.opto22.com/site/downloads/drilldown.aspx?aid=3405> on the Opto 22 website.

New Features

- Support for new S2 controller, SB1 & SB2 brains

- Support for the SNAP-AIMA-8, SNAP-AIV-8, and SNAP-AICTD-8 eight-channel analog input modules

- Support for inverted scaling on analog input points on Ethernet brains.

- Support for Background Download feature, which is the ability to download a strategy while the current one keeps on running.

- Added the Flag Lock Flag Unlock commands, which allow you to craft a strategy to give a task exclusive access to one or more objects--such as a tables, integers, or I/O units--until the task is complete.

- PAC brains now do more mistic-like features, including Digital/Analog Totalizing, Frequency/Period measurement.

- When communicating with I/O Units, retries are now logged in the message queue with an informational message: -539 "I/O error; performing retry" which could help in troubleshooting communication issues.

- Expanded Digital Event including support for high-density digital modules and latches

- New "appe:<localfile>,<remotefile>" option for FTP communication handles. This option is similar to send but appends to the end of the remote file.

- New "mkdir" and "cd" options for FTP communication handles. This is useful when using folders and subfolders on the remote FTP server.

- The Move Numeric Table to Numeric Table command now supports copying Integer 32 Tables to Float or Pointer Tables, and Float or Pointer Tables to Integer 32 Tables. Pointer tables can also be used for either the “from” or “to” side of the copy.

- Added “SECONDS since powerup” to status read at address F030 0160. This improves upon the “Milliseconds Since Powerup” value at address F030 010C because it will take 1000 times longer to roll over to 0.

- Added the Digital Feature Scan Interval (msec) feature at address 0xF038 0294. See the OptoMMP Protocol Guide, form 1465, for details.

- Added watchdog support for high-density digital points.

- Improved the handling of disabled I/O units for commands that have no IVAL to return. Remaining retries are now skipped, and an informational message is posted in the queue.

Bug Fixes

[PAC-R1, PAC-EB1]

KB59458 - A problem has been corrected where ramping didn't always work if called more than once. For example, the command may have had no effect, or it may have ramped up to a smaller number than expected.

[PAC-R, PAC-EB]

KB58962 – A problem has been corrected where load cell configurations were lost when power cycled to the I/O rack.

[PAC-R]

KB57299 - A problem has been corrected where watchdog timers configured on points local to the controller (like a SNAP-PAC-R or an Ultimate I/O unit), may have timed out even though the controller was accessing its own I/O points.

[PAC-R, PAC-S1]

KB58160 - A problem has been corrected where if a NULL pointer variable was requested from a controller strategy by a PAC Display project or an OPC client, a recoverable error (a Stack Overflow error) may have occurred.

KB57195 – A problem has been corrected where changing the TPO percentage on an output point resulted in the TPO cycle restarting immediately, using the new percentage.

KB58048 - A problem has been corrected where if the source for a PID setpoint was an I/O point, and the destination for the output was set to Host, the PID output gave unexpected results.

KB57840 – A problem has been corrected where the following commands could incorrectly convert a string's numeric value:
Convert Hex String to Number
Convert IEEE Hex String to Number
Convert Mistic I/O Hex to Float

This was more likely to occur if the string's prior length was longer than the length of the string passed to the command.

[PAC-R, PAC-S]

KB56323 A problem has been corrected where repeated use of FTP communication handles by Ultimate or SNAP PAC controllers could cause problems. Eventually, error 222 was reported by the controller when trying to access a file. Cycling power to the controller corrected the problem.

KB59514 A problem has been corrected where attempts by applications to connect to Ultimate I/O controllers on host port 22001 were not successful and received a -10038 Timeout while connecting to device message. Applications attempting to connect on the host port included, ioDisplay, ioTerminal, ioControl Debugger, and OPC Clients. The controller could, however, be pinged, and inspected with ioManager.

Version S8.0g

Internal release only

[PAC-S1 only]

KB59233 – An updated bootloader (loader) for the SNAP-PAC-S1 is available for controllers with loaders prior to version R3.1c. The update is not required, but is recommended for your next maintenance opportunity. Bootloader update kernel version S8.0g evaluates the installed SNAP-PAC-S1 bootloader and updates it to version R3.1c, if necessary.

