

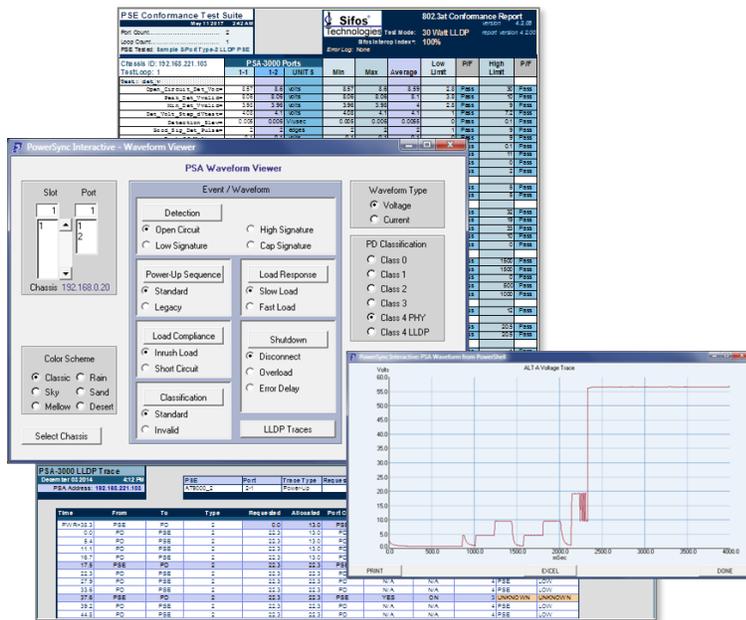


# PSA-3402

## Compact PowerSync® Analyzer

IEEE 802.3at & bt Power over Ethernet

### Product Overview



## Key Features

- Industry Leading IEEE 802.3at PoE PSE Conformance Tests
- Hardware / Firmware Ready for IEEE 802.3bt PSE Testing
- Continuous 2-Pair PSE Loading > 47 Watts Per Test Port (2 Test Ports)
- Continuous 4-Pair PSE Loading to > 99 Watts (Either Test Port)
- Replaces All General Purpose Test Equipment & Fixtures
- One-Button 2-Pair and 4-Pair PSE Waveform Analysis
- Small, Light Weight, Transportable with Built-In Power Supply
- Flexible Powered Device LLDP Emulation and LLDP Analysis
- Flexible and Accurate Measurements of Voltage, Current, Noise
- Noise Immune Triggering, Transients, and Time Interval Measurements
- Supports PSE Packet Transmission Testing with PoE Loads
- Smart Fan Control – Runs Cool and Quiet
- High Level Script Automation and Graphical User Interface

**Verification, Simplified.**

## **IEEE 802.3at and 802.3bt PSE's**

End-Spans

Mid-Spans

PoE Connectors

Injectors

## **Fully Automated 802.3at PSE Conformance Test**

Comprehensive Hardware /  
Firmware DV Testing

Device Qualification

LLDP Protocol Analysis

Interoperability Analysis

Quality Assurance

## **Compact but Capable**

Visualize Common 802.3at  
and 802.bt (4-Pair) PSE  
Behaviors and Responses

Prototype Tests and  
Software for PSA-3000

Troubleshoot PSE Ports  
Anywhere

## **Portable PoE Service Analyzer**

Automated PoE Service  
Outlet Interoperability  
Analysis

## **Overview**

Power-over-Ethernet (PoE) challenges design and test engineers to evaluate multi-channel, "intelligent" DC power sources that are activated and deactivated through signaling protocols operating over several power delivery and polarity configurations. The application and management of DC power over multiple local area network connections must be completely transparent and non-disruptive to the traditional data transmission functions of those network connections.

### **One Box Solution**

Sifos Technologies provides a **one-box solution** to facilitate complete testing and analysis of Power Sourcing Equipment (PSE) behaviors including overall compliance to the **IEEE 802.3at** and emerging **802.3bt** specifications. Each test port inside a PowerSync Analyzer is an autonomous and fully isolated instrument offering a rich set of stimulus and measurement resources for 2-Pair PSE testing. Together, both PSA-3402 test ports can be configured as an autonomous and fully isolated instrument for testing **802.3bt** and pre-standard 4-Pair PSE's.

### **Automated PSE Conformance Testing**

The PSA-3402 may be optioned via a license key to run the world's most advanced 802.3at **PSE Conformance Test Suite**. This fully automated application applies the PowerSync Analyzer's diverse resources to assess over 70 IEEE 802.3at specification parameters per port, presented in easily readable spreadsheet reports with multi-port statistics and clearly notated pass/fail limit analysis. The PowerSync Analyzer and the PSE Conformance Test Suite may be used to qualify PSE's for the Ethernet Alliance PoE Logo under the Ethernet Alliance PoE Certification Program.

### **LLDP Emulation**

The IEEE 802.3at specification introduced a generation of PSE's and Powered Devices (PD's) that communicate precise power demands and allocations using Ethernet layer 2 (LLDP) protocols. The PSA-3402 may be optioned via a license key to flexibly emulate PD's and to analyze the power negotiation protocols between PSE's and PD's.

