

Overview

The PowerSync Analyzer may be utilized today to test next generation **Mid-Powered** PSE's and associated product prototypes. A **Mid-Powered** PSE refers to a PSE that furnishes up to 30 watts of power delivered on 2 pairs to a PD. Sifos Technologies has incorporated into **PSA Software Release 3.1** capabilities to combine two physical test ports from a PSA test blade to serve as a single high power test port for the following purposes:

- ❑ PSE Conformance Testing Including 6 New High Power Overload Tests
- ❑ Active Loading to 1000 mA total load
- ❑ PD Emulation including Class 4
- ❑ DC Voltage, Current, and Power Measurements
- ❑ Packet Data Transmission Testing under Load
- ❑ Standardized Waveforms for High Power PSE Ports

With the anticipated release of IEEE 802.3at expected in 2008, first generation Mid-Power devices and Power Sourcing Equipment (PSE) are currently in active development throughout the networking industry. High power PSE's with capability to deliver well in excess of the 15.4 watt requirement of IEEE 802.3af PSE's are becoming available ahead of the IEEE standard.

IEEE 802.3at will specify a **Mid-Power** 2-pair solution for the delivery of up to 30 Watts of power to a Powered Device. PSE's will be required to deliver over 35 Watts of continuous DC power to fulfill this requirement. PSE's may range upwards of 39 Watts in continuous output capacity on a single PSE port delivered on either ALT A or ALT B (for a mid-span PSE) transmission pairs. DC currents will exceed 700mA and overload thresholds will approach 850 mA to 900 mA in many cases.

Hardware and Software Requirements

The only additional hardware required to enable **Mid-Power** PSE testing is a simple RJ-45 splitter available from Sifos as an integrated Port Combiner assembly. Figure 1 depicts a 4-port high power configuration involving test slots 1-4. Figure 2 provides a schematic representation of the test port setup.

PowerSync Analyzer software version 3.1 offers full support of this test configuration. PSA Interactive adds a new **High Power** control to enable Mid-Power PSE Conformance Tests, active load control up to 1000 mA, PD Class 4 start-up emulation, and dual-port voltage, current, and power measurements. PowerShell adds several new commands to perform similar functions from the command line or from automated test scripts.



Figure 1. PSA Port Combiner Setup

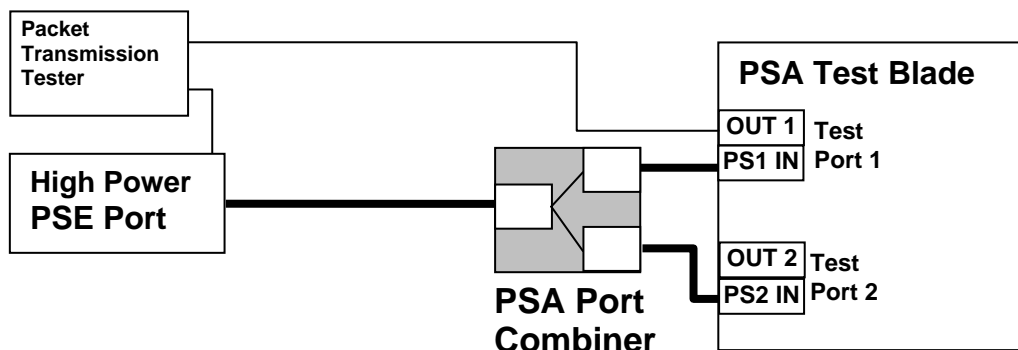


Figure 2. PSA Port Combiner Connections

PSE Conformance Testing – High Power PSE’s

PSA Software Version 3.1 includes six new PSE Conformance Tests that are applicable to High Power PSE ports. These are:

Test Name	Test Description
pwrup_inrush_2	PSE Inrush Load Compliance test for PSE's with current limiting thresholds (I_{lim}) in the 600mA to 1000 mA band.
pwrup_pwracap_2	PSE Port Power Capacity test for PSE's with output power capacity in the 20 to 38 Watt band.
pwrup_maxi_2	PSE Short Circuit Load Compliance test for PSE's with current limiting thresholds (I_{lim}) in the 600mA to 1000 mA band.
pwrup_overld_2	PSE Transient Load Response test for PSE's with maximum overload (I_{cut}) at or below 720 mA.
pwrnd_overld_2	PSE Overload Shutdown test for PSE's with overload cutoff currents (I_{cut}) in the range of 400 to 900 mA.
pwrnd_v_2	PSE Error Delay test for PSE's with current limiting thresholds (I_{lim}) in the 600mA to 1000 mA band.

Like existing PSE Conformance Tests, these tests can be run individually or sequenced automatically from the PSA Interactive GUI and from PowerShell. Each test produces output results and parameters that are exactly analogous to their corresponding 802.3af test counterparts. Each test, where applicable, supports display of voltage and current waveforms collected as part of the parametric analysis during testing. (See Figure 3.)

However, unlike existing 802.3af PSE Conformance Tests, firm test limits for certain parameters such as I_{cut} and I_{lim} do not exist at this time and will not exist until the completion of the IEEE 802.3at (PoE Plus) standard. Nonetheless, PSE Conformance Testing can be sequenced to the standard Sifos 802.3af Conformance Test Report spreadsheet for limit checking and statistical analysis. Any parameters outside the normal 802.3af limit boundaries will be flagged as “Fail”.

