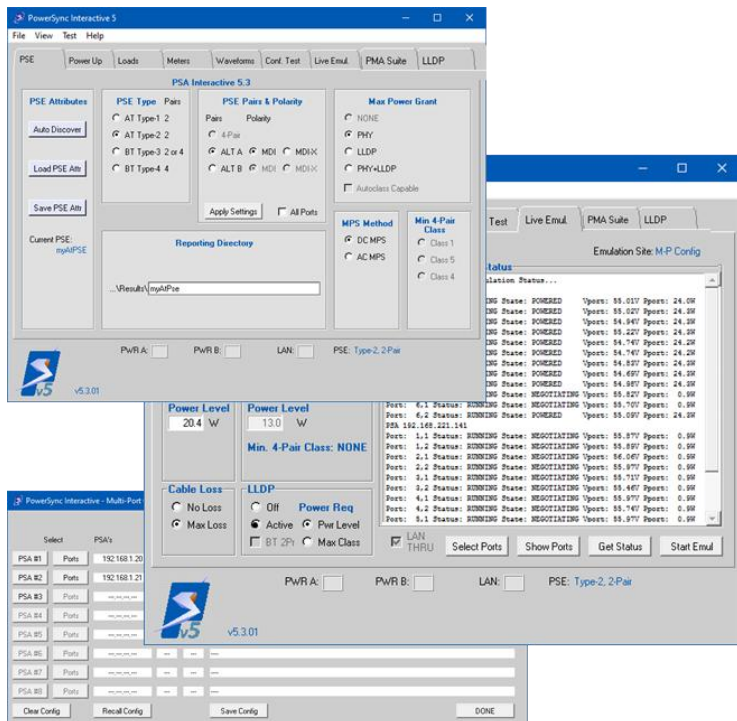# Sifos® Technologies

Multi-Port Live PD Emulation
for *2-Pair Powering PSE's*
IEEE 802.3 Power over Ethernet

Product Overview

PSA-3000

PSL-3000, PSL-3224

PSA-3x48

Key Features

- ☐ **Flexibly Mimic** Class 0 to 4 Powered Device Per PSA/PSL-3000 Test Port

- ☐ **Configure up to 192 Simultaneous IEEE 802.3 PD's**

- ☐ **User-Defined** Class 0 - 4 Powered Device Modeling with or without Cable Loss

- ☐ **Emulate 13W (Type-1/Type-3) and 25.5W (Type-2/Type-3) Devices**

- ☐ **Emulate 802.3at PoE-LLDP* Negotiations and Power Adjustments**

- ☐ **Emulate Both Valid and Non-Valid PD Loads**

- ☐ **Monitor Multi-Port Live Emulation Status**

- ☐ **Concurrent PD Loading to 34.5W on Every Port**

- ☐ **Available to PSA-3000 and PSL-3000 Platforms under the Multi-Port Suite Feature**

Verification, *Simplified.*

Overview

Power Sourcing Equipment (PSE) system developers and system test personnel are routinely confronted with the challenge to connect many Powered Devices (PD's) to many PSE ports in order to evaluate PSE administrative and power management behaviors.   With IEEE 802.3at extending power-per-port to 30 watts or more and adding the option of LLDP-managed power allocation between PSE's and PD's, the burdens on PSE power administration and power allocation processes are considerably larger.   PD's drawing more than 13 watts must respond to PSE power allocations and inrush delays before drawing full power.

IEEE 802.3 PSE's

802.3at End-Spans

802.3bt 2-Pair End-Spans

802.3at Mid-Spans

802.3bt 2-Pair Mid-Spans

No PD "Banks" Required

Emulate up to 24 PD's per Chassis, up to 192 PD's Total

Flexibly Emulate 802.3at Class 0 – 4 PD's including LLDP!

Flexibly Emulate 802.3bt Class 1 – 4 PD's

Evaluate PoE Admin & Power Management Decisions

Verify PSE Management Functions and Interfaces

Verify PSE Management Reporting

Verify Power Capacity

Multi-Platform Support

Configure ANY Combination of PSA-3000 and PSL-3000 Instruments

* LLDP Emulation & Analysis feature license is sold separately.

Multi-Port Live PD Emulation
Live PD Emulation represents a behavioral state where each Test Port in each PSA/PSL instrument autonomously behaves as a user-specified IEEE 802.3 PD regardless of the state of the PSE.   If a PSE administratively disables PoE service and then restores it, the PSE will detect a PD and re-apply power.   If a patch cord is disconnected and reconnected, the PSA/PSL Test Port will behave just as if an actual PD were at the end of the link. Users may describe PD Classification, PD Power Load, and Cable Loss Power when modeling PD's.   PD Classifications range from 0 to 4 and PD Power Loads range from 0.5 to 25.5 watts.   Cable Loss Power may be programmed to model *or exceed* worst case PoE power loss in a PSE to PD connection.

