

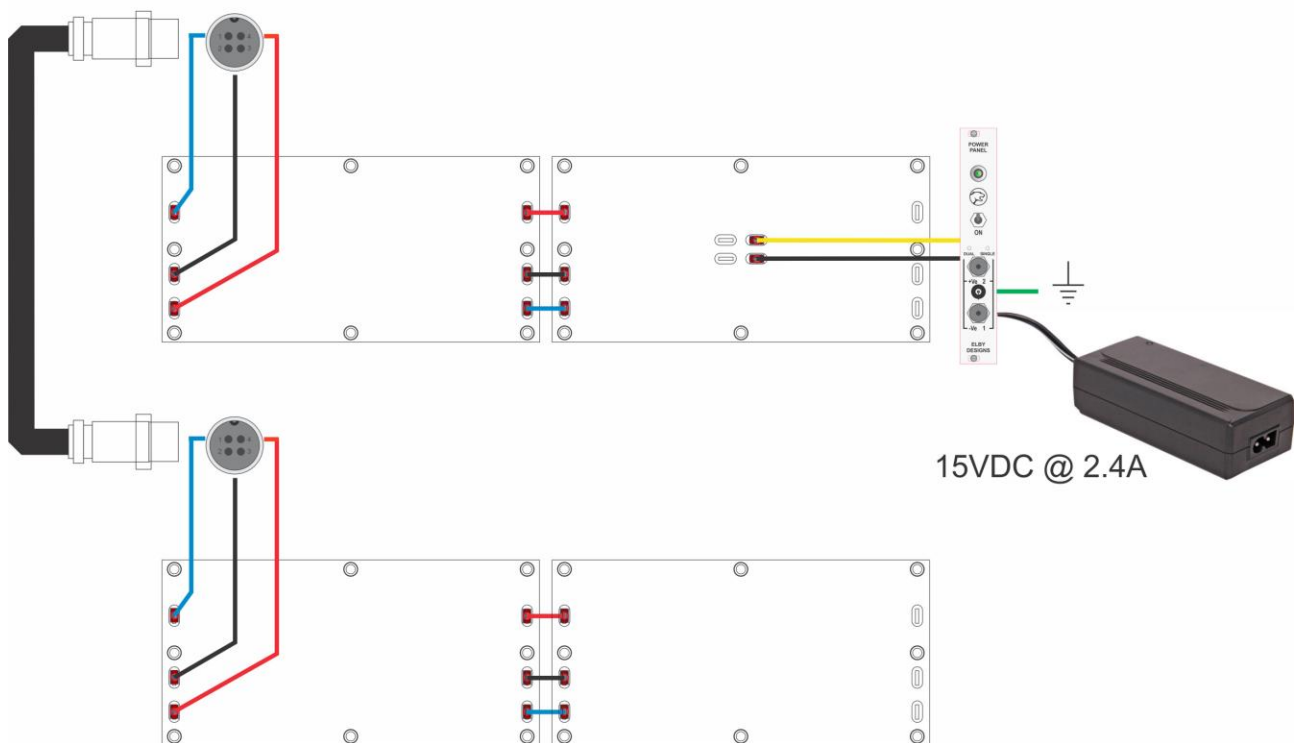
# Powering Multi-Boat Systems

The examples below show typical methods for connecting multi-boat systems.

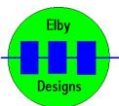
In this first example we have a single small capacity powered busboard (eg ED705) feeding a number of passive busboards (ED704). The ED705 is installed in to the first (main) boat which includes a 4HP Power Plate providing:-

- connection to the external 15VDC power brick,
- on/off switch
- power status indicator
- chassis grounding point

The 2nd boat is completely passive and so gets its +/-12V power using the DC-DC umbilical cord shown at left.



In this configuration the 2nd boat must always be connected using the DC-DC umbilical cord to allow it to operate.