Another key difference between the 802.3af tests and their High Power counterparts is the need within the Mid-Power tests to search for device-specific thresholds for cutoff current (I_{cut}) and overload limiting current (I_{lim}) thresholds. The tests will typically take longer to execute since these unspecified limit thresholds will vary according to PSE implementation and perhaps across PSE ports that are tested. Since the PSE Conformance Tests make no assumptions regarding these thresholds, the test are ready to use with proprietary implementations of Mid-Power PSE's.

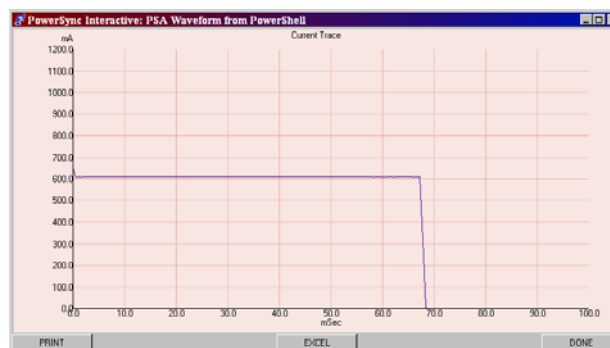


Figure 3. I_{lim} Current Trace from pwrup_maxi_2 Test.

All other PSE Conformance Tests will run using the standard 802.3af version and are not affected by the differences between 802.3af compliant PSE's and pre-802.3at high power PSE's.

PSE Conformance Test Reporting

The standard PSE Conformance Test Report spreadsheet for the PowerSync Analyzer will report results from both normal 802.3af and Mid-Power PSE testing that is sequenced from PSA Interactive or PowerShell. Since several important test limits are not yet available, some parameters such as I_{cut} (Overload Cut-off Current), I_{inrush} (Inrush Overload Current), and I_{lim} (Short Circuit Overload Current) are tested to “best guess” specifications and are flagged either as “Pass” (within limit) or “Info” (out of limit) in the standard spreadsheet report. Other parameters, particularly those associated with timing such as T_{lim} and T_{ovld} will test with identical limits as 802.3af and should presumably meet those limit criteria.

Figure 4 shows a sampling of test results from a 4-port PSE running a full suite of PSE Conformance Tests including the six new high power tests utilizing PSA Port Combiners.

