en/MK-Okto2

4

LotharF
MikroKopter.de

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- This page as a **PDF-Document**? Klick on the Symbol and wait a moment... --->

"'OktoKopter2-26'"

Page in Deutsch

Inhaltsverzeichnis

Info

Please read this manual **carefully**! This can avoid misunderstandings !
Technical knowledge is recommanded! Wrong soldering can cause damage!

⚠ For the first test you should use a regulated power supply and **not** the Lipo (battery) !
Wrong soldering or short circuit can destroy the electronics ! Use a power supply of 12V/500mA.

Rigger

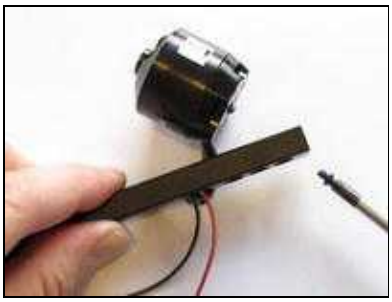
Mounting the Motor

⚠ **Before you mount the three motor cables into the riggers, you have to check and mount the Motor.**
All motors are tested but please check if there is no short circuit between the motor cables and the motor housing.

The engines are mounted with the screws thereby. That you not lost the screws during the flight, use a little drop of Threadlocker.

⚠ ATTENTION: The screws should be screwed firmly. However, the screw thread in the motor can be overtorqued if too much power!

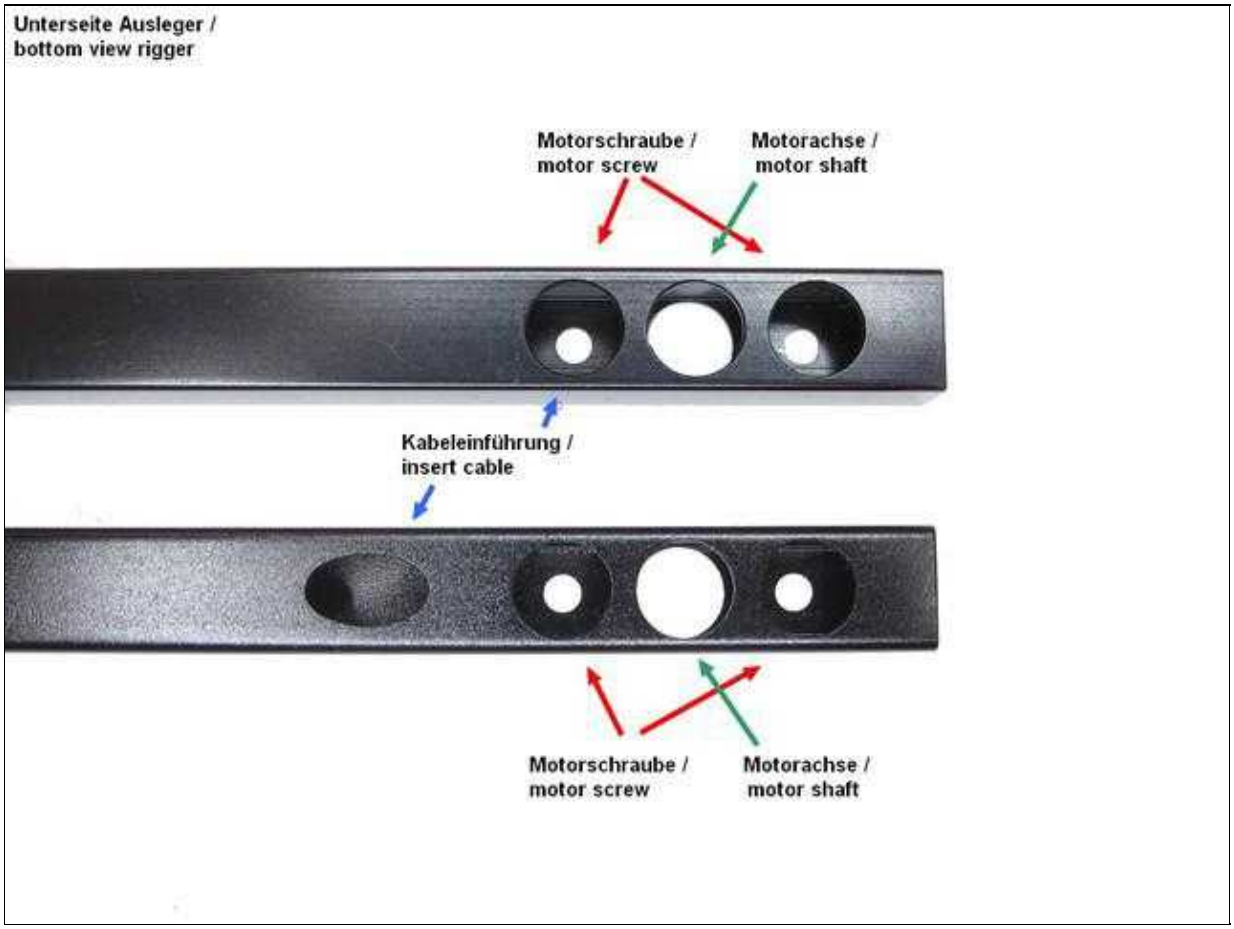
⚠ The threads at the engine (above/below left/right) have different distances!



mount the motor-, LED-, and buzzer cables

Also mount one red and one black 0,5mm cable (in suitable length) into the riggers who obtain a LED-stripe or a buzzer.
Please be carefully by bringing in the cable.

The cables for the motor and the lighting or the Summer will be recovered by the introductions to the underside of the boom.



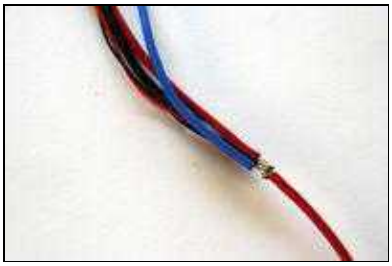
The cable of the Motor comes out on the left side of the rigger! (see picture)

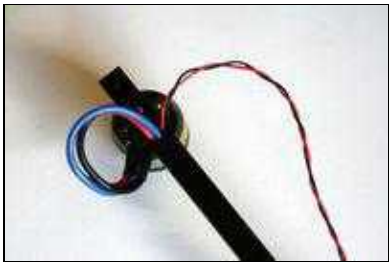
Example picture

Tips:

- Stick or solder wires together before pulling them through.
- if needed, attatch a string to the wires and pull it through first.

Attention: If you have stick or solder wires together, the motors are difficult to operate!





Propeller Mount

The three screws of the propeller should be tightened. In this case, a suitable screwdriver be used to avoid damaging the screw heads!
On the propeller mount, the propeller attached. How to assemble it, is clearly an example of the images.

Example: Robbe Motor


mounting and connecting the LED-strip

⚠ **COMMENT**: The color of the LED-strip of the Set can vary. Here we describe it with red and blue LED! The LED-strips of different colors can look equal. Before assembly, the color can be determined by applying a voltage. Terefore a power supply (12V) or a 9V battery that can be used.

⚠ A LED-strip consists of **6 LED's** (it could be, that you have to cut a strip)

On the red rigger at the front you can put the red LED-strip. Then put the blue LED-strip on the black riggers. Now you can solder the red and black Silicone cable (0.5mm²) in the right polarity ("+" red / "-" black) to the LED-strip .
Finally the LED-strip can be shrinked with the transparent shrink hose.

Example of the lighting		
Kopter	Red	Blue
Quadro	rigger 1	rigger 2,3,4
Hexa	rigger 1	rigger 3,5
Okto	rigger 1	rigger 4,6



Wiring of the buzzer cable

example 1: assembly with buzzer adapter

The buzzer can also be mounted with the buzzer adapter to the Kopter. But take care that the Buzzer is not mounted too close to the FlightCtrl.
This could be the use of the compass lead to disturbances!

We recommend to mount the Buzzer on a 15mm plastic spacer bolt like on the picture. Do not mount it on the Lipo holder. In case of a crash it could cut the cable to the Buzzer.

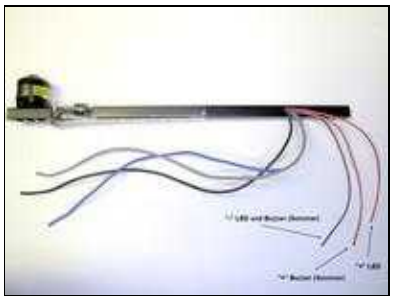
How to mount the buzzer adapter: Buzzer Adapter

example 2: Buzzer on a rigger

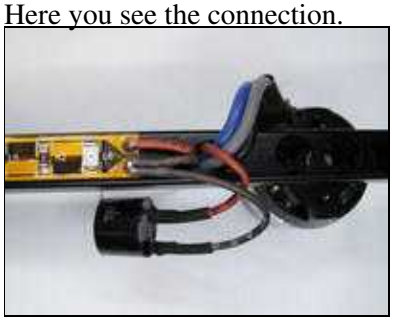
The buzzer can be mount e.g. on a rigger without LED. On the already mounted red and the black 0.5 mm² silicon cable stuck first a short piece of shrink tube. <
 Then the buzzer soldered correctly on the cable (long pin "+" (red), short pin "-" (black)).
Now the shrink tube can be pushed over the solder joints of the Buzzer and shrink.
Finally, the buzzer can be shrunk on the rigger with a short piece of transparent shrink tube.

example 3: Buzzer and LED in one rigger (alternative)

If the buzzer is to be mounted to a rigger in addition to lighting, this can be done with three cables.
The ground (-) can used simultaneously by the lighting and the buzzer.
The rigger has so besides the three motor cable a brown wire ("-" GND) and two red wire ("+" LED / "+" Summer).



