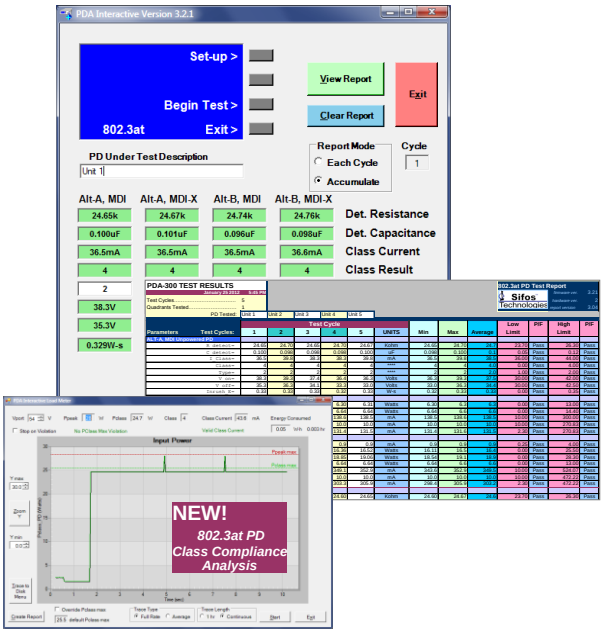
PDA-300
PoE Powered Device Analyzer
IEEE 802.3at Power over Ethernet

Product Overview



Key Features

- Automated Testing of IEEE 802.3at PD Parameters
- One-Button 802.3at Test Sequence & Report
- PD Load Monitoring and Class Compliance Analysis
- PD Load Monitoring over Voltage
- Informative Pop-Up Spreadsheet Reports & Statistics
- Continuous PD Source Power to 25.5 Watts
- Compliant 2-Event High Power Grants
- Thru Port for External PD Control, Packet Test, & LLDP Test
- PD Energy Consumption Measurements
- Optional User-Defined Tests and Limits
- Use Stand-Alone or with Windows PC
- Available as PDA-100 to PDA-300 Upgrade

Verification, *Simplified.*

IEEE 802.3at PD's

Type-1 (≤13W) PD's

Type-2 (≤25.5W) PD's

Assure 802.3at Interoperability

Automated Conformance Testing

Powerful Load Monitor

PD Classification & LLDP Request Validation

Simultaneous PD Control and Test

Versatile Applications

Evaluation & Design

Quality Assurance

Manufacturing

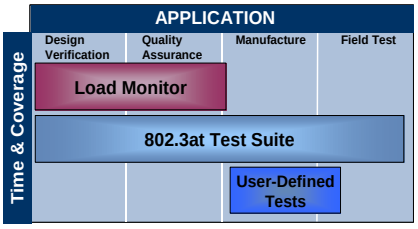
Field Service

Energy Rating

One Box Solution

Replaces PSE's, DC Supplies, Fixtures, Scopes, & Meters

Just Plug and Test



Overview

The PDA-300 Powered Device Analyzer is a single-box comprehensive solution for testing **IEEE 802.3at** PoE Powered Devices (PD's). It offers one-button, fully automated test sequences and limit processing for critical Powered Device operating parameters. With measurements performed at the Powered Device network interface, many parameters critical to IEEE 802.3at interoperation can be efficiently compared to specification requirements thus fully avoiding the need for extensive interoperability testing with IEEE 802.3at PSE's and network connections.

Superior Defect Coverage

The PDA-300 provides defect coverage well in excess of what a commercial PSE or instrument grade DC power supply might offer. It will automatically perform measurements across each powered pair and polarity combination. Measurements such as DC load-over-voltage, classification validity, power on-off thresholds, MPS validity, and detection impedance are readily performed and compared to applicable test limits with no special fixtures or device programming requirements. The PDA-300 can continuously source up at least **25.5 watts** to a PD.

Flexible Automated Testing of 802.3at PD's

The PDA-300 includes a built in, fully automated test sequence that measures up to twenty 802.3at specification parameters on any unmanaged PD. Testing can be initiated from the instrument front panel or from host PC software where test results are automatically captured to informative Microsoft Excel spreadsheet reports that check test limits and provide multi-unit statistics.