PSA TEST RESULTS				<div><div><div>Sifos Technologies</div><div>Sifos PSE Interop Index*: 81%</div></div><div>802.3af Conformance Report</div><div>version 3.0.22 report version 3.1</div></div>								
May 07 2007 7:47 PM												
Port Count..... 12												
Loop Count..... 1												
PSE Tested: Sample 4-Port Mid-Power PSE												
Chassis ID: 192.168.221.106	PORTS								Low Limit	P/F	High Limit	P/F
TestLoop: 1	1-1	2-1	3-1	4-1	UNITS	Min	Max	Average				
Test: det v												
Open Circuit Det Voc=	11.6	11.6	11.6	11.6	volts	11.6	11.6	11.6	2.8	Pass	30	Pass
Peak Det Vvalid=	8.75	8.88	8.78	8.8	volts	8.75	8.88	8.8025	3.8	Pass	10	Pass
Min Det Vvalid=	4.32	4.44	4.4	4.34	volts	4.32	4.44	4.375	2.8	Pass	9	Pass
Det Volt Step dVtest=	4.41	4.44	4.35	4.36	volts	4.35	4.44	4.39	1	Pass	7.2	Pass
Detection Slew=	0.0136	0.0129	0.0132	0.0135	V/usec	0.0129	0.0136	0.0133	0	Pass	0.1	Pass
Good Sig Det Pulse=	3	3	3	3	steps	3	3	3	1	Pass	9	Pass
High Sig dVtest=	4.44	4.53	4.4	4.46	volts	4.4	4.53	4.4575	1	Pass	8	Pass
High Sig MaxV=	8.75	8.93	8.8	8.8	volts	8.75	8.93	8.82	3.8	Pass	11	Pass
Non 802 Step V=	0	0	0	0	volts	0	0	0	0	Pass	0.1	Pass
Test: det i												
Init Current Isc=	0	0	0	0	mA	0	0	0	0	Pass	5	Pass
Det Current Isc=	4.23	3.82	0.59	3.7	mA	0.59	4.23	3.085	0	Pass	5	Pass
Test: det range												
Rgood Max=	31	29	30	30	Kohm	29	31	30	26	Pass	33	Pass
Rgood Min=	17	17	17	17	Kohm	17	17	17	15	Pass	19	Pass
Cgood Max=	0.14	0.14	0.14	0.14	uF	0.14	0.14	0.14	0	Pass	10	Pass
Test: det time												
Backoff Time Tdbo=	0	0	0	0	msec	0	0	0	-1	Pass	1000	Pass
Eff Backoff Tdbo eff=	104.9	36.1	34.1	105.3	msec	34.1	105.3	70.1	-1	Pass	1000	Pass
Detection Time Tdet=	72.6	142.9	144.9	72.7	msec	72.6	144.9	108.275	5	Pass	500	Pass
Total Det Time=	72.6	142.9	144.9	72.7	msec	72.6	144.9	108.275	5	Pass	1000	Pass
Test: det rsource												
Output Impedance Zout=	0.1	0	0	0	KOhm	0	0.1	0.025	45	Info	2000	Pass
Test: class v												
Pk Class Voltage Vclass=	17.8	18	17.8	17.9	volts	17.8	18	17.875	15.5	Pass	20.5	Pass
Test: class time												
Class Time Tpdcl=	19.5	18.8	19.5	19.5	msec	18.8	19.5	19.325	10	Pass	75	Pass
Test: pwrup time												
Pwr-On Rise Time Trise=	313	312	315	315	usec	312	315	313.75	15	Pass	50000	Pass
Power-On Time Tpon=	15.6	15.6	15.6	15.6	msec	15.6	15.6	15.6	0	Pass	400	Pass
Test: pwrup inrush 2												
Init Iinrush=	604.5	617.6	608.1	609.1	mA	604.5	617.6	609.825	720	Info	1024	Pass
Max Iinrush=	603	597.5	610.6	619.7	mA	597.5	619.7	607.7	720	Info	810	Pass
Min Iinrush=	592.9	593.4	604	604.5	mA	592.9	604.5	598.7	720	Info	810	Pass
Tlim Iinrush=	68.6	68.6	68.6	68.6	msec	68.6	68.6	68.6	50	Pass	75	Pass
Inrush Voltage=	45.6	45.8	45.6	45.6	Volts	45.6	45.8	45.65	10	Pass	57	Pass
Powered Vport=	47.2	47.4	47.1	47.2	Volts	47.1	47.4	47.225	50	Info	57	Pass
Test: pwrup v												
DC Voltage Vport=	47.6	47.7	47.4	47.5	volts	47.4	47.7	47.55	44	Pass	57	Pass
AC Ripple Vpp(low)=	9	11	4	4	mVolts	4	11	7	0	Pass	500	Pass
Test: pwrup noise												
AC Ripple Vpp(noise)=	12	12	12	8	mVolts	8	12	11	0	Pass	200	Pass
Test: pwrup pwr												
DC Power Pport=	2.3	2.4	2.3	2.3	watts	2.3	2.4	2.325	2.2	Pass	2.9	Pass
DC Current Iport=	50	50	49	49	mA	49	50	49.5	49	Pass	50	Pass
Test: pwrup pwr cap 2												
Pport Capacity=	26.2	25.7	26.1	25.8	watts	25.7	26.2	25.95	31.5	Info	41	Pass
Iport Capacity=	573	561	572	562	mA	561	573	567	552	Pass	720	Pass
Port Class=	4	4	4	4	None	4	4	4	0	Pass	4	Pass
Test: pwrup maxi 2												
Init Ilim=	637	624	642	643	mA	624	643	636.5	720	Info	1024	Pass
Max Current Limit Ilim=	604	597	611	620	mA	597	620	608	720	Info	810	Pass
Min Current Limit Ilim=	593	593	605	604	mA	593	605	598.75	720	Info	810	Pass
Short Cir Timeout Tlim=	68.6	68.6	68.6	68.6	msec	68.6	68.6	68.6	50	Pass	75	Pass
Output Voltage V=	19.7	19.7	20.3	20.7	Volts	19.7	20.7	20.1	50	Info	57	Pass
25 msec Short Vport=	47.6	47.6	47.4	47.4	Volts	47.4	47.6	47.5	50	Info	57	Pass
Test: pwrup overld 2												
Voltage Swing=	2	1.9	2	1.8	volts	1.8	2	1.925	-1	Pass	5	Pass
Negative Slew=	0.002	0.002	0.003	0.002	V/uSec	0.002	0.003	0.00225	0	Pass	3.5	Pass
Positive Slew=	0.002	0.002	0.002	0.003	V/uSec	0.002	0.003	0.00225	0	Pass	3.5	Pass
Power Duration=	3080	3080	3080	3080	uSec	3080	3080	3080	2750	Pass	3250	Pass
Integr Power Out=	84.48	82.94	83.83	82.97	mW-Sec	82.94	84.48	83.555	108	Info	124	Pass
Test: mps dc valid												
Minimum Valid Imin2=	9	9	10	9	mA	9	10	9.25	5.5	Pass	10	Pass
Min Valid Time Tmps=	40	35	20	30	msec	20	40	31.25	1	Pass	60	Pass
Test: mps dc pwr dn												
Max Invalid Imin1=	8	8	9	8	mA	8	9	8.25	5	Pass	9.5	Pass
Time-to-Shutdown Tmpdo=	342	351	351	343	msec	342	351	346.75	300	Pass	400	Pass
Max Voltage Vopen_max=	0.5	0.9	0.6	0.5	volts	0.5	0.9	0.625	-1	Pass	30	Pass
Test: pwr dn overld 2												
Class 4 Ovld Current Icut=	583	571	582	572	mA	571	583	577	552	Pass	720	Pass
Overld Time Limit Tovld=	68	68	68	68	mSec	68	68	68	50	Pass	75	Pass
Test: pwr dn time												
Turn-Off Time Toft=	96.8	97.2	100.9	97.7	mSec	96.8	100.9	98.15	0	Pass	500	Pass
Output Cap Cout=	0.25309	0.25644	0.27107	0.25297	uF	0.25297	0.27107	0.258393	0	Pass	0.52	Pass
Output Load Rp=	249.4	245.4	238.3	254.6	Kohm	238.3	254.6	246.925	45	Pass	50000	Pass
Test: pwr dn v 2												
Avg Idle Voff=	0.1	0.1	0.1	0.1	VDC	0.1	0.1	0.1	0	Pass	2.8	Pass
Error Delay Ted=	1226.6	1218.8	1218.8	1210.9	msec	1210.9	1226.6	1218.775	750	Pass	10000	Pass
Peak Error Delay Ved=	0.2	0.2	0.1	0.1	VDC	0.1	0.2	0.15	0	Pass	20.5	Pass