### **Getting Ready for 4-Pair PoE (802.3bt)**

The PSA-3402 offers capability to fully emulate emerging 802.3bt compliant PD's for the purpose of testing new Type-3 and Type-4 PSE's that provide over 90W of power. Starting in 2018, PSA 5.0 software will open the door to comprehensive 802.3bt PSE analysis and automated test development. Under current PSA 4.2 software, users may configure and observe signaling during 802.3bt compliant 4-pair power-up sequences while connected to either test port. Emulations include single and dual signatures, multi-event classes, and flexible 4-pair loading to over 99 watts.

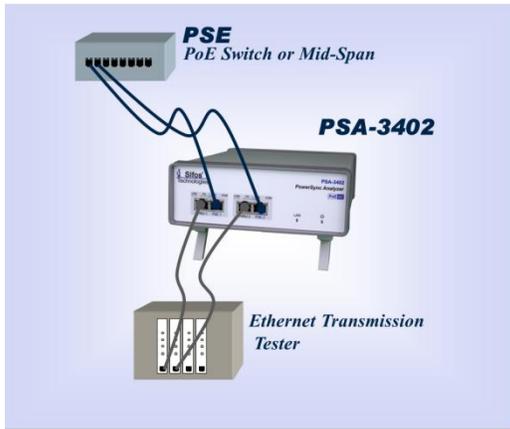
### **Start Small and Grow**

The PSA-3402 is well suited to early device qualification and design verification applications as well as to field application and support activities. Test plans and software developed with the PSA-3402 are readily extendable into PSA-3000 (24-port) and PSA-3248 (48-port) test platforms.

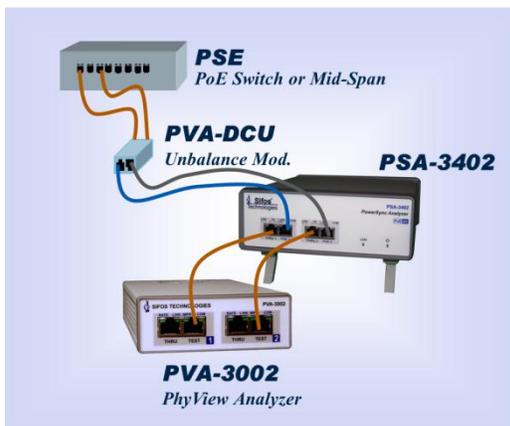
**Verification, Simplified.**

## PowerSync Analyzer Test Equipment Setups

### PSE DV, QA Test



### PSE Magnetic Bias Tolerance



### PoE Service Analysis



### Per-Port PSE Test Resources

Flexible 2-Pair and 4-Pair PD Detection & Class Emulation including all 802.3bt PD Types

Flexible Loads and Load Transients including 4-Pair PSE Loads to > 99 Watts on Either Test Port

Event or Edge Triggering of Load Transients & Measurements

Average, Peak (Min/Max), and Trace Measurements of Port Voltage and Load Current with Flexible Sampling Apertures

Standard One-Button Waveforms for Rapid PSE Analysis and Conformance Troubleshooting

Flexibly Triggered, Noise-Immune Time Intervals / Slews

O-Scope Graphical Waveforms

LAN Termination, LLDP Protocol Emulation and Tracing

Concurrent Packet Transmission and PoE Load Testing

### 802.3at PSE Conformance Suite\*

High Coverage, Fully Automated IEEE 802.3at PSE Compliance Testing and Analysis (including LLDP)

23 PSE Tests Producing Over 70 802.3at Parameters / Port

Automated Test and Port Sequencing with Comprehensive, Colorful Spreadsheet Reporting

Automatically Adapts to PSE Device Technologies

> 95% 802.3at PSE PICS Coverage

Regularly Updated with Sifos Tracking Service

Approved for Ethernet Alliance 1<sup>st</sup> Party (self) Certification Testing of 802.3at PSE's



### LLDP\*, PHY, Transmission Test Support

Flexible, Per-Port, Programmable PD LLDP Emulation for PoE with Payload, Timing, & Synchronization Control

Fully Automated LLDP Protocol Traces and Analysis

Test Port "THRU" Channel for 10/100/1000 PHY Testing (using the Sifos PVA-3000) and Packet Transmission Testing

Cisco UPoE 4-Pair PD LLDP Support (PD Emulation)

Negligible Thru-Channel Impairment (10/100/1000/2.5GBase-T)

### PoE Service Analyzer

Comprehensive Evaluation of PoE Service at a PD Interface

PoE Service Interoperability Analysis

Colorful Spreadsheet Reporting

### Powerful Software

PSA Interactive GUI for Control of all Test & Diagnostic Resources

Automated Test Menus for PSE Conformance and PoE Service Test Suites

Comprehensive, User-Friendly PowerShell PSA Script Development and Execution Environment Built on Tcl/Tk

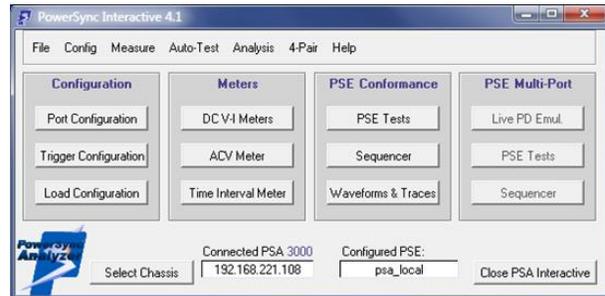
\* Available as an optional feature to the PSA-3402. See feature-specific data sheet.