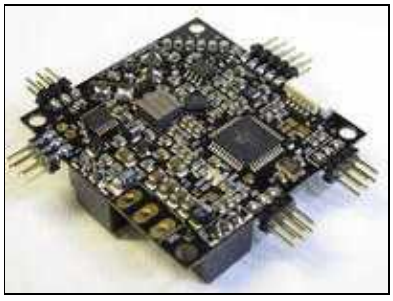
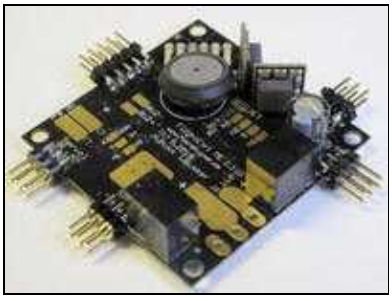
Here you see the connection.



First, the LED bar shrink with shrink wrap. Then the buzzer.


Flight Ctrl. 2.1

The FlightCtrl is already fitted with all needed components.

The FCV2.1 can be connected to the powerboard via the molex cable.

When using the Molexkabel between FlightCtrl and powerboard, you **don't** have to solder the I2C bus, the buzzer and the power cable to the FlightCtrl.
Only the power cable for the receiver still has to be soldered to the FlightCtrl.
The buzzer is connected directly to the appropriate solder points of the powerboard (Buzzer / -).
The I2C-bus and the voltage supply are provided from the power distribution via the Molex.
Alternatively, the FC V2.1 can be connected with individual cable to the power distributor. But then you don't have to use the Molexcable.

When mounting the FlightCtrl, the printed arrow shows to the rigger No.1 (red rigger). The PCB populated side facing up.

layout / wiring FC ME 2.1

Describes how a receiver is connected to the FlightCtrl: FlightCtrl 2.1

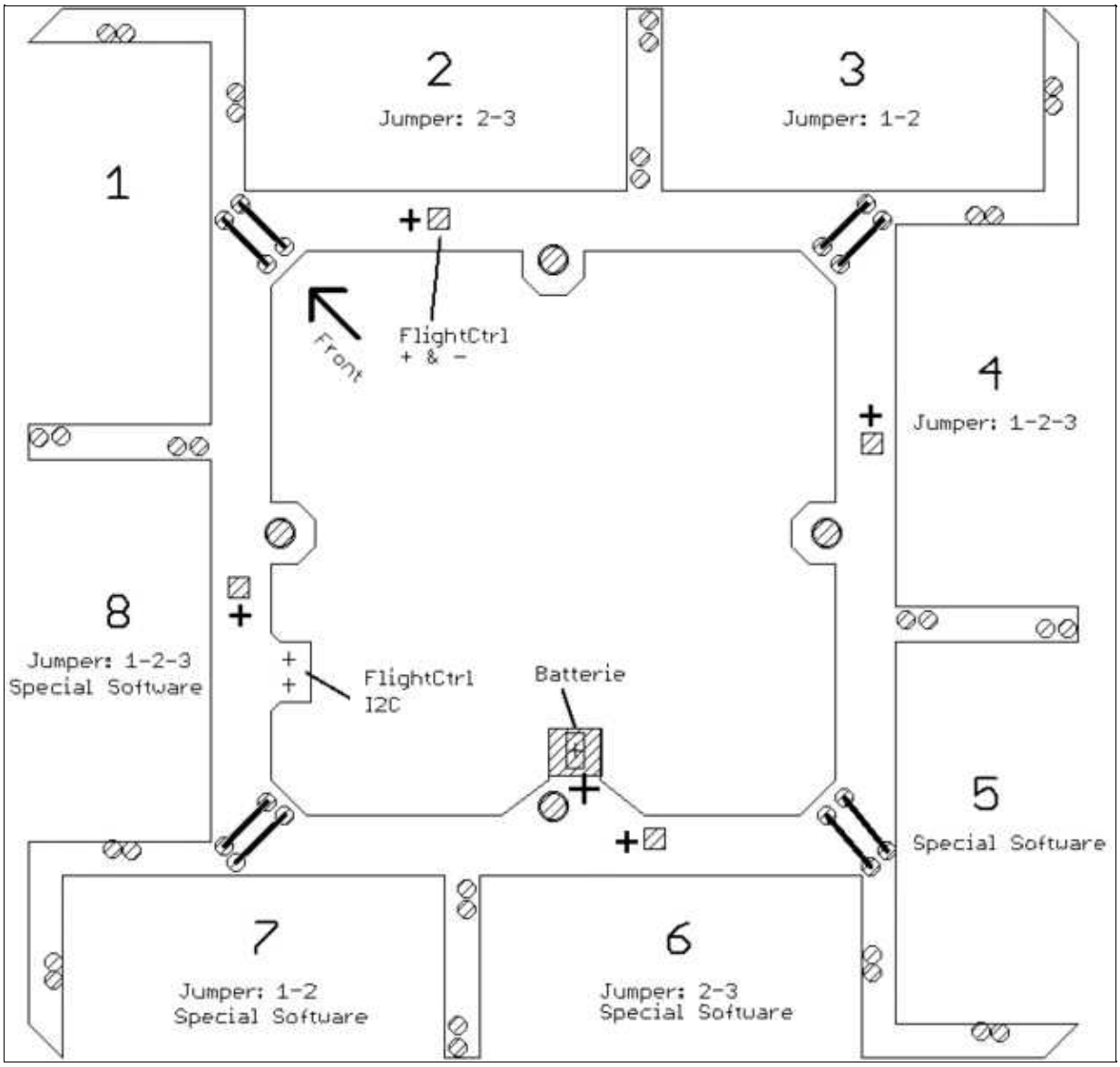
Okto Power Distribution

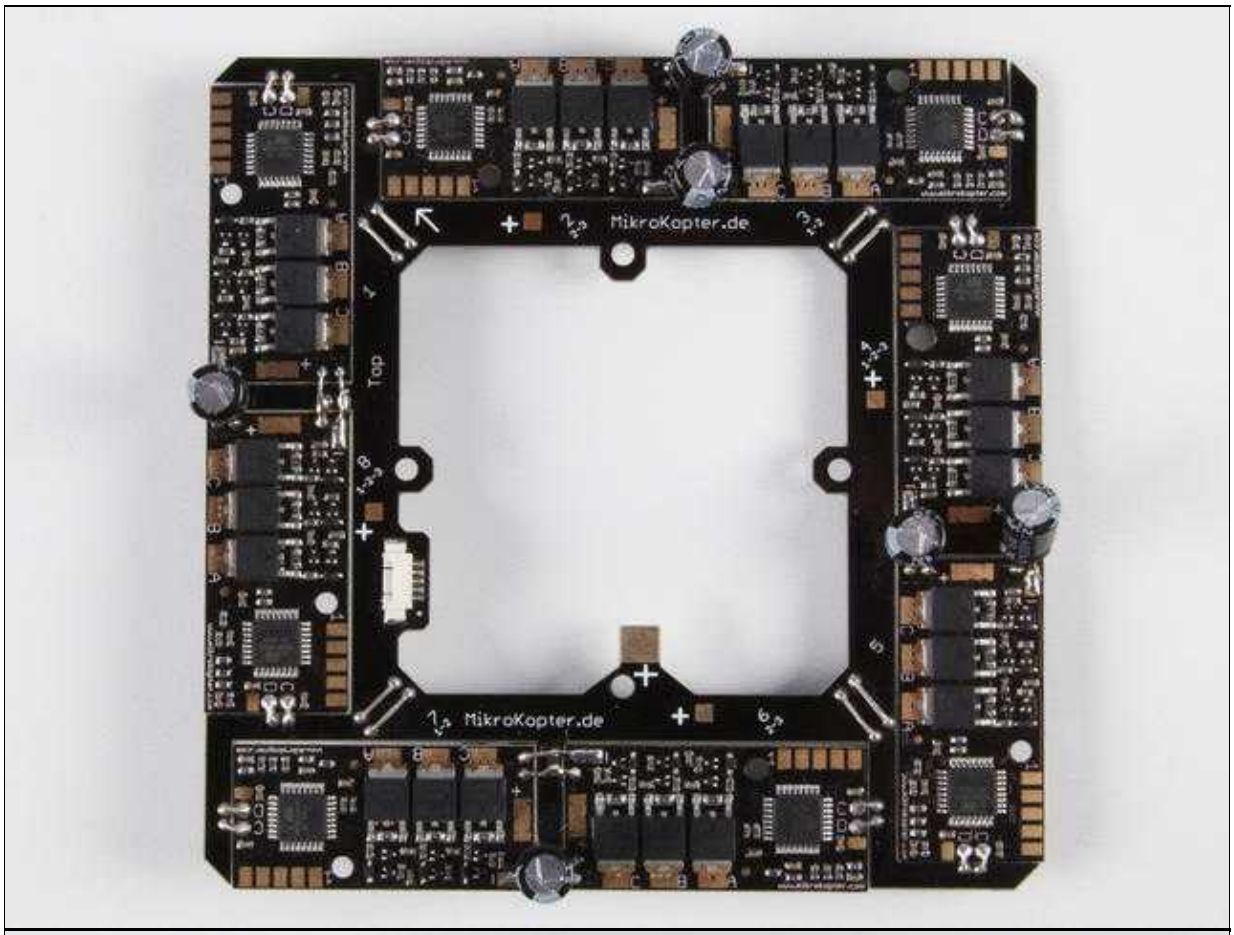
The Okto Power distributor provides the BL controller with power and connecting the I2C bus for communication.
You can install BL-Ctrl1.2 or BL-Ctrl2.0. The assembly is identical.
The BL controllers are mounted in the recesses of the distribution board and connected by wire bonds.
The top of the distribution board is marked with "+".

