

Neutrino Owner's Manual

Revision 1.1
9/5/14



Congratulations on your purchase of the Neutrino integrated power distribution and control system. Not only does this product represent the state of the art in power distribution and control, but offers a range of essential information. Most importantly, the system will acquire additional talents over time as updated software is made available for download.

Installation of the system is covered under the quick installation guide shipped with the Neutrino module, so we won't cover that again here. The purpose of this manual is to show you how to use the system to its fullest capability.

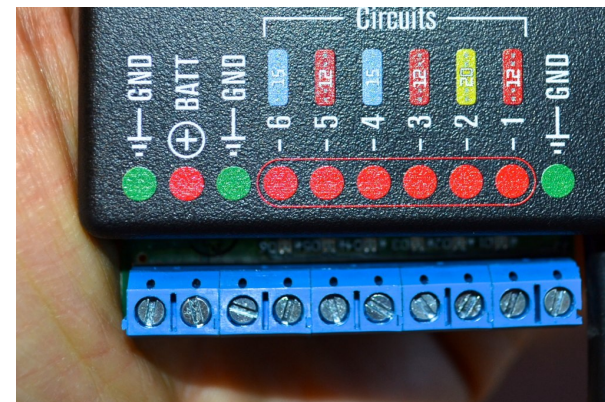
Chapter 1
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Configuration
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Chapter 1: Configuration

Once your phone and Neutrino module are communicating, configuring the system is easy and fun.

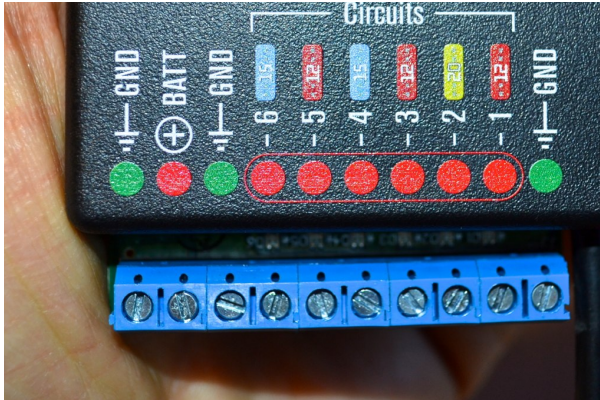
Step 1. Assigning circuits. Neutrino has 6 circuits plus direct battery charger inputs. It's important to note that the 6 circuits have different capabilities.



Circuits 1,3, and 5 are each rated at 12 amps, circuits 4 and 6 at 15 amps, and circuit 2 at 20 amps. This is the maximum load that each

circuit can handle, and the software won't let you set a level higher than this. This is done to optimize internal electrical paths within the unit. Please note that circuit 2 has some exceptional characteristics, in that it can actually handle peaks of significantly higher than 20 amps, so is ideal for devices such as HID lights that have very high starting current requirements, but quickly drop down to more moderate levels.

Note on grounding. Unlike other products, Neutrino includes a ground plane. This allows you the flexibility to take ground from either the Neutrino module or from the chassis. This not only greatly simplifies installation, but it also allows for direct connection of sensitive audio equipment without the risking ground loop issues



resulting from the use of chassis ground.

We include 3 ground connections on the module, one on either end of the connector strip

and a third adjacent to the direct battery charger connection. You can use any of these 3 ground points for any of your circuits.

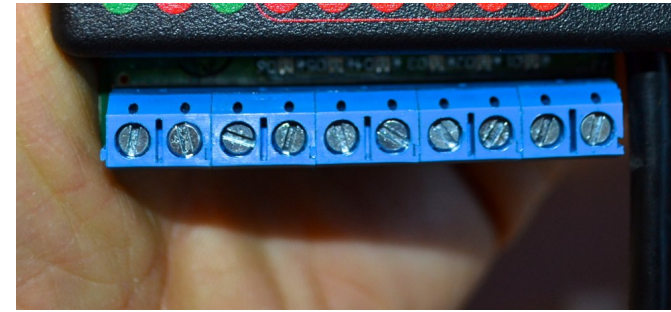
Step 2. Diagnostics: Now that you've got all your circuits hooked up it's time to talk about diagnostics.