To download the S8.0g bootloader and for detailed instructions, see OptoKB KB59233 <http://www.opto22.com/site/downloads/drilldown.aspx?aid=3405> on the Opto 22 website.

Version R8.0f

Limited Release Only
Sep 17, 2007

Bug Fixes

[PAC-R1 only]

- KB59249 – A problem has been corrected where the controller would reset when an error queue was "viewed" and there was an error that referenced an I/O point.

[PAC-R, PAC-EB]

- KB58676 - A problem has been corrected where resetting SNAP analog modules sometimes caused unexpected behaviors on some Ethernet brain features. Analog modules sometimes reset if there is insufficient voltage, or if the module is unplugged from the rack. They display an "invalid float value" such as -1.#QNAN, -1.#QNAN0, or -nan.

If one of these invalid float values was used as the input to a PID loop, the output option for when the input is out of range may not have been applied since the PID loop did not recognize the invalid float value as an out-of-range value.

[PAC-S1 only]

- KB57916 - When multiple serial mistic I/O units are configured, and one is taken off line (or turned off), this no longer causes other I/O units to go offline as well.

[PAC-S1, PAC-R]

- KB58578 - A problem has been corrected where when using the Move I/O Unit to Numeric Table command in a srategy, a possible "-3 Buffer overrun or invalid length error" message was sometimes posted to the controller message queue.

- KB58310 - A problem has been corrected where some 64-bit integer table element bit values in PAC Display projects or OptoOPCServer clients may have unexpected results.

- KB58879 - Diagnostic-info generation in spurious interrupt handler can cause call stack overrun.

Version R8.0e

Jul 3, 2007

Bug Fixes

[PAC-R, PAC-EB]
• (KB54532) Corrected a problem where setting a point's filter weight, for example, by using the Set Analog Filter Weight command, could cause a point's filtered value to get stuck at QNAN, 0xf80000000 (infinity) in certain situations.

[PAC-R, PAC-S]
• (KB58101) Corrected a problem where watchdogs do not work if any higher density modules (such as the SNAP-IAC-16) are configured.

Version R8.0d
Internal release only

Bug Fixes

[PAC-R, PAC-S]
• (KB57605) A problem has been corrected where bank read and write commands on I/O units using standard (4 channel) digital modules returned incorrect data when modules were installed in positions 8 through 15.

• (KB57617) A problem has been corrected where the Set Analog Filter Weight command had no affect.

Version R8.0c
May 15, 2007

Bug Fixes

PAC-R, PAC-EB

• (KB54562) Corrected a problem with the Ramp Analog Output command; if the ramp's endpoints were set outside the range of the analog output module, the analog output did not function correctly. The next Move command to the output caused the output to ramp to the position of the prior Ramp Analog Output command.

• (KB57251) Corrected a problem where only communication watchdogs configured on digital output points in the first position of a mounting rack would work. Watchdogs on digital output points in any other position on the rack would not respond.

PAC-R, PAC-S

• (KB57162) Corrected a problem whee outgoing TCP communications through PPP sometimes failed with some Outgoing PPP configurations. For example, if Specify Local IP Address was enabled for outgoing PPP and Set Default Gateway to PPP was not enabled for outgoing PPP, if the remote server negotiated an IP address that was not on the same subnet as that specified by Local IP Address for PPP Interface and Local subnet mask for PPP Interface, then packets destined for the remote device on the specified subnet could be dropped.

PAC-S

- (KB56949) A problem has been corrected where the DTR signal on the SNAP-PAC-S1's serial Port 0 was asserted at power up. As a result, if a modem was connected to this port, the data received by the controller was sometimes incomplete.

PAC-EB

- (KB57271) EB2 only. A problem has been corrected where event messaging did not work on the SNAP-PAC-EB2. This included streaming, e-mail, serial module, SNMP, and MemMap Copy Destination.

Version R8.0b
Apr 20, 2007

Bug Fixes

PAC-S, PAC-R

- (KB56600) A problem has been corrected where if the PAC Control and ioControl Move Numeric Table To I/O Unit command was sent to an Ethernet-based I/O unit, the controller performed a write to the unit's analog points, even if the unit was disabled. If the I/O unit was online, this could cause the unit's analog output values to change unexpectedly.

