Modification Instructions for the DPS-1200FB A Power Supply

(Isolated Output, Extended OVP, and Extended Adjust Range)

Compiled by: Joseph Haas, KE0FF
July 28, 2020

Disclaimer: There are a great many server-power-supplies on the surplus market these days. The modifications described below are for just one of these supplies. It should be accepted that these modifications will likely not pertain to other models. In addition, these modifications are being presented without warranty as to performance or safety. Use proper safety precautions when working on any power electronic device. The reader assumes all risk from any modifications that they perform.

The DPS-1200FB A is a 12Vdc, 67A (at 100Vac input) power supply that is designed to be installed in a cage-style configuration with a card-edge connector for the DC output and control signals. A standard IEC C13/C14 connection brings AC power to the supply.

With modifications to remove the DC ground connection from the chassis ground, several supplies can be series connected to produce a higher output voltage. The primary limit is the insulation breakdown of the power supplies WRT chassis ground. 50V output has been achieved by others, and this is less than the 120Vac breakdown of the input voltage, so as long as the insulation barrier isn't compromised, up to 60V should be feasible.

My use-case for these supplies is to provide three output voltages: 13.8, 28, and 50 Volts. Given this combination, two of the supplies must also be modified to extend the over-voltage protection (OVP) and the adjust range to allow as much as 14.2 V to be produced without tripping the OVP circuits.

DC Ground Isolation

To isolate the DC ground, two standoffs to the chassis must be removed and replaced with an insulating standoff/screw combination (nylon or Delrin are suitable materials). The image below identifies the two standoffs. A third standoff (not shown) is left unmolested to connect the AC Earth ground to the chassis.

Photo 1. Standoffs to be removed for DC ground isolation.

2mm is sufficient insulation spacing for safety. Large diameter nylon "bushings" with a 0.125" I.D. and something like a 0.25" O.D. are a good choice. Using a Dremmel with a cutoff wheel (and a lot of care) it is possible to shave off 2mm from these two standoffs. Care is important as these standoffs are press-fit into the chassis and are easily dislodged. If this happens, it is best to simply remove both and

replace with a full insulating standoff that is 3.5mm long. There are some decent videos available on you-tube that illustrate the chassis disassembly and standoff removal.

OVP Limit Extend

The standard OVP limit for these supplies is on the order of 13.2 to 13.4V. To get increased output from the supply, this limit must be adjusted. Simply installing a resistor between two nodes on the internal control board is sufficient to accomplish this. Photo 2 illustrates a modification that I performed. A small-package axial lead resistor is a better choice, but these are not common in most hobby storage bins, so plan to order them from Mouser or DigiKey.