The system includes diagnostics both on the module and in the phone app. Let's first talk about the on-board module diagnostics.

If you look at the base of the circuit board, where it exits the case, you will see 6 little LEDs. Each of these will tell you about the status of the corresponding circuit. If there is no light, the circuit is not energized. If there is an

amber light, the circuit is energized and everything is normal. If there is a red light, however, this means that there is a short circuit.

You can also get similar information from the application.



When you turn on a circuit the bar will change from blue to red. If, however, there is a

short circuit, the voltage indicator will turn red....a clear indicator that something is wrong.

The good news is that the circuit breakers will immediately shut the circuit down and will stay shut down until the short is rectified.

Please note that in the event you overload a circuit, say run a 6 amp load when the breaker is set for 3 amps, you will see a flashing red indicator.

Step 3. Configuring the circuits

In order to configure the circuits you will need to launch the Neutrino controller app on your phone and make sure you are connected either via USB or Bluetooth. In order to make a connection the ignition system of the host vehicle must be on.

Once connected you can start the configuration process.

Let's assume you are going to use all 6 circuits and you have a bunch of stuff to hook up. Our hypothetical example will include heated grips, a heated jacket, heated gloves, HID lights, LED lights, and a USB charger.

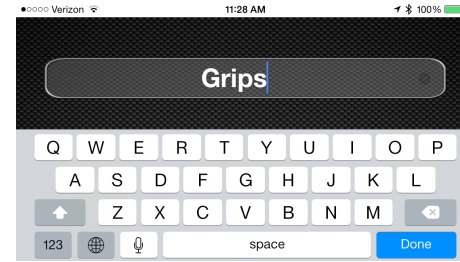
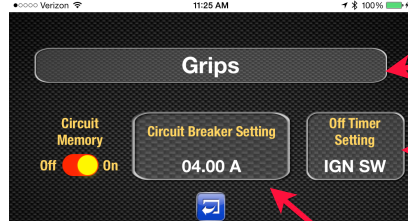
Since the only one of these that really needs a lot of power is the HIDs, these should be connected to circuit 2, and let's just assume that you connected the grips, jacket, gloves, LED lights, and USB charger to circuits 1,3,4,5, and 6.

So, let's get started with circuit 1, our heated grips. First, let's name the circuit.

To do this you tap circuit one from the opening page and you will be brought to the circuit adjust page.



From here tap the gear icon on the right and this will take you to the configuration page.



To name the circuit, just tap the default circuit name and a keyboard will appear.

Type in the new name and tap "done". Since we're here, let's also see the other circuit attributes.

Starting from the left, decide whether you want this circuit's operational settings to be memorized. Turn this feature on if you want this circuit to automatically revert to it's last "on" setting after you shut the vehicle down and restart. This is different from the basic configuration attributes, which will automatically be remembered.

So, let's say that you want your heated grips to come right back up to the same level they were at when you shut the vehicle down. In this case, you would tap the circuit memory switch to "on". If you instead set it at "off", when you restarted the vehicle the circuit would have defaulted to "off".



Next let's set the circuit breaker limit. Since heated grips typically take less than 4 amps, let's set the breaker for 4 amps. To do this simply tap the circuit breaker setting box and a scroll wheel will appear. Twirl the scroll wheel to 4 amps and press the return arrow.

It's that simple.

Finally, let's set the "ignition off" circuit behavior. This defines what you want this circuit to do when the vehicle is switched off. The default is for the circuit to shut down when the vehicle is off, but you have other choices. To



set this tap the "Off Timer Setting" box and another scroll wheel will appear. Here you have a choice of "ignition", which means the circuit will shut down when the ignition is shut off, or

you can set a specific number of seconds or minutes or hours that you want the circuit to remain live before it shuts down, or you can tell the circuit to shut down when the vehicle battery voltage drops to a certain level. This level is set on the master electrical page, which we will cover elsewhere, but if you want a voltage-dependent shutdown to happen, this is where you should make that selection.

