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Opto 22 Releases PAC Project Automation Software v9.5

Enhanced software suite includes IIoT integration through a RESTful API to controller tags and I/O—an automation and controls industry first.

Temecula, CA—July 21, 2016—Industrial automation manufacturer Opto 22 has announced immediate availability of version 9.5 of PAC Project™, a Microsoft® Windows®-based integrated software development suite for industrial automation, process control, remote monitoring, and Internet of Things applications. The most significant addition in this version is new firmware for Opto 22 programmable automation controllers (PACs) that includes an HTTP/S server with a RESTful API, providing developers with secure, programmatic access to control variables and I/O data using any programming language that supports JavaScript Object Notation (JSON). This new capability closes the IT/OT gap, allows for rapid Industrial Internet of Things (IIoT) application development, provides for secure data exchange using open Internet standards, and reduces time to market in machine and system design.

The addition of a secure RESTful server and an open, documented API to a programmable automation controller (PAC) is a significant, ground-breaking industry innovation, because REST architecture and associated technology are intrinsic to the Internet of Things and paramount to web and mobile-based application development. Opto 22's implementation of REST directly into a commercially available, off-the-shelf industrial PAC is unique in the market and places the company as the first and only industrial automation and controls manufacturer to offer this industry-changing technology.

Other features found in this new version include new tools to develop modular control applications with nested subroutines, new debugging tools to reduce development time,

support for a worldwide installed base of legacy Optomux® I/O systems, and integration of third-party systems and protocols with the IIoT. To provide enhanced security and auditing for HMI access, PAC Project now offers sophisticated user groups and data rights, as well as the ability to embed video directly into HMI windows.

An Industry First

PAC Project 9.5 provides updated firmware for Opto 22 SNAP PAC S-series and R-series controllers that enables a secure HTTPS server on PAC controllers. Combined with a RESTful open and documented API, this new version allows developers to write applications that access data on the PAC using the developer's programming language of choice with the well-known and widely supported JSON data format. This new capability allows software and IoT application developers to decrease time to market, reduce the development learning curve, and eliminate layers of middleware for secure Industrial Internet of Things (IIoT) applications.

Firmware version 9.5 for SNAP PAC R-series and S-series controllers enables REST endpoints for both analog and digital I/O points as well as control program variables including strings, floats, timers, integers, and tables. REST endpoints are securely accessed using the new, fully documented RESTful API for SNAP PACs. Names of RESTful endpoints are derived from a configured PAC Control program strategy file and are therefore unique to each PAC's program and I/O configuration.

Client data requests are returned in JavaScript Object Notation (JSON) format, enabling PAC controllers and I/O to be used with virtually any software development language with JSON support, including C, C++, C#, Java, JavaScript, node.js, Python, PHP, Ruby, and many more. Database support is also available for database tools that work with JSON, like MongoDB®, MySQL®, and Microsoft's SQL Server®. With the release of PAC Project 9.5, developers are no longer tied to a specific manufacturer's software development environment. They can use the development environment and language of their choosing to write new software, create web services, and build Internet of Things applications.

RESTful data from PACs is secured using TLS encryption over HTTPS connections authenticated using basic access authentication (Basic Auth). RESTful data access can be restricted to read-

only use, or allow reading and writing to I/O and strategy variables. The HTTP/S server is disabled by default and must be configured and enabled to operate, preventing unwanted or unauthorized access to the controller over HTTP.

Also included in this release are two Node-RED nodes, used for communicating with SNAP PAC controllers through the RESTful API with Node-RED, a visual tool for wiring up the Internet of Things. Node-RED is an open-source, graphical, flow-based application development tool designed by the IBM® Emerging Technology organization that makes wiring up APIs, represented as "nodes," simple and easy to do. Node-RED is particularly useful for developing IoT applications that interact with cloud-based platforms and APIs, such as IBM Bluemix®, IBM Watson™, Amazon's® AWS™ IoT, AT&T® MX2, Microsoft Azure®, and Google Cloud Platform™.

For more information on working with the new RESTful server for Opto 22 PACs, reviewing the open and documented RESTful API for SNAP PAC controllers, and using SNAP PAC Node-RED nodes, please visit http://developer.opto22.com.

A Multi-Tool for Control Programming

PAC Control™, PAC Project's control program development environment, provides engineers with an intuitive interface for writing control programs. Through a flowchart-based programming interface and a comprehensive plain-English command set, PAC Control allows engineers to design, build, and debug control programs in a single interface. The multi-tool of control program development, PAC Control includes commands for analog process and digital sequential control, complex math, conditional branching, string handling, serial device control, PID loop control, protocol support including EtherNet/IP™, Modbus® TCP/IP, OPC®, TCP/IP, FTP, SNMP, SMTP, NTP commands, data arrays, and other complex functions. PAC Control also provides an optional advanced scripting language, nested subroutines, and a graphical debugger to decrease development and debugging time.