## PSA Interactive Graphical User Interface

The Sifos PSA Interactive graphical user interface (GUI) is a flexible and powerful tool designed to allow users to quickly configure and perform both standard and user-defined measurements on IEEE 802.3 compliant power sourcing equipment (PSE). PSA Interactive provides an intuitive view of the full range of testing resources available within the PSA-3402 PowerSync Analyzer. Users can quickly harness the flexibility and power of these resources to perform design verification and diagnostic measurements or to prototype sequences that will eventually be automated in PowerShell PSA scripts.

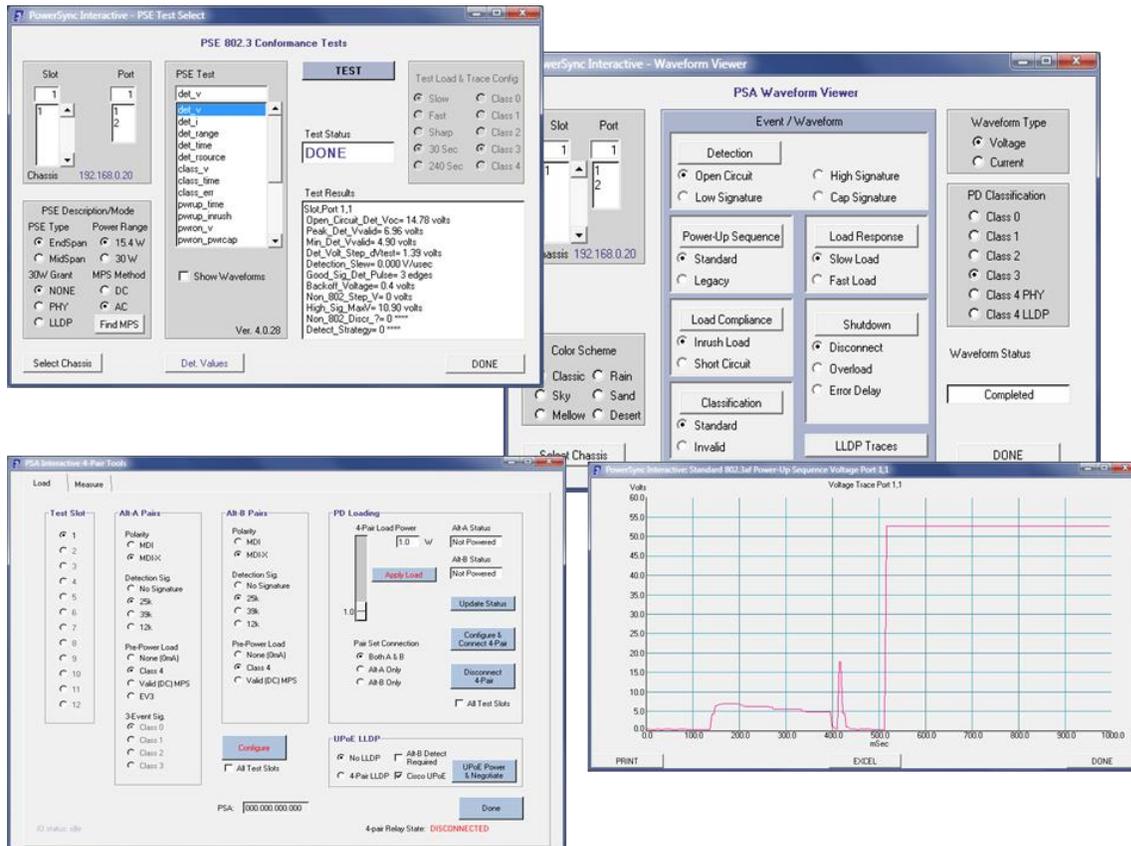
PSA Interactive organizes PSA-3402 resources and testing features into a variety of distinct subsystems\*:

- Port Detection Configuration
- Trigger Configuration
- Load and Load Transient Configuration and Activation
- DC Meters (Average, Max Peak, Min Peak, and Trace Voltage and Current meters)
- AC Peak Voltage Meter
- Time Interval / Slew Rate Meter
- PSE Conformance Tests
- PSE Conformance Test Sequencer
- Standard Waveforms & PD LLDP Emulation / Testing
- Pre-802.3bt (*proprietary*) 4-Pair Signature and Load Configurations with Metering and Pushbutton Waveforms
- PSE LLDP Emulation / Testing



PSA Interactive Main Menu

PSA Interactive enables rapid single or two-port configurations and one-button testing and analysis through intuitive subsystem dialogs that flexibly address test ports and PSA chassis.



