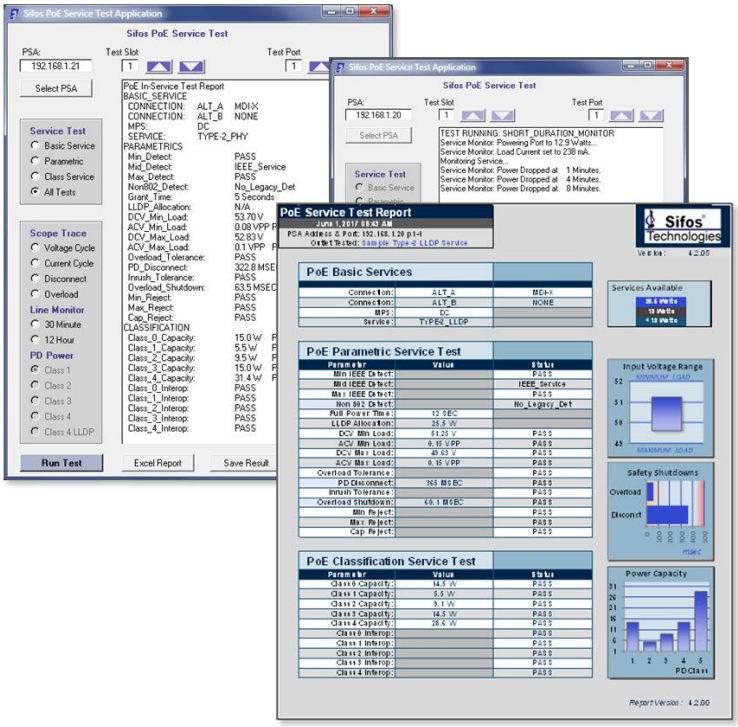
PSA-3002-SA
Comprehensive PoE Service Analysis & Verification

Product Overview



Key Features

- ❑ **Analysis and Troubleshooting for All Standard PoE Installations**
  - **13W Services**
  - **25.5W Services**
  - **25.5W + PoE LLDP Services**
- ❑ **Fully Automated Testing from the Leaders in PoE Test**
- ❑ **Verify Interoperability of PoE Service to the PD**
- ❑ **Verify PoE Service Safety Features**
- ❑ **Assess Power Delivery at the PD by PD Class**
- ❑ **Troubleshoot Intermittent PoE Service Problems**
- ❑ **Graphically View Signals and Waveforms at the PD Outlet**
- ❑ **Colorful Microsoft Excel Reporting**
- ❑ **Portable with Rugged Carrying Case**

Verification, *Simplified.*

There's a Whole Lot More to PoE Than A DC Voltage….

Assess Full 802.3 Compliant Service to All Powered Device Connections….

Confidently Sort Out PSE vs PD Interoperability Issues and Network Power Limitations

Overview

Power-over-Ethernet (PoE) is a pervasive technology with the promise of offering world-wide, industry standard power connectivity, intelligent power management, mission critical power backup, and the healthy elimination of numerous "wall wart" power modules. With the ability to serve 25.5 Watts of continuous power to each Powered Device (PD) today and a growth path toward over 70 Watts in the future, PoE is attracting greater numbers of applications including digital phones, wireless access points, tag and card readers, security cameras, displays, intelligent lighting, and industrial controls.

PoE technology is challenged with the delivery of robust and safe power over a cabling infrastructure that was designed primarily for low power, high frequency signals. The challenge of safe and effective PoE goes well beyond the ability to place a 50 Volt source onto a twisted pair LAN cable. Rather, the complete picture of PoE involves reliable steady state and transient power delivery to every Powered Device coupled with the vital need to avoid possible damage to all non-PoE network equipment. As an open standard, IEEE 802.3 has enabled the proliferation of thousands of PoE-capable switches and midspan injectors and even a greater variety and quantity of Powered Devices, thus placing ever increasing burden on device interoperability characteristics across all supported cabling systems and installations.

