

Title: MultiFlex ETH 1000 Series DC Power Supply Requirements
Products(s): All MultiFlex ETH 1000 Series Ethernet motion controllers
Keywords: MultiFlex, ETH, MFX, ground, DC power supply, PWR-0522
ID#: TN1065
Date: Dec. 18, 2007

Summary

As opposed to a PC-based controller which gets its power from the PCI-bus backplane, the MultiFlex ETH 1000 Series Ethernet motion controllers require a separate, external power supply. An understanding of DC power supplies as well as the controller's ground design is necessary to ensure signal integrity and to reduce system noise.

More Information

Figure 1 below shows a typical topology for linear regulator DC supplies such as the PWR-0522. The three voltage regulators are isolated-output, meaning that their current return terminals are not referenced to a particular potential. In addition to the **Line** and **Neutral** inputs on the mains side, there is a earth **Ground** terminal which is common to the supply enclosure and is accessible by a external screw lug.

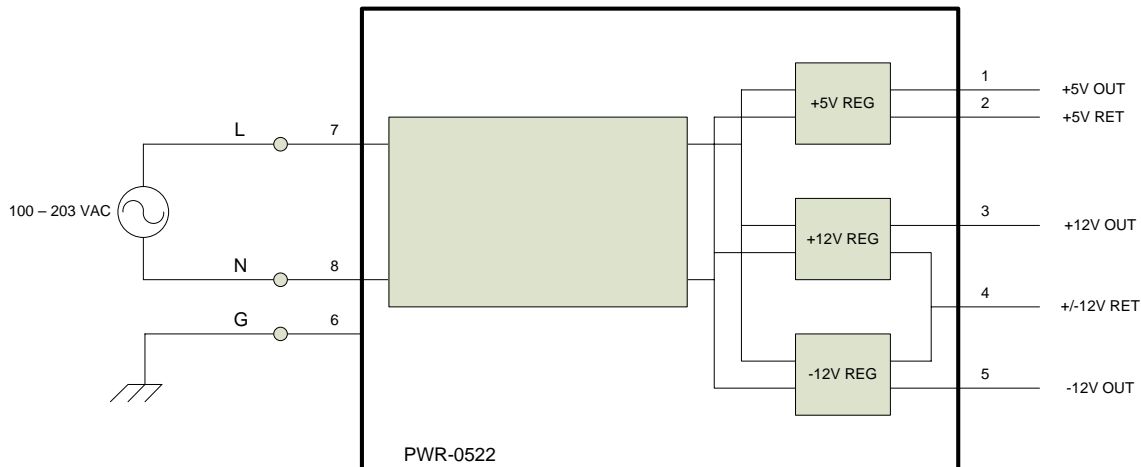


Fig 1. PWR-0522 DC Power Supply

Current that is returned from the +5V and +/- 12V supplies flow back into their respective regulator circuits in the power supply and do not flow through earth ground.

Figure 2 describes the ground topology on the controller and the corresponding nets that are associated with the supply. The +5V RET and the +/-12V RET nets are common and connected to the digital ground plane on the controller. In addition, there is a separate analog ground net that supplies the reference for the analog servo command DAC and op-amp circuits.