Tests may be pre-configured for single quadrant (ALT A, MDI) testing or multi-quadrant (ALT A&B, MDI & MDI-X) testing. Test limits can be adjusted in the PDA-300 instrument and/or in the specialized spreadsheet report template. IEEE 802.3at Type-1 and Type-2 PD's are always subjected to both Type-1 and Type-2 power grants during automated testing to assure interoperability across all PSE types.

Powerful Real-Time Load Monitor and Compliance Analysis

Under PDA Interactive software, the PDA-300 offers powerful real time tools for analysis of average, peak, and maximum classification compliant load levels. Analyses can be performed across a range of input voltages and may be done coincidently with PD control and configuration activity. Class and Peak Power violations are automatically recognized and computed according to requirements introduced in the IEEE 802.3at specification.

Fully Integrated, One-Box Solution

The PDA-300 removes the need for specialized instrumentation setups that might include DC power supplies, precision meters, specialized test fixtures, and custom software. The PDA-300 may be used stand-alone to rapidly qualify PD's or may be used with PDA Interactive software to develop detailed specification compliance analyses of new PD designs. It may also be remotely controlled by ATE software using an API library. This versatility allows users to apply the PDA-300 over the full lifecycle of any Powered Device including newer, Type-2, IEEE 802.3at compliant PD's.

Verification, *Simplified.*

PDA-300 versus a Commercial PSE

With the ready availability of commercial Power Sourcing Ethernet Switches (PSE), including low cost PSE's, a strong temptation exists to utilize these products to test Powered Devices. When coupled with long spools of cable or line loss simulators, a PSE may provide a "real world" interface to a PD.

As an "interop" test strategy, this use of PSE's suffers from the constantly growing number of PSE manufacturers, PSE device technologies, and product versions. The task of building confidence in a Power Device's interoperability performance is therefore growing in complexity as the testing permutations multiply.

The reality is that PSE's are not test instruments. A PSE cannot test key characteristics of a PD that are ultimately vital to interoperability over all PoE networks. Even the most sophisticated PSE's that offer some management reporting of PD classification and power draw offer no insight regarding how the PSE produces those parameters or what they might really mean.

Test Coverage or Feature	PDA-300	Commercial PSE
PD Power-Up	Covered	Covered
Ethernet Data Connection	Covered	Covered
ALT-A and ALT-B Power	Covered	Limited
MDI and MDI-X Polarity	Covered	Limited
Detection Resistance	Covered	Limited
Detection Capacitance	Covered	Not Covered
Classification Signature	Covered	Limited
Inrush Limiting	Covered	Not Covered
Type-2 Power Delay	Covered	Not Covered
PD Turn-On Voltage	Covered	Not Covered
PD Turn-Off Voltage	Covered	Not Covered
Average Power Consumption	Covered	Not Covered
Peak Power Draw	Covered	Not Covered
Classification Validity	Covered	Not Covered
Power over Voltage	Covered	Not Covered
MPS Validity	Covered	Limited

Table 1: PDA-300 vs Commercial PSE Coverage

The IEEE 802.3at specification offers wide discretionary ranges to PSE's as they perform PD detection, PD classification, and PD power management operations. While limiting PSE costs, these wide discretionary ranges severely limit the value of a PSE in qualifying PD interoperability.

Table 1 illustrates a variety of PD performance parameters that are critical to the broad interoperability of a PD and the respective test coverage that can be expected from a commercial PSE relative to a PDA-300.

The Automated 802.3at PoE Test Suite

Many features of a PD that are critical for interoperability with all 802.3at compliant PSE's are readily assessed through a fully automated sequence of measurements by the PDA-300. The PDA-300 emulates both Type-1 and Type-2 PSE's and will support PD power loads beyond the maximum allowed 25.5 watts.

The 802.3at PoE Test Suite can be accessed either from the PDA-300 front panel (stand-alone operation) or from **PDA Interactive** software where colorful Microsoft Excel spreadsheet reports are automatically produced. The suite is also accessible through the PDA-300 API library for Microsoft Windows.

The 802.3at PoE Test Suite tests pre-power characteristics in four "quadrants", that is independently on each powered pair with each power polarity (ALT-A, ALT-B, MDI, MDI-X). Powered PD parameters may be acquired either in a single quadrant or in all four quadrants to assure maximum fault coverage.