PSA Interactive Menus for PSE Conformance Selected Test, Standard One-Button Waveform Analysis, and pre-standard (proprietary) 4-Pair PD Signature and Load Configuration

\* PSA Multi-Port Suite Features and Menus are not available on the PSA-3402.

## PowerShell PSA Tcl/Tk Interface

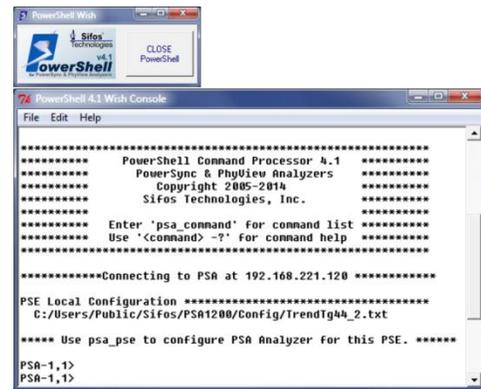
The PowerShell PSA Scripting Environment provides a high level, interactive means to control and program automated test sequences for the PSA-3402 PowerSync Analyzer. PowerShell enables fully automated testing suites that span multiple ports, blades, and instruments. Built upon the popular Tool Command Language (Tcl), it offers an extensive and extensible programming language well suited for automated testing.

PowerShell PSA provides a complete API for the PSA-3402 including high level commands that execute and sequence standard **802.3 PSE Conformance Tests** and **LLDP Protocol Analyzers**. PowerShell PSA commands access all of the resources of the PSA-3402 and enable the rapid development of highly customized test scripts. PowerShell PSA supports off-line script development and debug through its robust built-in emulation mode.

PowerShell PSA libraries can be integrated into broader Tcl environments that interlace traditional network transmission tests with Power-over-Ethernet tests. This enables seamless integration of custom or standard PSE tests with existing Tcl-based test suites.

Other features offered by the PowerShell PSA environment include:

- Interpretive command execution (no compilation, easy debug)
- Simple, intuitive PowerSync Analyzer commands (API)
- Integrated and extensive command “help” features
- Fast test execution speeds
- DUT-specific configuration files to configure settings
- Supports sequencing of test suite sequences and DUT-specific report routing
- Use sided-by-side with PSA Interactive GUI
- AnyEdit PSA Smart Editor for PowerShell PSA
- Traditional Tcl Console
- Command-Knowledgeable Wish Console with PSA waveform viewer capability



PowerShell Wish Console

## IEEE 802.3 PSE Conformance Test Suite

The IEEE 802.3at PSE Conformance Test Suite is a library of **fully automated, flexibly sequenced, and self-adapting** tests that provide a high degree of specification compliance testing on PSE ports without the need for any external instrumentation. The PSE Conformance Test Suite may be used to fully assess interoperability of one or more PSE ports given a single button press or single command. Colorful Microsoft Excel spreadsheet reports analyze all test results relative to IEEE 802.3at specification parameters, flagging failures and compiling statistics.

The PSE Conformance Test Suite serves as a virtual industry standard for PSE specification compliance. Testing can be completed without deep, internal knowledge of the 802.3at standard and without high expertise in PSA-3402 capabilities. Test coverage **exceeds 95%** of 802.3at PSE PICS.

See Sifos datasheet, **PSE Conformance Test Product Overview**, for further information about this test suite.

## PoE LLDP Emulation and Analysis

The PSA-3402 includes a subsystem designed to flexibly emulate 802.3at LLDP capable PD's (and PSE's) on a per test port basis. Fully automated

Time	From	To	Type	Requested	Allocated	Port Class	MDI Capability	MDI Status	Power Class	Source	Priority
10.0	PSSE	PSSE	CHALLENGE	13.0	13.0	PSSE	YES	ON	4	PRIMARY	LOW
10.0	PSSE	PSSE	CHALLENGE	22.3	22.3	PSSE	YES	ON	4	PSSE	LOW
10.0	PSSE	PSSE	CHALLENGE	22.3	22.3	PSSE	YES	ON	4	PRIMARY	LOW
10.0	PSSE	PSSE	CHALLENGE	22.3	22.3	PSSE	YES	ON	4	PSSE	LOW
10.0	PSSE	PSSE	CHALLENGE	22.3	22.3	PSSE	YES	ON	4	PRIMARY	LOW
10.0	PSSE	PSSE	CHALLENGE	22.3	22.3	PSSE	YES	ON	4	PSSE	LOW
10.0	PSSE	PSSE	CHALLENGE	22.3	22.3	PSSE	YES	ON	4	PRIMARY	LOW
10.0	PSSE	PSSE	CHALLENGE	22.3	22.3	PSSE	YES	ON	4	PSSE	LOW
10.0	PSSE	PSSE	CHALLENGE	22.3	22.3	PSSE	YES	ON	4	PRIMARY	LOW
10.0	PSSE	PSSE	CHALLENGE	22.3	22.3	PSSE	YES	ON	4	PSSE	LOW
10.0	PSSE	PSSE	CHALLENGE	22.3	22.3	PSSE	YES	ON	4	PRIMARY	LOW
10.0	PSSE	PSSE	CHALLENGE	22.3	22.3	PSSE	YES	ON	4	PSSE	LOW
10.0	PSSE	PSSE	CHALLENGE	22.3	22.3	PSSE	YES	ON	4	PRIMARY	LOW
10.0	PSSE	PSSE	CHALLENGE	22.3	22.3	PSSE	YES	ON	4	PSSE	LOW
10.0	PSSE	PSSE	CHALLENGE	22.3	22.3	PSSE	YES	ON	4	PRIMARY	LOW
10.0	PSSE	PSSE	CHALLENGE	22.3	22.3	PSSE	YES	ON	4	PSSE	LOW