Sifos Technologies is the industry leader in PoE Equipment testing and analysis. The Sifos **PoE Service Analyzer** is a special application of the proven Sifos PowerSync® Analyzer to the specific task of assessing many critical PoE service attributes at the Powered Device service interface.

Comprehensive Service Outlet Testing

PoE Connection Characteristics

Service Type Characteristics

Line Voltage & Noise - Low PD Power

Line Voltage & Noise - High PD Power

Valid PD Detection Range

Invalid PD Rejection Range

Non-802.3 PD Detection

PD Startup Inrush Tolerance

PD Valid Overload Tolerance

PoE Voltage Removal Timing

PoE Overload Shutdown Verification

Power Capacity by PD Classification

PD Classification Interoperability

PoE LLDP Protocol Compliance

Intermittent PoE Service Analysis

Graphical Microsoft Excel Reporting

Visual PoE Analysis

Observe PoE Power Cycles in Voltage and Current, Disconnect Shutdowns, and Overload Shutdowns

Waveform Export to Microsoft Excel

Flexible Connections

Run Testing Locally from a Laptop

Run Testing via Out-Of-Band Network Connection

Comprehensive PoE Service Access Tests

The Sifos Technologies PSA-3002-SA **PoE Service Analyzer** marries the Sifos **PSA-3002 Compact PowerSync® Analyzer** with specialized application software to enable the most comprehensive and fully automated testing available for PoE analysis and qualification at a Powered Device service access point. The available tests go well beyond standard power-up and line voltage measurements found in hand-held analyzers to fully assess interoperability risks, safety hazards, and PoE performance limitations at the connection to any Powered Device.

The PoE Service Analyzer provides fully automated testing in 3 categories:

Basic Service Tests evaluate the Power-over-Ethernet connection, reporting connection information such as powered pairs (including multiple PoE sources), power polarity, PD disconnect detection method, and service category.

Parameter	Outcome	Explanation
Service Pairs & Polarity	CONNECTION: ALT-A: MDI, MDI-X, NONE CONNECTION: ALT-B: MDI, MDI-X, NONE	PoE service is active on ALT-A and/or ALT-B pairset with polarity MDI or MDI-X.
	CONNECTION: NONE	PoE service is not available
Disconnect Detection	MPS: DC	PSE removes power when DC current below 5 mA.
	MPS: AC	PSE removes power when PD 25KΩ signature is removed.
Service Category	TYPE-1	PoE service up to 13W
	SUB_TYPE-1	PoE service between 4W & 7W
	TYPE-2_PHY	PoE service up to 25.5W to any Class 4 PD
	TYPE-2_LLDP	PoE service up to 25.5W provided Class 4 PD supports PoE LLDP
	TYPE-2_OTHER	PoE service up to 25.5W to any PD
	DISABLED	No PoE service available

Parametric Tests report a number of parameters of the PoE service that are relevant to interoperability of all PD's at the PoE service outlet. Additionally, certain safety related behaviors of the PoE service are analyzed. Information collected includes line voltages (DC and AC) at power extremes, detection signature range verification, rejection signature range verification, inrush and overload tolerance of the PoE connection, disconnect timing, and overload timing response of the PoE connection. In performing these tests, the PowerSync® Analyzer is utilized to emulate a wide range of IEEE 802.3af compliant steady state and transient Powered Device behaviors.