Figure 4: Mid Power PSE Conformance Test Report

PSA Interactive Conformance Test Menus

With PSA Software version 3.1, the **PSE Tests** Menu under the PSE Conformance group has been modified to include a PSE Power Output option selection. When **High Power** is selected, a message box will appear prompting the user to connect the PSE Port Combiners described above in Figures 1 and 2.

Once High Power mode is set, the Slot-Port selection area reduces to just one single test **Port** per **Slot** (or per test blade in the PSA). Additionally, the six new tests required for high power PSE testing are installed in the PSE Test selection area in place of their 802.3af counterpart tests.

In the high power mode, all PSE Conformance Tests run only on Port 1 which now represents both test ports of a single PSA test blade. Any PSE Conformance Test can be run exactly as it is for **Normal AF** mode testing. Just as before, the **Show Traces** check button will cause any signal traces utilized by any of the tests to be displayed during the course of testing.

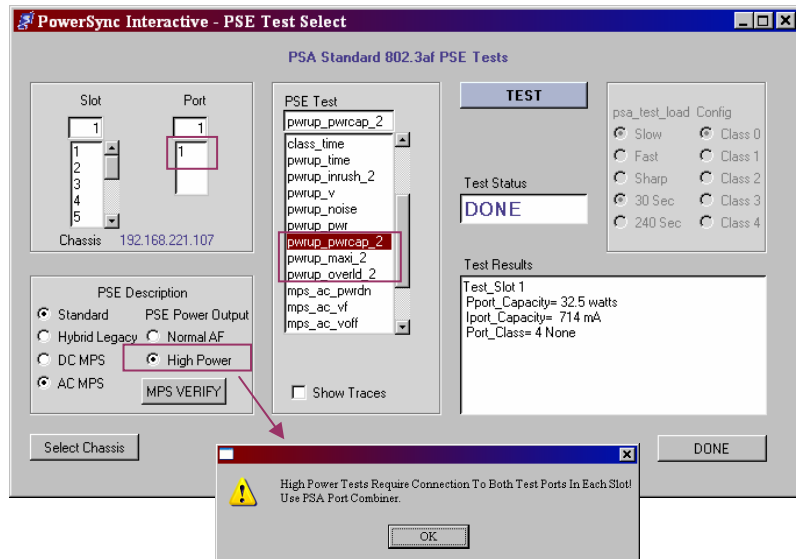


Figure 5. PSE Tests Menu for PSA Interactive 3.1

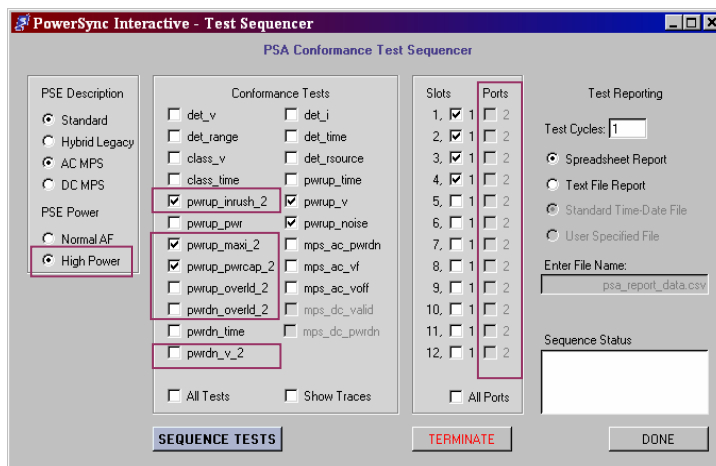


Figure 6. PSE Conformance Test Sequencer Menu

The PSE Conformance Test **Sequencer** menu also adds the PSE Power mode selection capability where users choose between **Normal AF** and **High Power**. Just as with the PSE Tests menu, the **High Power** selection will prompt for PSA Port Combiner connections with a message box. It will also disable all **Port 2** check buttons and only enable selection of **Port 1** on each test **Slot**. The six PSE Conformance Tests that are specific to high power testing are installed in the **Conformance Tests** selection area in place of their 802.3af counterpart tests.

Sequencing PSE Conformance Tests from PowerShell

The PowerShell command **sequence** enables users to sequence PSE Conformance Tests from PowerShell. A new **-hp** argument is added to specify that testing is to be run on a High Power PSE using the Port Combiner configuration. All other arguments associated with **sequence** are identical to the PSE 3.0 version. In place of the **-hp** argument, a user may specify any of the high power tests in a **-t** argument test list by its actual name (e.g. **pwrup_inrush_2**). However, the **-hp** argument is always required if the spreadsheet report is to apply modified test limits appropriate to Mid-Power PSE's.