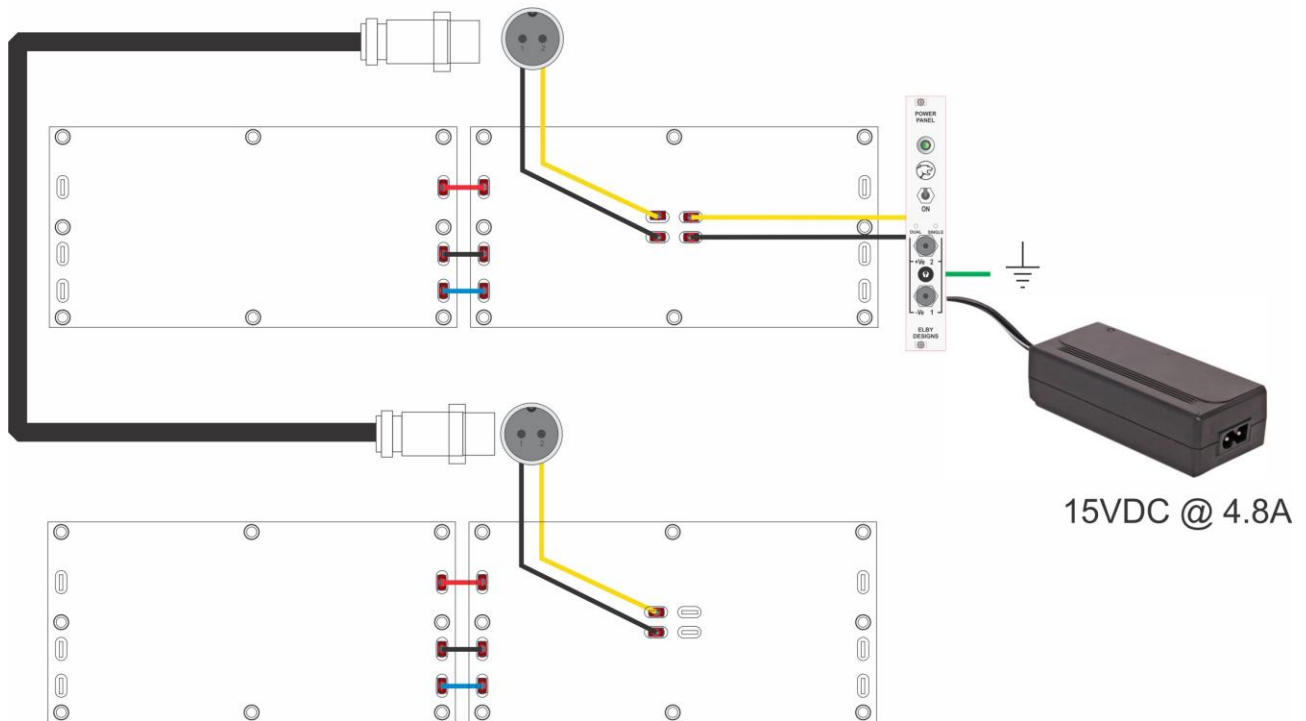
**Elby Designs - Laurie Biddulph**

9 Follan Close, Kariong, NSW 2250, Australia

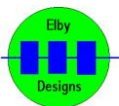
[elby\\_designs@ozemail.com.au](mailto:elby_designs@ozemail.com.au) <http://www.elby-designs.com>

# Powering Multi-Boat Systems

In this example we have 2 powered boats. This time the DC-DC umbilical cord feeds the +15VDC from the first boats powered busboard to the 2nd boats powered busboard. The rating of the power brick needs to be doubled to allow both boats to attain maximum loading.



In this configuration both boats can be used independently. Both boats would normally be configured with a 4HP Power Panel (this would be internally wired the same as the 1st boat) although it is possible to use an external power brick via the rear DC connection assuming it is terminated with the mating 2-pin MIC plug.



