There are PSE's (Power Sourcing Equipment) currently available that can supply more than the 15.4W maximum output power defined in the IEEE802.3af specification. These PSE's have been designed to meet the market demand for more power while the IEEE802.3at specification is being developed.

This application note will look at two different methods used by PSE manufacturers for delivering higher power to the Powered Device (PD) and how they can be used to work with two Ag9000 modules.

The first method to be looked at is that used by Microsemi; this is their PowerDsine range of High Power over Ethernet (HighPoE) 8000 Midspans that provide up to 39W per port. To achieve the higher power this product range supplies 57V @ 350mA over both the data pair and spare pair. The 8000 Midspan family has a common 57V supply but the power to the data pair and the spare pair outputs are controlled independently.

Because each pair has its own output control the PD has to have a valid signature before the PSE will apply power to that pair. Figure 1 shows how to connect two Ag9000 module one to each or the pairs.

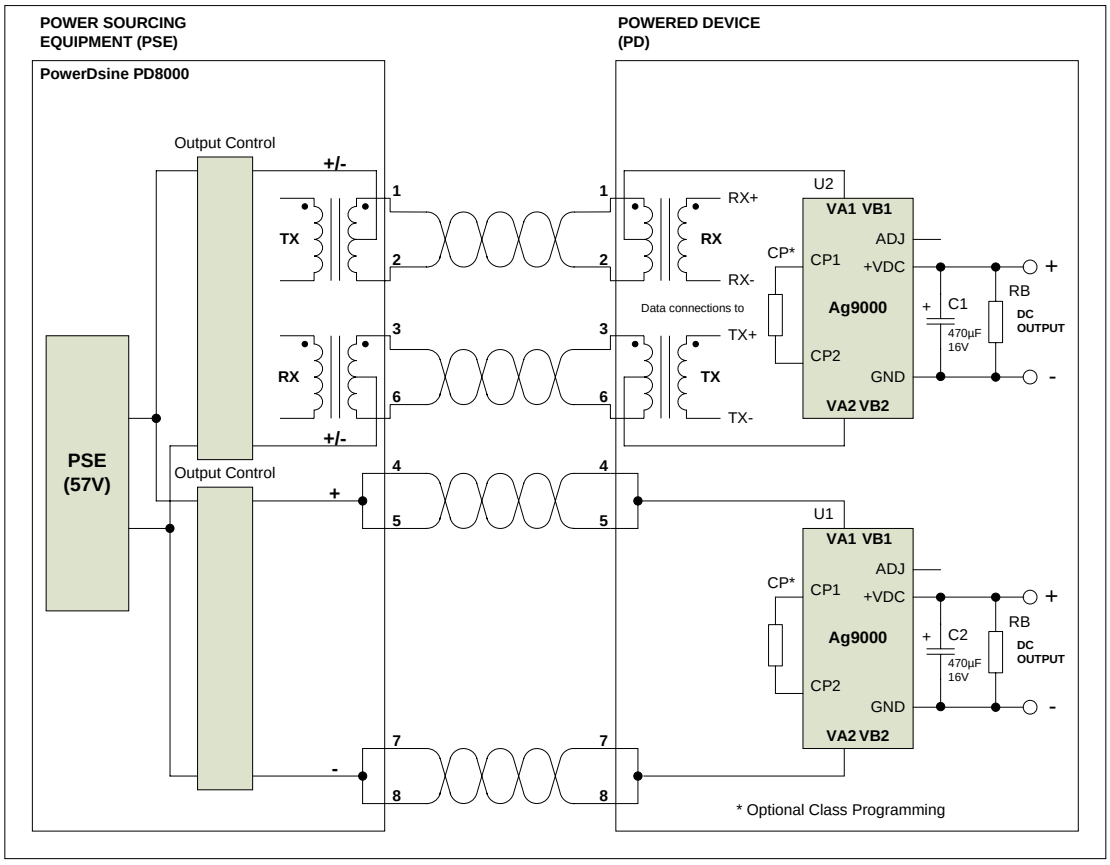

Figure 1: PowerDsine 8000 Connections

Note: The data connections shown in this document are all based on a "Straight-Thru" connection.