802.3at PoE Test Suite parameters and associated test criteria are shown in *Table 2*.

Category	Test Parameter	Description
Unpowered PD	R_detect	Detection resistance (2.7 to 10.1 Volt band)
	C_detect	Detection capacitance (2.7 to 10.1 Volt band)
	I_class	Classification signature current (15 – 20 Volt band)
	Class	PD Class determined from classification
	Type	PD Type determined from classification
	V_on	Voltage at which PD draws load current
	V_off	Voltage at which PD stops load current
	Inrush_E	Capacitive charging energy (watt-sec) over worst 20msec sub-interval of Inrush interval – a failure indicates an Iinrush_pd violation while a pass indicates very low inrush interoperability risk
Powered from **Type-1** PSE ***Single-Event*** *Classification* and ***48V*** *DC Source*	Pclass_pd_1	Average PD power draw following the 50msec inrush interval
	Ppeak_pd_1	Maximum PD transient load following the 50msec inrush interval
	Max_Load_1	Maximum transient load current sampled following the 50msec inrush interval*
	MPS_Load_1	Minimum load current sampled after power-up. (*Note: PD's meeting DC MPS signature criteria described in IEEE **802.3at** paragraph 33.3.8 will report 10mA or higher*.)
	Average_Load_1	Average load current following the 50msec inrush interval
Powered from **Type-2** PSE ***Two-Event*** *Classification* and ***54V*** *DC Source*	I_Mark	Class pulse discharge current measured between class pulses
	Pclass_pd_2	Average PD power draw following the 50msec inrush interval
	Ppeak_pd_2	Maximum PD transient load following the 50msec inrush interval
	P_type-1	Power load measured between end of inrush interval (50msec) and **Tdelay** (80msec) (*see IEEE **802.3at** paragraph 33.3.7.3*)
	Max_Load_2	Maximum transient load current sampled following the 50msec inrush interval
	MPS_Load_2	Minimum load current sampled after power-up. (*Note: PD's meeting DC MPS signature criteria described in IEEE **802.3at** paragraph 33.3.8 will report 10mA or higher*.)
	Average_Load_2	Average load current following the 50msec inrush interval

Table 2: 802.3at PoE Test Parameters

The 802.3at standard spreadsheet report operates in one of two ways: An automatic pop-up report at the end of *each test cycle* or a suppressed spreadsheet report that can *accumulate* up to 24 test cycles of test results while adding Min-Max-Average statistics for each parameter tested across N cycles. This second mode enables testing of multiple units or repeatability testing of a single unit.

An example report including 5 cycles (e.g. 5 units) of results is shown in *Figure 1*.

The standard 802.3at PoE Test spreadsheet report opens as a read-only file and may be saved to a directory path or file name selected by the PDA Interactive user.

PDA-300 TEST RESULTS — January 25 2012 5:45 PM

Test Cycles..... 5
Quadrants Tested..... 1
PD Tested: Unit 1 | Unit 2 | Unit 3 | Unit 4 | Unit 5

802.3at PD Test Report — Sifos Technologies — firmware ver. 3.21, hardware ver. 2, report version 3.04

