

ELBY Designs System Grounding

Grounding is a complex issue with no easy solution.

There are three main purposes for grounding, which sometimes conflict (especially in EuroRack systems):-

1. For electrical safety.
2. For noise/interference screening.
3. As a common 0V reference between different equipment.

EARTH - Electrical Safety

(*) When equipment is connected to the mains voltage there is the risk of a failure resulting in the user coming in to contact with lethal voltage/currents. To prevent this, 'live' equipment has to have at least 2 barriers of 'isolation' between all conductive surfaces and the actual live parts:-

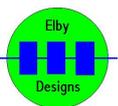
1. The first level is usually the protective sleeving around the live wires and through the use of insulated terminals.
2. The second level is usually either an EARTHED enclosure or an extra layer of insulating material. Laptop-style power bricks, as commonly used in EuroRack, are generally double-insulated and come under the second option and are classified as Class II.

This EARTH connection should NOT be used for any other purpose other than its intended purpose in electrical safety.

ELECTRO-STATIC CHARGE

The modern day environment and use of man-made materials results in an increased exposure to static electricity. Most EuroRack systems involve the use of metal in areas like the rails and module panels. All of these parts are exposed to the user and if not 'grounded' can generate static charges which can be unpleasant to the user and can potentially damage the sensitive electronics in the modules.

The common method to reduce/eliminate these static build ups is to 'ground' all metal parts. 'Grounding' is achieved by connecting all conductive surfaces to a EARTH point in the system (ideally this is as close to the point of entry of the EARTH in to the system). If the power solution in your system provides a true EARTH connection then this is a relatively easy task to achieve. Most, if not all, linear power supplies have a true EARTH connection as a part of their compliance with (1). However many power solutions now utilise 'floating' power supplies which do not have an EARTH connection and so the reader is forced to look at an alternate scheme to 'EARTH' or 'GROUND' their system. In countries that have an EARTH terminal on their mains outlets, readers can usually get special mains plugs that provide access to the EARTH terminal and these can be used to provide a GROUND connection for the system (as this involves working with mains components, the installation and use of such items MUST be done by a qualified electrician).



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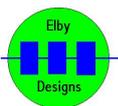
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It should be noted that the installation of a GROUND connection to your system may result in the introduction of ground-loops when multiple pieces of equipment are connected together. The reader will then need to consult the relevant experts on the options available for eliminating this issue.

(*) The description given here is greatly simplified for clarity. The reader is advised to read up on the full technical details with specific reference to Class I and Class II certification and the relevant electrical safety rules that apply in their country.

References

["To Float or Not to Float?"](#) - APT Associated Power Technologies



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