



PowerSync Analyzer **Version 3.5** software and related documentation is available starting April 20, 2010. This software replaces Version 3.4 software originally released in October 2009. PSA Version 3.5 software upgrades do not require any firmware upgrades to the PSA-1200, but will require firmware upgrades to the PSA-3000 if either LLDP or PSE Conformance Test features are activated.

**PSA 3.5 Host Platform Support**

PSA Software version 3.5 is the first major release of PSA software to universally support the following host platforms:

**Any Dual-Core PC Processor Host**

The dual core PC architecture does not assure the same real time execution speed of programming commands that would otherwise occur in a single processor architecture under Windows or Linux. Random occurrences of command “slips” lasting over 0.5 seconds can be detrimental to applications such as the PSE Conformance Suite or the PSA Multi-Port Suite. PSA 3.5 adds operating system controls that restrict all processing to a single core (or processor) for best real-time performance.

**Windows 7 and Vista**

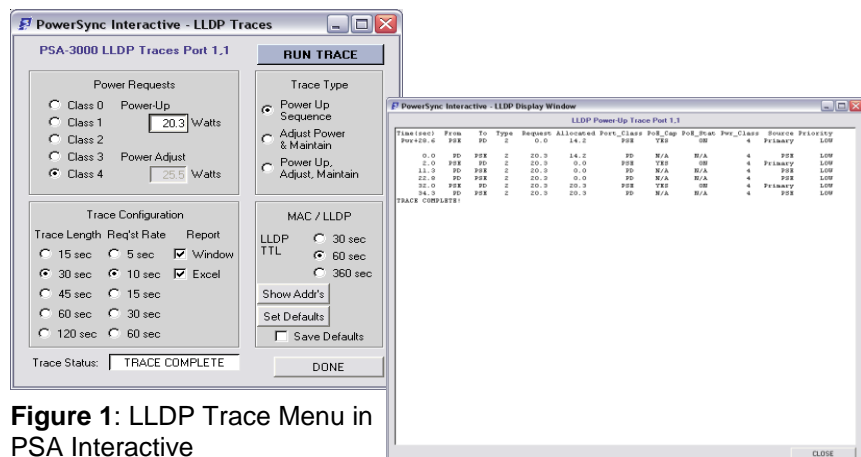
Windows 7 and more recent versions of Windows Vista place severe constraints on software installation, software updating, and especially placement of user data under the \Program Files directory. For security reasons, these versions of Windows will often prohibit such operations without announcing this to users. The PSA 3.5 installer establishes proper credentials to facilitate installations and upgrades under Windows 7 and Windows Vista, however, all user data files and directories associated with PSA 3.5 software are relocated to the user\public\ directory on these systems. See section 2.4 of the version 3.5 PSA Technical Reference Manual for further information.

**Full LLDP Testing ... Available NOW!**

**New 802.3at LLDP Emulation and Diagnostic Capabilities with PSA-3000 and PSL-3000**

PSA Software version 3.5 adds powerful new features for those working with new or developmental end-span PSE’s that use Link Layer Discovery Protocol (LLDP) for Type-2 power enabling, power-negotiation, and power management purposes. With the introduction of these features, the PSA-3000 and PSL-3000 LLDP options are now available to all customers through a simple license key upgrade from Sifos. LLDP capability enhancements with version 3.5 include:

- Full compliance to 802.3 Clause 33 and Clause 79 LLDP
- Fully automated protocol tracing (both PSE and PD packets) of LLDP power-up negotiations



**Figure 1:** LLDP Trace Menu in PSA Interactive

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- Fully automated protocol tracing of LLDP power-change negotiations
- Access to Protocol Traces and Emulated LLDP Power-Ups from PSA Interactive (Figure 1) and PowerShell PSA
- Colorful, pop-up Microsoft Excel spreadsheet with LLDP protocol content and timing analysis (Figure 2)

PSA-3000 LLDP Trace		PSE	Port	Trace Type	Requested	Allocated	Echo Time	Alloc Time	Init. Time	Time To Live
April 05 2010 3:18 PM PSA Address: 192.168.221.106		ACME 2412	5-1	Power-Up	7	7	10.7	10.7	15.1	300
					Watts	Watts	Seconds	Seconds	Seconds	Seconds
Time	From	To	Type	Requested	Allocated	Port Class	MDI Capability	MDI Status	Power Class Source	Priority
Pwr+28.6	PSE	PD	2	0.0	14.2	PSE	YES	ON	4 Primary	LOW
0.0	PD	PSE	2	20.3	14.2	PD	N/A	N/A	4 PSE	LOW
2.0	PSE	PD	2	20.3	0.0	PSE	YES	ON	4 Primary	LOW
11.3	PD	PSE	2	20.3	0.0	PD	N/A	N/A	4 PSE	LOW
22.8	PD	PSE	2	20.3	0.0	PD	N/A	N/A	4 PSE	LOW
32.0	PSE	PD	2	20.3	20.3	PSE	YES	ON	4 Primary	LOW

