

## THANKS FOR CHOOSING ONE OF OUR KITS!

This manual has been written taking into account the common issues that we often find people experience in our workshops.

Some steps are not obvious, so even if you're an experienced DIYer please read the steps thoroughly before starting. It might be good moment to take a look to this document:

[www.befaco.org/howto/](http://www.befaco.org/howto/)

Be warned that this bus will be powering up your modular system. If you do not feel confident with your skills, please **drop us a mail** for advice before starting the build. This is a critical part of your system and an error **might damage your modules**.

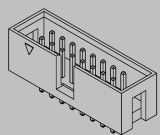
This power supply contains a PCB and a number of components. When soldering the components to the PCB ensure the body of the component is on the silkscreen side (the white images on the PCB) with the actual soldering done on the other side.

### SOME USEFUL INFO:

- Resistors are not polarised.
- The long leg is positive (LEDs, capacitors etc...).
- If both the legs of a capacitor are the same length, it is not polarised.
- Snip the excess length of the legs of components after soldering.
- Be gentle and triple check all steps!


## ENJOY!

## LET'S START WITH THE TROLLEY BUS PCB



**IDC CONNECTORS**

Solder the IDC connectors (the black boxes). You need to place the connector in the edge of the board, so each line of pins ends up at each side of the PCB. Ensure the small black triangle on each connector matches the white triangle on the silkscreen. Connectors **notches will end up facing up**. It will help you placing one connector and soldering one of the legs, making sure all pins are aligned with the pads. Using flux is advisable as will help big time.



**RESISTOR**

Qty	Value	Code	Name on PCB
3	2K2	Red, red, black, brown, brown.	R1, R2, R4
1	1k	Brown, black, black, brown,brown	R3

<b>LEDs</b>	
Place the LEDs onto the PCB minding, their polarity. The long leg is the positive and the short the negative. On the PCB the flat silkscreen indicates negative side.	
Qty	Name on PCB
4	+12VA, +12VB, +5V, -12V

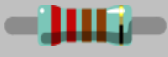
<b>2x3 RIGHT ANGLE MOLEX CONNECTOR</b>	
Solder the Molex connector at "J2" ensuring it is facing out from the edge of the PCB.	

<b>TERMINAL BLOCK</b>		
Qty	Name on PCB	Observation
1	J1	Place the terminal facing outside of pcb.

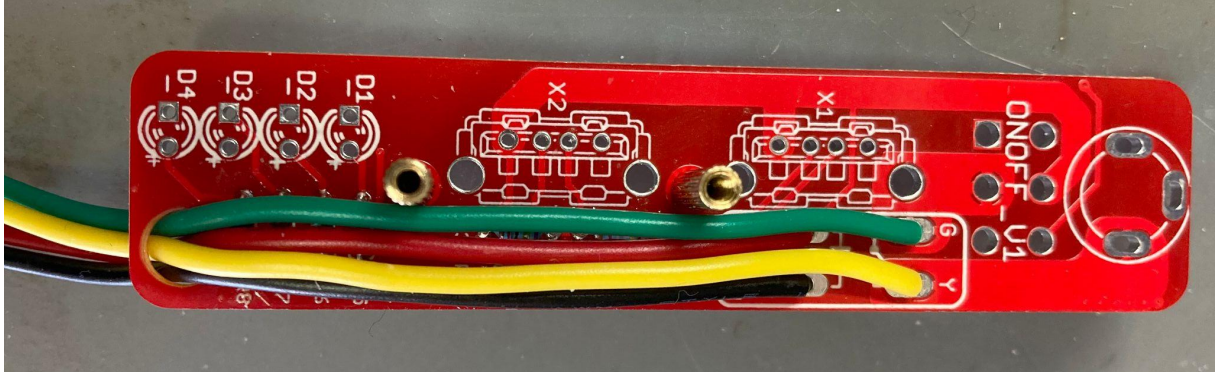
<b>DC REGULATORS</b>		
The large DC regulator should be placed at the center of the PCB and soldered into place where the large white square silkscreen indicates.		
Qty	Value	Name on PCB
3	12V	REG-12V, REG+12V_A, REG+12V_B
1	5V	REG+5V

<b>GRILL</b>
Screw the spacers on the central part holes using the 3x6mm screws. Then place the grill pcb over the DC regulators and screw it to the spacers.