Arrangement of the BL controller

The BL-controllers are arranged as shown here in the distribution board (clockwise BL-Ctrl Nr. 1-2-3-4-5-6-7-8).
The processors and the solder connections for the motor have to show up at all controllers.

Also the (red)BL-Ctrl1.2 can be installed in the power distribution. The BL-Ctrl1.2 for the number 5-8 have a Special Software! In the shop, the BL-Ctrl with the special software have a white dot on it.


1
2
Jumper: 2-3
3
Jumper: 1-2
4
Jumper: 1-2-3
5
Special Software
6
Jumper: 2-3
Special Software
7
Jumper: 1-2
Special Software
8
Jumper: 1-2-3
Special Software
Front
FlightCtrl
+ & -
FlightCtrl
I2C
Batterie


MikroKopter.de
Top
MikroKopter.de


BL-Ctrl 2.0
MikroKopter.de
BL-Ctrl 2.0

- The capacitors for the regulator 6 and 8 can be attached to the underside of the distributor. Then the 10+6-pin connector to the NaviCtrl can be inserted easily.

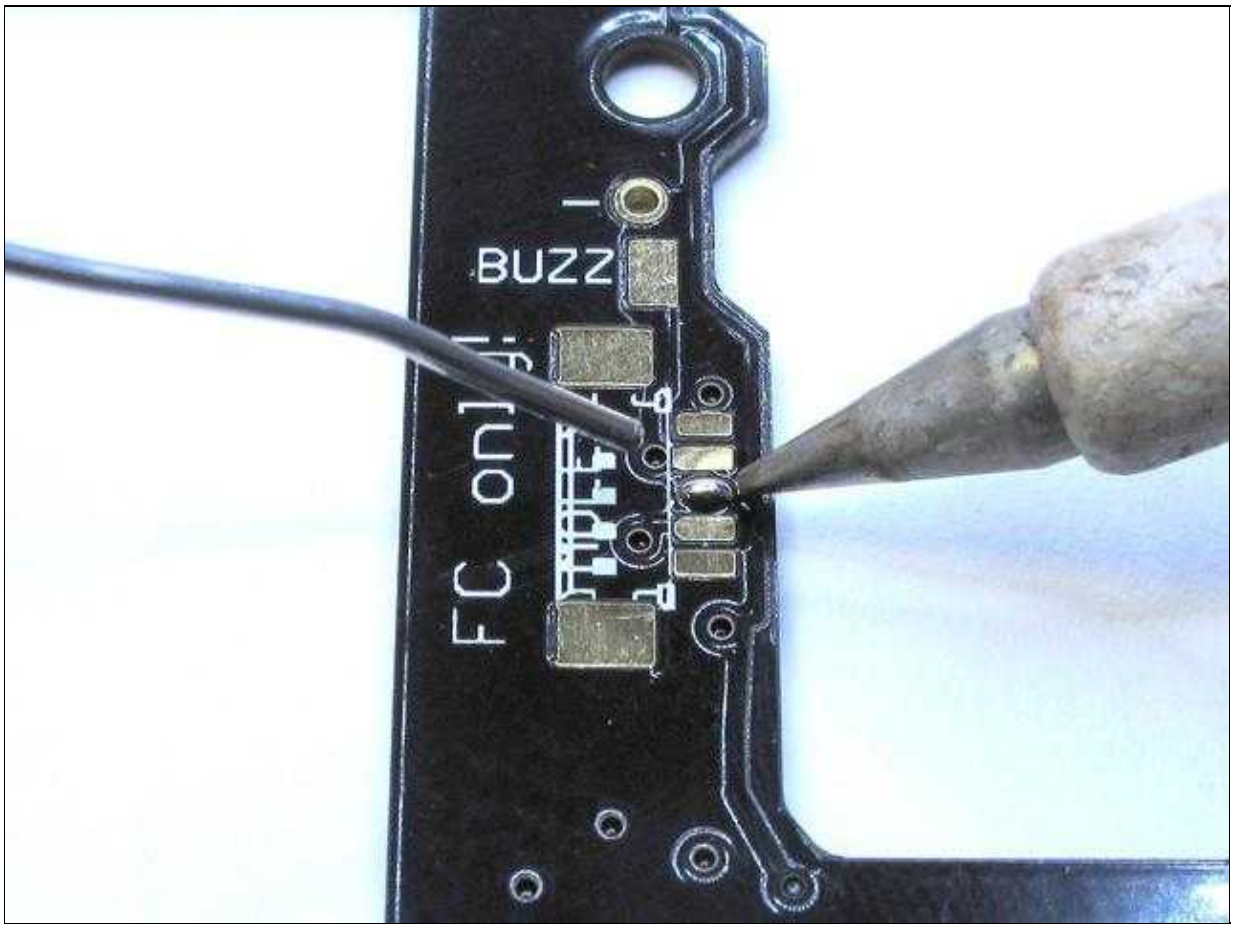
Assembly of the Molex connector

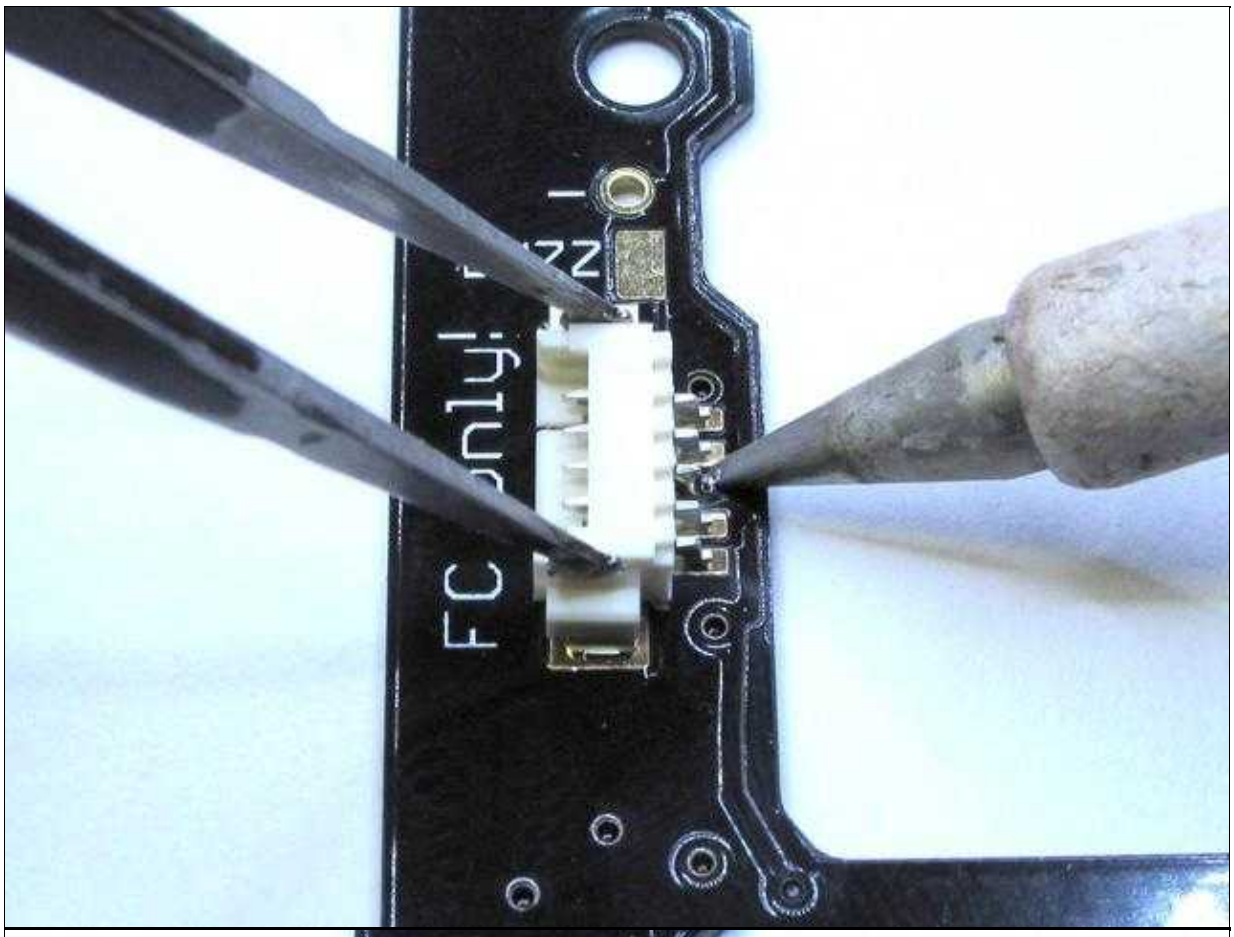
For this purpose you should use a fine tip. The first one is a solder pad on the distribution board and solder then Molexbuchse fixed thereto. This is to cater to the remaining contacts are soldered.