- (KB56657) A problem has been corrected where multiple controllers could stop communicating after an intense burst of general broadcast traffic on the Ethernet network. Disconnecting and reconnecting the Ethernet cables attached to the units restored communication to them.

- (KB56666) A problem has been corrected where two or more ioControl communication file handles used in different charts at the same time could cause unexpected results, including a controller reset.

- (KB56787) A problem has been corrected where the PAC Control MoveIoUnitToNumTable script command read the state of all of the modules and points, but then attempted write to the wrong index locations in the destination table, possibly resulting in lost data.

- (KB56793) A problem has been corrected where if the Get & Clear On-Latch or Get & Clear Off-Latch commands were used with a standard digital input point, the corresponding IVAL could not be cleared once the latch was set.

- (KB57034) A problem has been corrected where if two or more Ethernet interfaces (such as a computer and another SNAP-PAC controller) simultaneously attempt to connect to the same TCP port (such as the Host Task on TCP port 22001, or OptoMMP on TCP port 2001), the device could reset.

PAC-S

- (KB56419) A problem has been corrected where when the Set Mistic PID P Term command was used to set the gain on a Mistic I/O unit's PID loop, the input variable was also set. This could cause unexpected PID results.

PAC-R

- (KB56439) A problem has been corrected where attempts by Modbus/TCP protocol devices and applications to write to digital output points configured on SNAP-PAC-R2 I/O units were unsuccessful even though their states could be read.

Version R8.0a

March 1, 2007

Enhancement

Support has been added for the SNAP-AITM-8 thermocouple input module.

New Features

- (KB56085) There are new get.to/set.to options for setting and getting the timeout values for "ser:" and "tcp:" communication handles.

- (KB53048) You can now set up an FTP username and password for greater security when sending files via FTP to and from an Opto 22 controller or brain that has file capability. The username and password can be set up in the Network Security dialog box either in a configuration file or in Inspect mode.

- (KB56073) A hardware change to the SNAP-PAC-R1 unit increases support from 32 to 64 high-speed digital I/O points. The high-speed digital I/O features include:
  · high-speed counting
  · quadrature counting
  · on-pulse and off-pulse measurement
  · TPO
  · pulse generation

  On a 16-position rack such as the SNAP-M64, any position on the rack can support a digital module. Prior to the design change, you could only install a digital module in the first 8 positions of the mounting rack.

  SNAP-PAC-R1 firmware has an auto-detect feature to determine if the I/O unit hardware supports 32 or 64 points of digital I/O. This allows newer firmware to run on any the SNAP-PAC-R1 hardware version.

Bug Fixes

(KB55814) A problem has been corrected where if you clicked on the PIDs folder under an I/O unit, the PIDs wouldn't display, and the I/O unit would go offline.

PAC-S, PAC-R

- (KB51181) A problem has been corrected where the Config EEPROM 'Set' button in Debug mode disabled the I/O unit.

- (KB51806) A problem has been corrected where a paused, expired uptimer evaluated false when used with the conditional command Timer Expired?. Since the timer time had expired, this command should evaluate true.

- (KB51848) A problem has been corrected where writing a table to an Ethernet I/O unit was updating only the IVALs, even if the I/O unit and all its points were enabled.

- (KB53147) A problem has been corrected where commands used to transfer data with a FTP communication handle sometimes failed. Using the Send Communication Handle command sometimes returned error -408. Resetting the controller might temporarily clear the error.

- (KB53614) A problem has been corrected where if the streaming feature was configured to send to multiple stream clients, the synchronization code (an integer whose value is changed each time data is streamed) was incremented between each host instead of after transmitting to all hosts. With this behavior, the client could not detect if stream packets were dropped.

- (KB54363) A problem has been corrected where the ioControl command Generate Reverse CRC-16 on Table (32 bit) might not work when used with SNAP-PAC or Ultimate I/O units.

- (KB54505) A problem has been corrected that resulted when a communication handle in a subroutine was not closed before the subroutine was exited. For each local communication handle opened, but not closed, in a subroutine, an item was left on the data stack. This could eventually result in erratic controller behavior; in some cases, it could cause the controller to reset.