Command	Command Parameters
sequence	<p><-v> <loopCount> <-p slot_port_list> <-t testList> <-hp> <-c -f <-n file_name>></p> <p><i>Performs standard conformance test sequencing over designated test list and selected ports with options for reporting to psa_report.xls spreadsheet or to a ascii file as designated by user.</i></p> <p>-v Verbose mode – this is useful for tracking the test steps within each conformance test.</p> <p>loopCount The number of test cycles to execute where one test cycle is all specified tests on all specified ports. Range is 1 to 99. Default is 1.</p> <p>-p Sub-command indicating that a user specified list of slot-ports will be provided. Default is ALL available test ports.</p> <p>slot_port_list A space delimited TCL list of slot-port identifiers. Example would be {1,1 1,2 2,1 2,2}. Must be in braces if more than one port is specified.</p> <p>-t Sub-command indicating that a user specified list of tests will be provided. Default is ALL available tests for the PSE Type (AC MPS or DC MPS).</p> <p>testList A space delimited TCL list of test identifiers. Example would be {det_v det_i det_time}. Must be in braces if more than one port is specified.</p> <p>-hp Sub-command indicating that testing is to be done on combined PSA test ports for high power PSE's. High Power versions of 6 PSE tests will be substituted in place of the normal 802.3af power versions of those tests. If this argument is provided, the test list will only include Port 1 from each test slot.</p> <p>-c Sub-command to route test results to the psa_report.xls spreadsheet.</p> <p>-f Sub-command to route test results to an ASCII file where the default file will be a date and time-stamped file name placed in the \Results subdirectory.</p> <p>-n Sub-command to specify a file name and path that is different than the default for and ASCII report file</p> <p>file_name The absolute path and file name (excluding “.txt” extension) of ASCII formatted report. Use forward slashes in path input.</p>

Each Mid-Power PSE Conformance Test can be run individually from PowerShell simply by using the associated Mid-Power test name as a command. An example would be:

```
pwrup_maxi_2 3,1
```

This command will run the Short Circuit Overload Compliance test for Mid-Power PSE's on test slot 3. Port 1 should always be specified with each individual test command.

PSA Interactive and Mid-Power Testing

PSA Interactive fully supports testing of Mid-Power PSE's using the PSA Port Combiner configuration. There are 3 menus in PSA Interactive where **High Power** PSE Testing can be globally specified:

- ☐ Port Configuration Menu
- ☐ PSE Conformance “PSE Tests” Menu
- ☐ PSE Conformance “Sequencer” Menu

The latter two of these menus are described above where radio buttons are added to specify **Normal AF** or **High Power** PSE Testing mode. The Port Configuration menu adds a check button for this same purpose. As with the other two menus, when **High Power PSE** is selected, a dialog box will appear to remind the user that the PSE Port Combiners must be added to each PSA Test Blade. Similarly, the **Port** selection box drops down to a single PSA test port per blade, a feature that will be duplicated in all menus that allow Slot-Port selection.

One other feature of **High Power** PSE mode in PSA Interactive is that the **Copy Settings** sub-menu (Figure 8) will now be limited to Port 1 of each test slot only since PSA Slots (or test blades) are now considered to have only a *single combined test port*.

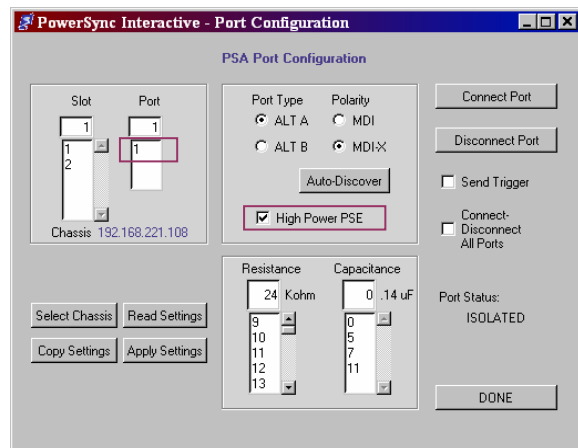


Figure 7. PSA 31. Port Configuration Menu

Application Note PSA-1200 PSE High Power Testing

All other features of the **Port Configuration** and **Trigger Configuration** menus remained unchanged and will work with the PSE Test Blade just as if it had a single, High Power PSE test port per blade.