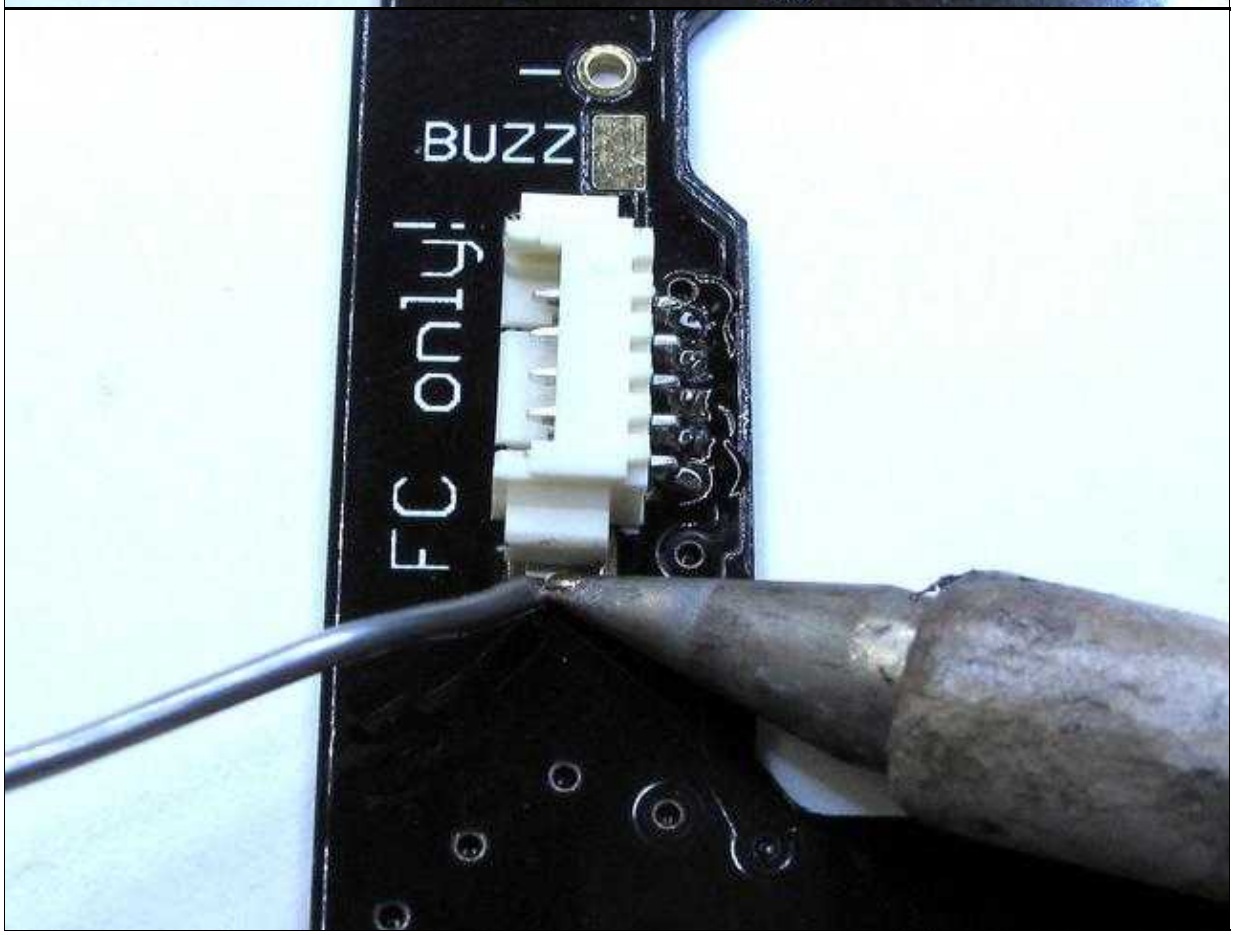
The contacts may have no connection with each other!

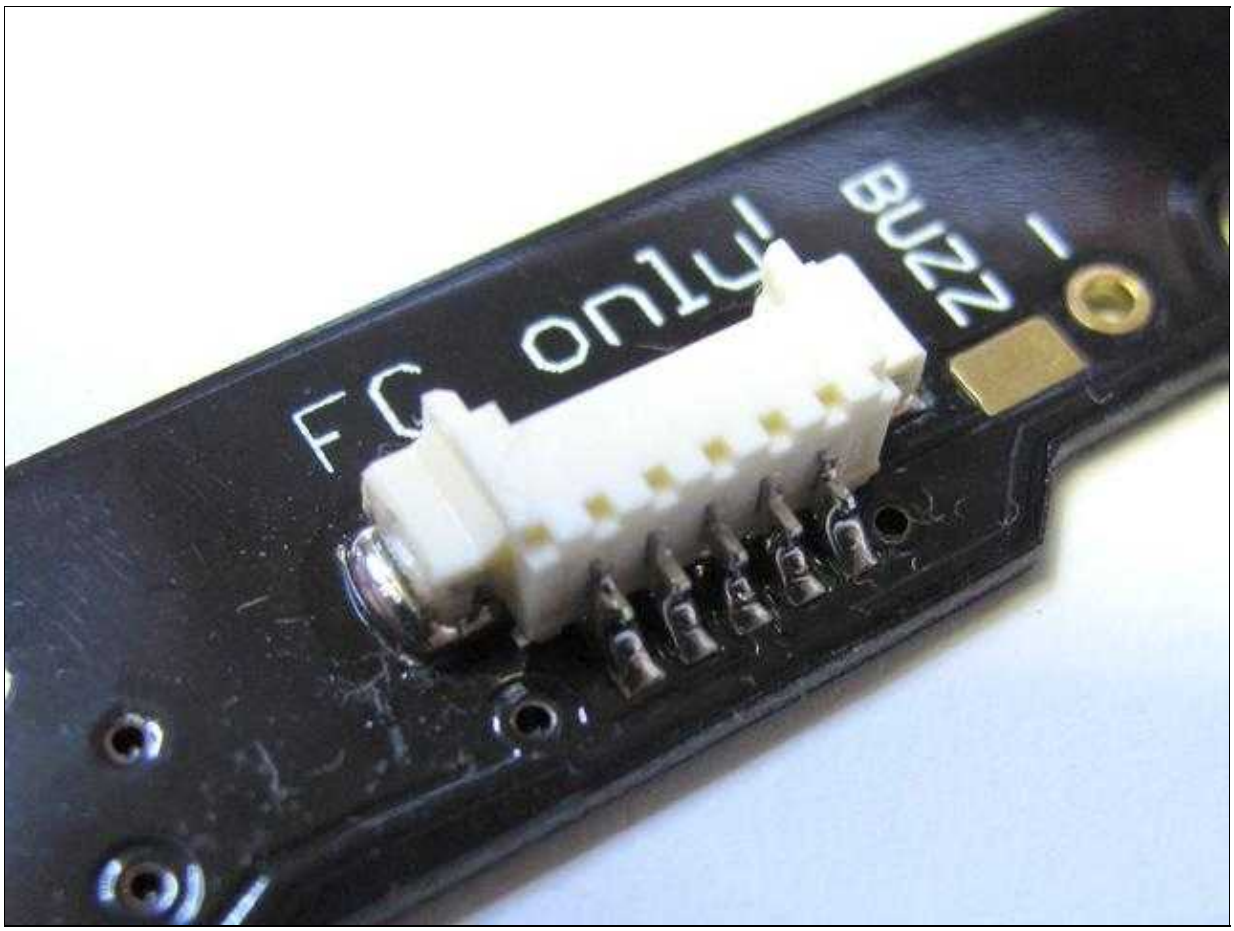
- **The FlightCtrl is connected over the Molex socket with power, I2C-bus and the Buzzer.**

Tip: Excess solder can be removed perfectly with solder wick. If the mounting of the Molex socket fails, the PCB can be gently heated from the bottom with a heat gun and the socket be released.



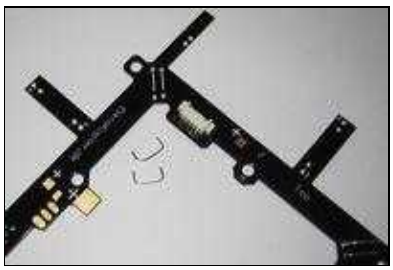


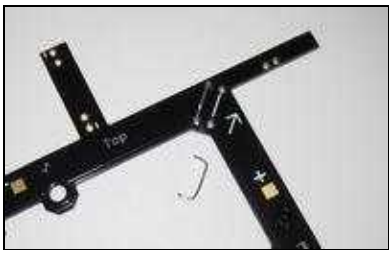

BUZZ
FC only!



Assembly of the bridges

8 bridges have to be assembled on the distribution board.

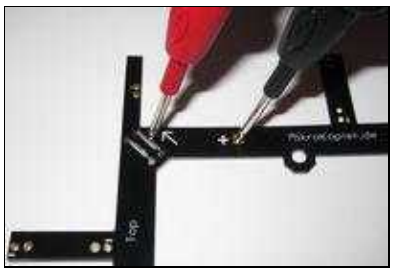
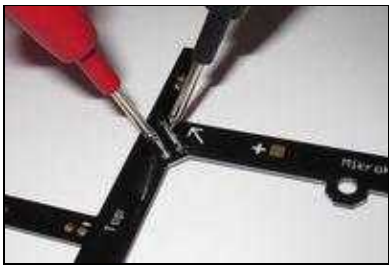




check for shortcut

The bridges may not have contact against each other or against plus or minus.
Measure with a multimeter: against each other and against plus and minus it must have high resistance.