Parameters / Test Cycles:	1	2	3	4	5	UNITS	Min	Max	Average	Low Limit	P/F	High Limit	P/F
ALT-A, MDI Unpowered PD													
R_detect=	24.65	24.70	24.65	24.70	24.67	Kohm	24.65	24.70	24.7	23.70	Pass	26.30	Pass
C_detect=	0.100	0.098	0.098	0.098	0.100	uF	0.098	0.100	0.1	0.05	Pass	0.12	Pass
I_Class=	36.5	39.8	38.3	38.3	39.8	mA	36.5	39.8	38.5	36.00	Pass	44.00	Pass
Class=	4	4	4	4	4	****	4	4	4.0	0.00	Pass	4.00	Pass
Type=	2	2	2	2	2	****	2	2	2.0	1.00	Pass	2.00	Pass
V_on=	38.3	39.3	37.4	36.4	36.3	Volts	36.3	39.3	37.5	30.00	Pass	42.00	Pass
V_off=	35.3	36.3	34.1	33.3	33.0	Volts	33.0	36.3	34.4	30.00	Pass	42.50	Pass
Inrush_E=	0.33	0.33	0.33	0.32	0.33	W-s	0.32	0.33	0.33	0.00	Pass	0.35	Pass
ALT-A, MDI Type-1 Grant													
Pclass_PD_1=	6.31	6.31	6.30	6.30	6.31	Watts	6.30	6.3	6.3	0.00	Pass	13.00	Pass
Ppeak_PD_1=	6.64	6.64	6.64	6.64	6.64	Watts	6.64	6.6	6.6	0.00	Pass	14.40	Pass
Max_Load_1=	138.6	138.5	138.5	138.6	138.5	mA	138.5	138.6	138.5	10.00	Pass	300.00	Pass
MPS_Load_1=	10.0	10.0	10.0	10.0	10.0	mA	10.0	10.0	10.0	10.00	Pass	270.83	Pass
Average_Load_1=	131.6	131.6	131.4	131.4	131.5	mA	131.4	131.6	131.5	2.30	Pass	270.83	Pass
ALT-A, MDI Type-2 Grant													
I_Mark=	0.9	0.9	0.9	0.9	0.9	mA	0.9	0.9	0.9	0.25	Pass	4.00	Pass
Pclass_PD_2=	16.42	16.42	16.11	16.36	16.52	Watts	16.11	16.5	16.4	0.00	Pass	25.50	Pass
Ppeak_PD_2=	18.96	18.96	18.54	18.85	19.06	Watts	18.54	19.1	18.9	0.00	Pass	28.30	Pass
P_type=1=	6.64	6.64	6.64	6.64	6.64	Watts	6.64	6.6	6.6	0.00	Pass	13.00	Pass
Max_Load_2=	350.9	351.1	343.6	349.1	352.9	mA	343.6	352.9	349.5	10.00	Pass	524.07	Pass
MPS_Load_2=	10.0	10.0	10.0	10.0	10.0	mA	10.0	10.0	10.0	10.00	Pass	472.22	Pass
Average_Load_2=	304.3	304.3	298.4	303.3	305.9	mA	298.4	305.9	303.2	2.30	Pass	472.22	Pass
ALT-A, MDI-X Unpowered PD													
R_detect=	24.67	24.65	24.65	24.60	24.65	Kohm	24.60	24.67	24.6	23.70	Pass	26.30	Pass
C_detect=	0.101	0.100	0.100	0.101	0.103	uF	0.100	0.103	0.1	0.05	Pass	0.12	Pass
I_Class=	36.5	39.8	38.3	38.3	39.8	mA	36.5	39.8	38.5	36.00	Pass	44.00	Pass
Class=	4	4	4	4	4	****	4	4	4.0	0.00	Pass	4.00	Pass
Type=	2	2	2	2	2	****	2	2	2.0	1.00	Pass	2.00	Pass
V_on=													
V_off=													
Inrush_E=													
ALT-B, MDI Unpowered PD													
R_detect=	24.74	24.74	24.63	24.70	24.63	Kohm	24.63	24.74	24.7	23.70	Pass	26.30	Pass
C_detect=	0.096	0.096	0.101	0.096	0.096	uF	0.096	0.101	0.1	0.05	Pass	0.12	Pass
I_Class=	36.5	39.8	38.3	38.3	39.8	mA	36.5	39.8	38.5	36.00	Pass	44.00	Pass
Class=	4	4	4	4	4	****	4	4	4.0	0.00	Pass	4.00	Pass
Type=	2	2	2	2	2	****	2	2	2.0	1.00	Pass	2.00	Pass
V_on=													
V_off=													
Inrush_E=													
ALT-B, MDI-X Unpowered PD													
R_detect=	24.76	24.81	24.74	24.70	24.67	Kohm	24.67	24.81	24.7	23.70	Pass	26.30	Pass
C_detect=	0.098	0.100	0.098	0.098	0.100	uF	0.098	0.100	0.1	0.05	Pass	0.12	Pass
I_Class=	36.6	39.8	38.3	38.3	39.8	mA	36.6	39.8	38.6	36.00	Pass	44.00	Pass
Class=	4	4	4	4	4	****	4	4	4.0	0.00	Pass	4.00	Pass
Type=	2	2	2	2	2	****	2	2	2.0	1.00	Pass	2.00	Pass
V_on=													
V_off=													
Inrush_E=													
Average-Over-Pairs Unpowered PD													
R_detect=	24.71	24.73	24.67	24.68	24.66	Kohm	24.66	24.73	24.7	23.70	Pass	26.30	Pass
C_detect=	0.10	0.10	0.10	0.10	0.10	uF	0.098	0.100	0.1	0.05	Pass	0.12	Pass
I_Class=	36.53	39.80	38.30	38.30	39.80	mA	36.5	39.8	38.5	36.00	Pass	44.00	Pass
Class=	4	4	4	4	4	****	4	4	4.0	0.00	Pass	4.00	Pass
Type=	2	2	2	2	2	****	2	2	2.0	1.00	Pass	2.00	Pass
V_on=													
V_off=													
Inrush_E=													