The second method for supplying additional power is used by Phihong in their 30W POE30U-560 PSE. In this method the power is only delivered via the data pair (56V @ 550mA).

Because there is only one output controller looking for a single signature the two Ag9000 modules cannot be directly connected to the data pair during this process. However once the signature recognition has validated that a PD is connected the PSE will connect the main power (56V) to the output. The PD signature is no longer required once the main power has been applied.

In Figure 2 U1 is connected directly to the centre taps of the transformer. The POE30U-560 will test for a valid signature and once this is confirmed the output control will apply 56V to the data pair. When U1 sees the main power is present, it will power the on-board dc/dc converter switching its output ON. This will result in the relay RL1 turning ON connecting the input of U2 to the PSE. Because the PSE has already verified the PD signature and is applying 56V, U2 skip the signature recognition and will power its on-board dc/dc converter switching its output ON.

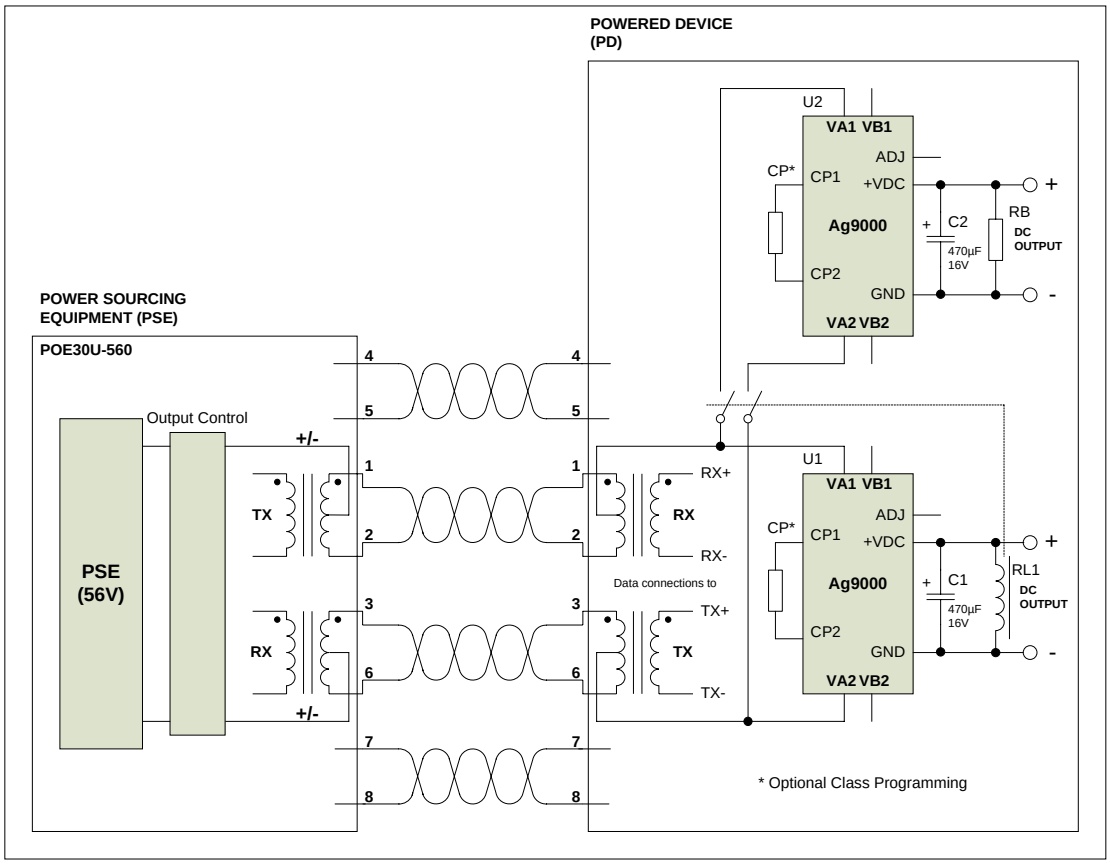

Figure 2: Phihong POE30U-560 Connections

There will be a delay between the two outputs powering up, this is due to the relay activation time and the time it takes U2 to turn ON.