Parameter	Description	Outcomes
MIN_DETECT:	Power Applied to Valid Low-End PD Signature *to assure all Valid PD's are detected properly (24 KΩ)*	PASS / FAIL
MID_DETECT	Power Applied to Nominal IEEE 802.3 Signature *to assure nominal 802.3at PD's are detected properly (25 KΩ)*	IEEE_Service / No_IEEE_Service
MAX_DETECT:	Power Applied to Valid High-End PD Signature *to assure all Valid PD's are detected properly (26 KΩ)*	PASS / FAIL
Non802_DET:	Power Applied to Capacitive Load, Invalid 802.3at PD *to note capability of PSE to power many "legacy" PD's*	Legacy_Det / No_Legacy_Det
Full_Pwr_Time:	Time from PD Connection until PD Can Draw Full Power	0 – 60 seconds
LLDP_Allocation:	Power Allocation from a Type-2, LLDP PSE	X.Y Watts / N/A
DCV_Min_Load:	PoE Line Voltage to Very Low Power PD *to assure valid line voltage to low power PD* *(Type-1 PSE: 37 to 57 VDC, Type-2 PSE: 42.5 to 57 VDC)*	0 – 60 VDC PASS / FAIL
ACV_Min_Load:	PoE Line Noise to Very Low Power PD *to assure "clean" DC line voltage to low power PD (≤ 0.5 Vpp)*	0 – 1 Vpkpk PASS / FAIL
DCV_Max_Load:	PoE Line Voltage to High Power PD *to assure valid line voltage to high power PD* *(Type-1 PSE: 37 to 57 VDC, Type-2 PSE: 42.5 to 57 VDC)*	0 – 60 VDC PASS / FAIL
ACV_Max_Load:	PoE Line Noise to High Power PD *to assure "clean" DC line voltage to high power PD (≤0.5 Vpp)*	0 – 1 Vpkpk PASS / FAIL

Parameter	Description	Outcomes
Overload_Tolerance:	Tolerance of Service to Maximum Transient Overload *to assure power maintained to compliant PD's (Type-1 PD: ≥400mA for ≥45msec, Type-2 PD: ≥684mA for ≥45 msec)*	PASS / FAIL
PD_Disconnect:	Power Removal Timing on PD Disconnect *to assure PoE service will not damage non-PD's (≤500 msec)*	0 to 1500 msec PASS / FAIL
Inrush_Tolerance:	Tolerance of Service to Worst Case Allowable Startup Load *to assure proper startup of all compliant PD's (≥450 mA for ≥45 msec)*	PASS / FAIL / N/A
Overload_Shutdown:	Power Removal Timing on PD Overload Shutdown *to assure PoE Service will tolerate short duration power peaks and not damage cables and connections (50 – 75 msec with Type-1 PSE: ≥402 mA, Type-2 PSE: ≥684 mA)*	0 to 1500 msec PASS / FAIL / N/A
Min_Reject:	Rejection of Invalid Low-End PD Signature *to assure that non-PoE devices do not get powered (≤15 KΩ)*	PASS / FAIL / N/A
Max_Reject:	Rejection of Invalid High-End PD Signature *to assure that non-PoE devices do not get powered (≥33 KΩ)*	PASS / FAIL / N/A
Cap_Reject:	Rejection of Highly Capacitive PD Signature *to assure that non-PoE devices do not get powered*	PASS / FAIL / N/A

Classification Service Tests report the behavior of the PoE service connection to each PD classification (0, 1, 2, 3, or 4). Information reported includes maximum power capacity available by PD classification as well as the ability of the PoE connection to deliver the appropriate power capacity to PD classification signatures that are borderline for each PD classification.

