

Understand the PSE you are testing

Both the PSA-3000 test instrument and the PSE Conformance Test Suite (2-Pair and 4-Pair) must be properly configured for the PSE to be tested. This is essential for the testing to be both successful and valid.

Is the PSE intended to be 802.3 compliant?

The **2-Pair PSE Conformance Test Suite** tests PSE's that power two wire pairs according to the IEEE **802.3af**, **802.3at**, or **802.3bt** specifications. The **4-Pair PSE Conformance Test Suite** tests PSE's that power four wire pairs according to the **802.3bt** specification. PSE's not designed to these standards should not be tested using either of these test suites.

Three things you must know about your PSE

There are three essential attributes of your PSE that must be described to PSA software. These are addressed by the following questions:

Question 1: Does the PSE power **2-Pairs** or **4-Pairs**?

Hint: If you know that your PSE is designed to IEEE **802.3af** or **802.3at**, then it must power just **2-Pairs**.

Important! If your PSE has a mix of **2-Pair** and **4-Pair** powering ports, it must be treated as two different PSE's.

Question 2: Is the PSE designed to the IEEE **802.3bt** standard?

Hint: If you know that your PSE powers all wire 4-Pairs, then it must be IEEE **802.3bt**.

Question 3: Does the PSE require a PD to use **PoE LLDP** protocol to obtain maximum power from the PSE?

Hint: If you know that your PSE is **Type-1** or was designed to IEEE **802.3af**, then it would not use PoE LLDP.

My PSE powers 2-Pairs. Now what?

This answers **Question 1**. PSE conformance testing is done using the **2-Pair PSE Conformance Test Suite**.

Essential attributes of 2-Pair powering PSE's must be properly described to PSA software before testing can begin. PSA software then configures both the **PSA-3000 instrument** and the **PSE Conformance Test Suite** based upon the following PSE attributes:

PSA-3000 Instrument	2-Pair PSE Conformance Test Suite
Powered Pairs (Alt-A or Alt-B)	Powered Pairs (Alt-A or Alt-B)
Power Polarity (MDI or MDI-X)	<p>From Question 2:</p> <p>PSE Type</p> <p>802.3at Type-1 (15W capable PSE, 802.3af/802.3at)</p> <p>802.3at Type-2 (30W capable PSE, 802.3at)</p> <p>802.3bt Type-3 (15W or 30W capable, PSE 802.3bt)</p> <p>From Question 3:</p> <p>Maximum Power Grant Method</p> <p>NONE (PSE is 15W capable Type-1 or Type-3)</p> <p>PHY (PSE is 30W capable Type-2 or Type-3 using 2-Event Classification to grant full PD power at power-up)</p> <p>LLDP (PSE is 30W capable Type-2 or Type-3 that requires PoE LLDP protocol to allocate full PD power after power-up)</p> <p>PHY+LLDP (PSE is 30W capable Type-2 or Type-3 using 2-Event Classification to grant full PD power at power-up, then using PoE LLDP to obtain precise PD power demand)</p>
	MPS Method (DC or AC)

Describe your 2-Pair PSE to PSA Interactive Software

The **PSE** tab menu in PSA Interactive software provides the means to enter each of these PSE attributes. In the following example, answers to **Question 2** and **Question 3** indicate that the PSE is an **AT Type-2** PSE that uses 2-Event Classification (**PHY** grant) at power-up but no PoE LLDP after power-up.

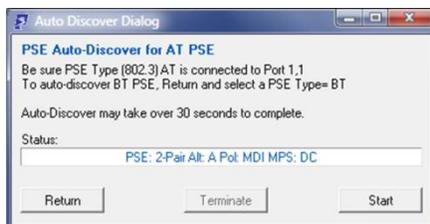
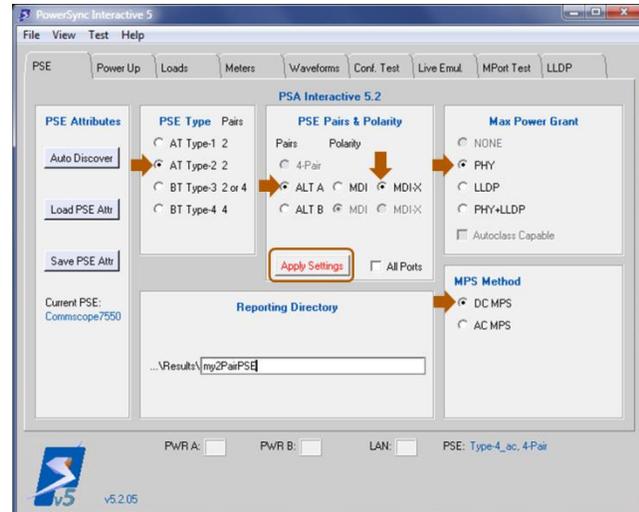
Application Note