Figure 2: LLDP Protocol Trace Report

- Flexible configuration of PD power targets, PD class, PD messaging rates, PD time validity, and trace duration with each protocol trace
- Emulated PD LLDP power-ups to any power level (Type-1 or Type-2)
- Improved and expanded PowerShell PSA command set for LLDP emulation programming

**Note!** PSA-3000 and PSL-3000 instruments must be upgraded to test blade firmware version **3.0B** to take advantage of the new LLDP features in PSA version 3.5.

## PSE Conformance Test Suite for 802.3at

PSA Software version 3.5 enables access to the enhanced “beta” version of the PSE Conformance Test Suite for **802.3at**. This test suite is designed to provide over 95% coverage of all PSE and LLDP PIC’s items in 802.at. Access to this suite requires a PSA-3000 that is fully enabled for the PSE Conformance Test Suite and also requires a Sifos-furnished PowerShell PSA command utilized to enable or disable the new test suite.

New features of the PSE Conformance Test Suite for **802.3at** include:

- New **class\_lldp** test: Generates coverage on many of the LLDP PIC’s items in 802.3at specification. New test is accessible to PSA-3000’s and PSA-1200’s with PSA-3102 test blades that are enabled for LLDP emulation.
- Numerous improvements to **class\_v**, **class\_time**, and **class\_err** tests to improve accuracy while working with many configurations of the latest PSE device technologies and tolerating the increasing presence of firmware-managed (or “multi-cycling”) power-up decisions and state transitions.
- Improved **pwrup\_time** test with more accurate measurements of **Tpon** and **Trise** (especially for fast rise times).
- Improvements to the new PSE adaptive logic to add coverage for a number of new variants of PSE Controller implementations observed since October, 2009 with full regression testing against many dozens of older PSE controller implementations.
- Implemented shared utility designed that will be used by all future 802.3at PSE Conformance Tests to manage any required LLDP emulated power-ups with automated diagnostic logging

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and diagnostic processing for failed power-ups and/or failed protocol. *Each of the remaining PSE Conformance Tests to be implemented for 802.3at will take advantage of this capability.*

- Improved **pwrup\_pwrcap** test to take advantage of new LLDP emulated power-up utility for PSE Conformance Tests. Refined power capacity testing logic.
- Revised the **pwrup\_inrush** test for 802.3at to take advantage of new PSA-3102 firmware feature that assures foldback suppression does not interfere with PD Class 4 signatures so PSE inrush behaviors given Type-2 PD connections can be properly captured and analyzed.
- Refinements to **det\_v** and **det\_time** to improve parameter accuracies.
- Modified PSE Conformance Test sequencer (using PowerShell PSA **sequence** command) to run with pure PD **Class 1** and PD **Class 2** emulations. This facilitates testing of PSE's that are designed to power PD's up to Class 1 (max 4 watts per port) or Class 2 (max 7 watts per port).

The Beta Version PSE Conformance Test Suite for **802.3at** currently offers the following tests:

- |                    |                      |                       |
|--------------------|----------------------|-----------------------|
| • <b>det_v</b>     | • <b>det_rsource</b> | • <b>pwrup_time</b>   |
| • <b>det_i</b>     | • <b>class_v</b>     | • <b>pwrup_inrush</b> |
| • <b>det_range</b> | • <b>class_time</b>  | • <b>pwrup_pwrcap</b> |
| • <b>det_time</b>  | • <b>class_err</b>   | • <b>class_lldp</b>   |

Under PSA 3.5, new Beta Versions of the 802.3at PSE Conformance Test Suite may be added at any time without further PSA software upgrades. Tests to be added include:

- |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|
| • <b>pwrup_v</b>      | • <b>mps_ac_pwrup</b> | • <b>mps_dc_pwrup</b> |
| • <b>pwrup_maxi</b>   | • <b>mps_ac_vf</b>    | • <b>pwrup_time</b>   |
| • <b>pwrup_overld</b> | • <b>mps_ac_voff</b>  | • <b>pwrup_v</b>      |
| • <b>pwrup_overld</b> | • <b>mps_dc_valid</b> |                       |

**Note!** PSA-3000 and PSL-3000 instruments must be upgraded to test blade firmware version **3.0B** to take full advantage of the new 802.3at Conformance Suite features in PSA version 3.5.

