Alpha Paralleling Options

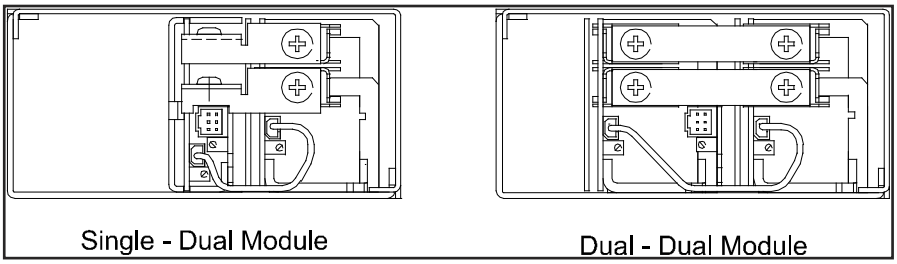
The Alpha power supply range can be fitted with parallel options which are designed to provide high current outputs (PP Option) or n + 1 redundancy. (PA Option) The type of option required is specified when configuring the Alpha unit.

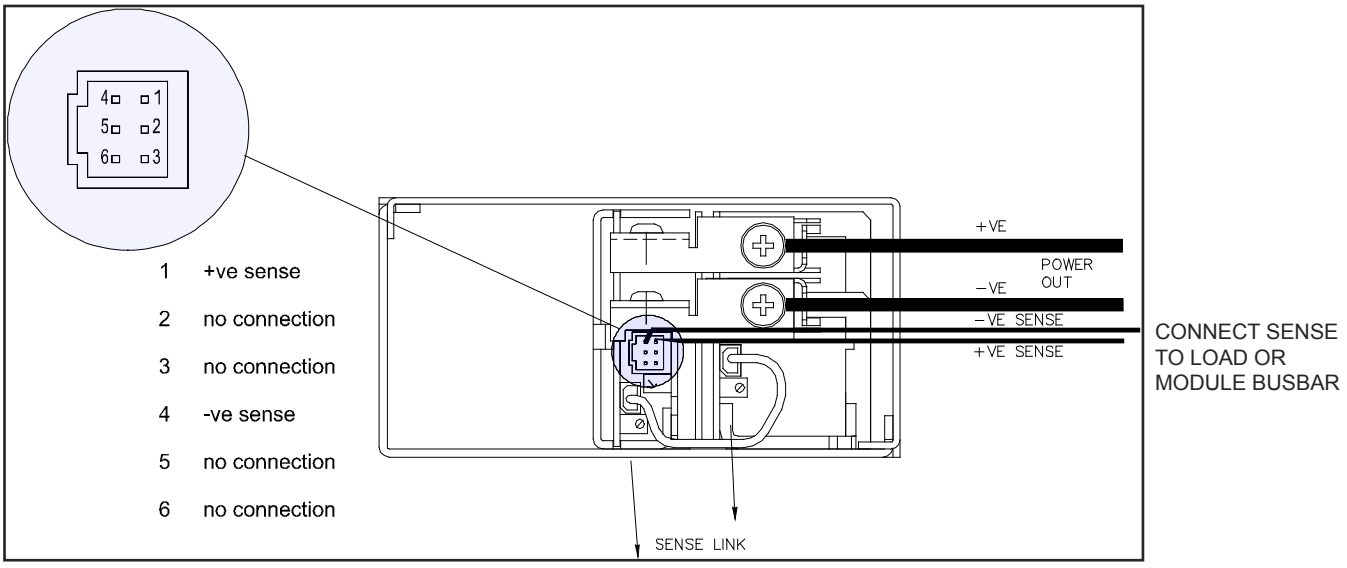
PP Option

The PP option enables two modules of the same voltage in the same unit to be paralleled together to increase output current capability. The module output terminals are 'hard' paralleled with joining busbars and the remote sense terminals are joined with a connecting loom. The PP option is factory fitted to one module of the parallel pair (usually the lower current module) and reduces the current limit threshold to allow continuous operation at current limit without exceeding the module rating (i.e. 95-100%). The output voltage of the adjoining module is set slightly lower (typically 1-2%) to ensure this module does not operate continuously in a current limit condition.
Maximum output current is therefore 95% of the module fitted with PP option and 100% of the adjoining module.

Example : A module (5V, 60A) paralleled with B module (5V, 25A)
PP option would be fitted to B module (lower current module)
Max output current = (95% x 25A) + (100% x 60A) = 83.75A

If required, remote sense should be made via the 6-way option connector (molex housing 90142-0006 & crimp pins 90119-2109 supplied).





PA Option

This option enables two or more modules of the same voltage to share current to the load. The modules can be either in the same unit or in separate units. The option has a Module good signal (open collector output) which indicates the output is within + / - 10% of the required voltage and that the module is functional.

The PA option allows a system to be wired for n + 1 redundancy by fitting external 'OR-ing' diodes in the positive power cable of each individual module.