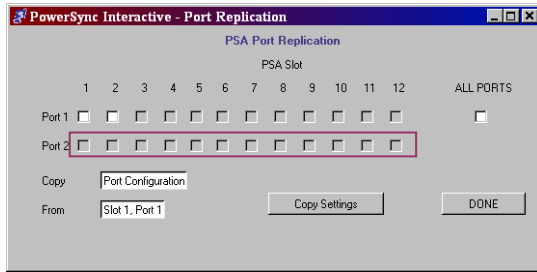


Figure 8. Port Replication Menu

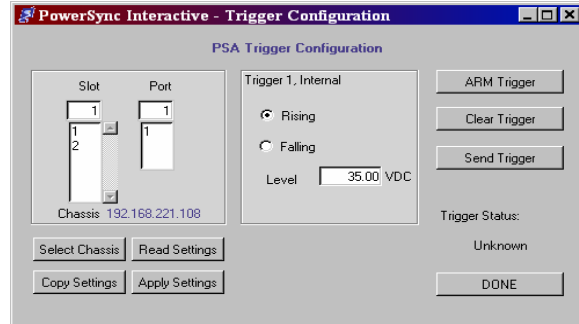


Figure 9. PSA 3.1 Trigger Configuration Menu

The PSA Interactive Load Configuration menu in Figure 10 also interacts with each PSA test slot as if it were a single, high power PSE test port. **Static Load Current** and **Transient Level** current can be programmed from 0 to 1022 mA when in the High Power PSE mode. Load transients may only be triggered using **Waveform** or **Event** triggering, however. The

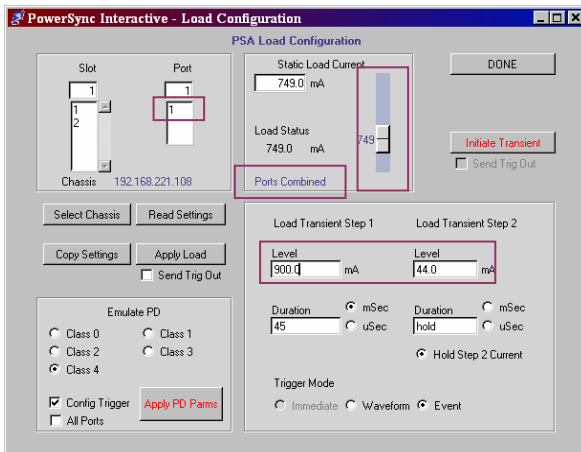


Figure 10. PSA 3.1 Load Configuration Menu

Immediate triggering mode is disabled. **Immediate** triggered load transients are still readily available by using the **Event** Trigger mode and then using the **Event Trigger** button in the Event Control Panel menu or the **Send Trigger** button in the Trigger menu. The progression to create an immediate transient in High Power PSE mode therefore is:

1. Configure the Transient, including **Event** trigger
2. **Initiate Transient**
3. Press **Send Trigger** or **Event Trigger** buttons

The Class 4 PD Emulation option will create the following load currents during a Class 4 emulated power-up:

- Class Current: 40 mA
- Inrush Current: 511 mA
- Steady State Current: 430 mA

The DC Meters menu is essentially unchanged except that again, only **Port 1** is available for measurements and a **Ports Combined** label indicates that the PSA software is working in the High Power PSE mode.

In the Ports Combined mode, all **DC Current** and **DC Power** measurements will interact with the combined PSA test ports and report total current flow. Each flavor of the DC Current Meter, **Average**, **Max Peak**, **Min Peak**, and **Trace** are available. All trigger modes are available as well.

DC Current measurements can range to over 1000 mA and **DC Power** measurements to over 40 watts when in the Ports Combined mode.

The **Event Control Panel** also provides an equivalent set of functions useful for managing PSE port state and facilitating trigger events under PSA Interactive. The only feature removed is the **Immediate** Transient Trigger mode, however, as stated above, the **Event Trigger** can serve an equivalent purpose for generating immediate triggers.

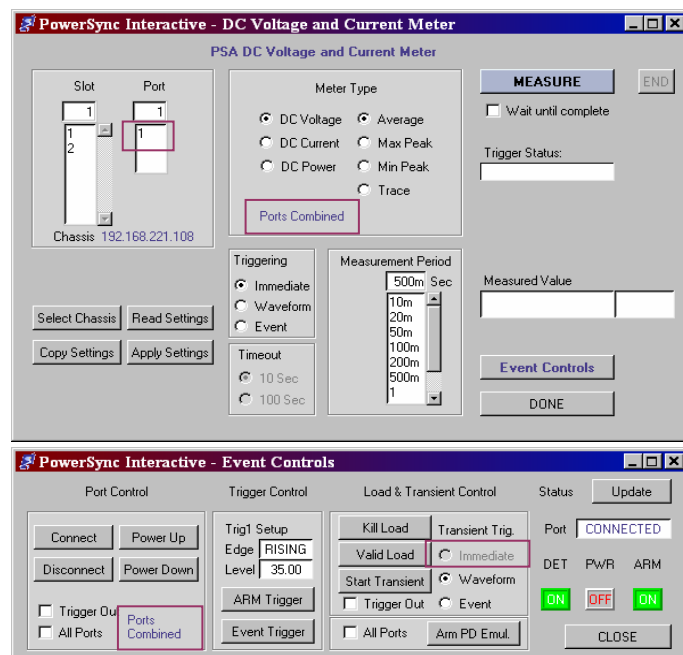


Figure 11. PSA 3.1 DC Meter & Event Control Menus

The AC Meter and Time Interval meter menus are largely the same for High Power PSE testing with PSA Port Combiners with the only difference being the limitation to a single test port per slot in the PSA.

The Waveforms Menu (Figure 12) fully supports High Power PSE analysis. As with the meter menus, it notes the **Ports Combined** status of PSA Software. It also adds **Class 4** PD Emulation which in turn will affect the **Classification**, **Power-Up Sequence**, and **Load Response** waveforms as well as the I_{cut} scanning range for the **Shutdown Overload** waveform.

