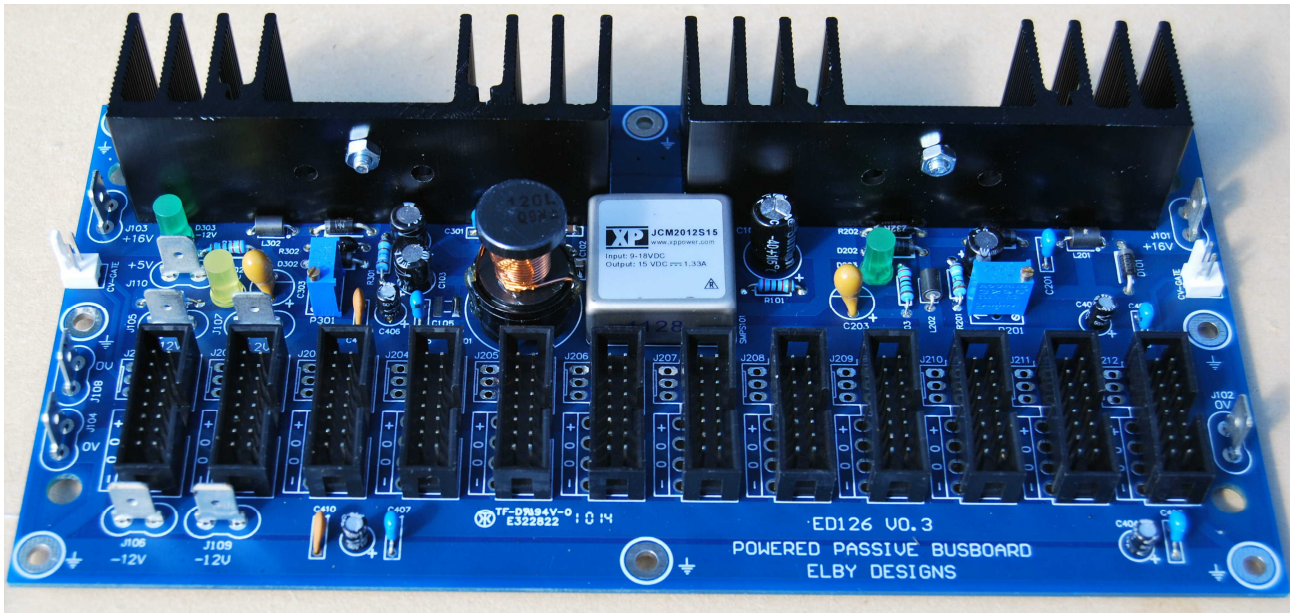
ED126 – Powered Passive Busboard



The ED126 is a powered busboard incorporating a dual linear regulator power supply providing +12V @ 1.5A and -12V @ 1.0A. In addition it provides 12 module power outlets.

Each module power outlet can be either a 16-way IDC boxed connector or a 0.156" KK connector.

The design of the ED126 follows a similar design approach as the ED123 by utilising a busbar approach to the power rail layout.

The ED126 requires an external power supply which should, ideally, have a 15VDC output. To determine the current capacity of the supply, sum the +12V and -12V loading for all modules and then multiply by 1.25. So, for example, if your system has a total draw on the +12V rail of 1.2A and a total draw on the -12V of 400mA then the calculation for the external supply rating would be:-

$$total\_loading = total\_draw * 1{,}25$$

$$= (1.2A + 0.4A) * 1.25$$

$$= 1.6A \times 1.25 = \mathbf{2A}$$

So the optimum rating would be 15VDC @ 2A. A larger capacity supply can be used but ideally, the maximum rating should be kept to less than 2 x *total_loading* or 4A in this example.

No allowance is made in these calculations for a 5V module supply. If you use one of the 12V-5V adaptors then you should add a 5V_loading figure to your total_draw where:-

5V_loading = (total current draw on the 5V rail) * 0.42

Heatsinks

The ED126 power section requires heatsinks to protect the regulators from thermal overload. The heatsinks used will develop a temperature rise in the order of 30C above ambient when running at full load. This means the heatsinks will run quite warm and will feel hot to the touch. It is important to be aware of these heatsinks and there location within your case to minimise thermal affects on your modules. Sensitive modules such as VCOs should, ideally, be kept away from the heatsink area of the ED126 where possible.

Please note that this kind of temperature problem is common to all linear regulator designs that need to regulate more than a few hundred milliamps of power. The heat generated is a product of the voltage difference across the regulators (in our case this is typically 16V – 12V = 4V), the current being drawn (can be in excess of 1A) and the thermal efficiency of the heatsinks. Using an external DC supply does not remove this temperature problem but (a) moves the AC component of the power system outside the system and (b) removes, in the case of a linear design, heavy and bulky transformer package outside of the case. The external supply will also reduce the amount of heat being generated but certainly cannot remove the heat problem completely.

Dimensions

The ED126 has dimensions of 205mm x 101mm so will comfortably fit in to a 3U 42HP section of your case. The upper section of the ED126 incorporates the heatsinks and these add a height constraint of around 30mm to this area of the busboard.

Larger Systems

Most systems will require more than 12 module outlets so will require extra busboards to be installed. This can be simply achieved by adding multiple ED123 Busboards. This configuration would set an upper limit on the whole system for both the +12V and -12Vrails to that of the ED126 supply which is of the order of 1.2A per rail.

Where a larger load capacity is required you can alternately install multiple ED126s and /or a permutation of ED126s and ED123s. Each ED126 added to the system will add in excess of 1A per rail to the total system capacity.

The ED126 has both +/-12V output connections and +15VDC connectors at its left end. The +/-12V connections are for connecting to ED123 Busboards, while the +15VDC connection is for connecting to another ED126. This arrangement means that we are distributing the main 15V supply around the case which is more tolerant on voltage drops across long runs and so can be daisy-chained together in confidence.

Readers are advised to read our document DC Distribution Systems for more information of power distribution systems and example system configurations.

5V Power

Some modules require access to an external +5VDC supply. The Doepfer busboard design allows for a +5V rail to be included although most power systems do not include a 5V output as standard. The common approach is to fit an adaptor that generates the required +5V from, usually, the +12V rail but some newer adaptors use the -12V rail instead.

We offer the EURO-5V adaptor to provide +5V (see the EURO-5V datasheets for more details).

If using the Mutable Instruments 5V Adaptor it should be noted that it can only be mounted in the left most power outlet (J201) and that the 2x 0V tabs will need to be, carefully, folded over at a slight angle to allow access to them. Be EXTREMELY careful when installing the adaptor to ensure it is correctly positioned within the header.