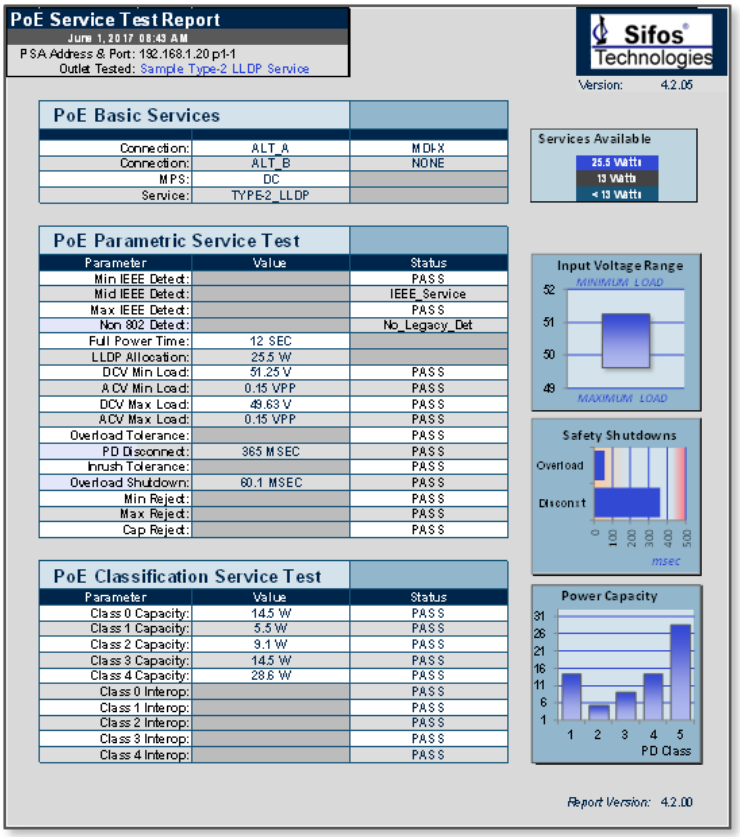
Parameter	Description	Outcomes
Class_0_Capacity:	Power Available to a nominal PD Classifying as Class 0 *to assure a minimum of 13 watts is available to PD*	1 to 15 Watts PASS / FAIL
Class_1_Capacity:	Power Available to a nominal PD Classifying as Class 1 *to assure a minimum of 3.84 watts is available to PD*	1 to 15 Watts PASS / FAIL
Class_2_Capacity:	Power Available to a nominal PD Classifying as Class 2 *to assure a minimum of 6.49 watts is available to PD*	1 to 15 Watts PASS / FAIL
Class_3_Capacity:	Power Available to a nominal PD Classifying as Class 3 *to assure a minimum of 13 watts is available to PD*	1 to 15 Watts PASS / FAIL
Class_4_Capacity:	Power Available to a nominal PD Classifying as Class 4 *to assure a minimum of 25.5 watts is available to PD*	12 to 37 Watts PASS / FAIL
Class_0_Interop:	Power Available to PD with Borderline Class 0 Signatures *to assure all Class 0 PD's receive the same power allocation*	PASS / FAIL
Class_1_Interop:	Power Available to PD with Borderline Class 1 Signatures *to assure all Class 1 PD's receive the same power allocation*	PASS / FAIL
Class_2_Interop:	Power Available to PD with Borderline Class 2 Signatures *to assure all Class 2 PD's receive the same power allocation*	PASS / FAIL
Class_3_Interop:	Power Available to PD with Borderline Class 3 Signatures *to assure all Class 3 PD's receive the same power allocation*	PASS / FAIL
Class_4_Interop:	Power Available to PD with Borderline Class 4 Signatures *to assure all Class 4 PD's receive the same power allocation*	PASS / FAIL

By the IEEE 802.3at standard, PD's are classified by power utilization according to the table below. PD's are responsible for "signaling" this classification prior to receiving power from the PoE enabled network connection.

Classification	PD Maximum Power Requirement
0	0.44 to 13.0 Watts
1	0.44 to 3.84 Watts
2	3.85 to 6.49 Watts
3	6.49 to 13.0 Watts
4	13.0 to 25.5 Watts

PoE Service Test Reporting

The Sifos PoE Service Analyzer includes a colorful Microsoft Excel Test Report* that can be automatically produced upon completion of the full set of PoE Service Access Tests. In order to produce this report, the full sequence of Service Tests must be completed. The report header provides the time and date of the testing performed and enables user entry of the test site or outlet location.



PoE Service Spreadsheet Report, Fully Compliant Service

The report provides three tabular tables that include results from **PoE Basic Services**, **PoE Parameteric Service** testing, and **PoE Classification Service** analysis. Parameters that should comply to the IEEE 802.3at PoE system specification are notated with **PASS**/**FAIL** indications in these tables.