Figure 1: Standard 802.3 Test Report, Single Quadrant

Load Monitoring with the PDA-300

Full compliance testing of a Powered Device (PD) often requires some form of intervention from a control entity in order to assess all states of power draw by the PD. PD's vary widely in the variety of operating states and methods of control required to actuate those states. For this reason, the **Automated 802.3at PoE Test Suite** alone cannot fully assess specification conformance during powered-on states of a PD.

The **Load Monitor** (or Load Meter) samples power loading behaviors of a PD over an arbitrarily long time period while allowing users the opportunity to manipulate states or other test conditions in the PD while the Load Monitor collects data. As a stand-alone instrument, the PDA-300 offers a basic load meter that samples PD power (in watts and mA) continuously at a rate of about three samples per second and displays those values to the LCD display.

Within **PDA Interactive** software, a more sophisticated Load Monitor (*see Figure 2*) assesses **Pclass_pd** and **Ppeak_pd** behaviors and limit violations. The PDA Interactive Load Monitor utilizes 20msec real-time sampling to provide a live strip-chart view of either instantaneous power load (updated 50 times per second) or **Pclass** running average over a 1 second averaging window.

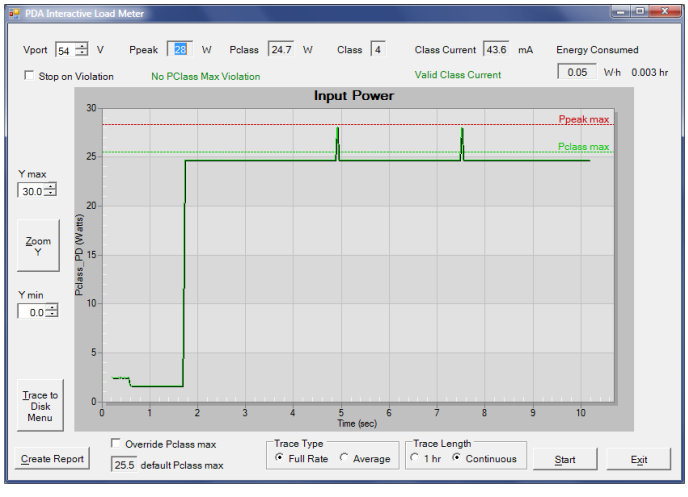


Figure 2: PDA Interactive Load Monitor

Ppeak_pd limit violations occur when **Ppeak_pd** exceeds **Ppeak_max**. **Pclass_pd** limit violations occur when **Pclass_pd** exceeds **Pclass_max** for longer than 50 msec. The PDA Interactive Load Monitor plots **Ppeak_max** and **Pclass_max** limit lines using either default values from PD physical classification or based upon user override values

that might reflect a PD's LLDP-embedded power request. Even very rare limit violations can be automatically captured and analyzed using the **Stop on Violation** feature of the Load Monitor.

The PDA Interactive Load Monitor can help designers and QA personnel assess the validity of a PD's classification level and/or LLDP power request level. Even very rare intermittent power transients can readily be trapped and analyzed to determine whether PD's are either mis-classified or generating unexpected load levels.

The PDA Interactive Load Monitor also records **Energy Consumption** over longer periods of time in order to report watt-hour rating of a PD. Long duration load tracing is facilitated by a **Trace to Disk** feature where real time loading behavior over periods of minutes or hours can be recorded continuously to a data file. The Load Monitor Trace Display (*see Figure 2*) can also be exported to a Microsoft Excel spreadsheet (*see Figure 3*).