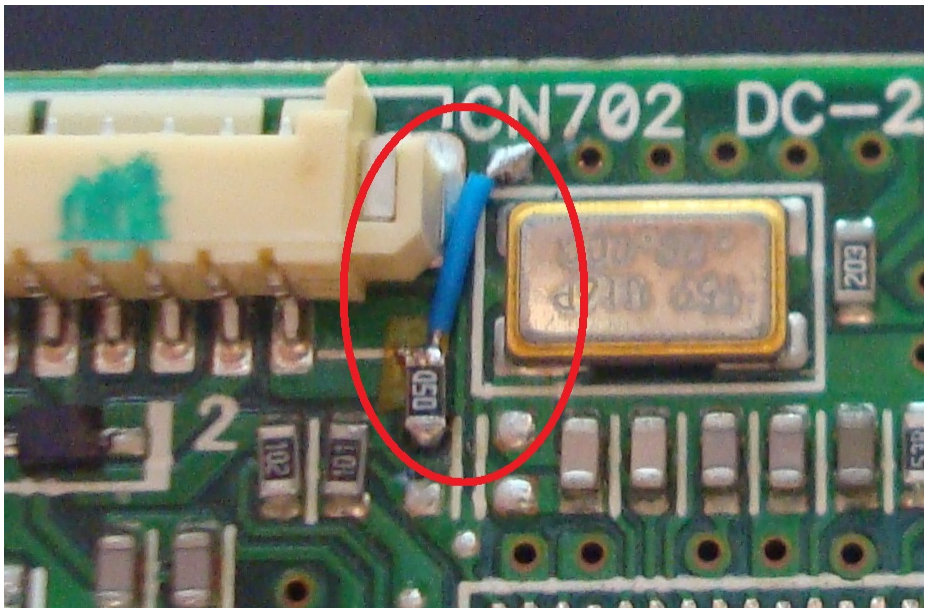


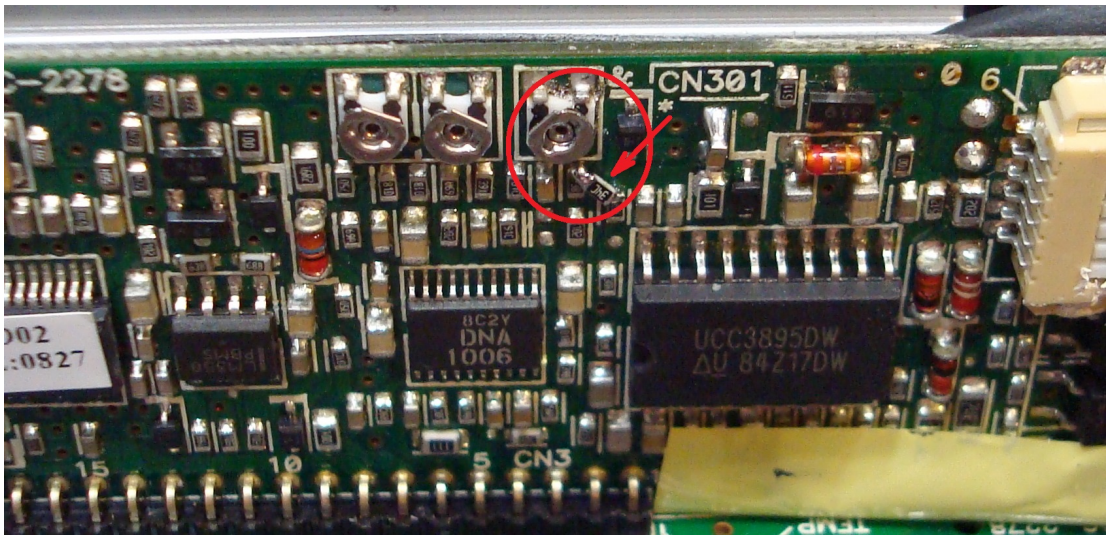
Photo 2. OVP extension resistor installation. *Note: a layer of Kapton tape is placed under the chip resistor to prvent shorting to the underlying copper.*

110KΩ should produce an OVP limit of about 14.2V while 82KΩ should increase the OVP to about 14.5V.

Output Adjust Range Extend

A potentiometer is used to trim the output voltage of the DPS-1200FB A. As-built, the range is limited to 13.5V, more or less. Photo 3 illustrates the placement of a resistor to increase the output adjust range. With a 22KΩ resistor, one can expect at least 14.2V as an upper limit, perhaps more. Reducing this resistor will increase the upper adjust limit. I would suggest that 10K is an absolute minimum, but this is more of a guess. The greater the range, the further one deviates from the factory configuration. The suggesting is that this increases the risk for unintended behaviors. So, try to stay close to the 22K value for best results.

Photo 3.



Extended voltage adjust range modification. The arrow indicates the added resistor. The potentiometer circled is the voltage adjust pot (do not adjust the other two unless you have credible information as to their purpose).

Checkout

The output voltage and OVP limit should be checked with a load on the DC output of at least 5A (four 10Ω, 25W resistors in parallel, attached to a heat sink). If you plan to maintain the edge connector, the Gigampz CSV2 test board is a good choice. This allows for easy connection to the load and properly biases the DPS-1200 to turn it on. Once the load is connected, apply power and verify that the supply is providing at least 9V to the load.

To test the OVP limit, use a non-conductive, flat blade screwdriver (hard-plastic, ceramic, or fiberglass) to slowly rotate the adjust pot such that the output of the supply increases. At some point, the supply voltage should drop rapidly (once the OVP limit is reached). Note the voltage just prior to this drop. That voltage is approximately the OVP limit. Rotate the pot to reduce the voltage, then cycle AC power and repeat the above several times. Average the results to get a better confidence on the OVP limit voltage. You would like to see the OVP limit at least 0.2V above your desired output voltage.

Once the OVP limit is verified, simply adjust the output voltage to that desired for the target application. Remove power and re-assemble the supply chassis. The modified DPS-200FB A is ready for service.

Bibliography

http://colintd.blogspot.ca/2016/10/hacking-hp-common-slot-power-supplies.html, *Hacking HP Common Slot Power supplies – 12V@100A,* by Colin Tregenza Dancer (07/27/2020)

https://www.youtube.com/watch?v=F0QWQntPkO4, *HP DPS-1200FB A HSTNS-PD11 13.8v mod*, by djm38fr (07/27/2020) (a you-tube video)