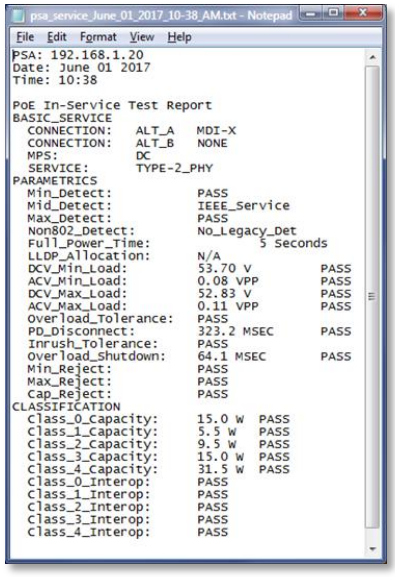
The **Services Available** graphic indicates the level of PoE service available, that is, 25.5W (Class 4), 13W (Class 3), or <13W (Class 1 or 2). This is based upon PSE capability.

A second graph, **Input Voltage Range**, depicts the PD supply voltage range as a function of PD load power. PD's should receive a minimum of 37V if PSE provides Class 0-3 service and 42.5V if the PSE provides Class 4 service.

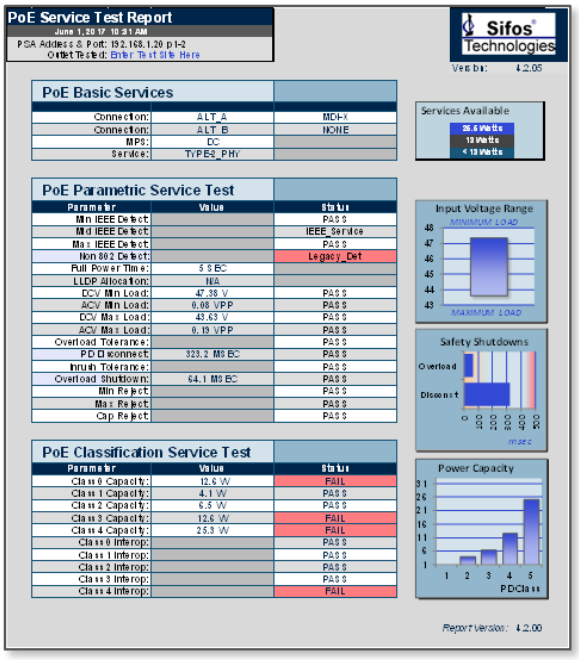
A **Safety Shutdowns** graph shows the timing of power removal both in response to a PD disconnect and to a PD power surge or overload. Service should be removed between 300msec and 400msec when a PD is disconnected and between 50msec and 75msec when an overload event occurs.

A **Power Capacity** graph charts the power available to various PD classifications.

Text reports may also be produced when running all or any subset of the PoE Service Access Tests. These reports are also time-date stamped and carry much of the same information included in the spreadsheet report.



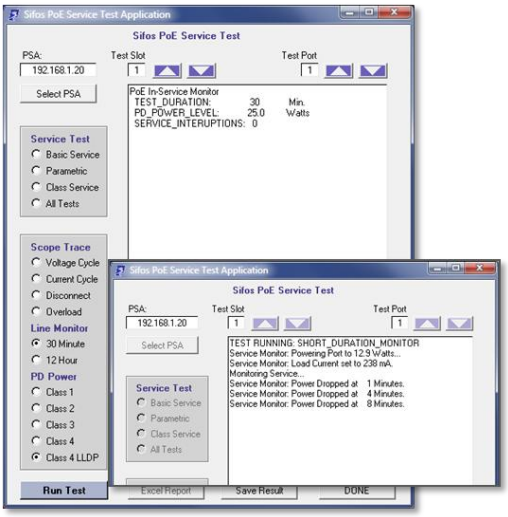
PoE Service Text File Report



PoE Service Report – Marginal PoE Service to PD

PoE Intermittent Service Detection

The PoE Service Analyzer also includes an automated Line Monitor designed to capture intermittent service drop-outs. This test may be configured to run with PD Class 1, 2, 3 or 4, including Class 4 with LLDP, PD emulation. Users select between a 30 minute test and a 12 hour test, though in either case, user's have the option to terminate monitoring at any time and recover results.