Figure 3 shows an example of the start-up delay, in this example U1 is an Ag9050 and U2 is Ag9120. The relay connected to the output of U1 takes ~5ms to switch the contacts, followed by U2 taking ~7ms to power up giving and overall delay of ~12ms.

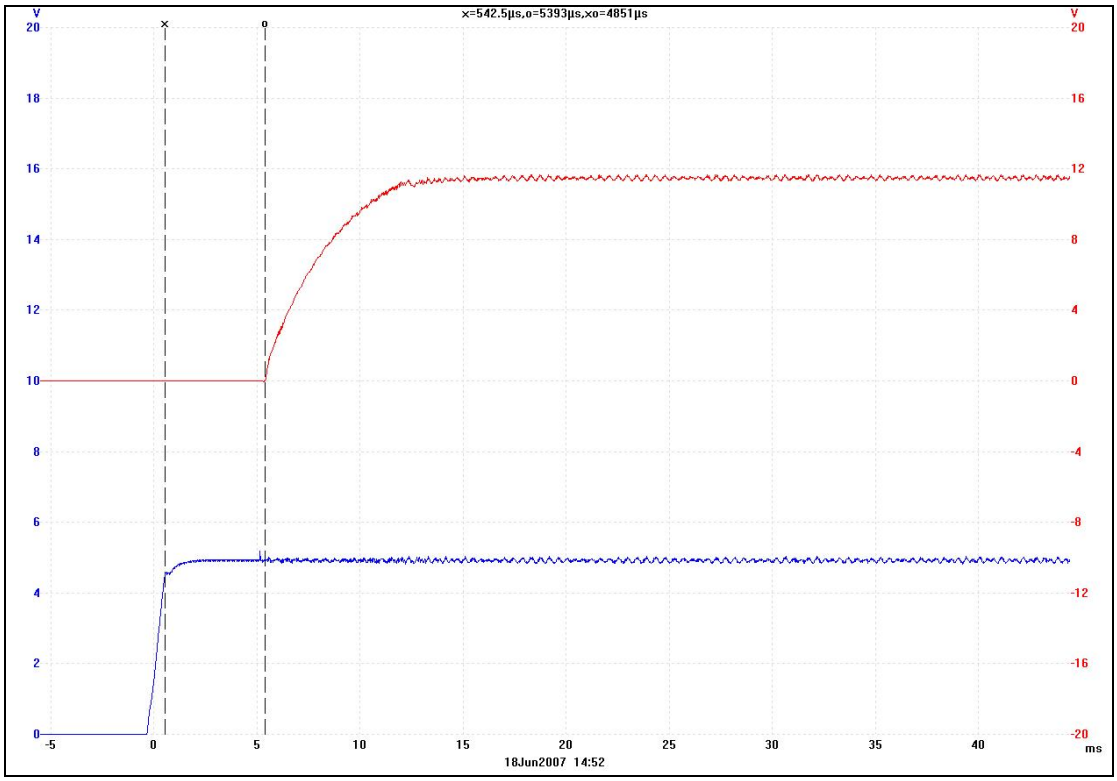

Figure 3: Example of start-up delay

When considering the data transformer it is very important that you ensure that it's capable of handling 350mA for the first method and 550mA for the second method.

