ALT-A vs ALT-B PSE Declaration

With the transition from IEEE 802.3af to IEEE 802.3at as the guiding standard for interoperable Power-over-Ethernet, a change was incorporated that allowed for MidSpan PSE's to feed power on either the ALT-A pairs, the 10/100Base-T data pairs, or the ALT-B pairs, the 10/100Base-T spare pairs. This change was consistent with enabling the concept of MidSpan PSE's that would work on 1000Base-T (gigabit Ethernet) links.

With this change, the notion that a **MidSpan** PSE had to use ALT-B for powering was no longer valid. Historically, all MidSpan PSE's utilized ALT-B in order to be standard compliant and virtually all **EndSpan** PSE's utilized ALT-A so that they did not need to rely on spare pair connections all the way to the Powered Device.

The one PSE Conformance Test Suite parameter affected by ALT-B versus ALT-A power feeding is **Tdbo** (det_time test), the detection back-off time. This is the time between successive detection measurements should a first measurement fail to detect a valid PD signature. ALT-B PSE's were required by IEEE 802.3af and now by IEEE 802.3at to avoid re-detection for at least 2 seconds. Separately, it is recommended (*but not absolutely required*) that ALT-A PSE's complete a second detection in less than 2 seconds. This combination of requirements helps assure that in the event a MidSpan PSE is placed in the link between and EndSpan PSE and an Powered Device (PD), that the PD will most likely get powered and that the powering will most likely come from the PSE feeding power on the ALT-A pairs.

Historically, the PSE Conformance Test Suite for the PowerSync Analyzer required the user to declare if a PSE was an **EndSpan** or **MidSpan** PSE. If declared **MidSpan**, then the requirement that **Tdbo** exceed 2 seconds was always enforced. If declared **EndSpan**, no strict requirement was enforced though the expectation was that **Tdbo** should be less than 1.5 seconds in order to meet the 802.3af / 802.3at recommendation. More recently, as of the PSA Software Sub-Release **4.0.05** (April, 2012), the declaration of **EndSpan** versus **MidSpan** PSE is no longer important and the PSE Conformance Test Suite applies the criteria of **ALT-A** versus **ALT-B** to establish testing limits for **Tdbo**. **ALT-A** versus **ALT-B** do not need to be user-declared because in order for the PSE Conformance Test to operate, test ports must be pre-configured to the proper power feeding pairs meaning software already knows this PSE characteristic.

Special Test Limit Cases – "-1" Limits

In certain cases, if a parameter is either meaningless or un-measurable given a certain class of PSE, the test will report a parameter value of "**-1**" and the report must then process it as a "PASS" or "INFO" rather than a failure. For example, the parameters **Isoft** and **Tsoft** (pwrdn_overld test) are specifically looking for a behavior where a PSE experiencing some level of overload current takes longer, typically much longer, to remove power than the **Tovld_max** parameter of 75 msec. If the test does not find evidence of a software-based overload shutdown behavior, then it reports **-1** for the parameters which simply says that those parameters do not apply since the PSE does not have a software-based overload shutdown threshold.

Another example is **Zout** (det_rsource test) where the value -0.1Kohm allows for effective source impedance measurements down to zero ohms if it discovered that the PSE regulates detection voltage steps (a voltage source PSE) rather than allowing detection voltages to float according to detection signature resistance (a current source PSE). The test will never report a negative number, so the test limit of -0.1Kohm allows a 0 ohm result to pass.

The **Output_Cap_Cout** parameter in the pwrdn_time test represents another situation where -1 as the lower limit allows for capacitance assessments down to 0 μF, the lowest *measured value* that can possibly be reported, but also allows for un-measurable cases that occur when certain PSE's apply an active discharge to minimize **Toff** following disconnect shutdowns. The test will report -1 for **Output_Cap_Cout** if the PSE is observed to apply an active discharge to remove port voltage.

Verification, Simplified.