

# NEOWARS CONNECTORS, A FREE STANDARD.

Neopixel Blades and connector considerations by "Pepito Sables" V1.2 BETA

First of all, excuse my bad English, is not my native language.

## Connector selection, choosing the free standard:

We need at least 3 wires for working a neopixel blade. 1 Vin, Vout, and Data, but it is desirable to have more than 3 wires for extra functions. A 4<sup>th</sup> wire is very interesting for having the recharge and kill plug in the same blade socket.

So, with 4 wires we can make a saber with all connections/port in the same place. We are saving place inside the hilt, make the install easier and also put inside bigger batteries, see install "diagrams" and "batteries" section for further details.

Other important consideration is connector length, we all love thin neck sabers and a short connection is a must if you want light starts at the very beginning of the emitter.

It is also important that you can find the connectors very easy and affordable if possible.

Last but not least, it must be a strong build to have a long life and hit resistance.

The only connector I find with all of these considerations are XLR GX16 connectors, but not all of them and some modifications are required.



Please notice that only 2-4 pin connector have split pins and 5-9 have solid pins.

Split pins pros: 1) The pressure/flexibility keep connection live better than solid ones. 2) if you have bad connection you can gently separate both parts of the pin and you will have fully working connection again.

So I have a winner, the 4 pins GX16 XLR connector.

## CONNECTOR LAYOUT, ORIENTATION AND MODS.

The fact is I have to set the connector like this:

Orientation: The plastic female part goes into the hilt, the metal male part goes into the blade, this way you can make adapter to the female part, that reduce the length of the whole connection, examples are in the pics.



Pinout:

- 1- Vin
- 2- Vout
- 3- DATA
- 4- Battery GND (in the blade pin 4 and 2 are in shorted ever, in the hilt are individual pads)

The reason for this pinout is the easiness of soldering several kinds of string and strip neopixel blades. Examples of string of single leds and strip solder and connection are in the diagram section pics. You will understand better this pinout decision looking at this pics.



**HILT PINOUT:**  
 1-Vin  
 2-Vout  
 3-Data  
 4-Battery

**BLADE PINOUT:**  
 1-Vin  
 2-Vout  
 3-Data  
 4-Bridge to 2

### NEOWARS CONNECTOR (GX16-4) PINOUT

No matter what, the blade pin 2 must be bridged to blade pin 4. the reason is, if you are going to use the "no charge port" diagram, is crucial to have 2-4 bridged, and if you use the "charge port" diagram it have no diferent to have 2-4 solder or unsolder, but if 2-4 are not bridged, you can not use the blade in a "no charge port" instal, so remember to solder 2-4 for full compatibility in this standard.



FOR STRIP OR STRING, THE PINOUT IS THE MOST CONVENIENT, YOU CAN SOLDER STRAIGHT TO THE CONNECTOR

**Standard gx16-pins mod needed:** In order to fit in all hilts you need to mod the female part of standard female part. I was testing a lot, and the best for me, is to keep the original metal holder but cutting the most part as you can see in pictures, or you can watch this video <https://youtu.be/SeQivobW9o> You can use a tube cutter or dremel to cut, also you can buy the complete connector in my store and stop reading. You will need 2 extra caps, one for the female matching the inside of the hilt, and another one for the male to fit into the blade. The best solution is to make it in aluminum, but not we all have a lathe so, you can print the free models here, <http://www.slimsaber.com/NeoWarsFreeConnectors3DPrinterPack.rar> courtesy of Sly Tools. If you have not a 3D printer you can you can get the very same models from my friend Sly Tools in Shapeways (no markup) <https://www.shapeways.com/shops/slytools> . You can also buy the complete mod connector at my store <http://www.slimsaber.com/slimsaber/en/43-neopixel>