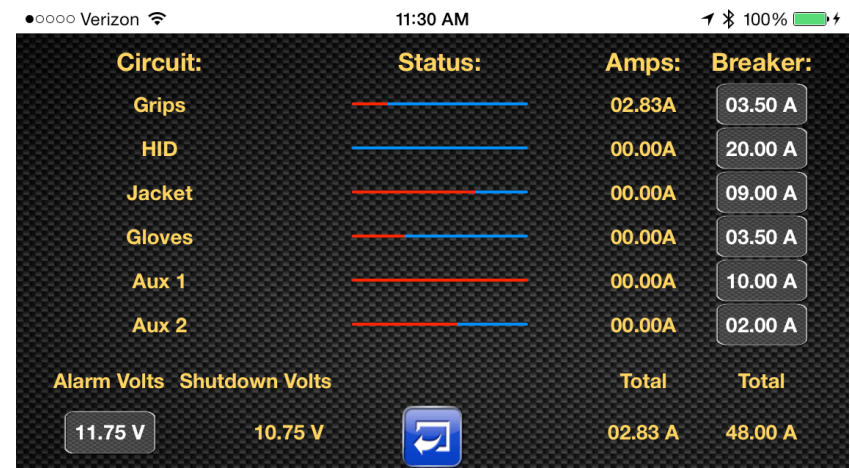
Congratulations! You've now mastered circuit configuration and can apply the same concepts to the other 5 circuits.

A really cool feature if Neutrino is that if you have multiple Neutrino modules on multiple vehicles each will remember it's own configuration. So, when you hook you phone up to the motorcycle all the settings that you had made will automatically pop up on the phone. If you then hook the phone up to the Neutrino on your boat, a completely different group of settings would appear.

Step 3. Units of measure. If you tab back to the first page you will see an icon at the upper right of the screen that will allow you to set units of measure. When you tap it you will get a screen that allows you to choose between feet and meters, miles per hour or kilometers per hour, temperature in fahrenheit or centigrade, and time in either 12 or 24 hour format. You are free to mix and match any of these to your preference.



Step 4. Global electrical settings. All the electrical settings we've been making so far have been by circuit. There are, however, a few that are global. To access these tap the voltage indicator on the first page and you will be presented with a grid view of the entire electrical



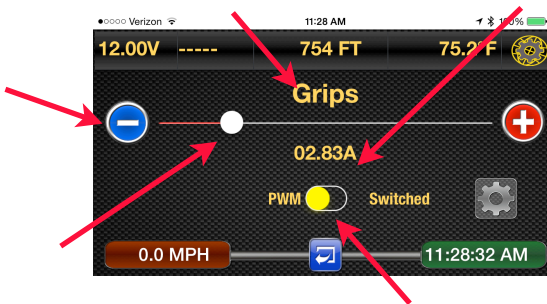
system. It shows you the status of each circuit, the

current amperage draw by circuit, total amperage draw, and allows you to adjust the alarm voltage.

To do this, tap the alarm volts button on the lower left of the screen and you will get a scroll wheel where you can set a voltage at which you want the system to let you know that the vehicle voltage is below what you deem to be a safe level. This will also cause the automatic shutdown voltage to be set at 1 volt lower than the alarm setting. As discussed earlier, this shutdown voltage will be used to shut down a circuit where you have designated it as being voltage-dependent.



you will see the circuit name and a bar with a blue button on the left and a red button on the right. There's also a switch just below the amperage indicator that allows you to set the circuit to be PWM or switched.



Let's assume we are wanting to control the heated grips we set up earlier. Since we want infinite heat adjustment,

let's leave the PMW/switched slider at PWM, or pulse width modulation. Now you can either drag the white dot from left to right or tap the red button to advance the white dot and the blue button to retard it.

If, however, this circuit was going to be used for our HID lights, which don't like anything other than full power on or full power off, then you would set the PWM/switched slider to "switched". Now when you touch either the white dot or the red/blue buttons, the circuit is either 100% on or 100% off.