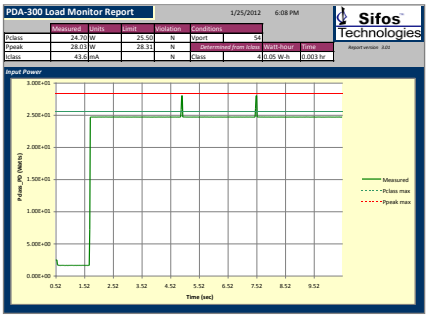


Figure 3: Load Monitor Spreadsheet Report

PDA-300: Stand-Alone or Computer Hosted

The PDA-300 operates either as a stand-alone instrument or under Microsoft Windows PC-based software control using **PDA Interactive** software. As a stand-alone instrument, users may configure and run 802.3at PoE Tests, run the basic Load Meter, and create simple User-Defined Tests (with modified test limits) to get parameter data and PASS/FAIL indications.

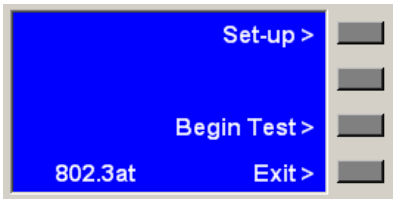


Figure 4: PDA-300 Soft-Key Test Menu

PDA Interactive enhances each of these capabilities with the ability to route test data into informative spreadsheet reports and with the addition of the more sophisticated Load Monitor capabilities described above.

The PDA-300 implements a simple soft-key front panel control (*see Figure 4*) that is largely replicated as a virtual front panel in PDA Interactive (*see Figure 5*). Most configuration and control operations are intuitive and are performed identically regardless of whether the instrument is used stand-alone or under PDA Interactive software.

The PDA-300 may also be controlled from user-developed ATE software via the PDA-300 API for Microsoft Windows.

Figure 5: PDA Interactive Virtual Soft-Key Test Menu

User-Defined Tests and Limits

Both the PDA-300 as a stand-alone instrument and PDA Interactive allow for specialized testing using user-defined test limits. This features enables users to create specific tests with narrower limit ranges, specified test quadrants, specified sampling durations, and certain measurement exclusions. Generally, such testing might be useful in a production setting where obtaining a PASS/FAIL indication relative to user-specified criteria is important.

What about PoE LLDP ?

Under IEEE 802.3at, Type-2 (high power) PD's are required to operate as Type-1 (normal power) PD's until receiving a grant (or permission) from the PSE to operate with higher power load. All Type-2 PD's must support both a 2-Event (classification) power grant *and* a PoE Link Layer Discovery Protocol (LLDP) grant since Type-2 PSE's generally have discretion to use one or the other method.

The PDA-300 performs comprehensive, multi-state electrical testing of the Powered Device, including full power states achieved following a 2-Event power grant. Load Monitoring can be used to establish or verify LLDP Power Request levels that a PD should utilize.

Users wishing to verify LLDP protocol and state behaviors of a Powered Device may do so by routing the PDA-300 THRU port to an LLDP (PSE) emulation entity. The PDA-300 Load Monitor may then be used to assess PD power state changes and any potential violations of Pclass_max, Ppeak_max, and LLDP Power Request levels.

The Sifos Technologies PDA-LLDP can perform highly flexible PSE LLDP emulation and protocol analysis. This instrument can be combined with the PDA-300 to assess LLDP behaviors of an 802.3at compliant PD. See Sifos datasheet **PDA-LLDP Powered Device LLDP Analyzer** for further information.

Technical Data

Input/Output

Interface	Parameter	Specification
TEST Port	Connections	RJ45
	PoE Signaling and Supply Modes	ALT-A MDI, ALT-A MDI-X, ALT-B MDI, ALT-B MDI-X
	Data Rates and Signaling	10/100/1000BaseT
	Impedance	100Ω, Balanced
THRU Port	Connections	RJ45
	Data Rates and Signaling	10/100/1000BaseT
	Latency	0 (Passively Coupled)
	Impedance	100Ω, Balanced
Serial Control Port (RS232)	Connection	DB-9, Straight (non-null modem), Auto-Configured
	PDA Interactive Host Environment	Microsoft Windows 7, Vista, XP, 2000
User Interface	Instrument Control	4-Button Soft-Key Control
	Display	White/Blue LCD screen
	LED's	**DET**ecting: Performing Detection **CLA**ssifying: Performing Classification **2 EV**ent Grant: 2-Event Class Prior to Power-Up **PWR** On: DC Power Applied to PD