### ***(Original) PSE Conformance Test Suite Enhancements***

Under PSA version 3.5, enhancements affecting the “traditional” PSE Conformance Test Suite for 802.3af and for pre-standard high power testing include:

- Improvements to the original PSE adaptive logic to add coverage for a number of new variants of PSE Controller implementations observed since October, 2009 with full regression testing against many dozens of older PSE controller implementations.
- Improved **Tdbo** measurements in **det\_time**.
- Improved **det\_range** test in the area of capacitive signature analysis.
- Corrected conditional problems in **pwrup\_time Trise** and **mps\_dc\_valid Tmps** measurements.
- Modified **mps\_dc\_valid** and **mps\_dc\_pwrup** to accept PD Class argument to enable emulation of PD Class 1 and 2, rather than default PD Class 0.
- Revise **Tovld** parameter in **pwrup\_overld** to **Tcut** to align to final 802.3at standard.
- Modified PSE Conformance Test sequencer (using PowerShell PSA **sequence** command) to run with pure PD **Class 1** and PD **Class 2** emulations. This facilitates testing of PSE's that are designed to power PD's up to Class 1 (max 4 watts per port) or Class 2 (max 7 watts per port).

## PSE Conformance Tests: PSA 3.5 vs the Future

The original PSE Conformance Test Suite (for 802.3af) will continue to be supported on the PSA-1200 platform in future releases.

Future releases of PSA software will automatically substitute the PSE Conformance Suite for **802.3at** whenever users are connected to a PSA-3000 (or PSA-1200 with 100% PSA-3102 test blades). So the original PSE Conformance Test Suite (for 802.3af) would no longer be utilized with PSA-3000's from that point forward.

As many PSE's evolve to 802.3at and Sifos customers upgrade from PSA-1200 to PSA-3000 platforms, the original PSE Conformance Suite (for 802.3af) will eventually reach obsolescence.

## PSE Conformance Test Report Enhancements

- Version 3.5 standard spreadsheet report fully adapted to work with both the 802.3af and PSA-1200 Port Combined tests as well as new PSA-3000 802.3at tests.

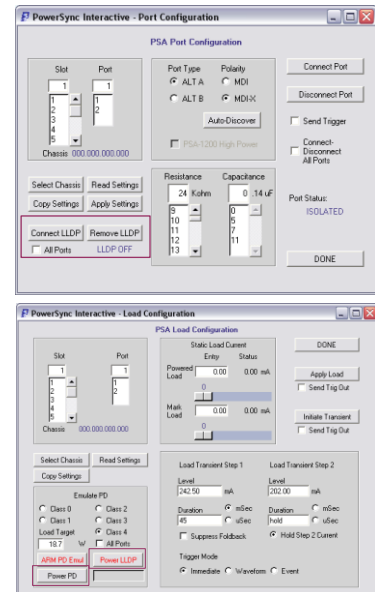
## PoE Service Analyzer Enhancements

- Rolled the Service Analyzer application from the PSA-100 to the PSA-3002 Compact PSA
- Improved power capacity measurement accuracy and repeatability

## PSA Interactive Enhancements and Improvements

PSA 3.5 adds several new PSA Interactive features mainly to support LLDP emulation and testing.

- Added **Connect LLDP** and **Disconnect LLDP** functions (*Figure 3*) to Port Configuration menu. **Disconnect LLDP** will route the PSE IN port to the OUT port.
- Added **Power PD** control to the Load Configuration Menu (*Figure 3*). **Power PD** will connect the virtual PD and cause the emulated (non-LLDP) power-up to complete on selected port or **All Ports**.
- Added **Power LLDP** control (*Figure 3*) under **Emulate PD** sub-menu. **Power LLDP** will power up a PSE port using both the selected **PD Class** and the **Load Target** power level and report status of LLDP power negotiation.
- Added access to LLDP Power-Up Trace and LLDP Change Power Trace from the PSE Tests menu (*Figure 4*) including specification of PD Classification.
- Added a second standard PSE **Classification Waveform (Invalid)** to assess PSE port power-up response to a high (e.g. 75 mA) Classification Signature (*Figure 4*).
- Added access to the **LLDP Traces** menu from the PSE Waveforms & Traces menu under PSA Interactive (*Figure 4*).



