Here's what you need to know about Neutrino and lighting, horns, and other motor-driven accessories.

Relays and Diodes:

Given the high current capabilities of Neutrino circuits for most accessories a direct connection is possible…and desired. In the event that the accessory draws too much startup current a great option is to connect the accessory to 2 Neutrino circuits and activate them simultaneously using the relay switch functionality.

In the even that a relay is desired or unavoidable it is necessary to protect the Neutrino circuit from back current/voltage that is generated with these devices. To do this all that's required is to install a diode (BYV27) with the cathode (black band side) connected the circuit and the anode connected to a ground terminal. This will ensure that back current/voltage is shunted to ground rather than into the Neutrino module.

This is also true for high performance horns as they use electric motors that can cause similar problems.

Note: Neutrino Element and Aurora PLUS include built in reverse current protection diodes so the addition of diodes for reverse current protection is not necessary with these units.

Lighting:

Neutrino is a great system for both powering and controlling aftermarket lighting and here are guidelines for how best to use our system for this purpose.

Halogen lights

These can be powered and dimmed via the Neutrino system by connecting the positive lead to circuit 2 of the NBB and setting the circuit breaker at 20 amps. The reason for using circuit 2 at 20 amps is that halogen lights require very high startup current and the NBB has been optimized for a gradual (~8 seconds) startup on circuit 2 at 20 amps.

HID lights

These can be powered (but not dimmed) via the Neutrino system by connecting the positive lead to circuit 2 of the NBB and setting the circuit breaker at 19 amps. In most cases this will allow enough current to ignite the lights. If the circuit breaker trips it will be necessary to parallel 2 Neutrino circuits together and control via an external switch using the relay switch functionality. Please contact us for more information on configuring this.

LED lights

There are 2 types of LED lights in the market, those with their own controllers and those without.

For all 2 wire other LED lights on the market Neutrino can power and dim these using any circuit that will handle the amperage. Since most LED lights are very low amperage most any Neutrino circuit should work. These lights will have 2 wires, one which should be connected to the positive terminal on the Neutrino Module and one to ground. We strongly recommend eliminating any relays included as part of the wiring for use with Neutrino as relays simply aren't needed.

A number of the newer LED lights have 3 rather than 2 wires, ground, power and PWM. Typically these would be black, red and green. It is possible to use Neutrino with these sorts of lights several ways:

Good. Use Neutrino to provide power to these lights while using their control electronics. In this case Neutrino simply replaces the battery and should be configured as switched. The red wire will connect to a switched Neutrino output with black going to a ground and green going to the accessory light manufacturer's PWM controller.

Because many of these harnesses use relays there is the potential for reverse current issues that can cause current/voltage spikes to enter Neutrino. This problem is easy to overcome with the addition of a diode. Connect the diode's anode to one of the NBB ground terminals and the cathode (the side with the black band) to the hot terminal being used. Apply some shrink sleeving to this side. That's it. The recommended diode is a BYV27 which we can supply at no charge.

Much better. Use Neutrino to both power and control your 3 wire lights.

Variant A. Use Neutrino as a replacement for the manufacturer's PWM controller.

To do this you would eliminate the accessory light manufacturer's included PWM controller and instead wire the lights directly to the Neutrino, connecting the red wire to a switched output (or the red battery charger input), black to ground and green to a Neutrino circuit set as variable. This will enable very smooth (100 step) control of your lights. NOTE: While with most 3 wire light manufacturers this works as expected with Clearwater lights it works opposite of what's expected. Because Clearwater has inverted their circuitry ON is OFF and OFF is ON. Once you understand this everything works just fine.

Variant B. Enable both a daytime standard setting (say 40% on) going to 100% when the high beam is activated.

To do this connect the lights as above and run another hot lead to a relay switch configured terminal set to activate when sensing "open". In the case of Cleatware lights due to the reversed wiring, when the Neutrino input senses +12V (when the high beams are activated) it will cause the circuit to turn off which will cause the Clearwater lights to go to 100%. For non-Clearwater lights the opposite is true.

In the case of the Clearwater CANopener we recommend that Neutrino not be used to provide power to this device because of potential timing issues with Neutrino providing start up power slightly after the CANbus does. While many have reported no issues we simply aren't able to constantly test this device to ensure compatibility as Clearwater makes changes to its product….so you're on your own.

Note: CANbus electronics are not affected by Neutrino. The two happily co-exist as they perform different functions and are electrically 'invisible' to each other. This applies to all CANbus systems/add-ons, irrespective of manufacturer and including the Clearwater CANOpener product.