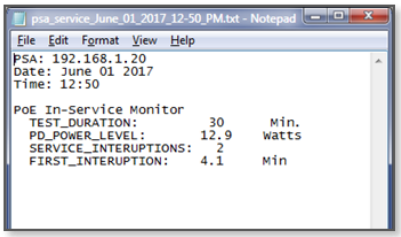


PoE Service Line Monitor

Intermittent Service Detection is sensitive to power drops that are either instantaneous or of longer durations. The test will report a count of observed drops as well as the elapsed time until the first observed service drop-out.

Testing for intermittent PoE service at any test site or outlet may can be beneficial both for assessing intermittent connections and for capturing PSE behaviors at a particular outlet when power demands or other intermittent transitions are exceeding total output power capacity across a range of PoE served devices.

Line Monitor Test Reports can be saved to a time-date stamped text file upon test completion.

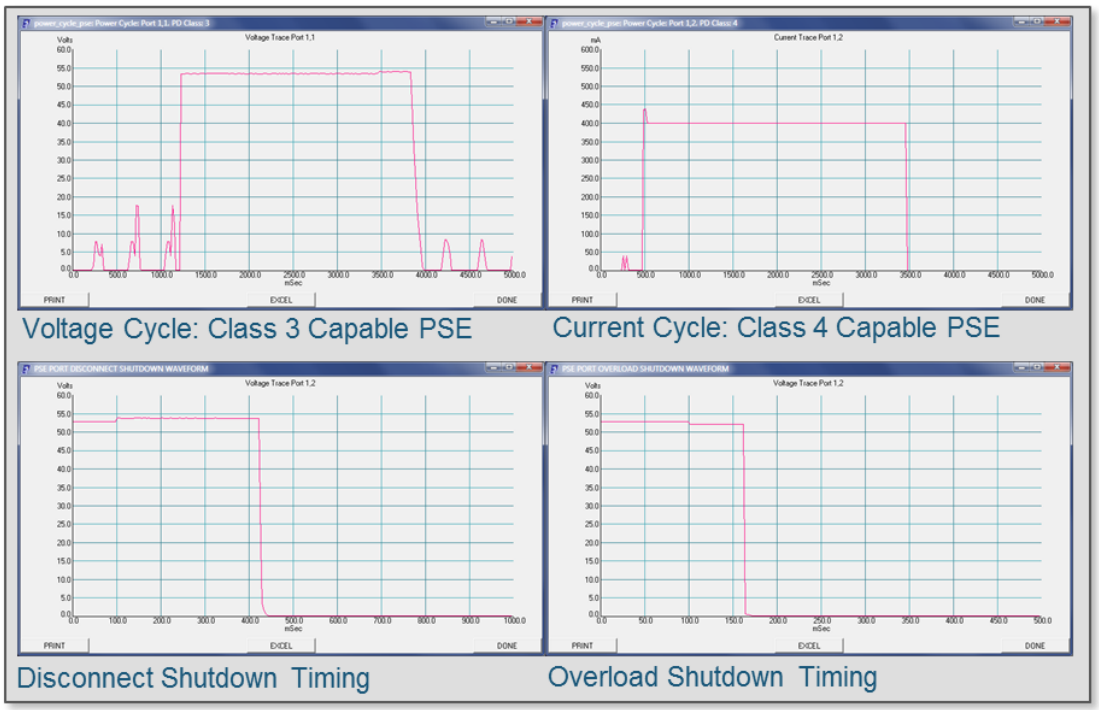


PoE Line Monitor Report

Visual PoE Analysis

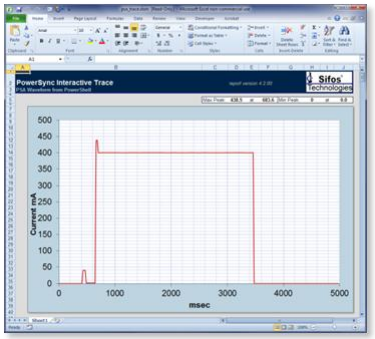
Another unique feature of the Sifos PoE Service Analyzer is the ability to produce graphical waveforms of controlled PoE events. These waveforms can be useful for observing problem behaviors.