LLDP Protocol Trace

applications allow in depth capture and analysis of protocol between the PSE and the PD. See Sifos datasheet, **LLDP Emulation and Analysis Overview**, for further information on this topic.

## PoE Service Analyzer Application

The PoE Service Analyzer is a special automated test and reporting application to enable comprehensive parametric and interoperability analysis at any PD connection point in a PoE enabled wiring plant. See **Sifos Technologies, PoE Service Analyzer Product Overview** for further information regarding the PoE Service Analyzer.

**PoE Service Test Report**

PSA Address & Port: 192.168.1.20 p1-1

Service: TYPED LLDP

**PoE Basic Services**

Connection	ALP A	WORK
Connection	PSSE	PSSE
Service	DC	DC
Service	TYPED LLDP	

**PoE Parametric Service Test**

Parameter	Value	Status
Min IEEE Current	PASS	
Max IEEE Current	IEEE Service	
Min IEEE Current	PASS	
Max IEEE Current	No. LAMPs: 0	
Full Power Time	12.500	
LLDP Allocation	25.0 W	
DCV Min Load	31.25 W	PASS
DCV Min Load	6.25 W	PASS
DCV Max Load	46.0 V	PASS
DCV Max Load	6.25 W	PASS
Overload Tolerance	303 W/SEC	PASS
Health Tolerance	PASS	
Overload Discharge	65.1 W/SEC	PASS
Min Reject	PASS	
Max Reject	PASS	
Cap Reject	PASS	

**PoE Classification Service Test**

Parameter	Value	Status
Class 0 Capacity	14.5 W	PASS
Class 1 Capacity	3.5 W	PASS
Class 2 Capacity	3.5 W	PASS
Class 3 Capacity	14.5 W	PASS
Class 4 Capacity	14.5 W	PASS
Class 0 Interop	PASS	
Class 1 Interop	PASS	
Class 2 Interop	PASS	
Class 3 Interop	PASS	
Class 4 Interop	PASS	

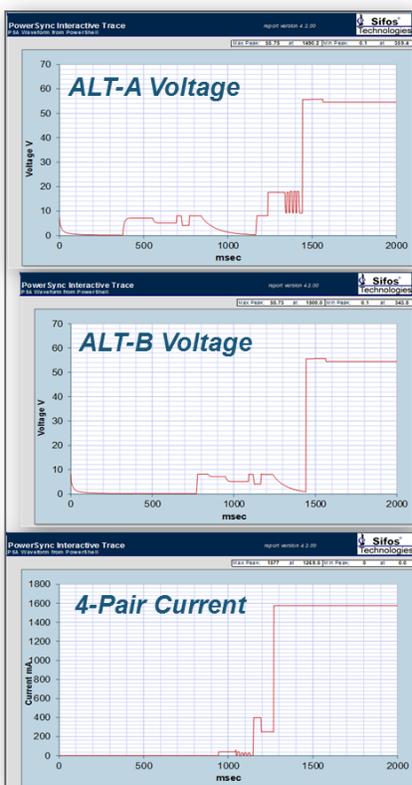
Report Version: 4.2.01

Service Analyzer Report

## 802.3bt Powering Emulations & Analysis

The PSA-3402 is hardware and firmware ready for IEEE 802.3bt PSE testing and PD emulation. Features for analysis of 802.3bt PSE's include:

- 4-Pair Testing from **Either** Port 1 or Port 2
- Emulate 802.3bt **Single** and **Dual Detection** Signatures
- Accurately and Flexibly Emulate 802.3bt **Class 5, 6, 7, and 8 Single Signature** PD's with 4-Pair Loading Over 99 Watts per Test Blade (Up to 12 test blades per PSA chassis)
- Accurately and Flexibly Emulate 802.3bt **Dual Signature Class 1, 2, 3, 4, and 5** PD's with Class and Load defined per Pairset
- Accurately Emulate 802.3bt **Pair Unbalance** Loads from 0% to 100%
- Accurately Emulate 802.3bt **Auto-Class** Signatures and Loading
- Reliable Multi-Event Edge Transition De-bouncing
- Accurately Emulate Minimum DC MPS Low-Power Loading Cases