Multi-Port Live PD Emulation is a feature available under the **Multi-Port Suite** for the PSA-3000 and the PSL-3000.   Using PSA Interactive software, users may configure up to 192 Test Ports across up to 8 PSA/PSL chassis' to simultaneously model a user-defined PD.

Alternatively, using PowerShell PSA, users can program unique PD emulations *per Test Port* across any number of PSA/PSL instruments.

Multi-Port Live PD Emulation with LLDP
Live PD Emulation can be extended to model PoE (802.3at) LLDP messaging and protocol from a PD.   All 25.5W (or Class 4) PD's are required to support PoE LLDP protocol while 13W PD's have the option to support this link layer protocol.   PoE LLDP enables PSE's to manage power loads with 0.1 watt granularity per powered PD and also allows PSE's to "throttle" down Class 4 PD power levels (13 to 25.5 watts) to Type-1 levels, that is less than 13 watts.

Live Status Monitoring
PD emulation status across all emulating test ports is readily captured and displayed with a single mouse click to PSA Interactive software. This status information can be compared to PSE status information to assess that PSE status reports are accurate and up-to-date.
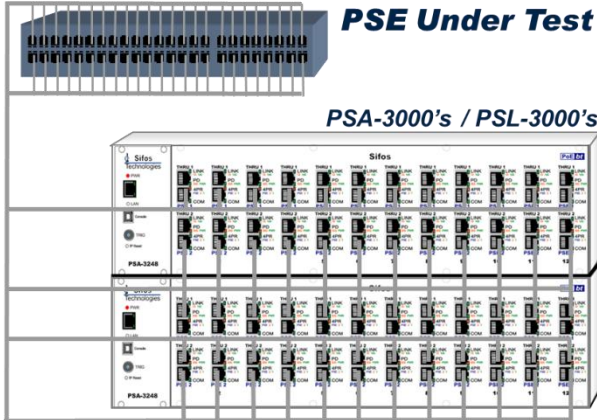
What About 802.3bt and 4-Pair Powering PSE's?
Live PD Emulation for 2-Pair PSE's will function with all 2-Pair 802.3bt PSE's and with 4-Pair 802.3bt's that support 2-pair PD powering.
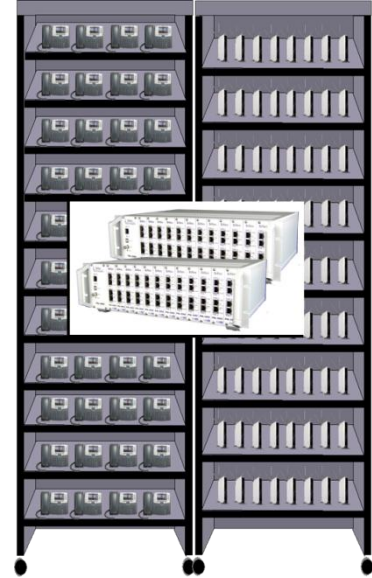
Live PD Emulation for PSE's powering any combination of 2-Pairs up to 30W and 4-Pairs up to 90W is available for the **PSL-3424A** and **PSL-3424L** instruments. *See* **PSE Live PD Emulation for PSL-3424 Overview**.

## Multi-Port Test Configuration (48 Port Example)

Flexible IEEE 802.3 PD Modeling on Every PSE Port

With the ongoing expansion of PD Types and Classes, PSE system developers and system testers are ever more challenged by testing administrative and power management functions in multi-port PSE's. The traditional "rack of PD's" is becoming prohibitively expensive and space consuming given the range of Powered Devices that are now possible under 802.3 standards. Emerging 4-Pair PSE's that power both 802.3at and 802.3bt PD's further complicate the system testing requirements and associated resource needs.

Using **Multi-Port Live PD Emulation for 2-Pair PSE's**, each PSA/PSL-3000 test port can flexibly model any Powered Device from Class 0 to Class 4 with static power loading from 0.5 watts to well over 25.5 watts. Maximum 2-Pair cabling losses can also be modeled along with PD power demand.