- (KB54846) A problem has been corrected where if a default gateway was configured on the primary Ethernet interface, the secondary interface for communication could not communicate via the secondary interface, even after the secondary interface was reenabled.

- (KB54853) A problem has been corrected where when attempting to read a numeric scratchpad element (for example using GetIoUnitScratchPadInt32Element), or to write a table to numeric scratchpad elements while in a subroutine, a -29 error would be generated, and the value(s) would not be read or written.

- (KB54940) A problem has been corrected where if a pointer table was passed into a subroutine and an element was changed to point to a subroutine variable, the controller sometimes locked up when the table element was accessed.

- (KB55154) A problem has been corrected where the command Set End-of-Message Terminator did not report an error code (-52) when the communication handle connection was not open.

- (KB55166) A problem has been corrected where the command Set End-of-Message Terminator sometimes caused problems when used with file communication handles if it was set to 0x00 (null). For example, if it was used with the Receive String Table command, the command failed and reported error –44.

- (KB55168) A problem has been corrected where if the command Receive String Table command was used with a communication handle that had no data waiting, the command did not wait for the configured timeout period to expire.

- (KB55848) A problem has been corrected where if an I/O unit was not configured with an address of 0 through 3, the RS-485 serial port on SNAP-PAC-S1, SNAP-PAC-R1, and SNAP-PAC-R2 controllers may not have been properly initialized to communicate to serial I/O units. The serial port alternated between being properly initialized and not being properly initialized.

- (KB55977) A problem has been corrected with receiving data on via a serial communication handle when there are multiple EOM characters in the receive buffer.

- (KB56192) A problem has been corrected where un-initialized (NULL) Pointers to any type of point (Analog/Digital or Input/Output) could cause a reset following a failed assignment.

- (KB56283) A problem with the command Calc CRC on Table has been corrected.

PAC-S

- (KB51837) A problem has been corrected where a SNAP-PAC-R1 I/O unit could not be re-enabled after both the primary and secondary Ethernet ports on a SNAP-PAC-S1 were disabled, and then re-enabled.

- (KB55182) A problem has been corrected where the command IVAL Set I/O Unit from MOMO Masks did not set the IVALs to the specified mask values on a disabled, serial I/O unit.

- (KB55091) A problem has been corrected where Input module IVALs were changed when the ioControl command Set I/O Unit from MOMO Masks was used with a SNAP-PAC-S1 and a serial I/O unit. Digital inputs with IVALs previously in the ON state, were changed to the OFF state. Their corresponding XVALs indicated they were actually ON.

- (KB55236) A problem has been corrected where in a peer-to-peer network with a SNAP-PAC-S1, if the SNAP-PAC-S1 was intentionally stopped, the controller would sometimes reset. If the controller reset from ioControl debug mode, a timeout message would appear.

- (KB55187) A problem has been corrected where a communication handle with a reference to an invalid serial port returned a successful status code when used with a communication handle command on a SNAP-PAC-S1 controller.

- (KB55825) A problem has been corrected where Scratch pad information was not stored to the flash EPROM when instructed to, such as when Store configuration to flash was selected from ioManager or PAC Manager.

- (KB56017) A problem has been corrected where, if the watchdog was enabled on a Mistic I/O unit, that unit might not be fully initialized if the I/O unit returned a watchdog error during configuration. The only way to recover was to cycle power to the I/O unit, which would clear the watchdog error.

PAC-R

- (KB52576) A problem has been corrected where if a point on a SNAP-AIRTD or SNAP-AITM type module was configured as an RTD or thermocouple Point Type, respectively, subsequent point reconfigurations of the same point could produce invalid readings.

- (KB55161) A problem has been corrected where digital inputs configured as counters or quadrature counters on SNAP-PAC-R1s sometimes reported the wrong counter value. The counter value might have temporarily (for one digital scan period) reflected a value that was too high by up to 255 counts.

Versions R7.1h and Earlier

For enhancements and bug fixes previous to R8.0a, see:

http://www.opto22.com/documents/RM_ALL_ENET_fw_71h.pdf