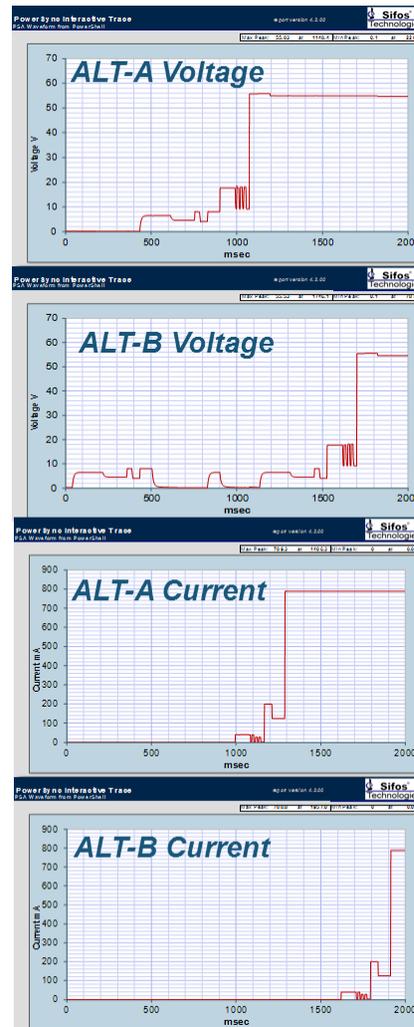


802.3bt Class 8, 90W Power-Up

Each of these features are available in **PowerShell PSA** software version 4.2 and will include GUI support and **Pushbutton Waveforms** in PSA 5.0 software. PSA 5.0 will enable future automated test suites for 802.3bt PSE Conformance and Multi-Port System testing. Additionally, LLDP will be extended to support PoE LLDP extensions associated with the 802.3bt standard.

The waveforms here depict two 802.3bt emulated power-ups performed using a single command, **power\_bt** in PSA 4.2 software. One power-up is an emulated 802.3bt Class 8 PD drawing 90 watts while the second power-up emulates an 802.3bt dual Class 5 PD that also draws 90W at the PSE.

These waveforms are optionally produced by the **power\_bt** command.



802.3bt Dual Class 5, 90W Power-Up

## Technical Data: PSA-3402

LAN Interface Specifications			
Operating Mode	Signal Path	Parameter	Specification
Data Through Mode	PSE # to THRU #	Connections	RJ45
		Data Rates and Signaling	10/100/1000BaseT/2.5GBaseT 5GBase-T, 10GBase-T with minor impairment
		Latency	None - Passively Coupled
		Impedance	100Ω, Balanced
		Pair-Pair Isolation	≥ 36dB @ 100MHz
		Insertion Loss	≤ 2dB, 0.1MHz to 100 MHz
		Insertion Loss Variation	≤ 0.75dB, 0.1MHz to 100 MHz
Return Loss (OUT pairs terminated into 100Ω)	≤ -24dB, 1MHz to 100MHz		

LAN Interface Specifications			
Operating Mode	Signal Path	Parameter	Specification
Data Connect (LLDP Emulation) Mode	PSE-# to Blade Transceiver	Connection	RJ45
		Data Rate and Signaling	10/100Base-T
		Orientation	MDI End Point
		Protocol	802.1ab, 802.3bc, 802.3at
		Impedance	100Ω, Balanced
		Return Loss	≤-20dB, 1MHz to 100MHz

PoE Port Connections			
Operating Mode	Dependency	Parameter	Selections
2-Pair Power	Port 1 and Port 2 operate independently	Powered Pair	ALT-A or ALT-B
		Polarity	MDI or MDI-X
4-Pair Power:	Connect to Port 1 (Port 2 disabled) or Connect to Port 2 (Port 1 disabled)	ALT-A Polarity (Port 2)	MDI or MDI-X
		ALT-B Polarity (Port 1)	MDI or MDI-X
		Detection Signature Type (PSA-3202 Test Blades)	Single (shared) or Dual (independent)

Detection and AC MPS Specifications			
Description	Conditions	Parameter	Specification
Detection Resistance	Vport = 2.5VDC - 12VDC, Port Connected, Transition Current Load = 0	Range	9 KΩ to 39 KΩ
		Resolution	1 KΩ
		Accuracy vs Setting $\Delta V / \Delta I$ at 4.5 Volt Spacing	±1.75% + 300Ω
Detection Capacitance	Vport = 2.5VDC - 12VDC, Port Connected, Transition Current Load = 0	Range	0.14, 5, 7, 11μF
		Accuracy	±15%
Detection Signature Cut-Off Threshold	Port Connected	Vport	12V ± 2%
AC MPS Signature	Vport = 12VDC - 60VDC, Port Connected	AC Impedance	24KΩ    (0.1μF + 330Ω)
		Resistance Accuracy $\Delta V / \Delta I$ at 2 Volt Spacing	22.8KΩ ± 250Ω
	Port Isolated	AC Impedance (≤ 500 Hz)	≥ 1.1 MΩ
		AC Impedance (≤ 120 Hz)	≥ 3.0 MΩ