Once you have adjusted the circuits as desired you can either leave the screen at that circuit so that you can quickly change it, or go back to the first screen. You will note that the environmental data is maintained on the adjustment screen so that you won't be missing much if you choose to stay there.

Chapter 2: Control

Now that the system is all set up the way you want it, it's time to use it to actually control circuits. Here's how it works.

From the main screen just tap any of the 6 circuit icons and you will activate the circuit adjustment page. Here

This brings us back to the subject of warning indicators/ messages.

As discussed earlier, if you overload a circuit you will get a flashing red indication. The fix for this is to set the circuit breaker level higher.

If you have a short circuit you will get a solid red and you will need to resolve this issue before being able to use the circuit.

If the vehicle voltage is less than the voltage alarm setting, you will see a flashing red indication on the voltage indicator. You can either choose to accept this as a message you need to know, turn off some electrical accessories, or lower the voltage alarm level.

Finally, the system won't allow you to exceed 60 amps total circuit breaker settings. If you attempt this you will get messages informing you of this and you will be forced to lower the overall settings to 60 amps or less before you can proceed.

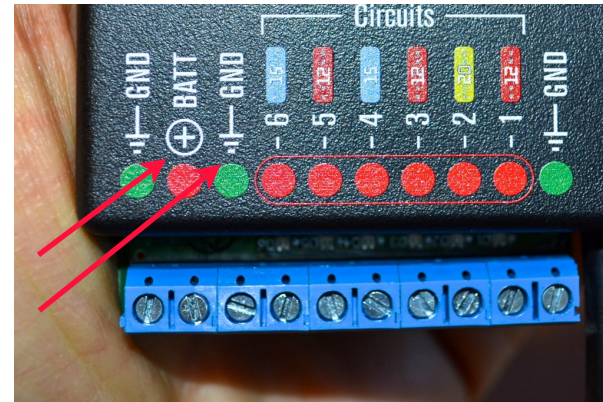
Chapter 3. Specifications, etc.

Warnings:

1. Don't reverse polarity! As noted in the quick setup guide shipped with the Neutrino module, it's critically important that you don't reverse polarity when you

connect the module to the battery. If you do, you will cause irreparable damage to the Neutrino module that cannot be repaired and will not be covered under the warranty

2. Don't connect a battery charger without proper fuse. Unlike the 6 controlled circuits, the battery charger inputs run directly from the charger to the battery.
- 3.



There is no internal fusing for this circuit, so it's critically important that you make sure to install a <3 amp fuse on the positive leg of this input.

Failing to take this precaution could result in disastrous consequences.

4. While we know this is motherhood and apple pie stuff, please don't make circuit adjustments and the like unless it's completely safe to do so. Operating a motor vehicle while distracted is extremely dangerous to you and every creature around you, so please be careful. We strongly recommend that circuit adjustments only be made when on the open road, far away from other vehicles, with flat terrain, and with minimal chance of animal interactions. Better yet, stop the vehicle and make the adjustments.

5. While the Neutrino module is completely waterproof, if you mount it where water can get to the powered accessory connections it's important that you waterproof these connections. We recommend the use of silicone grease for this purpose as it's easily applied, easily removed, and will definitely keep water from affecting the circuit connections.

Specifications:

Physical:

Neutrino module is .9" thick, 3" wide, and 2" deep, exclusive of wires and connector strip.

Epoxy encapsulated and waterproof.

Weights xx oz.

Electrical:

Total capacity is 60 amps at 12.5 volts.

Individual circuit capacities:

20 amps x 1

15 amps x 2

12 amps x 3

Connectivity:

Data: USB socket on pigtail accepting either USB>phone cable or BTLE adapter. USB provides 5 volt power.

Power outputs: 10 screw terminals capable of up to 14 AWG wire. 3 ground connections.

Inputs:

Direct battery charger input connections.

Remote thermosensor.

Ignition status sensor.

Just in case:

In the unlikely event of a software lockup please disconnect the positive lead from the Neutrino module to the battery momentarily. This should reset the module to normal operation.