Two Power-Cycle waveforms are included to observe the full cycle of an ordinary PoE power-up and PD disconnect power-down captured over a 5 second time interval. One waveform looks at line voltage while the other records electrical current flow. Both can be configured to run with PD Class 1, 2, 3 or 4, including Class 4 with LLDP, emulation. Users with an introductory understanding of PoE technology can observe and analyze detection signaling, classification signaling, the powered line state, and service response to a PD disconnect.



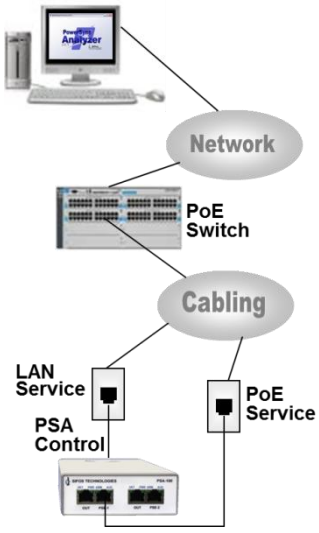
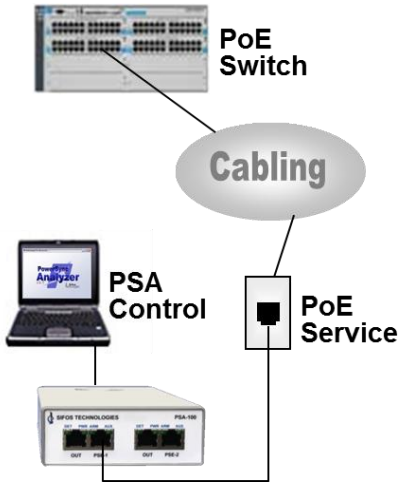
Two additional waveforms available are Disconnect Shutdown and Overload Shutdown. These waveforms may utilized to visualize the PD service outlet response to either a PD disconnect or a PD transient overload condition. Both conditions should result in power removal in order to prevent damage to network devices when plugged into
the service outlet. The disconnect shutdown should occur in approximately a half second while the overload shutdown should occur in less than one tenth of a second, regardless of PD Classification selected.

Following waveform capture, waveforms may be printed or imported to Microsoft Excel for further analysis.



Voltage Cycle Waveform - Excel

PoE Service Test Configurations

Remote, Out-of-Band Test Config.	Local Test Config
	

PSA-3002-SA Technical Specifications

LAN Interface Specifications			
Operating Mode	**Signal Path**	**Parameter**	**Specification**
Data Through Mode	PSE-# to OUT-#	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
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: ***PSA-3102***	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	Dual (Port 1 and Port 2)

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 ΔV / ΔI 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 ΔV / ΔI 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*) Pair	Range	0 to 750 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 Active, Per Powered Pair	Range	0 to 400 mA
		Resolution	0.25 mA
		Accuracy	± (0.5% setting + 0.25mA)
		Slew Rates	> 4mA / μsec
		Activation Voltage	14V, Falling Vport
		De-Activation Voltage	6V, Falling Vport
Configurable Load Transient	Vport > 15VDC	Sequential Load Steps	2
		Transient Sequence Repeats	0 to 4
		Load Step 1 Range	0 to 1800 mA
		Load Step 2 Range	PSA-3102: 0 to 750 mA
		Resolution (0 – 1023 mA) Resolution > 1023 mA	0.25 mA 0.50 mA
		Accuracy	± (1% setting + 0.5mA)
		Slew Rate	< 10mA / μsec
		Step 1 Duration < 1024 mA	200 μsec to 1 sec
		Step 1 Duration > 1023 mA	200 μsec to 80 msec
		Step 2 Duration Load Step 1 < 1024 mA Load Step 1 > 1023 mA	 20 μsec to 1 sec (or persist) 1 sec
		Step Resolution	100 μs
		Trigger Modes:	Immediate, Edge, Event
		Active Load Resistance	37 Ω

