



Application Note

OPERATING ISOLATED POWER SUPPLIES IN PARALLEL OR SERIES

OVERVIEW

ICT products are designed to provide continuous trouble free power for a wide variety of applications. This note describes how to connect isolated ICT products in parallel or series.

This application note covers all isolated power supply products. All ICT AC to DC power supplies are isolated, as are the ICT Isolated Series, Isolated Series 2, and Site Converter Series DC to DC power converters.

Outputs of matching isolated output power supplies and converters can be connected in parallel for more current, or in series (2 units maximum) for higher voltage.

PARALLEL CONNECTION

When connecting two or more supplies together in parallel, it is important to make sure that the units share the load as evenly as possible. This prevents one unit from providing an unevenly large share of the load while the other unit provides very little power. To make sure the power supplies share properly, ICT recommends that the output voltage of each unit be adjusted to match each other at the maximum load expected. All of our products are set to approximately the same output voltage at half of maximum load, but it is important for the installer to verify proper sharing using a volt-meter. The output voltage is easily adjusted on most products using the internal potentiometer (consult user manuals for details).

This method of current sharing is sometimes called the droop method, because if one supply is providing more current, the output voltage will decrease slightly so that the other power supply starts to provide more current. This is a result of the products being designed to slightly decrease in output voltage as the load increases. The units should share the load evenly within 10% if adjusted to the identical voltage.

The Digital Series power supplies have an optional digitally controlled active power sharing capability that enables multiple parallel connected units to be configured and controlled as one large supply. See the Digital Series user manual for details.

SERIES CONNECTION

When connecting two units in series, the current drawn is equal for both units. However, an external diode across each output (anode to negative, cathode to positive) as well as an output fuse is recommended to help protect the outputs in case of a shorted load. If two units are connected in series and the load is shorted, the units are essentially connected to each other with reverse polarity, which would result in damage to the units. The external diode rating should match the maximum current provided by the system.

If you have any questions, please contact our Technical Support department for assistance.

WARNING: Risk of Electrical Shock

Always unplug the power supply before removing the cover. Dangerous internal voltages may be present for several minutes after the power supply has been turned off due to stored energy in capacitors. Servicing should only be done by a qualified technician.