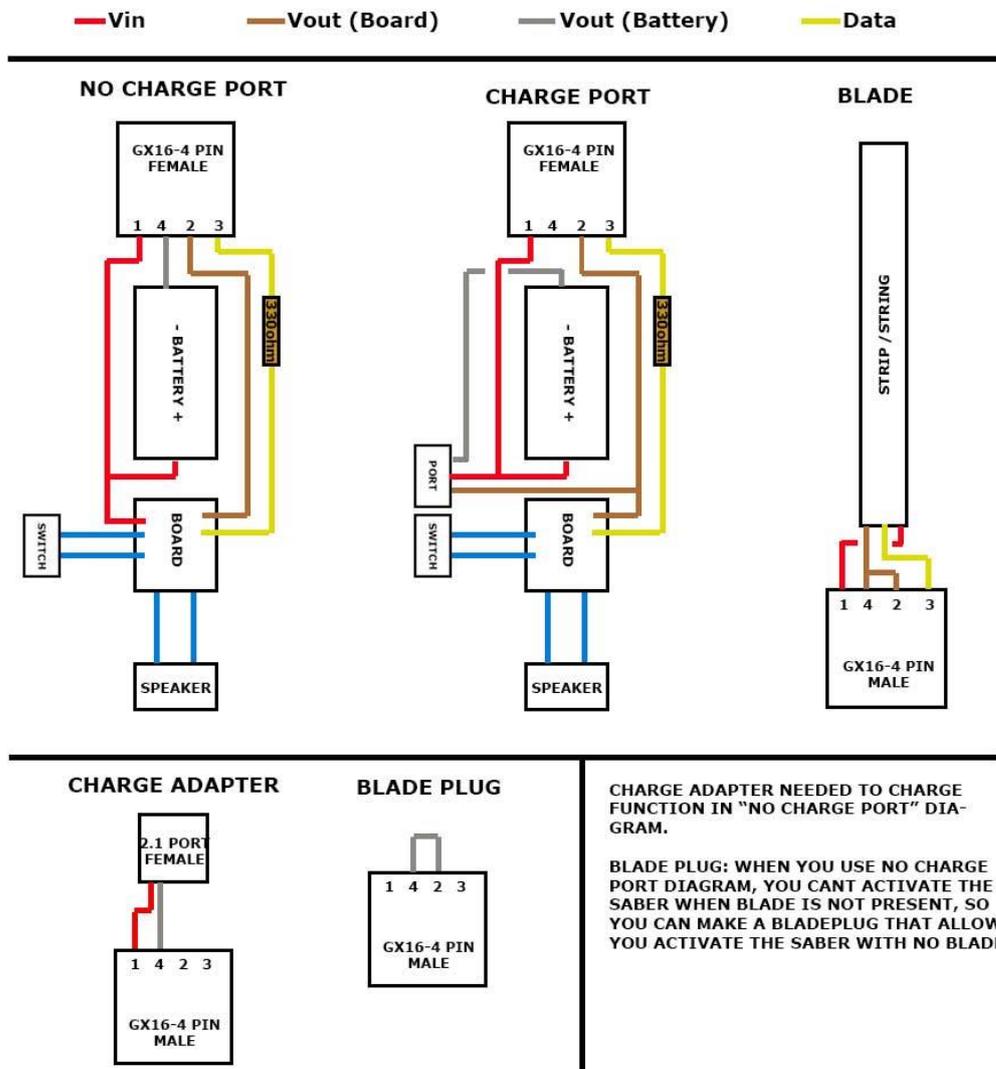


YOU CAN CUT THE FEMALE CONNECTOR USING A PIPE CUTTER OR DREMEL TOOL AFTER YOU NEED TO 3D PRINT ADAPTERS OR BUY A MACHINED ONE



DIAGRAMS:

## NeoWars Connector Standard



### THE NEOPIXEL BLADES:

Perhaps you have seen a lot of videos about neopixel blades, what you can't see is most of neopixel blades you see have shadow zones, or shadow lines up and down the blade, of course in videos you see perfect light and evenness, also in videos and pics the blade is brighter than in real. I have been making neopixel blades since jun 17 and when I see the shadow zones I cant stop seeing, so my first goal is making the most even blade VS the brightest-shadowed

one. If you don't use any diffusion material inside the blade it will be brighter, but it won't look as a lightsaber.