Source Specifications

Source	Parameter	Specification
DC Supply	Voltage Range - Continuous	Continuous: 36 VDC to 57 VDC Timed ≤120 Sec.: 28 – 35 VDC
	Voltage Accuracy	± 1.5%
	Voltage Resolution	1 Volt
	Maximum Source Current	Continuous: 600 mA 50msec Transient: 630mA
PD Detection Resistance	Method	ΔV / ΔI
	Probing Voltage	~4.5V - ~9V
PD Detection Capacitance	Method	Slew Time
	Probing Voltage	~4.5V - ~9V
PD Classification	Modes	One-Event and Two-Event
	Classification Probing Voltage & Time	~17.5V, ~15.5msec
	Mark Region Voltage & Time	~8.5V, >6msec

Measurement Specifications

Measurement	Parameter	Specification
PD Detection Resistance	Range	2kΩ to 50kΩ
	Accuracy	± 1% (19kΩ to 26.5kΩ) ± 3% (15kΩ to 33kΩ) ± 15% (Full Range)
	Internal 802.3at Test Limits	23.7kΩ to 26.3kΩ
PD Detection Capacitance	Range	1nF-50μF
	Accuracy	± 3% + 3nF
	Internal 802.3at Test Limits	0.05μF- 0.12μF
PD Classification	Classification Range	0mA to 60mA
	Classification Accuracy	+/-2% + 600μA
	Mark Region Range (*Mark 2 Event Only*)	0.1 to 4.1 mA
	Mark Region Accuracy	± 2% + 100μA
	Internal 802.3at Test Limits	Class 0 PD: 0 to 4 mA Class 1 PD: 9 to 12 mA Class 2 PD: 17 to 20 mA Class 3 PD: 26 to 30 mA Class 4 PD: 36 to 44 mA Mark Region: 0.1 to 4.1 mA
Power Level (General)	Range	0 to 30 Watts
	Resolution	<10 Watts: 0.01 W ≥10 Watts: 0.1 W
	Accuracy	± 2% + 0.1W
	Sample Timing & Integration	~18 msec (> 55 samples / sec)

Measurement	Parameter	Specification
PD Class Power (Pclass)	Measurement Integration Time	802.3at Test: ~5 Seconds Load Monitor: 1 sample *or* 1 second Load Monitor Violation Test: ~54 msec
	Internal 802.3at Test & PSA Interactive Load Monitor Limits *(Upper Limit*= Pclass_max)	Class 0, 3 PD: 0 to 13.0 Watts Class 1 PD: 0 to 3.84 Watts Class 2 PD: 0 to 6.49 Watts Class 4 PD: 0 to 25.5 Watts *After* $\mathbf{T}_{delay}$
Peak Power Level (Ppeak)	Measurement Integration Time	1 sample (~18 msec) Load Monitor Violation Test: 1 sample
	Internal 802.3at Test & PSA Interactive Load Monitor Limits *(Upper Limit*= Ppeak_max)	Class 0,3 PD: 0 to 14.4 Watts Class 1 PD: 0 to 5.00 Watts Class 2 PD: 0 to 8.36 Watts Class 4 PD: 0 to 28.3 Watts *After* $\mathbf{T}_{delay}$
P_Type-1 Power	Measurement Time Interval	~54 to ~72 msec after power-up
	Internal Test Limits (All Classes)	Ppeak (*Class 4 restricted 14.4W*)
Inrush_E	Measurement Time Interval	~0 to ~72 msec after power-up
	802.3at Test Limits (Highest Sample)	0 to 0.38 Watt-Sec
Load Current (General)	Range	0 to 630 mA
	Resolution	0.1 mA
	Accuracy	$\pm$ 1% + 600μA
	Sample Timing & Integration	~18 msec (> 55 samples / sec)
Load Current (802.3at Test)	Integration Time	Max Load: 1 sample MPS Load: 1 sample Average Load: $\geq$ 1 second
	Internal 802.3at Test Limit Range (mA)	Max Load: 10 to Ppeak_max / Vport MPS Load: 10 to Pclass_max / Vport Average Load: 2.3 to Pclass_max/ Vport
Turn-On Voltage	Range	28 to 48 V
	Resolution	0.1 V
	Accuracy	*
	Internal Test Limits	$\leq$ 42 VDC
Turn-Off Voltage	Range	28 to 48 V
	Resolution	0.1 V
	Accuracy	*
	Internal Test Limits	$\geq$ 30 VDC

* Voltage Turn-On and Turn-Off results are based on observed changes in PD current.