Finally, when PSA Interactive is in the High Power PSE testing mode, the three Multi-Port menus will not be available since the Multi-Port Test Suite will not work with Port Combiners and Mid-Power PSE's.

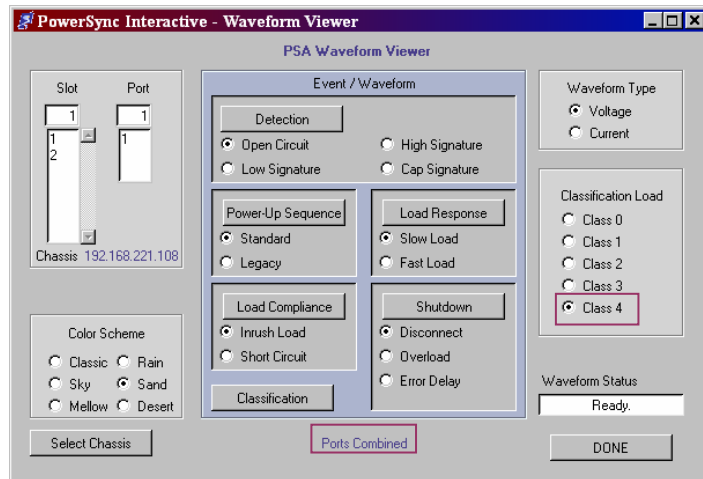


Figure 12. PSA 3.1 Waveform Menu

PowerShell Extensions for Mid-Power Testing

PowerShell has also been extended to add several commands helpful for those writing test scripts to test Mid-Power PSE's using the PSA Port Combiners. Added commands are provided in primitive resource control, load and power measurements, and utility level functions as described in the tables below. All commands support the optional <slot,port> argument common to many other PowerShell commands, however the "port" should generally be specified as "1" for each of these commands since PSA test blades are considered to have just one Mid-Power test port.

Command	Command Parameters
iload_2	<p><slot,1> <i current> <trigout> <stat ?></p> <p>Configures active load entity to a steady state current load. Option provided to generate a trigger out on each issuance of this command.</p> <p>i specifies current entry current is current load in units of mA. Current load has range of 0 to 1022 mA with 0.5 mA steps. trigout: Generate an event trigger coincident with static load change.</p>
itrans_2	<p><slot,1> <i1 current1> <t1 duration1> <i2 current2> <t2 duration2> < trig1 ext> trigout</p> <p>Configures and launches current transients consisting of 2 sequential steps of current with specified durations. Optionally produces trigger out. Returns to "iload" current upon completion of transient. There is no memory of trigger mode – must be specified on each instance of usage.</p> <p>i1, i2: specify current entry for step 1 and 2 respectively. t1, t2: specify duration entry for step 1 and 2 respectively. current1 is first current value in units of mA (0 to 1022 mA). duration1 is first duration value (range 1m to 1000m or 200u to 1000u where "m" is mSec and "u" is µSec.) current2 is second current value in units of mA (0 to 1022 mA). duration2 is first duration value (range 1m to 1000m or 200u to 1000u where "m" is mSec and "u" is µSec.) duration2 may also take the value "hold" causing the current load to sustain indefinitely at the current2 value. trig1 = start current transient on next trig1 event ext = start current transient on next ext trigger event trigout = generate hardware trigger on command execution</p>