Current Load Specifications			
Description	Conditions	Parameter	Specification
Load Current	Per Powered (or classifying) Pairset	Range	0 to 950 mA
		Resolution	0.25 mA
		Accuracy	± (0.5% setting + 0.25mA)
		Slew Rates	> 4mA / μsec
		Activation Voltage	15V, Rising Vport
		De-Activation Voltage	14V, Falling Vport
Transition (Mark Region) Current	Load Current Activated, Per Powered (or classifying) Pairset	Range	0 to 400 mA
		Resolution	0.25 mA
		Accuracy	± (1.0% setting + 0.5mA)
		Slew Rates	> 4mA / μsec
		Activation Voltage	14V, Falling Vport
		De-Activation Voltage	PSA-3202: 4.5V, Falling Vport PSA-3102: 6V, Falling Vport
Multi-Event Classification <i>(Not available to PSA-3102)</i>	Multi-Event Activated, Vport > 15VDC	802.3bt Signatures Emulated	Single Signature Class 5 - 8
			Dual Signature Class 1 - 5
		Non-Standard Signatures	Class Current per Event
		802.3bt Auto-Class	2mA @ 80msec of LCE1
		Multi-Event Activation	psa_connect or mclass
Multi-Event Deactivation	psa_disconnect or mclass		

Current Load Specifications			
Description	Conditions	Parameter	Specification
		Multi-Event Timeout	100 msec @ > 15V
		Event Start Glitch De-bounce	150µsec
		Mark and Idle Transition Glitch De-bounce	500µsec
		Event Count Reset Condition	< 4.5V for > 500µsec
		Power-On Expiration (default)	115 msec
Configurable Load Transient	Vport > 15VDC,  Per Powered Pairset	Sequential Load Steps	2
		Transient Sequence Repeats	1 to 6 cycles
		Load Step 1 Range	0 to 1800 mA
		Load Step 2 Range	0 to 950 mA
		Resolution (0 – 950 mA)	0.25 mA
		Resolution (> 950 mA)	0.50 mA
		Accuracy (0 – 25 mA)	± (2% setting + 0.5mA)
		Accuracy (> 25 mA)	± (1% setting + 1mA)
		Slew Rate	< 10mA / µsec
		Step 1 Duration ≤ 950 mA	200 µsec to 1 sec
		Step 1 Duration > 950 mA	200 µsec to 80 msec
		Step 2 Duration Load Step 1 ≤ 950 mA Load Step 1 > 950 mA	200 µsec to 1 sec (or persist) 1 sec
		Step Resolution	100 µs
		Trigger Modes: ≤ 950 mA > 950 mA	Immediate, Edge, Event Immediate
		Active Load Resistance	37 Ω
Foldback Suppression Min. Port Voltage (@ 400mA)	30 VDC		
Foldback Suppression Duration	Step 1 + Step 2 Duration		

DC Metering Specifications			
Description	Conditions	Parameter	Specification
Voltage Meter	Average, Max-Peak, Min-Peak, Scope Trace	Voltage Range	0 - 60V
		Aperture or Trace Length	256 Samples (10ms, 20ms, 0ms...10s)
		Extended Trace Length <sup>3</sup>	1024 Samples (200ms, 2s, 4s, 8s, 20s)
		Sample Rates	39.1 µsec - 39.1 msec (1,2,5 steps)
		Resolution	16 mV
		Displayed Resolution	Avg & Peak: 2 decimal places O-scope Traces: 25 mV
		Accuracy <sup>1</sup>	> 30VDC: ± (1.5% reading + 16mV) < 30VDC: ± (2.0% reading + 16 mV)
		Measurement Triggers	Immediate, Edge, Event, Power-Up ( <i>traces only</i> )
Current Meter	Average, Max-Peak, Min-Peak, Scope Trace	Current Range	0 – 2000 mA
		Aperture or Trace Length	256 Samples (10ms, 20ms, 50ms...10s)
		Extended Trace Length <sup>3</sup>	1024 Samples (200ms, 2s, 4s, 8s, 20s)
		Sample Rates	39.1 µsec - 39.1 msec (1,2,5 steps)
		Resolution (0– 1023 mA)	0.25mA
		Resolution (1024–2000 mA)	0.5mA
		Accuracy <sup>2</sup>	± (0.5% reading + 0.5mA)
		Triggers	Immediate, Edge, Event, Power-Up ( <i>traces only</i> )

1. Does not include Voltage drop due to cable losses and 0.45Ω maximum test port input resistance.
2. Does not include Port-Connected MPS current, which is approximately (Vport - 12V)/24kΩ.
3. Scope Traces only - requires PSA controller firmware 3.10 or newer.

AC Metering Specifications			
Description	Conditions	Parameter	Specification
AC Peak-Peak Meter	Low Band, VDC= 40-57V	Accuracy, 25Hz – 325Hz	-15%, +11%
		Accuracy, 50Hz – 300Hz	-7.5%, +11%
	High Band, VDC= 40-57V	Accuracy, 2.5KHz – 250KHz	-15%, +7%
		Accuracy, 20KHz – 250KHz	-6%, +7%
	Full Band, VDC= 40-57V	Accuracy, 50Hz – 250KHz	-7.5%, +8.5%
	All Bands, VDC= 40-57V	Resolution	1mV
Range		1Vp-p	
Input Impedance		0.05μF <sup>1</sup>	

1. Input impedance models the lowest possible PD input capacitance – measurements are therefore affected by the effective source impedance of the PSE, including any frequency specific variations in that source impedance.

