

Overview

This Application Note was written to provide an insight into issues surrounding the parallel connection of two or more power supply units with series connected output modules.

Background

Multiple NEVO and VCCM power supply units can be paralleled to achieve higher power levels. While it is possible to parallel all output modules within each unit and then parallel each unit, this does not achieve the best performance and can require additional parallel links and current share cables.

In certain applications, it is possible (and preferable) to series connect the output modules within each unit and then parallel each unit. This configuration has the following advantages,

- Perfect current share for all modules within each unit.
- Minimised requirement for power links
- Minimised requirement for current share cables.

Details

Figure 1 below shows a typical application setup.

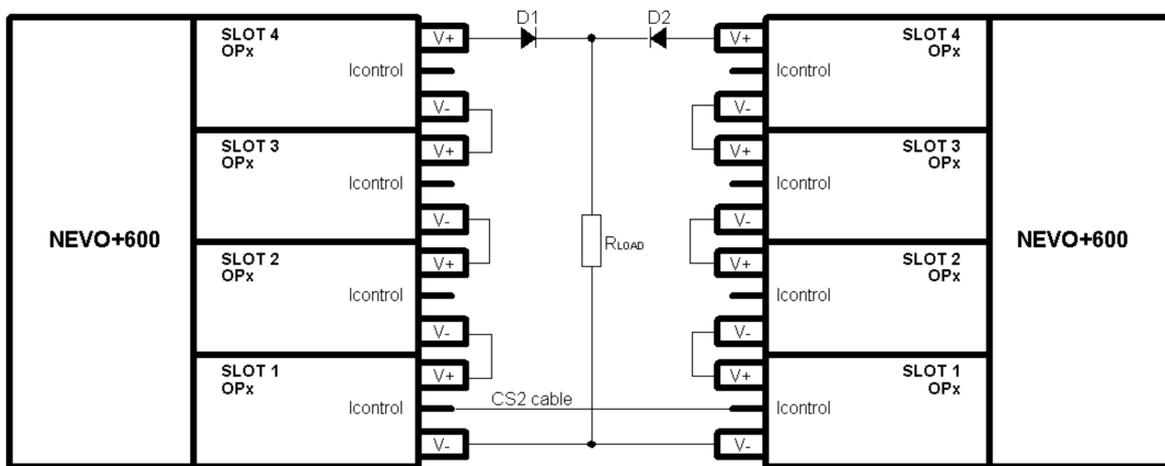


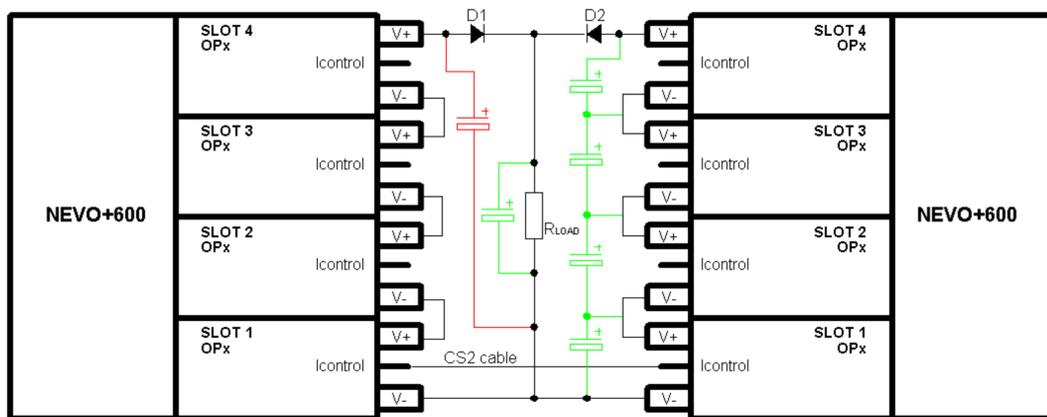
Figure 1 – Typical application setup for two paralleled NEVO+600 units with 4 series connected output modules in each unit.

Using this configuration, each set of four output modules within each unit carries the exact same current without the need for current share cabling between the modules.

Only three series links are required for each unit (6 in total) and current sharing between units can be achieved using a single CS2 cable.

To achieve the best performance the following guidelines should be observed,

- Diodes (or controlled mosfets) are required to prevent reverse current flowing into either unit which could result in damage.
- The AC power (and any PSU inhibit functions) should be operated in parallel for both units. (Do not power only one unit)
- Each output module should be adjusted to the same voltage to ensure all modules process the same power.
- CS2 cable must be attached only to the modules that have their V- terminals connected together.
- Best performance will be achieved if both units are mounted on the same ground plane.
- If the system experiences noise when CS2 cable is attached, a small 1nF capacitor from Icontrol to COM on each J5 signals connector may be necessary.
- V- cable length should be minimised to minimise current share signal error.
- The diagram below shows (in green) examples of allowed positions for external capacitors. Do not place capacitors in the positions shown in red or where the external capacitors stored energy is not balanced evenly across the outputs.



- Excessive external capacitance can cause an overpower condition on startup due to capacitor charging currents. If this occurs the unit may latch off. However, the issue may be overcome by sequencing the startup of the outputs using the PG and inhibit signals.

Conclusion

Vox Power modular power supplies can be very versatile and flexible. Seriesing and paralleling output modules or multiple units can allow for large voltages/current and powers to be delivered to the application.

Where possible it is generally a better solution to use series outputs (or units) rather than paralleled.

If there is ever any doubt about the correct wiring or application setup, you can always contact Vox Power Technical Support who will be happy to help!