Physical and Environment

Characteristic	Specification
W x H x L	7.5" x 3" x 10"
Weight	3.2 Lbs.
Power	100-240VAC, 50-60Hz, 700mA Max.
Operating Temp.	0°C to 40°C
Storage Temp.	-20°C to 85°C
Humidity	5% to 95% RH, Non-Condensing

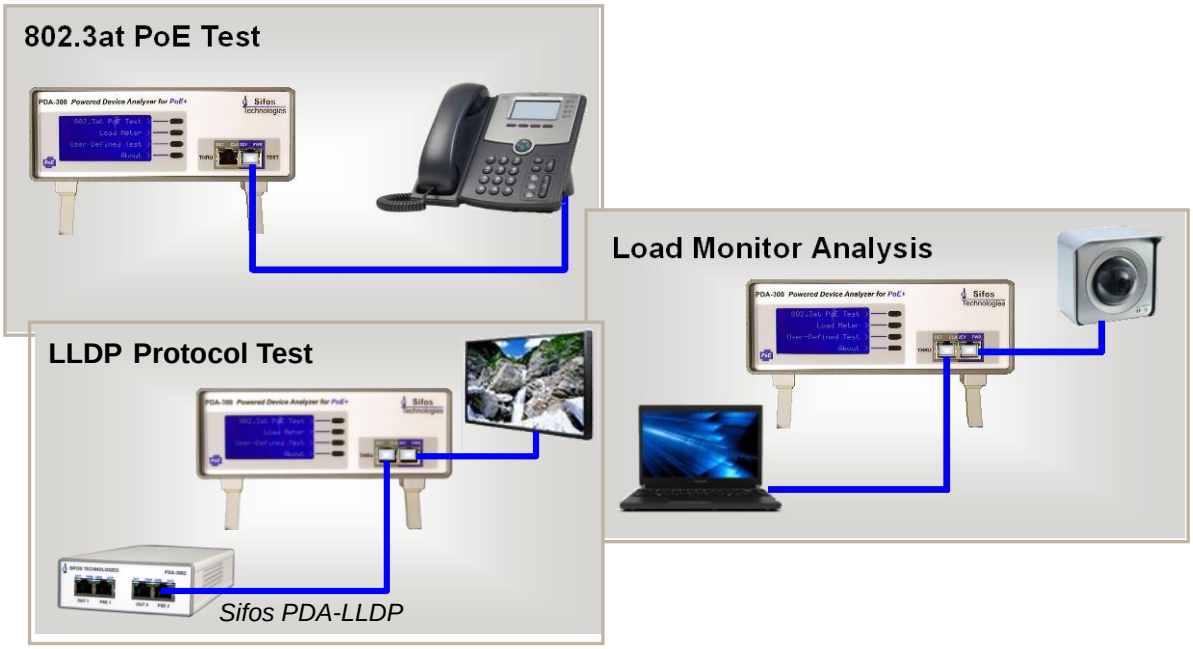
Certifications

Description	Certifications
Emissions	FCC Part 15, Class A Meets EN55011, VCCI, AS/NZS 3548
Safety	CSA Listed (CSA22.2 No. 61010) Meets EN61010-1
European Commission	Low Voltage Directive (73/23/EEC) CE Marking Directive (93/68/EEC)Electromagnetic Compatibility Directive (89/336/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.

Test Configurations



Ordering Information

PDA-300	Powered Device Analyzer
PDA-300U	PDA-100 to PDA-300 Upgrade
PDA-300-Cal	Calibration Service for PDA-300

Accessories Included:
- PDA-300 Reference Manual
- PDA Interactive Software (CD)
- Power Cord
- Ethernet Patch Cable
- RS-232 Cable

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

Verification, Simplified.