Triggering Specifications			
Description	Conditions	Parameter	Specification
Edge & Event Triggers	All Modes	Range	0.25V - 59.5V
		Resolution	0.125 mV
		Accuracy (relative to DC Meter)	± 0.0625 mV
		Trig1 to Meter or Transient Latency	~ 50 μsecs
		Event Trigger Latency	< 500 μsecs
	Trigger Noise Immunity	Pre-Trigger Qualification Time (Voltage below Rising threshold or above Falling threshold)	1.5 msec
		Normal Mode Edge Noise Rejection	125 mV
		Noisy Mode Edge Noise Rejection	500 mV

Time Interval Metering Specifications			
Description	Conditions	Parameter	Specification
Time Interval Meter	Microsecond scale	Time Range	4 – 26200 μs
		Time Resolution	1 μsec
		Time Accuracy	± 2 μsecs
		Min. Resolvable Time Interval	~ 4 μsecs
	Millisecond scale	Time Range	2-6550 msec
		Time Resolution	0.1 msec
		Time Accuracy	± 1 msec
		Min. Resolvable Time Interval	2 msec
	Second Scale	Time Range	0.1 – 16.1 sec
		Time Resolution	0.1 sec
		Time Accuracy	± 50 msec
		Min. Resolvable Time Interval	0.1 sec
	Triggering & Noise Immunity	Start Trigger	Edge or Event
		Stop Trigger	Edge
Normal Mode Edge Noise Rejection		125 mV	
Noisy Mode Edge Noise Rejection		500 mV	

LED Indicators – PSA-3202		
LED Label	Parameter	Description
LINK	LLDP Link Status & Activity	<b>GREEN:</b> Linked at 100Base-Tx for LLDP, Blink with Activity <b>AMBER:</b> Linked at 10Base-T for LLDP, Blink with Activity <b>OFF:</b> Unlinked (or Disconnected)
PD	PoE Power Status	<b>GREEN:</b> PSE powered with Vport > 36 VDC <b>AMBER:</b> Valid 802.3 Detection Signature Connected (No PSE Power) <b>OFF:</b> PSE not powered & PD signature not connected
4PR	Test Port Mode	<b>GREEN:</b> Test port configured for 4-Pair powering <b>AMBER:</b> Opposite test port configured for 4-Pair powering <b>OFF:</b> Test port configured for 2-Pair powering
COM	Communications	<b>ON:</b> Indicates active communications with test port

Programming and Control	
Description	Specification
Interface	Ethernet 10/100BaseT (Telnet Port 23 protocols) <b>NOTE:</b> The <b>Console</b> interface is for IP Address config only.
Host Requirements	PC running Microsoft Windows XP, Vista, 7, 8, 10, or Linux PC (Fedora, SUSE, Debian)
Control Environment	Sifos PowerShell PSA or PSA-Interactive
Recommended Network Latency:	< 5 msec

Physical and Environmental	
Description	Specification
Dimensions	7.5"W x 3"H x 10"D
Weight	3.2 lbs.
Power	100VAC-240VAC, 50-60 Hz, 1.3A Max.
Ambient Operating Temperature	0°C to 40°C (≤ 100W combined PoE loading on both test ports)
Storage Temperature	-20°C to 85°C
Operating Humidity	5% to 95% RH, Non-Condensing.

Certifications		
Description	North America	Europe & International
Emissions	FCC Part 15, Class A	Meets EN55011 VCCI, AS/NZS 3548, ICES-001
Safety	<b>CSA Listed</b> (CSA22.2 No. 61010)	Meets EN61010-12
European Commission		Low Voltage Directive (2014/35/EU) Electromagnetic Compatibility Directive (2014/30/EU) <b>CE Marking</b> Directive (93/68/EEC)
<p>FCC Statement:</p> <p>This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.</p>		

## Ordering Information

**PSA-3402**, PowerSync Analyzer 3402 including PowerShell PSA and PSA Interactive Software  
**PSA-LLDP**, IEEE 802.3at LLDP Emulation and Analysis Feature for One PSA PSA-3402 Instrument  
**PSA-CT**, IEEE 802.3at PSE Conformance Test Suite for One PSA-3402 Instrument  
**PSA-TS1**, IEEE 802.3at PSE Conformance Suite Tracking Service for One Year for One PSA-3402 Instrument  
**PSA-TS2**, IEEE 802.3at PSE Conformance Suite Tracking Service for Two Years for One PSA-3402 Instrument  
**CASE-PDA**, Protective Carrying Case for Transporting PSA-3402 and Accessories  
**RACKKIT-PDA**, Rack Mount Kit for PSA-3402

**Accessories Included:**

- Installation Guide & Configuration Chart
- PowerSync Analyzer Reference Manual (Binder and CD)
- Power Cord
- Cross-Over Ethernet Cable
- RS-232 Cable

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**Verification, Simplified.**

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