It is possible to have a combined solution that can be configured to work with either the PowerDsine 8000 or the Phihong P0E30-560. Figure 4 shows a selectable solution that can be configured during installation. When connected to a PSE that uses both the Data and Spare pairs to supply the power, then links LK1 and LK2 are not fitted. If the PSE only supplies the power over the Data pair, then LK1 is fitted and LK2 is not fitted. If the PSE only supplies the power over Spare pair, then LK2 is fitted and LK1 is not fitted.

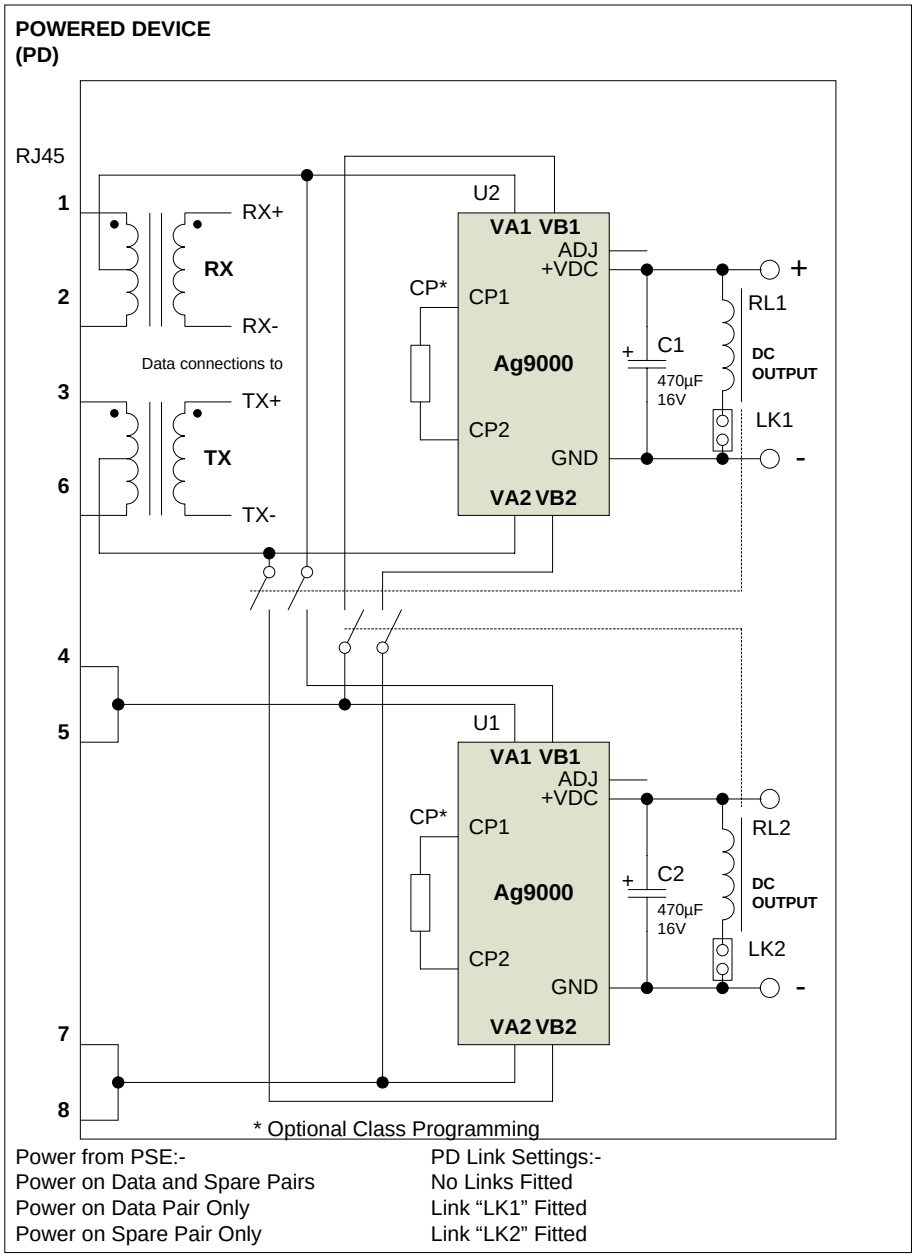

Figure 4: Selectable Option

The Ag9000 outputs can be run independently as shown in Figures 1, 2 and 4, or they can be connected together as shown in Figure 5.