### **String led blades:**

In my experience the most perfect and even blades are the string 5mm leds strings, usually this blades have 60-100 leds and can be made only handcrafted, good example of this technology are MAKOTO blades, the HHLCSABERS "Firaxan" blades, this blades uses Single leds, Makoto have RGB, Firaxan single color led. Also this string blades, can work with a 18650 3200mha battery 2-3hours at full color, in some sabers crystal chamber sabers or tiny hilts you can only wear small battery so the string is a must, because with a strip you will have just 5 min of fun and then 4 hours in recharge.

The con: the string blades are not as bright as strip blades, and some colours like royal blue are just as bright as a tri-cree, but much more EVEN.

My Strip "Tizona Neopixel" blade is a 81 single neopixel led handcrafted blade, my focus in this blade was to avoid any shadow, so is a near perfect even blade.

### **STRIP BLADES:**

Most of blades you can see in Youtube are strip blades, this blades are usually made with 2x 144pixel/meter glued back to back. Due to the actual NeoPixel strip tech, a shadow zone is visible between both strips, but not in video, unless you get too close. Pros: brighter blade than a string blade, more than 200 leds vs 100 or less leds, and much more easy yo make than string handcrafted blades.

The cons are: With a 18650 battery 3200 mha, working time is 30min and shadow zones/lines in close inspection.

The best in my opinion of neopixel tech, is you can have any main and foc (Flash on clash) color at same time in any saber. That is not possible with no other tech, single led or no neopixel string/strip led chain.

### **BLADEPLUGS:**

Blade plugs also might be rethink.

In my opinion you have two ways of thinking:

**Normal blade plug:** no problem but your saber will not light in the emitter with this, but you can also make weird freaking movements to hear sounds in the saber (joke 😄), the real problem if your saber have kill plug/charge port in hilt blade connector, you cant even turn on the thing. I like the idea you cant turn on the saber without the blade it is very loyal to the films, but if you have a crystal chamber installed it is a good idea you can see it in action without blade.

**Neopixel blade plug:** It must have a connector like the real blade, and must use at least a neopixel led, so you can turn on the saber and have a little light in emitter, you can also make a blade plug with just a short in pin 2-4 so you can activate the saber if you have kill plug in the emitter. But the real pain is that the blade plug must match same length of hilt blade hole, to maintain esthetic and make contact to the pins at same time.

## TABLES:

GX16-4PINS VS POGO PINS SOLUTION TABLE COMPARISON.

	GX16-4pins	Pogo Pin 3 pads Solution
Charge port/kill key in blade hilt connector	Yes	No
DIY	Yes	No/Very difficult
STANDARD	Yes (all GX16-4 are same)	Yes (if monopoly vendors not change or stop selling it)
Price	2-5 usd (need access to 3d printer) You can buy premade too in metal or 3d printed slytools shapeways	30usd, if you want all parts from vendors.
Durability hipotesis	All metal parts except female connector, you can drill printed parts to hold with screws.	Circuit board with pogopins solder and plastic parts holder glued to the board
Quality of connection	GX16-4 proven data speed for data pad, and big diameter connection in all pins, tolerance movement in internal pins	Tri signal in + and data, - signal just 1 pin. Inside Spring pogos quality durability is a must.
Connection Orientation	Need just 1 position to fit the connexion	No orientation, you can connect easily in any position.

MORE PICS:



CREDITS/THANKS:

Pepito Sables <http://www.slimsaber.com/slimsaber/en/43-neopixel>

Sly Tools 3d designer <https://www.shapeways.com/shops/slytools>

Free pack for 3D printers

<http://www.slimsaber.com/NeoWarsFreeConnectors3DPrinterPack.rar>