PAC Control also now includes improved support for legacy Optomux I/O systems by adding the ability to configure E1 and E2 I/O units, or "brains", directly in PAC Control, just like other I/O units. PAC Control also offers several integration kits to communicate with systems and protocols like BACnet®, Modbus serial, HART®, DNP, IEC-60870-5, TL1, and more.

Together with the release of the RESTful API to SNAP PAC controllers, data from these legacy I/O systems, third-party devices, and industry-specific protocols can be acquired in any language that supports JSON, including applications used to build the Internet of Things, thereby helping companies collect machine, sensor, and system data for predictive analytics, maintenance systems, and data collection.

Video, Live Streaming, and Interactive Web App Support

PAC Project's PAC Display Professional™ Runtime HMI software now supports video and interactive web apps through integration of Google's Chrome™ web browser into PAC Display screens. This new feature allows PAC Display Pro users to easily integrate video feeds into HMI screens, providing a rich interface to machines and equipment while at the same time increasing an operator's situational awareness of what's happening in their applications in real time.

Enhanced SNAP I/O Module Support

Saving PAC Project users time and improving their ability to respond to last-minute I/O changes, version 9.5 provides quick and easy methods for moving I/O modules and associated I/O points among various remote SNAP I/O units throughout a system.

Two new SNAP I/O modules are also supported in PAC Project version 9.5. The SNAP-OMR6T-C mechanical power relay output module offers four isolated channels of switching for up to 250 VAC or 30 VDC, 6 amp loads. This module includes integrated transient suppression while maintaining minimal leakage current. Each of the four mechanical contacts can be used in a normally open or normally closed configuration.

The new SNAP-AIRTD-8U multi-function RTD/resistance analog temperature module provides eight input points, each individually software-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. Commonly used for 3-wire RTD temperature inputs, the module is also suited to high-resolution resistance measurements.

Deeper Database Integration

PAC Project version 9.5 now offers deeper database integration through its PAC Display HMI software. In addition to SuperTrend historical data, historical logs, and Runtime operator logs, PAC Display can now send data from alarm logs and event logs to ODBC-compliant databases such as Microsoft Access®, SQL Server, and MySQL databases. This new integration support allows control data and system information to be easily shared across a multitude of data repositories.

About PAC Project

The complete list of PAC Project components:

- **PAC Control**—an intuitive flowchart and scripting control programming software application for developing control programs that run on SNAP PAC controllers. Ideal for sequential control, batch and process control, PID loop control, and more. Using the built-in scripting language OptoScript™ simplifies complex math, conditional branching, and string handling.

- **PAC Display**—a human-machine interface (HMI) development application used to create graphical interfaces to monitor and operate a control system. Support for alarm management, recipe handling, operator logging, real-time and historical trending, multimedia, and unlimited tags puts PAC Display on par with competing HMI development applications costing thousands of dollars more per seat.

- **PAC Manager**™—a configuration and maintenance tool used to set up and inspect controllers and I/O data in real time.

- **EtherNet/IP Configurator**—a configuration tool for establishing communication between an Allen-Bradley® PLC system and intelligent remote SNAP I/O.

- **SoftPAC**™ (included with PAC Project Professional™ or available separately)—a software-based programmable automation controller for PC-based control.

- **OptoOPCServer**™ (included with PAC Project Professional or available separately)—an OPC 2.0-compliant server used to consolidate and publish SNAP PAC System™ data to

OPC-aware clients, including third-party HMIs such as Wonderware's® InTouch, Intellution's® iFix™, and Iconics' GENESIS32™ and GENESIS64™.

- **OptoDataLink**™ (included with PAC Project Professional or available separately)— connectivity software used to enable bidirectional data transfer between the SNAP PAC System and enterprise databases—such as Microsoft SQL Server, Microsoft Access, and MySQL—without brokering the data through an HMI..

About Opto 22

Opto 22 designs and manufactures industrial control products and Internet of Things platforms that bridge the gap between information technology (IT) and operations technology (OT).

Based on a core design philosophy of leveraging open, standards-based technology, Opto 22 products are deployed worldwide in industrial automation, process control, building automation, industrial refrigeration, remote monitoring, data acquisition, and information technology applications. Designed and manufactured in the U.S.A., Opto 22 products have a worldwide reputation for ease-of-use, innovation, quality, and reliability. For over 40 years OEMs, machine builders, automation end-users, and information technology and operations personnel have and continue to trust Opto 22 to deliver high-quality products with superior reliability. The company was founded in 1974 and is privately held in Temecula, California, U.S.A. Opto 22 products are available through a global network of distributors and system integrators. For more information, contact Opto 22 headquarters at +1-951-695-3000 or visit www.opto22.com.

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