In this example, it is also known that the PSE powers the **Alt-A** pairset with negative (**MDI-X**) polarity and also that the PSE utilizes the **DC MPS** PD disconnect detection scheme. Settings take effect when the **Apply Settings** button is pressed.

Note! In PowerShell PSA software, the `psa_pse` command is used to describe PSE attributes to the PSA-3000 instrument and to the 2-Pair conformance test suite.

What if I don't know Powered Pairs, Polarity, or MPS Method?

The **Powered Pairs**, **Polarity**, and **MPS Method** can be automatically determined and configured to the PSA-3000 instrument and to the 2-Pair Conformance Test Suite using the **Auto Discover** function. In this example, responses to **Question 2** and **Question 3** indicate that the PSE is **802.3at Type-2**, a PSE port is connected to PSA slot 1, port 1, and slot 1, port 1 is selected in the Slot-Port panel of PSA Interactive. **AT Type-2** is selected, then **Auto Discover** is pressed to open the Auto Discover Dialog. Pressing the **Start** button initiates the discovery.



Here, the PSE connected on Slot 1, Port 1 was detected to power the **Alt-A** pairset with **MDI** (positive) polarity and to use the **DC MPS** PD disconnect method. When this completes, the PSE tab menu will be updated and both the PSA-3000 instrument and the PSE 2-Pair PSE Conformance Test Suite will be properly configured for these three PSE attributes. Note that, in response to **Question 3** above, the **Max Power Grant** must be properly declared by the user and is not automatically discovered.

My PSE powers 4-Pairs. Now what?

This answers both **Question 1** and **Question 2**. Testing is done using the **4-Pair PSE Conformance Test Suite**.

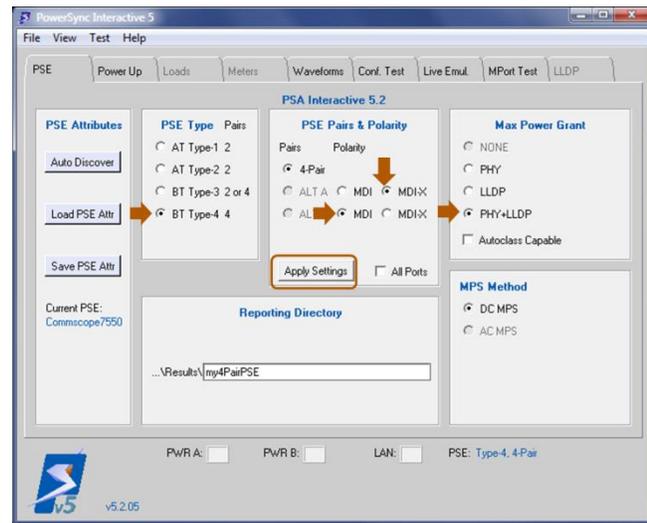
Essential attributes of 4-Pair powering PSE's must be properly described to PSA software before testing can begin. PSA software then configures both the **PSA-3000 instrument** and the **4-Pair PSE Conformance Test Suite** based upon the following PSE attributes:

PSA-3000 Instrument	4-Pair PSE Conformance Test Suite
Power Polarity (MDI or MDI-X) for each of the powered pairsets (e.g. Alt-A MDI-X , Alt-B MDI)	PSE Type (Type-3 , up to 60W or Type-4 , up to 90W capable) <i>(The 4-Pair PSE Conformance Test Suite will verify and, if necessary, adjust this particular selection.)</i>
	<p>From Question 3:</p> <p>Maximum Power Grant Method</p> <ul style="list-style-type: none"> NONE (PSE is 15W capable Type-3) PHY (PSE is 30W to 60W capable Type-3 or 75W to 90W capable Type-4 using Multi-Event Classification to grant full PD power at power-up) LLDP (PSE is 30W to 60W capable Type-3 or 75W to 90W capable Type-4 that requires PoE LLDP protocol to allocate full PD power after power-up) PHY+LLDP (PSE is 30W to 60W capable Type-3 or 75W to 90W capable Type-4 using Multi-Event Classification to grant full PD power at power-up, then using PoE LLDP to obtain precise PD power demand)