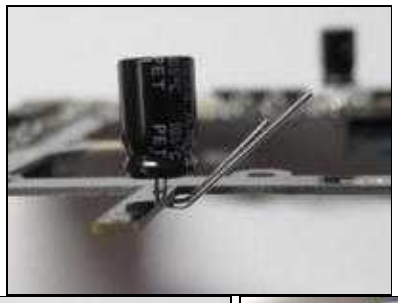
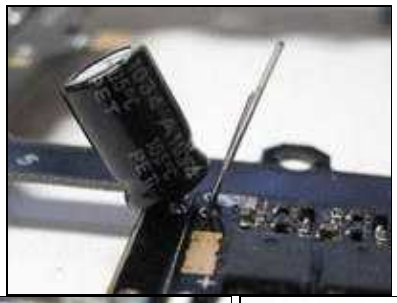
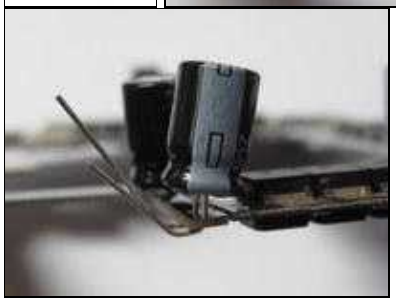
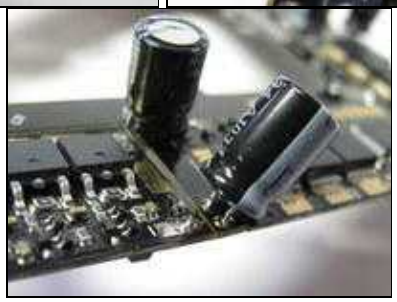
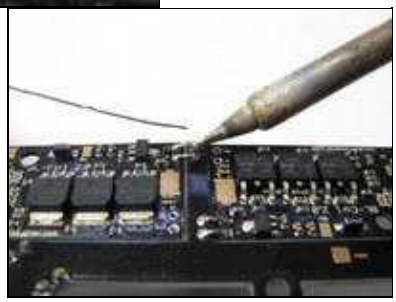
⚠ If the current distribution completely soldered incl. Bl-Ctrl, you should make the same measurement again! Be sure that no short circuit exist.

Solder Elkos

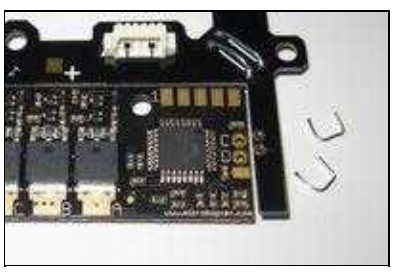
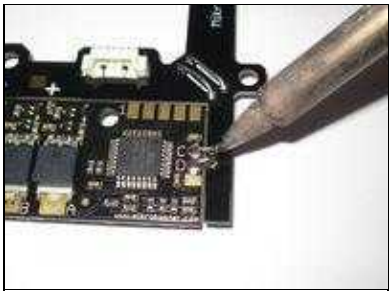
The BL-Ctrls are connected via the wires of the Elko (capacitors). The Elkos are assembled from the top of teh distribution board.
The Elko-wires are to be bent over and put (and soldered) through the + and - solder-pads of the BL-Ctrls. Solder these pads from both sides of the distributor!

⚠ MINUS (marked on each Elko) goes to the outer sides - do not mix plus and minus here!
⚠ a lot of heat has to be used on the distribution board to make a perfect connection

I2C connections

connect C & D to the BL-Ctrls

Connect the batterie cable

On the large "+" and "-" solder pads connect the cable for the Lipo. With a cable tie the cable can be fixed to the power distributor.

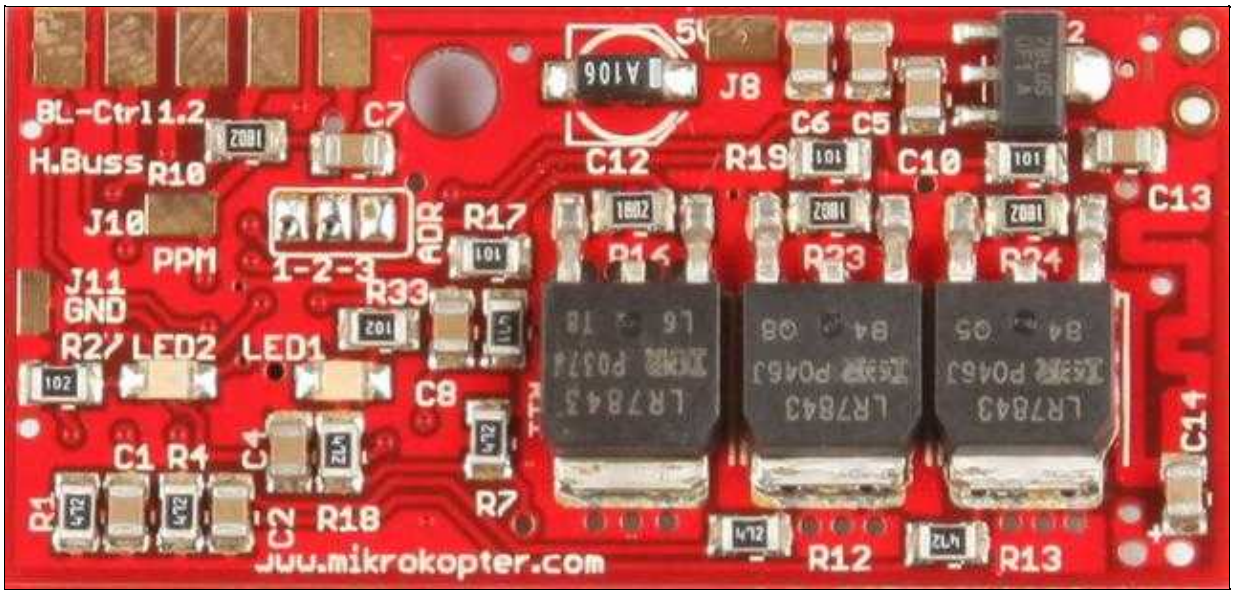
- plus = red
- minus = black

⚠ do not mix plus and minus here!

BL-Control - addressing

Info

The BL-Ctrl is specially designed for the MikroKopter.



<=**BL-Ctrl 1.2**

<=**BL-Ctrl 2.0**

Unlike conventional BL controllers, it has a fast data bus to the FC (I2C) and sets the motor target values spontaneously.
Conventional BL controllers can't be used. The addresses of the BL controllers needs be set via jumpers.

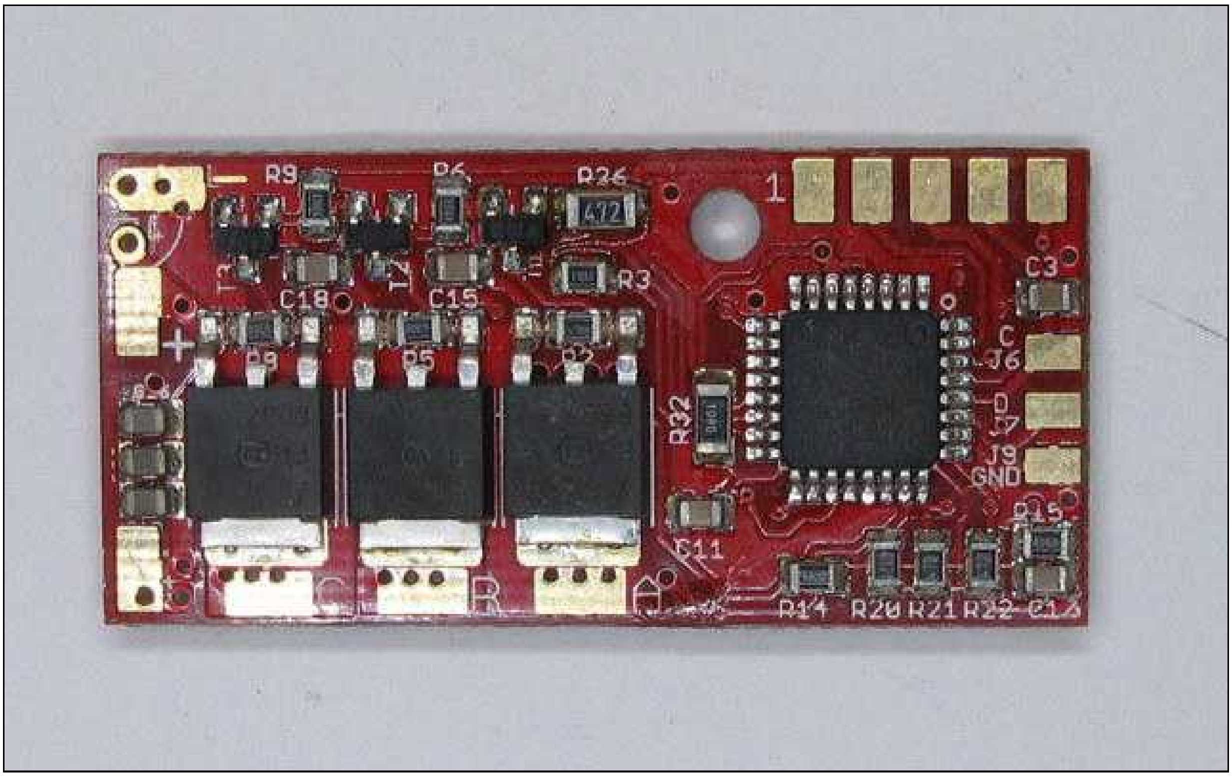
⚠ **Each motor requires a unique address. A Quadrokopter requires the addresses 1-4, a HexaKopter the addresses 1-6 and the Oktokopter the addresses 1-8.**