## NOW WE WILL MOUNT THE ONOFF PCB

RESISTOR 			
It's strongly recommended to measure the resistors with a multimeter. Color code might be hard to read with blue/green background.			
Qty	Value	Code	Name on PCB
3	2K2	Red, red, black, brown, brown.	R5, R6, R7
2	49k9	Yellow, white, white, red, brown.	R1, R2
1	43k2	Yellow, orange, red, red, brown.	R4
1	75K	Violet, green, black, red, brown.	R3
1	1k	Brown, black, black, brown,brown	R8

SPACERS
Secure the spacers onto PCB (through the holes with silver outline, near USBs ) with the main body of the spacer on the component side, use the 2x6 phillip screw.

Button socket and Cable
Remove or cut the <b>blue</b> wire from the button socket, run the cables through the hole of the pcb, from back to component side and solder the cables on his corresponding pad, <b>G</b> for green, <b>Y</b> for yellow, <b>R</b> for red, and <b>BK</b> for black.
You can tin the wires to make easier this process.


2x3 MOLEX CONNECTOR
Place the 2x3 Molex connector at <b>J1</b> , the tab should face the white mark on the silkscreen.

## FRONT PANEL COMPONENTS MOUNTING TIPS:

Now we will proceed to mount the DC jacks, switch and LEDs. This part of the assembly is **CRITICAL**. Please take your time and read the following instructions carefully.

These components must **NOT** be soldered until they are placed on the PCB and fully attached to the front panel.

There are two reasons for this:

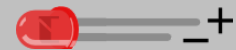
The height of the panel components are not all the same. Because of this, if not attached properly before soldering, they will not stay properly seated against the panel. This might cause mechanical stress reducing their life expectancy and in the worst case cause them to break.

The second reason is that it is very difficult to align the components to the holes if the panel is not positioned prior to soldering. In the case of the LEDs, they are almost impossible to set to the correct height without reference to the front panel.

### USB CONNECTORS

Place USB connectors at x1 and x2 but **don't solder them yet**.

### LEDs



Place the LEDs onto the PCB minding, their polarity, but **don't solder them** until the front panel is in place. This is the only way to solder them in the right position.

The long leg is the positive and the short the negative. On the PCB the square pad indicates the negative side and there is a + symbol to indicate the positive.

Qty	Name on PCB
4	D2, D3, D4, D5

### DC connector

Put the DC connector on his place, top part of PCB, but **do not solder them**.

### FRONT PANEL

Attach the **front panel** adjusting the parts one by one if necessary until they fit. At this point a pair of fine tweezers can be helpful.

To finish:

- Secure the parts to the panel in this order: A) **spacers** (using the 2x5mm hex screws) B) **Dc Jack**
- Ensuring the dc jack is **flush with the panel** solder it.
- Next, adjust the **LEDs** so that they are flush with the panel and solder them.
- Solder the usb connectors, ensuring they are flush to the pcb, you can connect a usb Cable to make sure these are aligned.

**Button and Cable**

Secure the button to the panel, make sure the hex nut is aligned to the panel so the edges are not getting out and not avoiding you to properly place the module on the row.

Then connect the socket to the button. **Make sure that the notch matches with the latch.**

**TESTING THE MODULE**

**DO NOT CONNECT ANY MODULE TO THIS BUS BEFORE TESTING IT!!!**

The trolley bus need a minimum **120W DC** power supply with **center positive 5.5/ 2.5mm** Barrel connector.

On power up, the 4 leds on the panel and the 4 on the bus should light. There are testing points for each rail on the bus, you can measure the voltages there.

**TROUBLESHOOTING**

-If the LEDs are not lit but you are getting the correct voltages, the LEDs are the wrong way round.

-If the LEDs are not lit and you are not getting the correct voltages (or any voltages) at the pins, carefully go back through the workbook checking your connections and that you have made good solder joints. Also check your power supply is the correct polarity.

**ENJOY YOUR NEW BEFACO MODULE!**