Describe your 4-Pair PSE to PSA Interactive Software

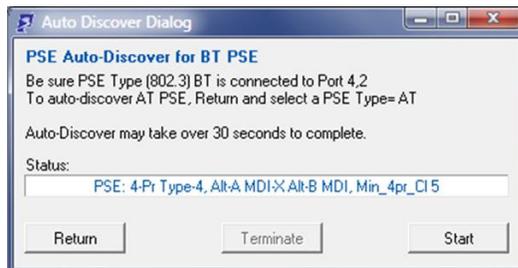
Again, the **PSE** tab menu in PSA Interactive software provides the means to enter each of the essential PSE attributes. In the following example, the PSE is known to power 90 watts (Type-4) and that the PSE powers the **Alt-A** pairset with negative (**MDI-X**) polarity and the **Alt-B** pairset with positive (**MDI**) polarity. In response to **Question 3**, it is known that the PSE provides Multi-Event classification to grant full PD power at power-up but that the PSE also then uses PoE LLDP to refine PD power demand (Max Power Grant = **PHY+LLDP**). **DC MPS** is the only allowed PD disconnect method for an 802.3bt compliant PSE.

Note! In PowerShell PSA software, the `psa_pse` command is used to describe PSE attributes to the PSA-3000 instrument and to the 4-Pair conformance test suite.



What if I don't know PSE Type or the Pairset Polarities?

The PSE Type and Pairset Polarities can be automatically determined and configured to the PSA-3000 instrument and to the 4-Pair Conformance Test Suite using the **Auto Discover** function. In this example, the PSE is known to be **802.3bt**, a PSE port is connected to PSA slot 4, port 2, and slot 4, port 2 is selected in the Slot-Port panel of PSA Interactive. Either **BT Type-3** or **BT Type-4** is selected, then **Auto Discover** is pressed to open the Auto Discover Dialog. Pressing the **Start** button initiates the discovery.



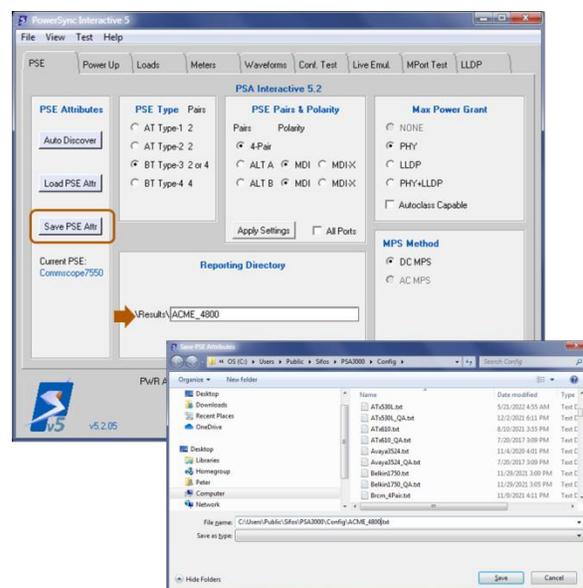
Here, the Auto Discovery determined that the PSE is Type-4 (e.g. offering at least 75W capacity) and that it powers Alt-A with negative (**MDI-X**) and Alt-B with positive (**MDI**) polarity. Auto Discover also reports that the 4-Pair PSE performs 2-Pair powering to PD's with Class 0-4 as the minimum 4-Pair Class is 5. This attribute will be verified when PSE conformance testing is run.