Sharing Accuracy

To prevent the good module going into current limit when a short circuit is applied to the other module, the maximum load current must be derated by Vo/10.

e.g. 5A modules derated by 0.5A
24G modules derated by 2.4A

In this application the maximum load current, Io max., is the maximum rated output current of one of the modules (for 1+1).
The sharing accuracy at Iomax is defined as follows:
With perfect sharing at Iomax the current from module 1 = I1 = Iomax / 2
Ia = actual current supplied by one module.
Accuracy = ((I1 - Ia)/I1) * 100
Sharing accuracy at I0 max, when Vo = required voltage + / - 1%.
3.3V modules = 22%
5V modules = 22%
12V modules = 24%
24V modules = 29%

Sharing accuracy at limit of the pull up range
3.3V modules = 26%
5V modules = 26%
12V modules = 28%
24V modules = 33%

Min load current required for the modules to share = 23%

The current sharing circuit works by increasing or pulling up the output voltage of the module that is not delivering current. Min pull up range = 110% of set voltage.

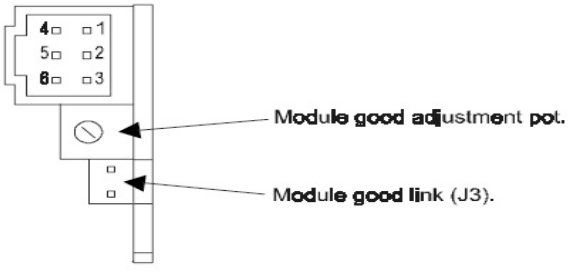
Fot the modules to share the output voltage of each module must be within set limits of each other i.e. within the capture range. Min Capture range = 5% of set voltage.

Note when the Vo high threshold is reached the sharing circuit is disabled. This may limit the pull-up and capture range.

Module Good

A TTL compatable open - colector signal referenced to -ve output (option connector pin 5).
Min load current to show out of capture range = 34%
Vo high threshold Typ 112.5% + / - 2.5% at the sense terminals
Vo low threshold Typ 87.5% + / - 2.5% at the sense terminals
Vo low threshold Typ 85% at the power terminals
Max sink current = 50mA for V < 0.8 volts.
= 100mA for V < 1.5 volts.

1	+ve sense
2	Module good
3	Star point
4	-ve sense
5	-ve power
6	Star point

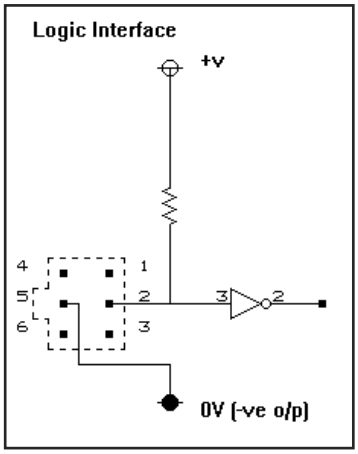


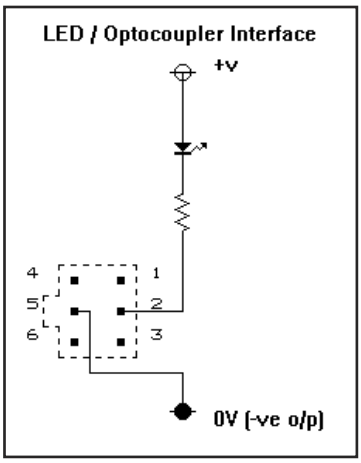
Module Good Set Up

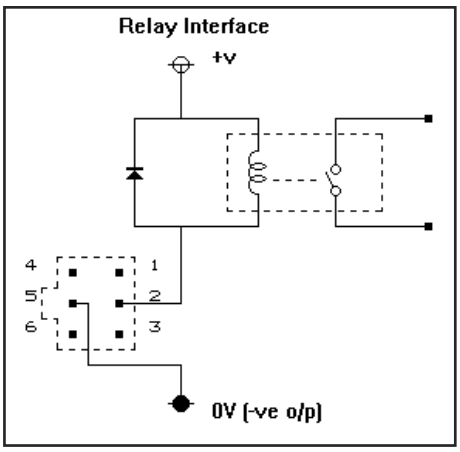
This is factory set for the specified output voltage ordered. If there is a requirement to change this setting, the procedure is as follows. Note that the modules are not connected in parallel during this procedure.

1. Remove link J3 from the PA board.
2. Wire an LED to the Module Good pins as shown in the interface connection section below.
3. Set the module to the required output voltage by adjusting the output potentiometer.
4. Set the Module Good threshold by turning the option potentiometer fully anti-clockwise, then adjust the potentiometer clockwise until the LED turns on. Continue adjusting clockwise until the LED just turns off.
5. Fit link J3 back in the PA board.

Typical Circuit Connections - Module Good







Typical PA Circuit Connections - N+1 Redundant Systems