. <=Quadro  <=Hexa . <=Okto

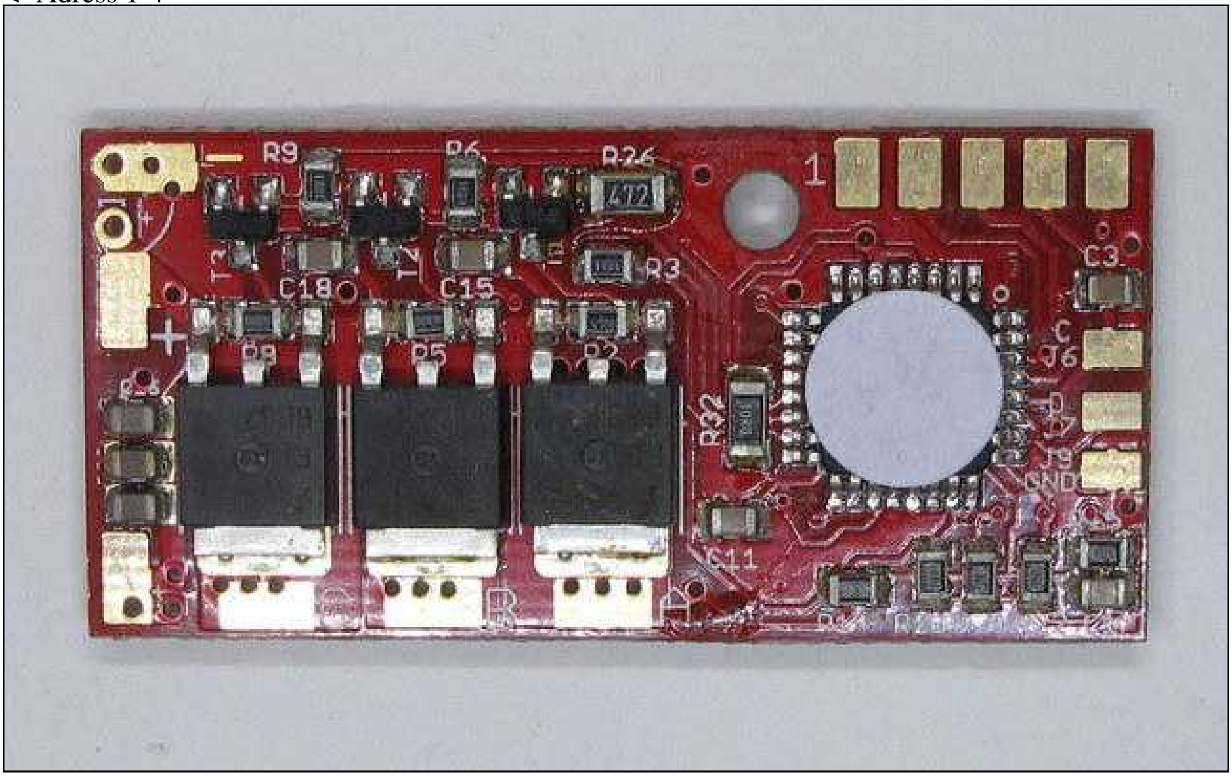
Other forms and their .mkm tables can be found here.

BL-Ctrl 1.2 address

A BL-Ctrl1.2 **without a white round label** can be set to the adresses 1-4, a BL-Ctrl **with a white round label** the adresses 5-8.

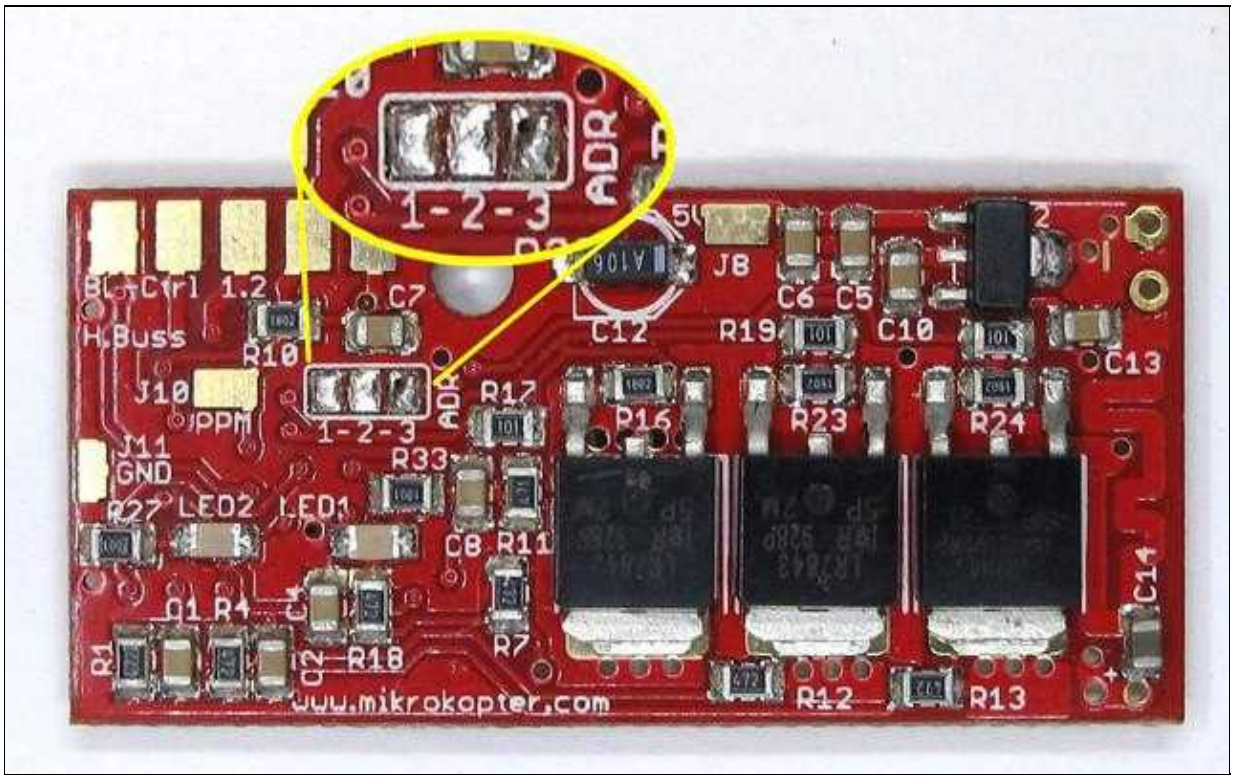

R9
R6
R26
472
1
T3
T2
T1
R3
C3
C18
C15
R8
R5
R2
C
J6
D
J7
R32
J9
GND
C11
R15
R14
R20
R21
R22
C12

<=Adress 1-4


R9
R6
R26
472
1
T3
T2
R3
C3
C18
C15
R8
R5
R2
C
J6
D
J7
R32
J9
GND
C11

<=Adress 5-8

The addresses can be set via jumpers directly on the board. (solder)



<=jumper on BL-Ctrl1.2

Adress 1-4

Adress (Motor)	1-2	2-3
1	open	open
2	open	closed
3	closed	open
4	closed	closed

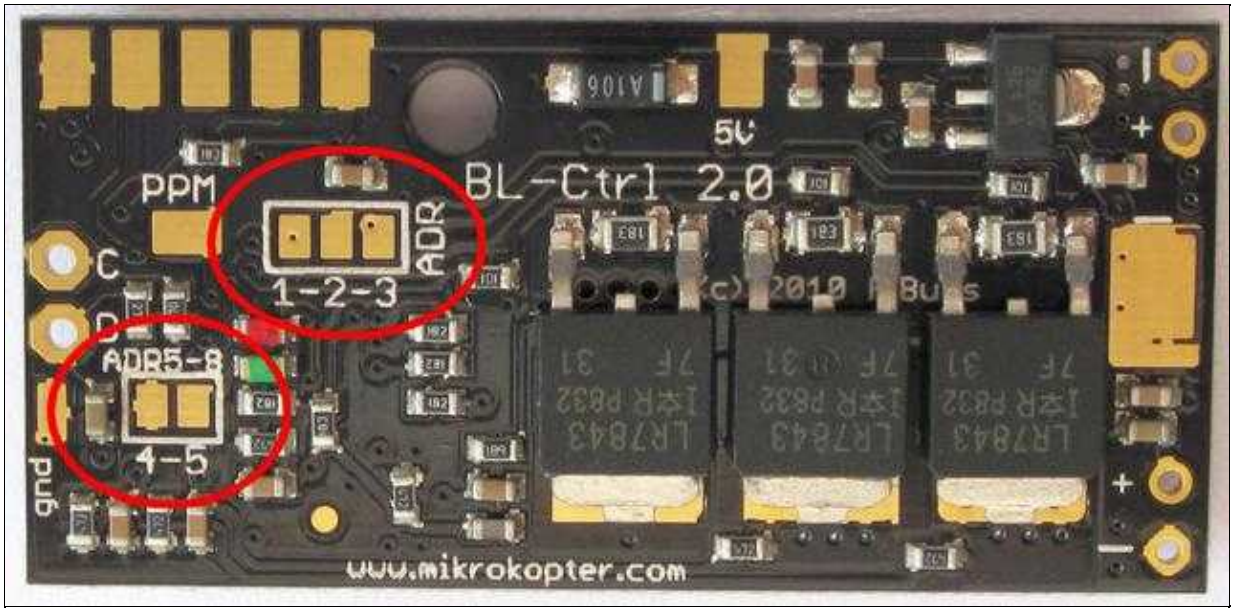
Adress 5-8

BL-controller with extra software (a white point on it):

Adress (Motor)	1-2	2-3
1	open	open
2	open	closed
3	closed	open
4	closed	closed

BL-Ctrl 2.0 Adress

A BL-Ctrl 2.0 needs also be addressed properly for each motor.
A BL-Ctrl 2.0 can be addressed via jumpers on the addresses 1-8.