**Elby Designs - Laurie Biddulph**

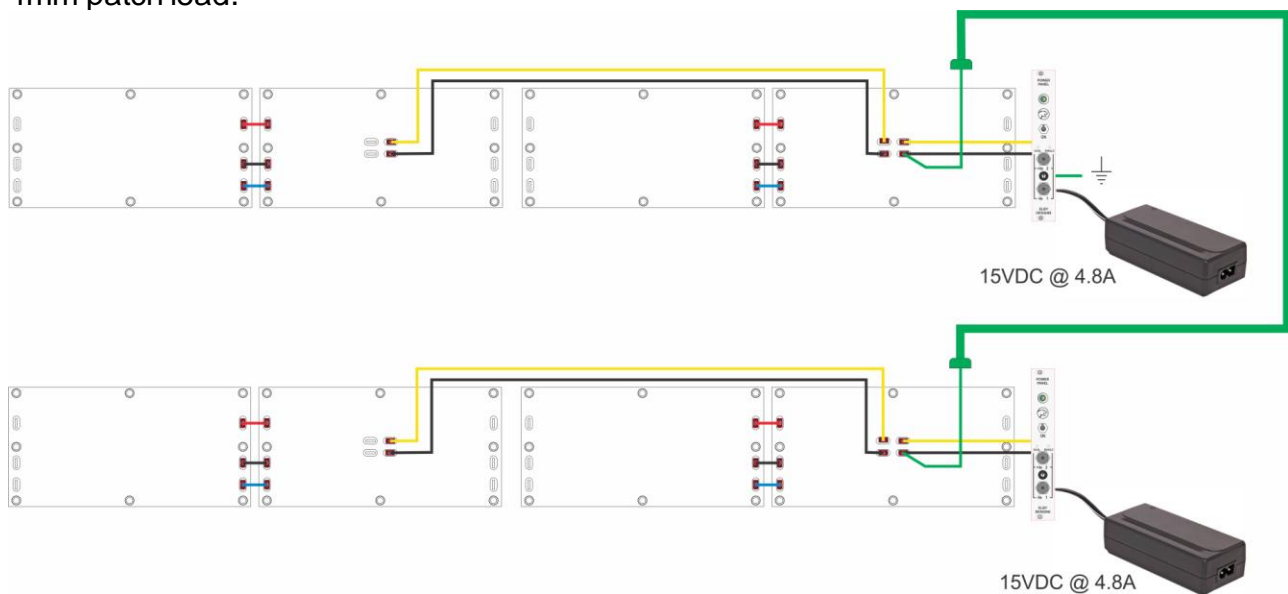
9 Follan Close, Kariang, NSW 2250, Australia

[elby\\_designs@ozemail.com.au](mailto:elby_designs@ozemail.com.au) <http://www.elby-designs.com>

# Powering Multi-Boat Systems

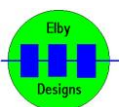
Both of the boats in the preceding examples can be 3U or 6U boats and 84HP or 104HP wide. For wider boats (126HP and 168HP) you will normally need to add additional busboards which may be either passive or powered as dictated by the module loading for each boat. If adding additional powered busboards you need to be aware of the manufactures specification for the DC connector used on the 4HP Power panel which is 5A. It is recommended for these larger systems that each boat has its own power brick. This not only allows each boat to be used totally independently of the other boats but also permits the use of the smaller power bricks.

In this configuration it is necessary to establish a 'common signal ground' connection between the boats which is easily achieved using the grounding strap arrangement shown in the example below. Each boat is fitted with a 4mm 'grounding socket' which is connected to the boats 0V rail at a point nearest the incoming 15VDC. The boats are then 'commoned' using a 4mm patch lead.



The above example shows a suggestion for 168HP wide boats. For 126HP wide boats either the left-most ED704 or left-most ED705 would be omitted depending on the boats loading requirements. If removing the ED705 then it may be possible to reduce the rating of the 15VDC supply.

Readers are referred to the document [DC Distribution Systems](#) for more information on configuring various width systems.



**Elby Designs - Laurie Biddulph**

9 Follan Close, Kariong, NSW 2250, Australia

[elby\\_designs@ozemail.com.au](mailto:elby_designs@ozemail.com.au) <http://www.elby-designs.com>

# Powering Multi-Boat Systems

## CHASSIS GROUNDING

It is a requirement in most countries that electronic (non-battery) powered systems comply with the countries local electrical safety and EMC regulations.

One of the requirements as a result of this compliancy is that all exposed metal (electrically conductive) surfaces be tied to mains EARTH to prevent electrical shocks.

The use of SMPS power bricks means that most systems have a 'floating chassis' as most domestic SMPS supplies do not provide an EARTHED output. It is important, therefore, that the user takes steps to ensure that their systems are electrically safe.

In all of the preceding examples you will notice an EARTH symbol next to the GND socket on the 4HP Power Plate. This point should be connected to a true EARTH point. Where a system involves 2 external power bricks, only one of the 4HP Power Panels has its GND socket connected. This is because :-

- the GND connection to the 2nd boat is provided by the green EARTH Strap shown to the right
- terminating both GND points to EARTH may result in ground loops

Not providing an adequate 'chassis ground' may result in, amongst others, :-

1. electrostatic shock when touching any metal part of the system
2. audible 'clicks' when patching signals between boats to external equipment such as a mixer or amplifier
3. none or unpredictable operation of modules using touch sensing technology