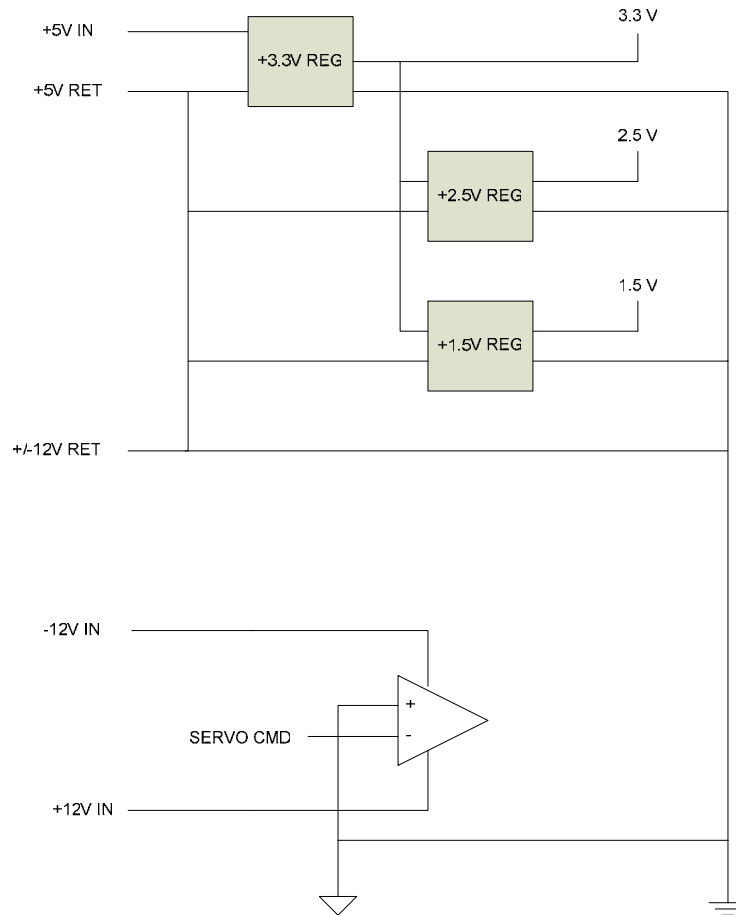


Fig 2. MultiFlex ETH Series Motion Controller Grounds

The digital and analog grounds are connected in common on the controller board at a single point in order to reduce coupling of switching noise from the logic circuits into the analog signal path.

In many cases, the user may choose to connect the grounds from the controller board to a ground reference point in their system in the interests of reducing ground loops and noise coupling from motors and other devices connected to the controller.

If this is not the case and there is no system ground reference, it is recommended that the user adds an additional jumper wire (20AWG) from pin 4 on the terminal block of the PWR-0522 to the binding lug on the enclosure, as shown in Fig. 3.

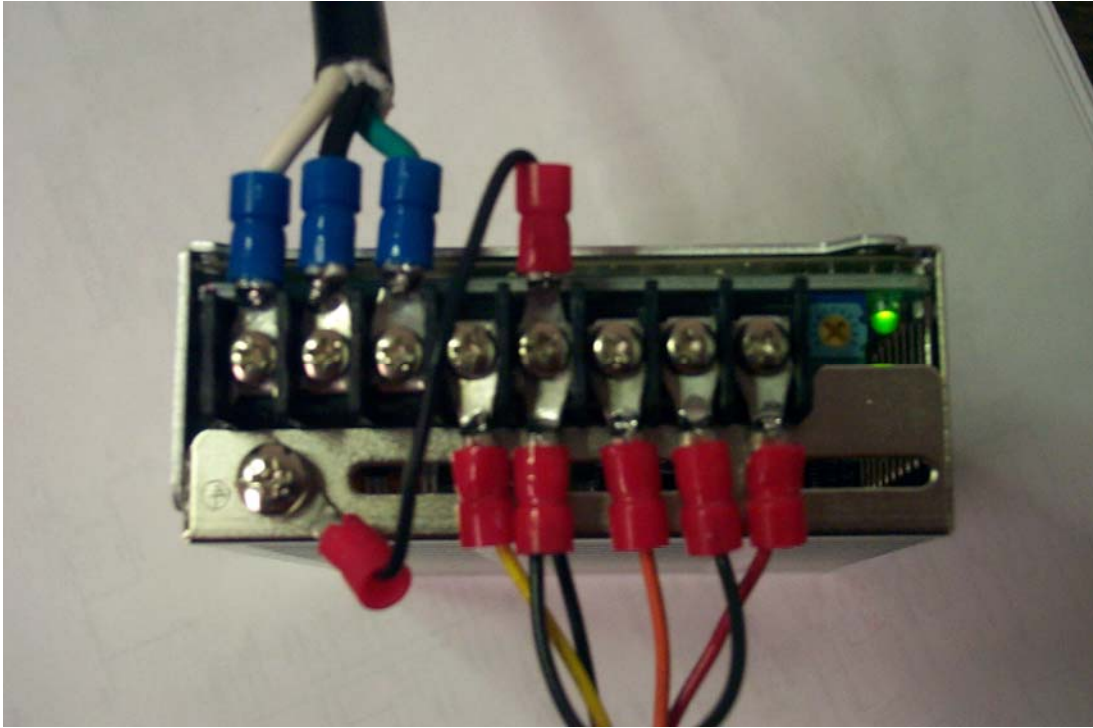


Fig 3. PWR-0522 Terminal Block Jumpering