

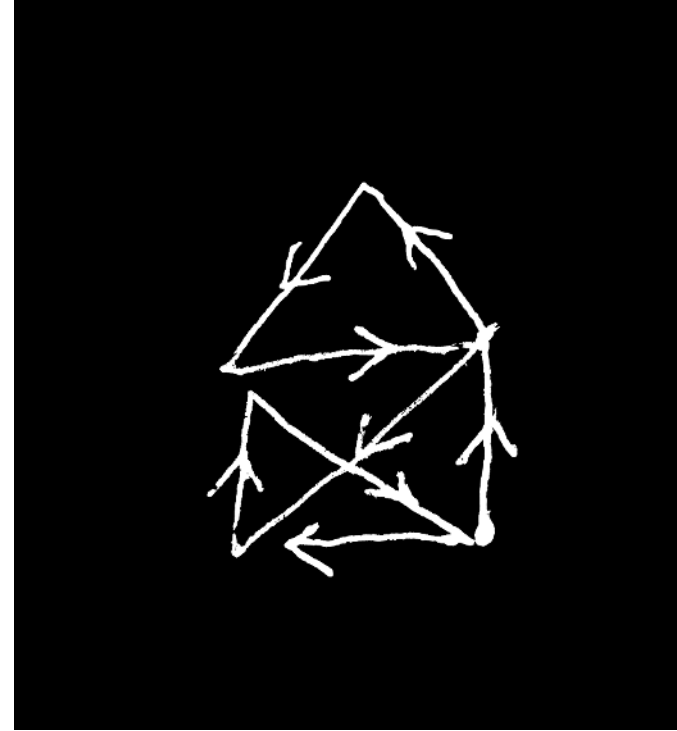
## Lulu-star / HOWTO

Lulu is a simple solution for connecting e-textiles with optic-fibers. A tiny PCB with sewable pads for powering and controlling a bright LED light with a coupling solution that mounts the end of an optic-fiber directly in front of the LED light source.



## Lulu-star kit\_01

- 1 x Lulu-star PCB (Yellow | Red | UV | green)
- 1 x Lipo-batterie (100 | 300 | 1000mA)
- 1 x Lilpo-chargeur
- 1 x Optic fibers wafer (9 x 0.5)
- 1 x Optic fibers wafer (35 x 0.25)



## Lulu workshop!

By using Lulu as an e-textile educational tool we promote the learning by doing.  
Observ, Understand, Define, Make it easy



**Lulu embroidering**



**Lulu pauline headband**

<https://www.flickr.com/photos/plusea/26017029028>



## Clara Daguin

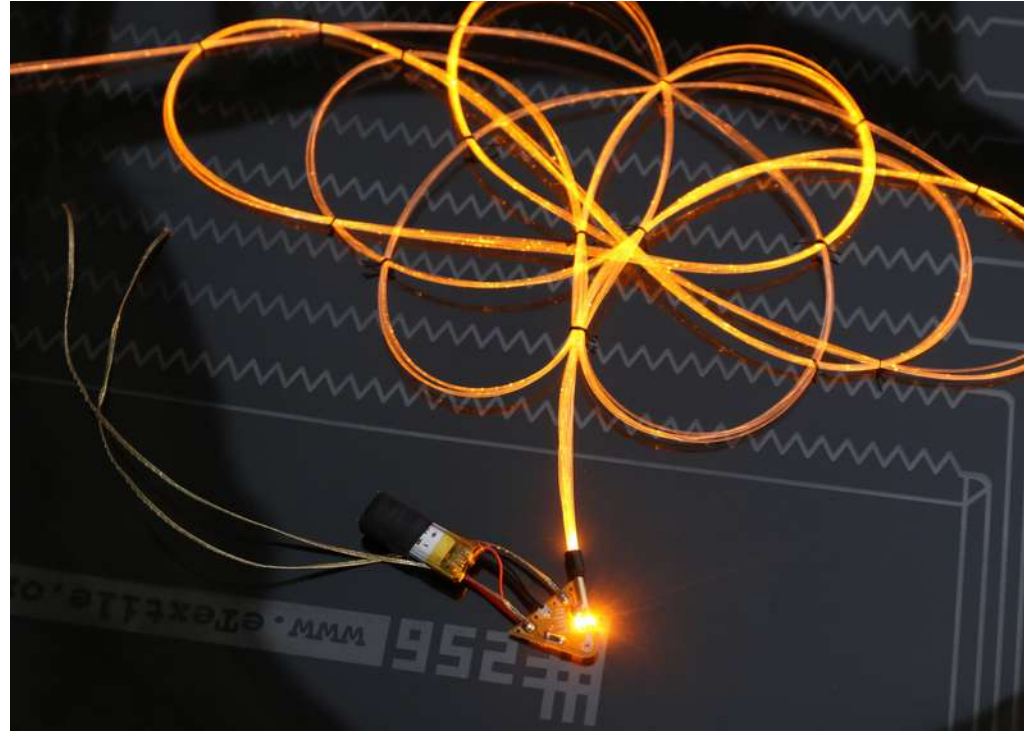
Would love to collaborate for a creation !