Adress 1-8

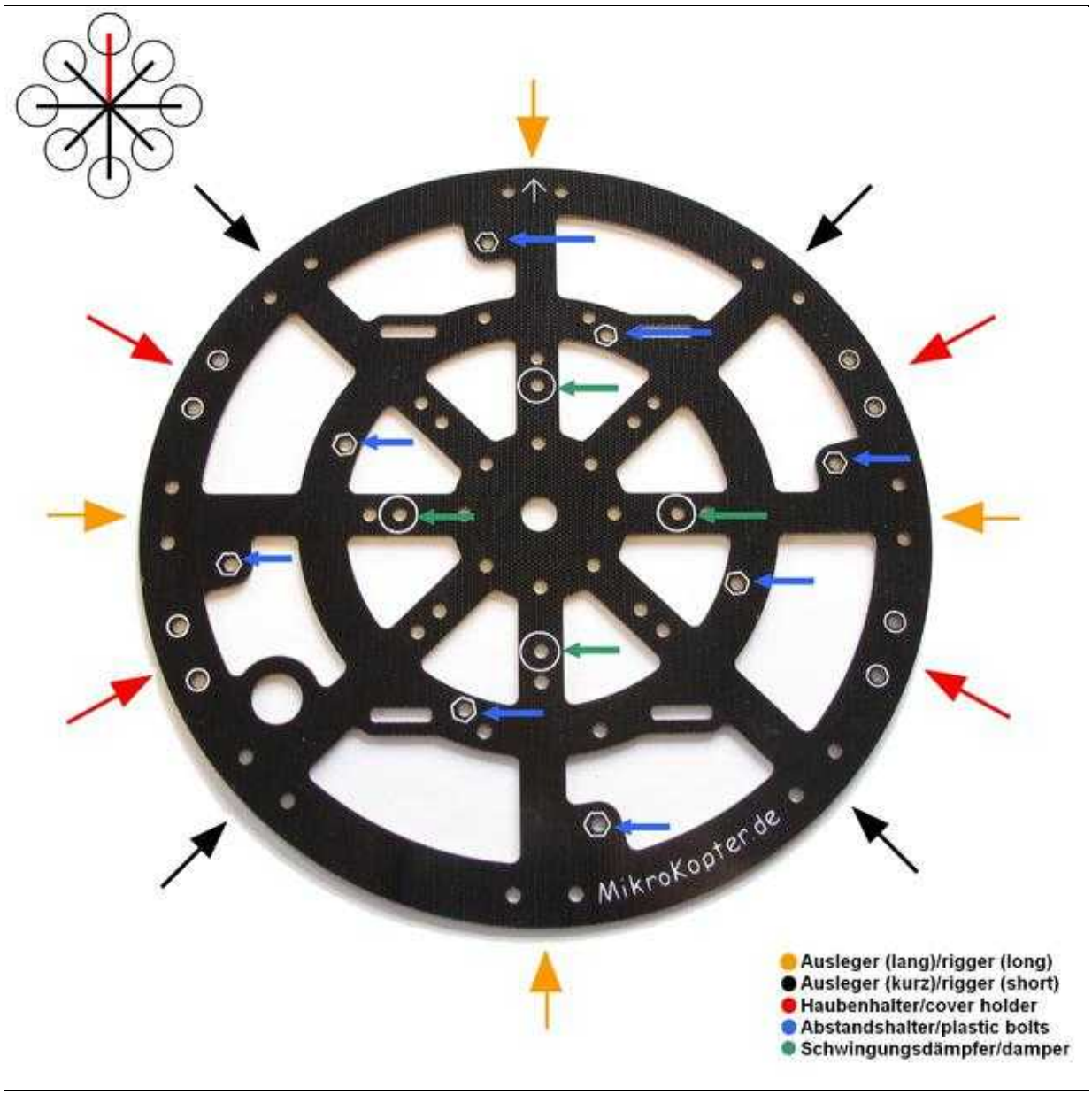
Adress (Motor)	1-2	2-3	4-5
1	open	open	open
2	open	closed	open
3	closed	open	open
4	closed	closed	open
5	open	open	closed
6	open	closed	closed
7	closed	open	closed
8	closed	closed	closed

Assembling Centerplate

Two Centerplates hold the riggers and the electronics together.

⚠ The printed side of the Centerplate always shows up. The arrow always points forward.
⚠ The red arm is front. The rigger, starting with the red one, clockwise from 1-8.

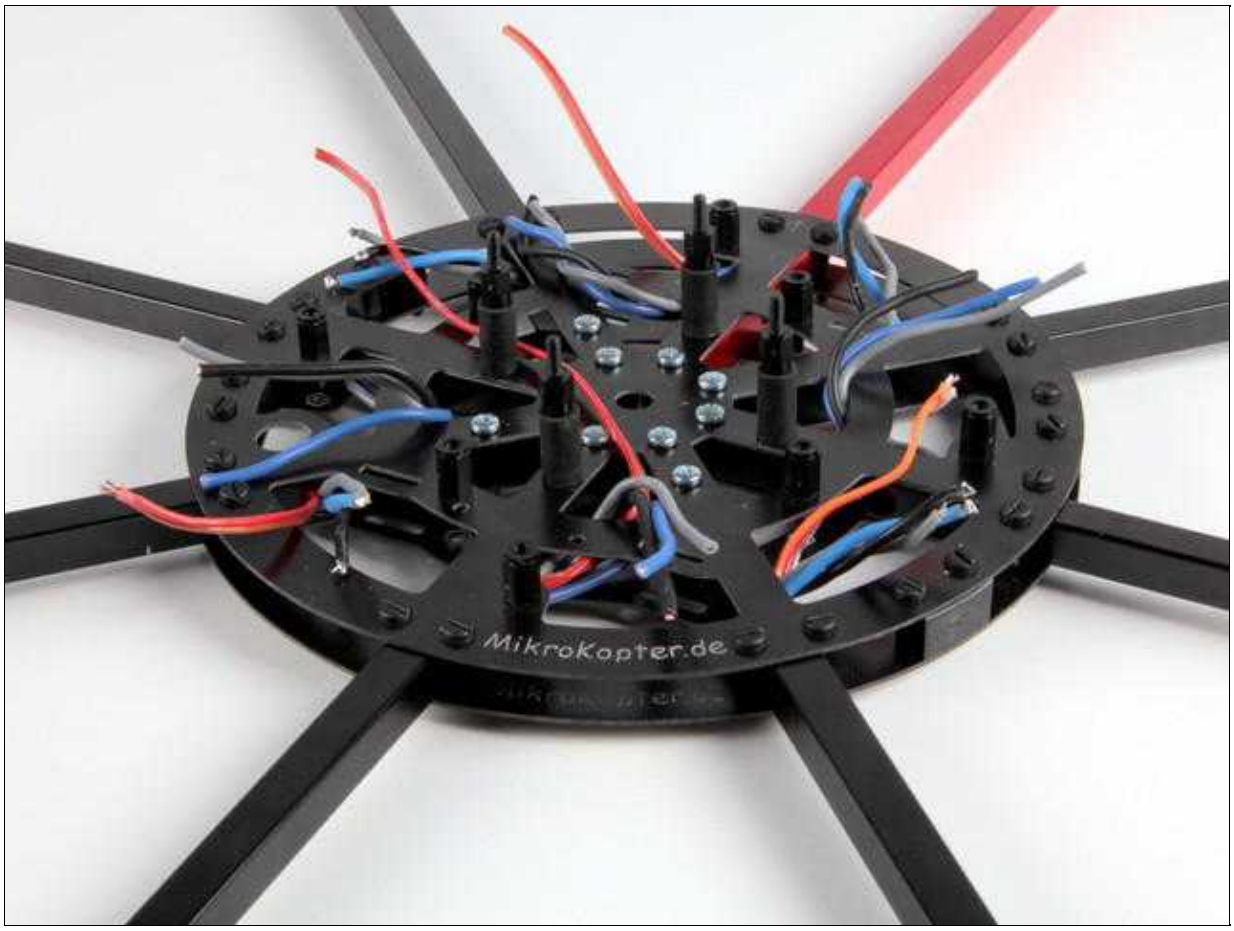
Example

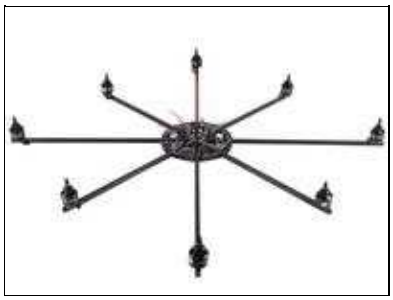

MikroKopter.de
Ausleger (lang)/rigger (long)
Ausleger (kurz)/rigger (short)
Haubenhalter/cover holder
Abstandshalter/plastic bolts
Schwingungsdämpfer/damper

At the top centerplate the eight spacers (M3x10) are assembled first. On this eight spacers the power distributor is mounted later. Insert the eight spacers with the thread into the centerplate and secureit with a nut. In the next step, the lower and the upper centerplate (with the spacers), can be mounted with the cover holder. Therefore you need 2x plastic screws (M3x16) / plastic nuts (M3)for each cover holder.
If you have a cover holder with 1cm high in you set, you doesn't need the spacer plate that you see in the picture!