Save and Recall PSE Attributes: The **BEST** way to **ALWAYS** get it right

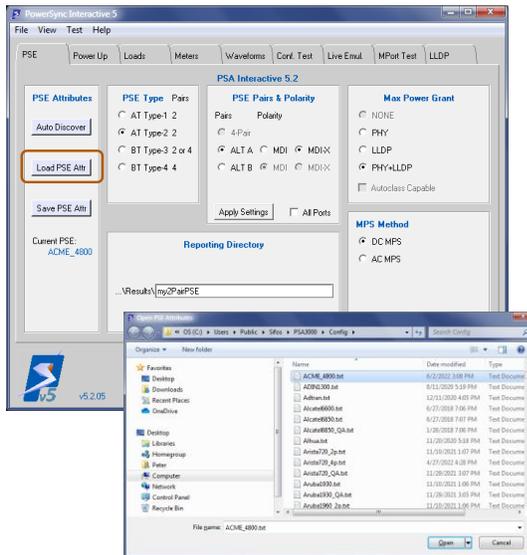
Discovering and entering PSE attributes for any given PSE type need only be a one-time event. PSA software offers robust capability to save PSE attributes to a unique, PSE-specific name, then later retrieve those attributes using that PSE-specific name. When PSE attributes are retrieved, both the PSA-3000 test instrument and PSE Conformance Test Software are properly configured for that PSE.

Example: You are connected to an ACME 4800 PSE port. You have discovered and entered all applicable attributes. The PSE is a **4-Pair, Type-3** (60W) PSE powering both pairsets with positive (**MDI**) polarity and using **PHY** method of Max Power Grant. Because it is 802.3bt, it will force the **DC MPS** method.

You also have the opportunity to direct all test reports to a non-default directory path specific to this PSE. That path



name is entered under **Reporting Directory**. Here 'ACME_4800' is used. This too will be retained as a PSE attribute. Reports from this PSE will be found in the `c:\Users\Public\Sifos\PSA3000\Results\ACME_4800\` path.



Press **Save PSE Attr** to open the save dialog and enter the PSE-specific name, in this case, ACME_4800 is used. All essential PSE attributes are stored when **Save** is pressed.

Three months later, you need to test the ACME_4800 PSE but you have no recollection of the PSE attributes. So you open PSA Interactive to the **PSE** tab menu and press the **Load PSE Attr** button. Then select ACME_4800 from the list and press **Open**. This will complete the configuration of the PSA-3000 instrument and select the appropriate PSE conformance test suite (2-Pair or 4-Pair) so that testing can be run successfully.

Note! In PowerShell PSA software, use the `psa_pse` command to install specific PSE attributes by simply providing the root name (ACME_4800) of the PSE attribute file. Example:
`psa_pse ACME_4800`

Can I run the 2-Pair Test Suite on a 4-Pair PSE Port?

Generally not. The 2-Pair PSE Conformance Test Suite implements 2-Pair connections between PSE ports and the PSA-3000 test port. An 802.3bt 4-Pair PSE should generally reject a 2-Pair connection through the 802.3bt connection check process meaning the PSE port will never classify or power. This will spawn many test errors because of the PSE failure to classify and power up.

Some 4-Pair PSE's are specially designed to provide 2-Pair powering according to 802.3at specifications if they detect a 2-Pair PD connection. This feature allows a degree of backward compatibility into environments where only two wire pairs connect a PSE to a remote PD. This feature is outside the 802.3bt standard but may allow the 2-Pair PSE conformance test suite to run with no error conditions and possibly no conformance failures. It should be recognized however that this is not a valid conformance test of a 4-Pair capable PSE port.

Can I run the 4-Pair Test Suite on a 2-Pair PSE Port?

No. The 4-Pair PSE Conformance Test Suite initially determines what minimum PD classification is required to obtain 4-Pair powering. Since a 2-Pair PSE port has no ability to provide 4-Pair powering, this PSE characterization check will spawn a catastrophic error early in the testing sequence.

Can I run the 2-Pair Test Suite on a 2-Pair 802.3bt PSE Port?

Yes! From **Question 1**, the PSE is a 2-Pair PSE and from **Question 2**, the PSE is designed to the 802.3bt standard. So, the PSE Type will be **BT Type-3** in the **PSE** tab menu and the **PSE Pairs** will be either **ALT A** or **ALT B**. Various test parameters and test limits will be adjusted according to the 802.3bt standard requirements.

More Information Is Available

Topic	Reference
PSE Attribute Files	PSA-3000 Reference Manual Section 3.2.4
PSE Tab Menu	PSA-3000 Reference Manual Section 4.2
<code>psa_pse</code> Command	PSA-3000 Reference Manual Section 5.7
PoE Technology - General	PSA-3000 Reference Manual Section 2