## Lulu kobakant jaket

When the two golden wire connect the light goes on ;-)





## **Lulu-star Braiding demo**

When the two golden wire connect the light goes on



**Lulu's backstage**

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maurinElectroTextile	Moved Lulu_daisySwatch.ino to the Lulu-daisy branch	Latest commit 97ef972 24 days ago
Hardware	Removed .DS_Store	3 months ago
Software/Arduino	Moved Lulu_daisySwatch.ino to the Lulu-daisy branch	24 days ago
docs	Updated Kobakant/lulu project URL	24 days ago
.gitignore	adding lulu daisy to the master branch	3 months ago
LICENSE	Added new web page link	a year ago
README.md	Update Lulu-star picture	3 months ago

README.md

## Open hardware & open software

The project source code is hosted on Github repository  
Users can fork the design to adapt to their needs  
and collaborate in the development.

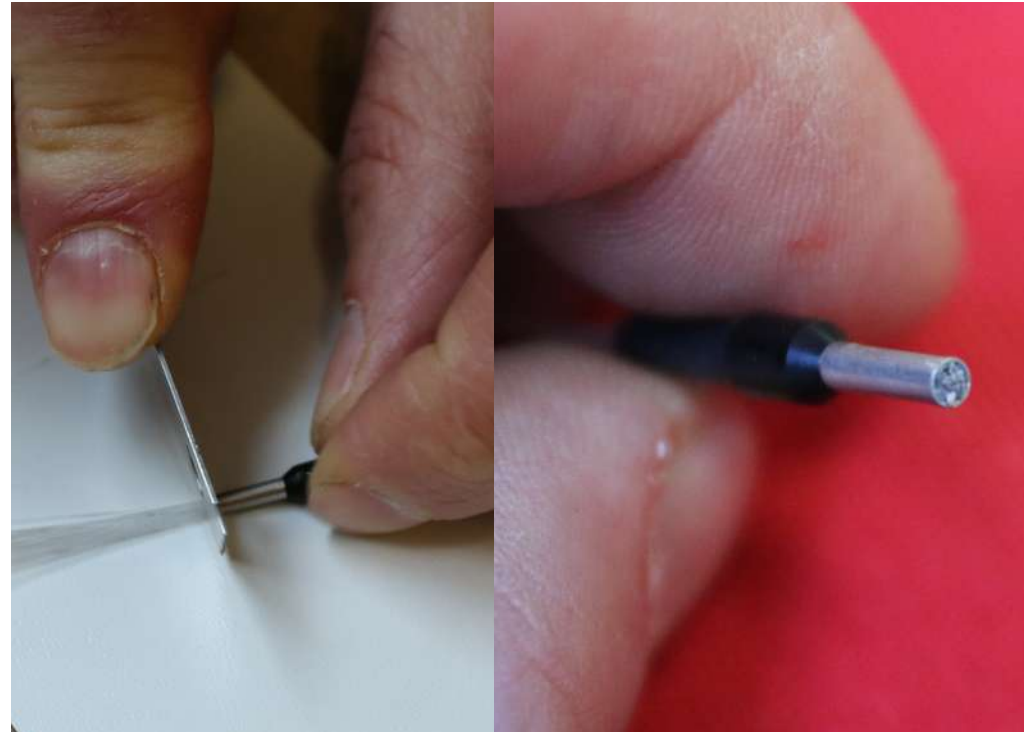


## Custom Tooling

### Optics fibers warping tool

Regular optics fibers are made to conduct the light from the source to the end. This hand tool is made to sandblast the optic fibers to have the lighting effect all the long of the PMMA fibers. Isn't it a violin archer ?