**Figure 3:** Port and Load Config Menus

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- Added new LLDP Traces menu for configuring and collecting comprehensive PoE LLDP Protocol Traces and associated reporting (Figure 5).
- Enabled the **psa\_test\_load** test to perform LLDP emulated power-ups when **30W Grant** is LLDP and **PD Class** is 4.

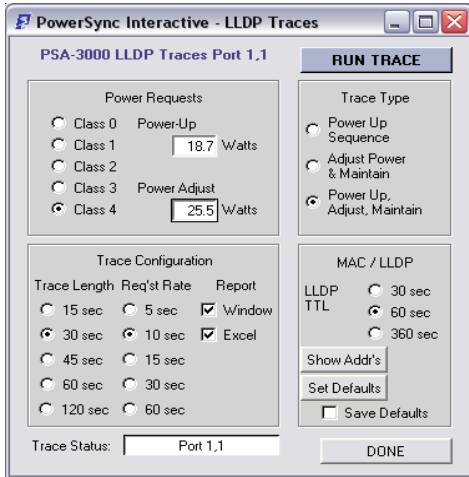


Figure 5: PSA LLDP Traces Menu

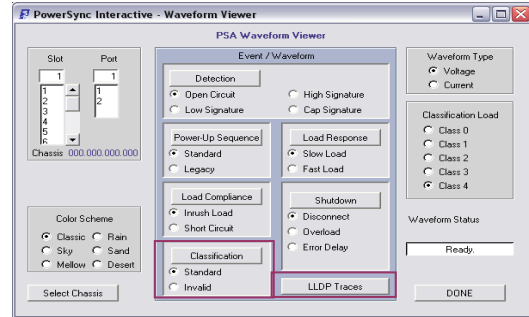
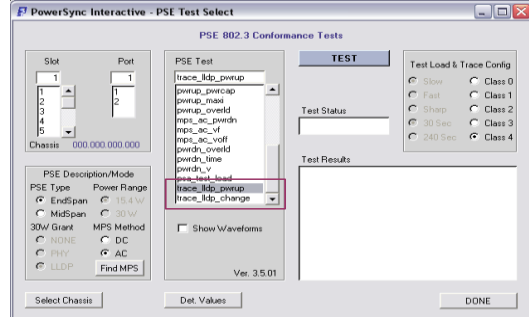


Figure 4: Selected Tests and Waveforms & Traces Menu

## PSA Interactive PL Enhancements

PSA 3.5 adds several new PSA Interactive-PL features mainly to support LLDP emulation and testing.

- Added **Power via LLDP** check box (Figure 6) to support PD Class-specific LLDP power-ups on selected test port. When checked, any PD Class selection will govern a default power request and status of power-up and negotiation will be reported in the Measured Value and Units display.
- Added **LLDP Traces** button to access the LLDP Traces menu shown above with PSA Interactive (Figure 5).

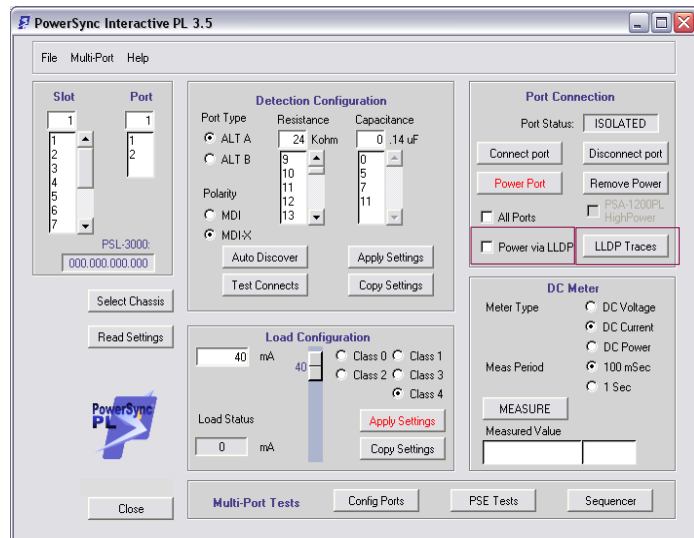


Figure 6: Version 3.5. PSA Interactive PL

## PowerShell PSA Tcl-Wish Enhancements

PSA version 3.5 software includes the following modifications and enhancements to PowerShell PSA:

- Modified **itrans** command to accept new '**step1**' argument to delay foldback suppression until approximately 1 msec following the start of load transient step #1. This change enables inrush testing with PD class 2 – class 4 signatures regardless of PSE classification voltage.
- Modified **class** command to accept new '**init**' argument with LLDP power requests in order to force PSE Allocated Power to equal PD Request Power when port is first powered on.
- Modified **timint** (time interval meter) query to compensate usec scale measurements by a minimum baseline of +4 usec following in depth analysis of fast time interval measurements compared to reference external measurements.
- Enabled **psa\_test\_load** script to perform LLDP emulated power-ups.
- Corrected a problem in **sequence** affecting selected test lists with one or more **mpps\_** tests included.
- Corrected a problem with PSA-1200 firmware updates that was introduced in a prior release.
- Modified **psa\_update\_fw** to allow automated sequencing of PSA-3102 and PSL-3102 firmware updates inside a PSA-1200 chassis.
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## Enhancements to LLDP Extensions to PowerShell

- Added new Protocol Trace commands, **trace\_lldp\_pwrup** and **trace\_lldp\_change** to provide flexible and comprehensive analysis of PSE-PD LLDP protocol sequences.
- Enabled Demo Mode to support LLDP emulated power-ups and Protocol Traces from PSA Interactive and PowerShell PSA.
- Modified default **power\_port** LLDP timeout from 15 seconds to 35 seconds to allow for slow power grants. Improved **power\_port** time-to-power-up performance when emulating LLDP power-ups.
- Modified **power\_port** to allow any input target power specified with the '**p power**' argument to override the LLDP power request in governing the final power draw of the PD emulated power-up.
- Modified **power\_port** to automatically clear the LLDP receive buffer and reset PSE frame count to 0 during power-ups.
- Added **psa\_lldp\_clear** command to clear the LLDP receive buffer and reset PSE frame count to zero.
- Removed redundant status of TTL from **pd\_frame** command. PD LLDP TTL is configured and queried from the **pd\_lldp** command.
- Modified **psa\_lldp\_trace** to respond quicker to active protocol exchanges and to fully support higher layer LLDP Trace applications. Enabled traces as short as 15 seconds. Modified file output arguments and added a .csv format output.
- Modified **psa\_alloc\_wait** to respond quicker to "early" incoming packets and to seek allocations that are "equal to" rather than "equal to or less than" when doing a "max" allocation seek.
- Modified **psa\_alloc\_wait** to optionally return on a PSE Power Request Echo rather than the final Power Allocation given the new '**ack**' argument.
- Modified **psa\_lldp\_wait** to respond quicker to rapid PSE LLDP echo's following PD Request transmissions with virtually no latency. Collectively, **psa\_lldp\_wait**, **psa\_alloc\_wait**, and the various protocol trace commands will be responsive to PSE Request echos occurring 100msec or less following transmission of a PD Request packet.

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- Modified **pd\_req** to accept the new argument 'init' whereupon the next PD Request Frame will set PSE Allocated Power (echo) to the PD Request Power level as required when an LLDP subsystem initializes.
- Extended **pd\_req** to make power requests up to 30W, or above maximum allowed by Type-2 PD's.
- Added 'rxtrig' arguments to **pse\_alloc\_wait** and **pse\_lldp\_wait** commands (PSA-3000 only) to enable PD Request transmission to start immediately upon receipt of the next PSE LLDP packet captured inside those utilities.
- Enhanced **pse\_frame** abilities to parse and present "raw" LLDP transmissions received from a PSE. Added ability to trap certain protocol violations.

**Note!** PSA-3000 and PSL-3000 instruments must be upgraded to test blade firmware version **3.0B** to take full advantage of the new LLDP features in PSA version 3.5.

### ***PSA Test Blade Version Support***

- PSA-1200 Test and Load Blades, Version 1, 2, and 3
- PSA-3000 Test Blade, Version 1
- PSL-3000 Test Blade, Version 1 and 2

### ***PSA Current Firmware Versions***

PSA-3000 Controller Blade	3.07
PSA-3102 Test Blades	3.0b
PSL-3000 Controller Blade	3.07
PSL-3102 Load Blades	3.0b
PSA-1200 Controller Blade	1.65
PSA-1200 Test Blades	1.59
PSA-1200-PL Load Blades	1.59