Without any additional circuitry the outputs can be connected in series, providing positive and negative supply rails or just used as a single rail (sum of the two output voltages).

Alternatively the outputs can share a common GND (-) with two (+) positive rails.

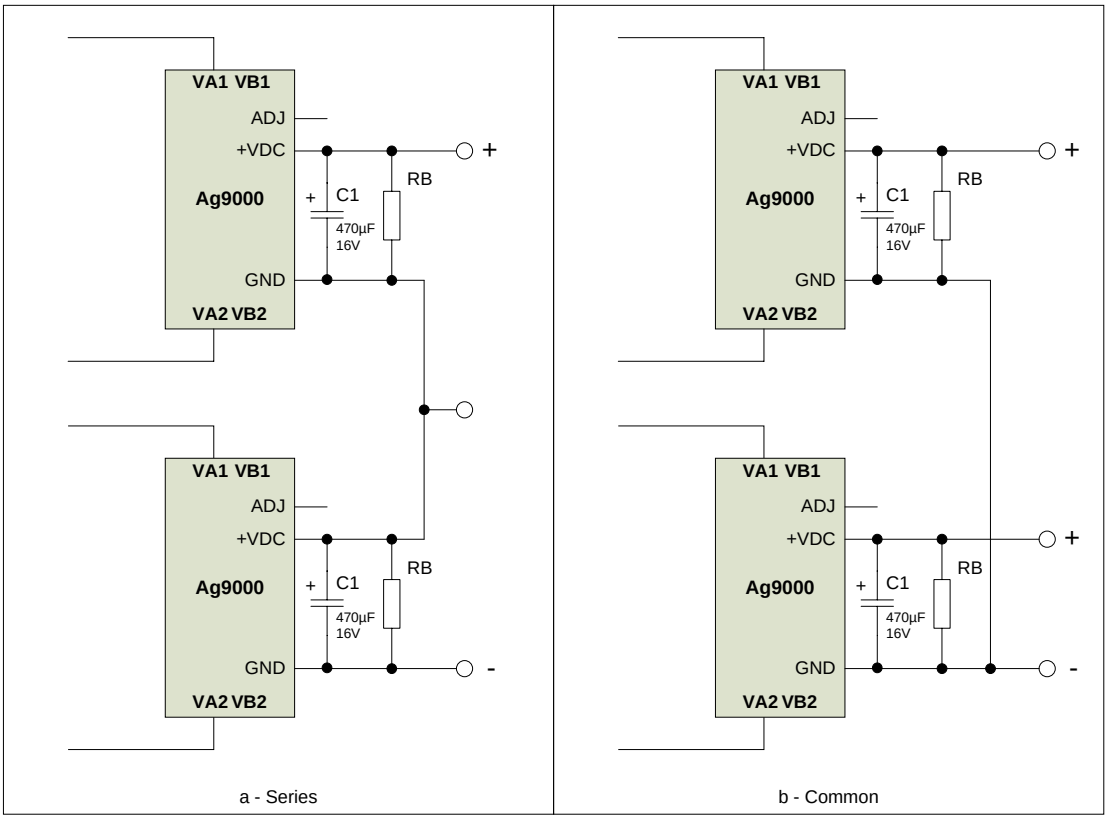

Figure 5: Connecting Outputs

When using the second method it is important to remember that there will be a delay between the first and second outputs turning ON.

Connecting the Ag9000 outputs in parallel to achieve higher current capacity is not recommended because of problems with unequal current sharing.