Now you can mount the riggers.
The short riggers (2, 4, 6, 8) are fastened with **two** metal screws in the middle of the center plate, each with a self-locking nut.
The long riggers (1, 3, 5, 7) are fixed with **one** metal screw in the middle of the center plate, each with a self-locking nut.
The second metal screw is used from below to attache the damper (M3x15).
On the rubber damper is still one each M3 plastic nut **or** a spacer (M3x10) screws to the FlightCtrl give a little more distance.
Those objectives are later attached to FlightCtrl.

On the outer ring of the Center Plate, all boom is secured with two plastic screws (M3x16) / plastic nuts (M3).





The cables are led out as in the picture to see.

The Lipo cable is inserted through the Center Plate. Later you can fix it with a cable tie.


After the power board was screwed onto the eight spacers, the motor cable can be solder onto the BL-Ctrl.
The result:

The arrow of the powerboard shows to the red rigger!

Info:
Motor connection A = **gray**, B = **blue**, C = **black** cable on the **uneven Motor addresses** (**clockwise rotation**).
Motor connection A = **blue**, B = **gray**, C = **black** Kabel bei den **even Motor addresses** (**anticlockwise direction**).
Just in case during the motor test (later) on motor would turn in the wrong direction, simply exchange two of the three cables.

Lighting

Connection Powerboard Okto2-26:

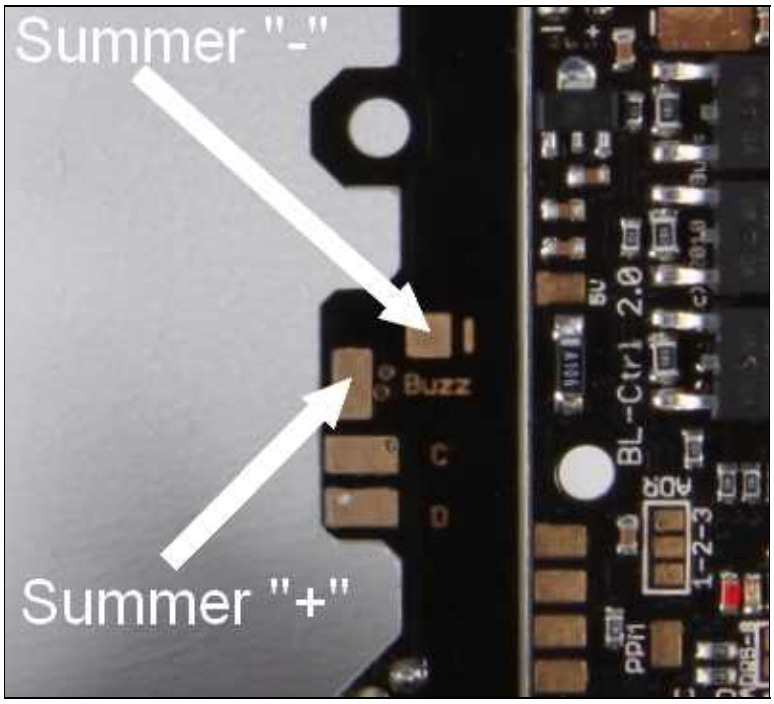
You can connect the lighting (LED) directly to the "+" and "-" pad at the lower and upper side.

Connection Powerboard OktoXL:

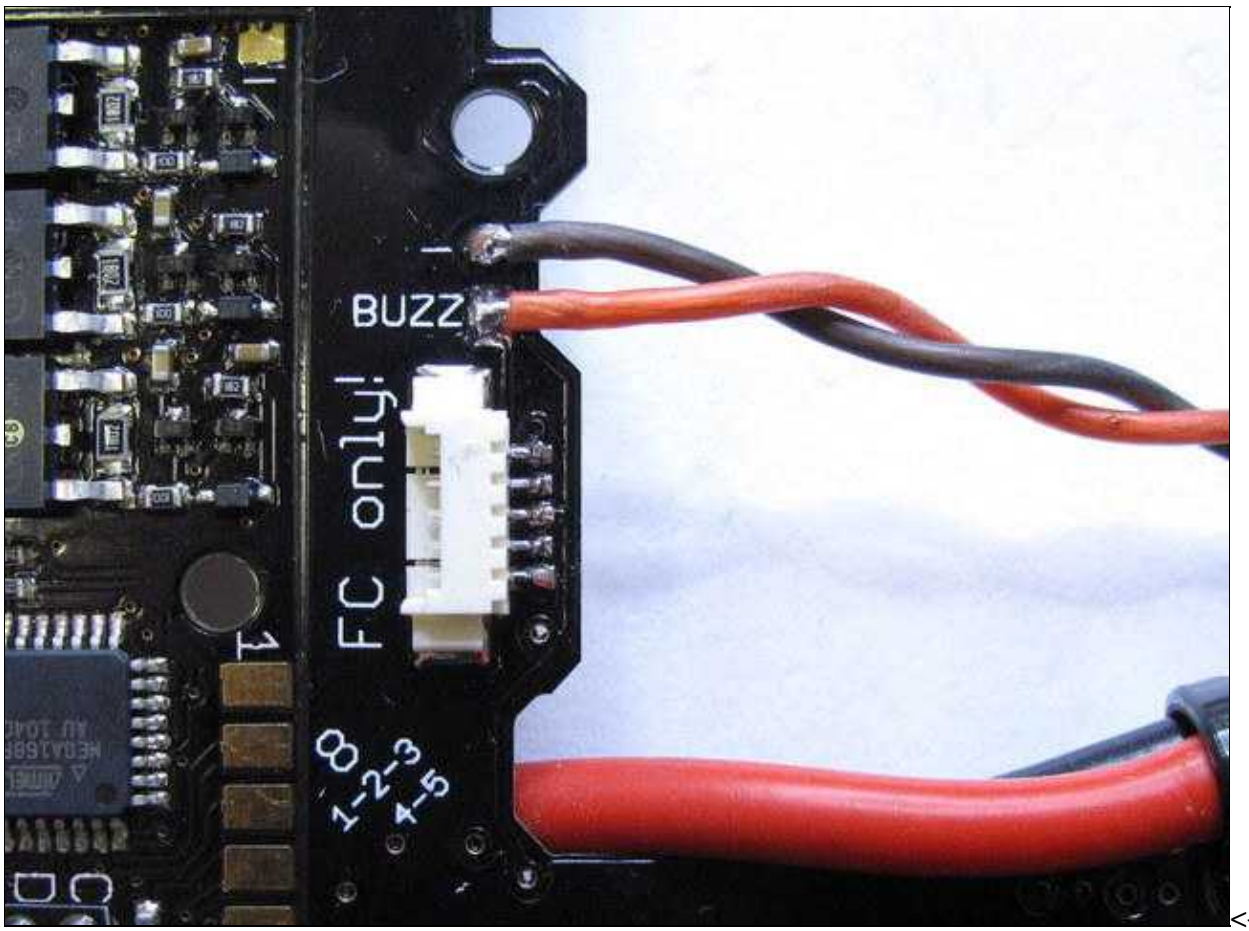
You can connect the lighting (LED) directly to the outer "+" and "-" pad.
Connect the LED's like you see here:

Buzzer

Now the buzzer can be soldered. **(BUZZ = +)**



<- distributor Okto 2-26



<-
distributor OktoXL

.<- OktoXL V3

Lipoholder

The Lipoholder can be mounted on four bolts of the cover holder.

connect the FC

The FlightCtrl2.1 will be connected later with the Molex-cable.

.

The printed arrow on the FlightCtrl must point to the on the rigger No.1 (red rigger) !

HiLander-26

You can mount the HiLander-26 on each rigger.

You can mount it on rigger 1-3-5-7. If you use a camera mount, you can use rigger 2-4-6-8.

HiLander-26 (Version1)

HiLander-26 (Version2)

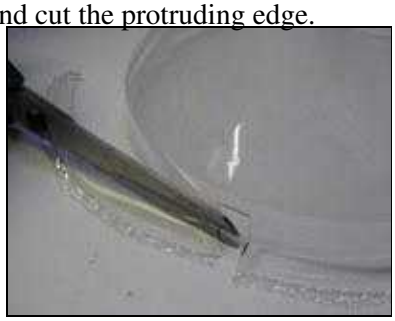
mount transparent cover

Put the cover over the riggers for marking. You can fix it by a tape. Please notenthat the upperpart of the cover is a square. Put one edge of this square towards rigger Nr.1

Example mounting on a quadroKopter. On a HexaKopter OktoKopter the sequence is identical!

Now mark the position of the rigger with a pencil.


Now it can be cut with scissors and cut the protruding edge.

The transparent cover is then attached and secured with a screw. For this you can drilling with a 2mm drill to the cover and the cover holder.


If you use the new version of the cover holder you can use the recess on it.
Attention: The recess should be shown up! A matching bolt is located on each motor.

⚠ The transparent cover should be painted in any color from the **inside**. This will save the light-sensitive altitude sensor from malfunction. This can happend, if sun's rays strike on the sensor directly.

Cooling hole in the cover

If you use payload > ca. 700g or you fly in high temperatures, a cooling hole (2cm) in the cover might be useful to avoid heat accumulation.

First start

Now the Kopter is ready assembled and soldered. The next step is now to check and set the Kopter and the function of the transmitter.
For this we use the KopterTool.

Where you can get the KopterTool and what you have to check/set is explained in simple steps.

Here we go to the easy "steps": **Initial startup**

safety

A Kopter can be dangerous. Safety comes first, so read carefully:

- SafetyFirst
- Safety references of LiPos

- KategorieAnleitung