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, 50ms…10s)
		Extended Trace Length[3]	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[1]	> 30VDC: ± (1.5% reading + 16mV) < 30VDC: ± (2.0% reading + 16 mV)
		Measurement Triggers	Immediate, Edge, Event, Power-Up (*traces only*)
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[3]	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[2]	± (0.5% reading + 0.5mA)
		Triggers	Immediate, Edge, Event, Power-Up (*traces only*)

1. Does not include Voltage drop due to cable losses and 0.45Ω maximum test port input resistance.
2. Does not include MPS current present in Port Switch Connected state that adds approximately (Vport - 12V)/24kΩ.
3. Scope Traces only - require PSA controller firmware 3.10 or newer and test port firmware 3.14 or newer.

AC Metering Specifications

Description	Conditions	Parameter	Specification
AC Peak-Peak Meter	Low Band, VDC= 40-57V	Accuracy, 25Hz – 325Hz Accuracy, 50Hz – 300Hz	-15%, +11% -7.5%, +11%
	High Band, VDC= 40-57V	Accuracy, 2.5KHz – 250KHz Accuracy, 20KHz – 250KHz	-15%, +7% -6%, +7%
	Full Band, VDC= 40-57V	Accuracy, 50Hz – 250KHz	-7.5%, +8.5%
	All Bands, VDC= 40-57V	Resolution	1mV
		Range	2Vp-p
		Input Impedance	0.05µF[1]

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 readings)	± 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

Front Panel PSA-3102 LED Indicators

LED Label	Parameter	Description
DET	Detection Signature & LLDP Link Status	**ON:** Valid 802.3 Detection Signature Connected Normally Off **BLINKING**: LLDP connected but NOT LINKED Normally On **BLINKING**: LLDP connected and LINKED **OFF**: Detection Signature & LLDP link removed
PWR	PSE Power On	**ON**: PSE powered with Vport > 36 VDC **OFF**: PSE not powered - Vport < 36 VDC

Front Panel PSA-3102 LED Indicators		
LED Label	**Parameter**	**Description**
ARM	Trigger ARM	**ON:** Edge Trigger 1 in the ARMED State **OFF:** Edge Trigger 1 NOT in the ARMED State
AUX	Communications	**ON**: Indicates active communications to test port

Programming and Control	
Description	**Specification**
Interface	Ethernet 10/100BaseT (*Telnet Port 23 protocols*) **NOTE**: The **Console** interface is for IP Address config only.
Host Requirements	PC running Microsoft Windows XP, Vista, 7, 8, 10, or Linux PC (Fedora, SUSE, Debian)
Host Software Environment	Sifos PowerShell PSA or PSA-Interactive
Recommended Network/Run-Time Latency:	< 20 msec

Physical and Environmental	
Description	**Specification**
Dimensions	19"W x 5.25"H x 12"L (3U Rack Mount)
Weight	20.4 lbs. (Fully Populated with PSA-3x02 Cards)
Power	100VAC-240VAC, 50-60 Hz, 1.35A Max.
Ambient Operating Temperature	0°C to 40°C (≤75W combined loading per PSA-3002 Compact PSA)
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	CSA Listed (CSA22.2 No. 61010)	Meets EN61010-1 CB Scheme IEC 61010-1
General Certification		Low Voltage Directive (2014/35/EU) Electromagnetic Compatibility Directive (2014/30/EU) CE Marking Directive (93/68/EEC)
FCC Statement: 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.		

Ordering Information

PSA-3002-SA	**PoE Service Analyzer** including PSA-3002 Compact PowerSync® Analyzer and PSA Interactive Software for PoE Service Analysis.
Accessories Included:	Hard-Shell Carrying Case Configuration Guide and CD PoE Service Analyzer Reference Manual Power Module LAN and RS-232 Cables

Sifos Technologies, Inc.
1061 East Street
Tewksbury, MA 01876
+1 (978) 640-4900
www.sifos.com
sales@sifos.com

Verification, Simplified.

PSASA061517