Command	Command Parameters
idccverage_2	<p><slot,1> <trig OFF ON EXT> <period interval> <timeout 10 100> <? stat></p> <p><i>Configures and performs an Average DC Current measurement on a PoE Pair up to 1022 mA.</i></p> <p>trig off enables immediate execute of DC measurement when “stat” query is issued.</p> <p>trig on specifies that the measurement will be performed when the trigger condition specified on Trig1 is achieved. Trig1 will be armed automatically when “stat” query is issued.</p> <p>trig ext specifies that the measurement will be performed when the external input trigger is asserted.</p> <p>period specifies that an averaging period will be defined.</p> <p>interval specifies the averaging period as “Nm” where N is 10, 20, 50, 100, 200, 500 mSec or “Ns” where N is 1, 2, or 5 seconds. Default value is 100 mSec.</p> <p>timeout 10 specifies that a hardware triggered measurement should time out if no trigger is found within 10 seconds following trigger arm.</p> <p>timeout 100 specifies that a hardware triggered measurement should time out if no trigger is found within 100 seconds following trigger arm.</p>
idccpeak_2	<p><slot,1> <trig OFF ON EXT> <max min> <period interval> <timeout 10 100> <? stat></p> <p><i>Configures and performs a Peak DC Current measurement on a PoE Pair up to 1022 mA.</i></p> <p>trig off enables immediate execute of DC measurement when “stat” query is issued.</p> <p>trig on specifies that the measurement will be performed when the trigger condition specified on Trig1 is achieved. Trig1 will be armed automatically when “stat” query is issued.</p> <p>trig ext specifies that the measurement will be performed when the external input trigger is asserted.</p> <p>period specifies that an averaging period will be defined.</p> <p>interval specifies the averaging period as “Nm” where N is 10, 20, 50, 100, 200, 500 mSec or “Ns” where N is 1, 2, or 5 seconds. Default value is 100 mSec.</p> <p>timeout 10 specifies that a hardware triggered measurement should time out if no trigger is found within 10 seconds following trigger arm.</p> <p>timeout 100 specifies that a hardware triggered measurement should time out if no trigger is found within 100 seconds following trigger arm.</p>
idctrace_2	<p><slot,1> <trig OFF ON EXT> <period interval> <timeout 10 100> <? stat></p> <p><i>Configures and performs a DC Current Trace measurement on a PoE Pair up to 1022 mA.</i></p> <p>trig off enables immediate execute of DC measurement when “stat” query is issued.</p> <p>trig on specifies that the measurement will be performed when the trigger condition specified on Trig1 is achieved. Trig1 will be armed automatically when “stat” query is issued.</p> <p>trig ext specifies that the measurement will be performed when the external input trigger is asserted.</p> <p>period specifies that an averaging period will be defined.</p> <p>interval specifies the averaging period as “Nm” where N is 10, 20, 50, 100, 200, 500 mSec or “Ns” where N is 1, 2, or 5 seconds. Default value is 100 mSec.</p> <p>timeout 10 specifies that a hardware triggered measurement should time out if no trigger is found within 10 seconds following trigger arm.</p> <p>timeout 100 specifies that a hardware triggered measurement should time out if no trigger is found within 100 seconds following trigger arm.</p>
paverage_2	<p><slot,1> <period interval> stat</p> <p><i>Performs an immediate average power measurement and returns power in watts. Since this measurement function uses vdcaverage_2 and idccverage_2, there is no memory for the configuration and the “?” query is not supported. “stat” must be specified on each execution of the command.</i></p> <p>period specifies that a sampling period will be defined.</p> <p>interval specifies the sampling period as “Nm” where N is 10, 20, 50, 100, 200, 500 mSec or “Ns” where N is 1, 2, or 5 seconds. Default value is 100 mSec.</p>
psa_disconnect_2	<p><slot,1></p> <p><i>Forces a PSE Port power-down to occur. Opens the port switch, sets DC current load to 0 mA.</i></p>

Command	Command Parameters																		
power_port_2	<p><slot,1> <p power i load c class ci class_current> <dr resistance> <dc capacitance></p> <p>Simulates a PD connected to a PSE port to bring power up to a user-specified condition. If no command parameters are specified, the default power-up condition is a static load of 20 mA. Status of port is returned upon completion of command.</p> <p>p indicates that power draw of port will be specified.</p> <p>power is the power in watts that the port will power-up to. Regardless of power specified, classification will detect a “Class 0” PD. Range is .2 to 15.4 Watts.</p> <p>i indicates that current draw of port will be specified.</p> <p>current is the current draw in mA that the port will power-up with. Regardless of current specified, classification will detect a “Class 0” PD. Range is 0 to 350 mA.</p> <p>c indicates that classification of port will be specified.</p> <p>class is the port classification. Range is 0 to 4. Load currents implemented by classification are:</p> <table><tr><th>Class</th><th>Class Current</th><th>Power-Up Current</th></tr><tr><td>0</td><td>2 mA</td><td>140 mA</td></tr><tr><td>1</td><td>10 mA</td><td>44 mA</td></tr><tr><td>2</td><td>18 mA</td><td>108 mA</td></tr><tr><td>3</td><td>28 mA</td><td>202 mA</td></tr><tr><td>4</td><td>40 mA</td><td>324 mA</td></tr></table> <p>ci indicates that the classification current to be applied will be specified.</p> <p>class_current is the classification current to apply during classification. Range is 0 to 45 mA. Power-up current will be determined according the class-band of the specified classification current.</p> <p>dr indicates that a non-default detection resistance should be used.</p> <p>resistance is the detection load resistance to use for the power-up. Range is 11 to 39KΩ.</p> <p>dc indicates that a non-default detection capacitance should be used.</p> <p>capacitance is the detection load resistance to use for the power-up. Range is 0, 5, 7, or 9 μF.</p>	Class	Class Current	Power-Up Current	0	2 mA	140 mA	1	10 mA	44 mA	2	18 mA	108 mA	3	28 mA	202 mA	4	40 mA	324 mA
Class	Class Current	Power-Up Current																	
0	2 mA	140 mA																	
1	10 mA	44 mA																	
2	18 mA	108 mA																	
3	28 mA	202 mA																	
4	40 mA	324 mA																	
replicate_ports_2	<p><slot,1> config_type {target_slots}</p> <p>Replicate configuration of resources from one test slot to a number of other test slots for Mid-Power PSE testing with PSA Port Combiners.</p> <p>config_type: The type of configuration to be replicated from <port> to {target_ports}. Options are: port trig load vdca vdcp vdct idca idcp idct acv time all. “all” will fully replicate all subsystem configurations.</p> <p>target_slots: A list of all slots to which the configuration is to be copied. Each slot is in the form as “slot#, 1” and is space delimited in the list.</p>																		

Test Configuration



Figure 13: PSA with Port Combiners for Mid-Power PSE Testing.

For more information on the Sifos Technologies’ Power over Ethernet test & measurement solutions look us up at:
www.sifos.com

Sifos Technologies, Inc.
 1061 East Street
 Tewksbury, MA 01876
sales@sifos.com

Publication # TBD