## Fiber optic Lulu-connector

Light injection into a 2mm optic fibers wafer

**JTE connector - Starfix cable end** (2mm outer diameter)  
**Cyanoacrylate glue**  
**Cutter**

LED osram oslon	Ref	Current	Résistor
YELLOW	<a href="https://farnell.com/osram">farnell.com /osram</a>	200 mA	2.7 Ohm
RED	<a href="https://farnell.com/osram">farnell.com /osram</a>	350 mA	
GREEN			
UV			

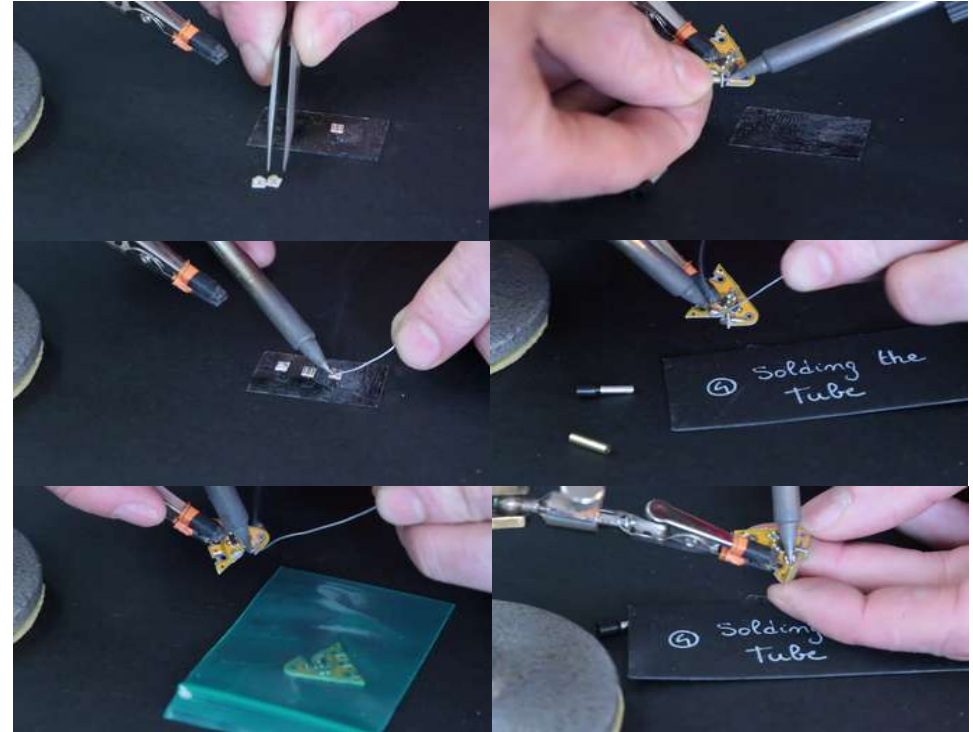
## Lulu-star hand soldering

<https://github.com/eTextile/Lulu/tree/master/Hardware>

**Osram OSOLON LED** (200-350mA)

**Brass tube** (10mm long, 2mm inner diameter)

**Current limit resistor R2** (Thick film 0.25W)



1/ LED tining

2/ PCB thermal pad tining

3/ LED Soldering

4/ Brass tube soldering (This can be optimized in the next Lulu-star version)

5/(R2) Resistor soldering (This current setup resistor could be pick and place for 200mA setup, can still be resolder for other setup)



## Conductive ribbons

**Connectivity to facilitate the e-textile integration process**

Some companies are selling multi tracks conductive textile bus. Industrially produced this can be done by any passementerie companies like In **Saint Etienne** (FR). But good price can be achieved with big quantity.



## Crimping tool

Allowing e-Textile removable electronics designs, reusable e-textiles components. Textile buses have energy tracks used as well for communication (copper monofilaments).

Specific tooling is not very common and still in B to B stage. Trying to collaborate with NICOMATIC to see what they can do.