Traditional Rack of PD's vs 2x PSL-3000

Under control of **PSA Interactive** software, Multi-Port test resource fields of up to 192 test ports spanning up to 8 PSA/PSL-3000 chassis' may be configured. A single common PD emulation may then be activated on every test port in the resource configuration, thus allowing a PSE to experience up to 192 PD's including cable loss effects.
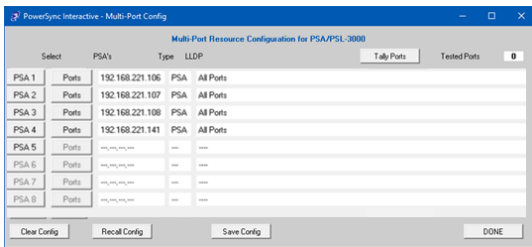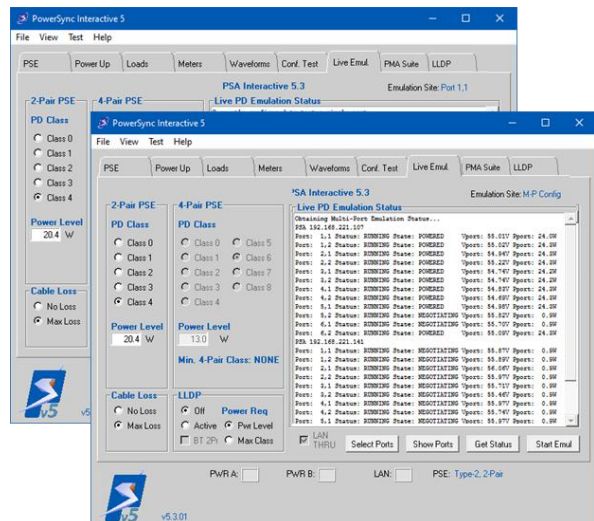

PSA Interactive Resource Configurations

Using **PowerShell PSA** scripting, PD emulations may be uniquely defined to individual PSE ports or they may be uniformly defined to all PSE ports.

Using PSA/PSL-3000 instruments that are licensed for the LLDP feature option, Live PD Emulation will automatically emulate Powered Device **802.3at LLDP** messaging and power management actions. Each time a PD is disconnected and re-connected, or each time PSE PoE service is restored, the PD will carry-out a start-up power negotiation with the PSE. If a PSE elects to throttle back Type-2 power levels to a powered PD using LLDP, the PD will drop back to a pre-negotiated, Type-1 power level that the user may define.

Live PD Emulation runs indefinitely on each PSA / PSL test port until terminated by the user. While running, current power status, negotiation status, and actual power loading may be sampled for all utilized test ports with a single mouse click.

PSA Interactive Live PD Emulation Status

Technical Specifications

Live PD Emulation: General Configuration Requirements	
Supported Instruments	PSA-3000, PSA-3248, PSL-3000, PSL-3224
Supported Test Blades	PSA-3202, PSL-3202, PSA-3102, PSL-3102
	Not supported on PSA-3402 or PSA-3002 Compact PSA's
Required Instrument Feature	PSE Multi-Port Suite

Live PD Emulation: Class 0-4 PD's						
Maximum PD's Emulated	192					
Maximum PSA Instruments / Resource Configuration	8					
Emulated Detection Signature Resistance / PD	9 – 39 KΩ, 1 KΩ steps					
Emulated Detection Signature Capacitance / PD	0.1, 5.1, 7.1, or 11.1 μF					
Emulated PD Class	0, 1, 2, 3, or 4					
Emulated Minimum Power / PD	0.5 W					
Emulated Maximum Power / PD	PD Class	**0**	**1**	**2**	**3**	**4**
	Maximum Watts	13.0	3.8	6.5	13.0	25.5
Maximum PSE Load Power / PD (*Includes emulated line power loss*)	Maximum Watts	17.7	4.6	8.0	17.7	34.3

Live PD Emulation Class 0 - 4 PD's with LLDP	
LLDP Protocol	802.3at (12 octet)
Required Instrument Feature	LLDP Emulation & Analysis*
Pre-Negotiated (Quiescent) Power Load	0.5 W to 15.5 W
Connection Mode: Active Always	LLDP runs indefinitely while PD is powered up with capability to throttle back power given PSE request.
Connection Mode: Active Until Grant	LLDP runs until initial power negotiation is completed and PD is at requested power. PSA **OUT** port is then connected to PSE.

* See Sifos Datasheet **LLDP Emulation & Analysis for the PowerSync Analyzer** for further information regarding LLDP.

Ordering Information

PSA-3000-MPT   PSE **Multi-Port Suite** for 2-Pair powering PSE's including Multi-Port Live PD Emulation and the Power Management Analyzer Suite for one **PSA-3000** Address* (*up to 24 test ports*)

PSL-3000-MPT   PSE **Multi-Port Suite** for 2-Pair powering PSE's including Multi-Port Live PD Emulation and the Power Management Analyzer Suite, for one **PSL-3000** Address* (*up to 24 programmable load ports*)

* The Multi-Port Suite requires a PSA-3000 or PSL-3000 with one or more PSx-3x02 test blades, PSA-3x48, or PSL-3x24. It may be added to previously installed PSA/PSL-3000 systems using a license key purchased from Sifos Technologies.

Any emulation and testing of PSE LLDP behaviors further requires the LLDP Emulation & Analysis feature license for the PSA-3000.

Sifos Technologies, Inc.
1 Tech Drive, Suite 100
Andover, MA 01810
+1 (978) 975-2100
www.sifos.com

sales@sifos.com

Verification, Simplified.

MPSLE031524