en/DoubleQuadro-BL-Ctrl_3

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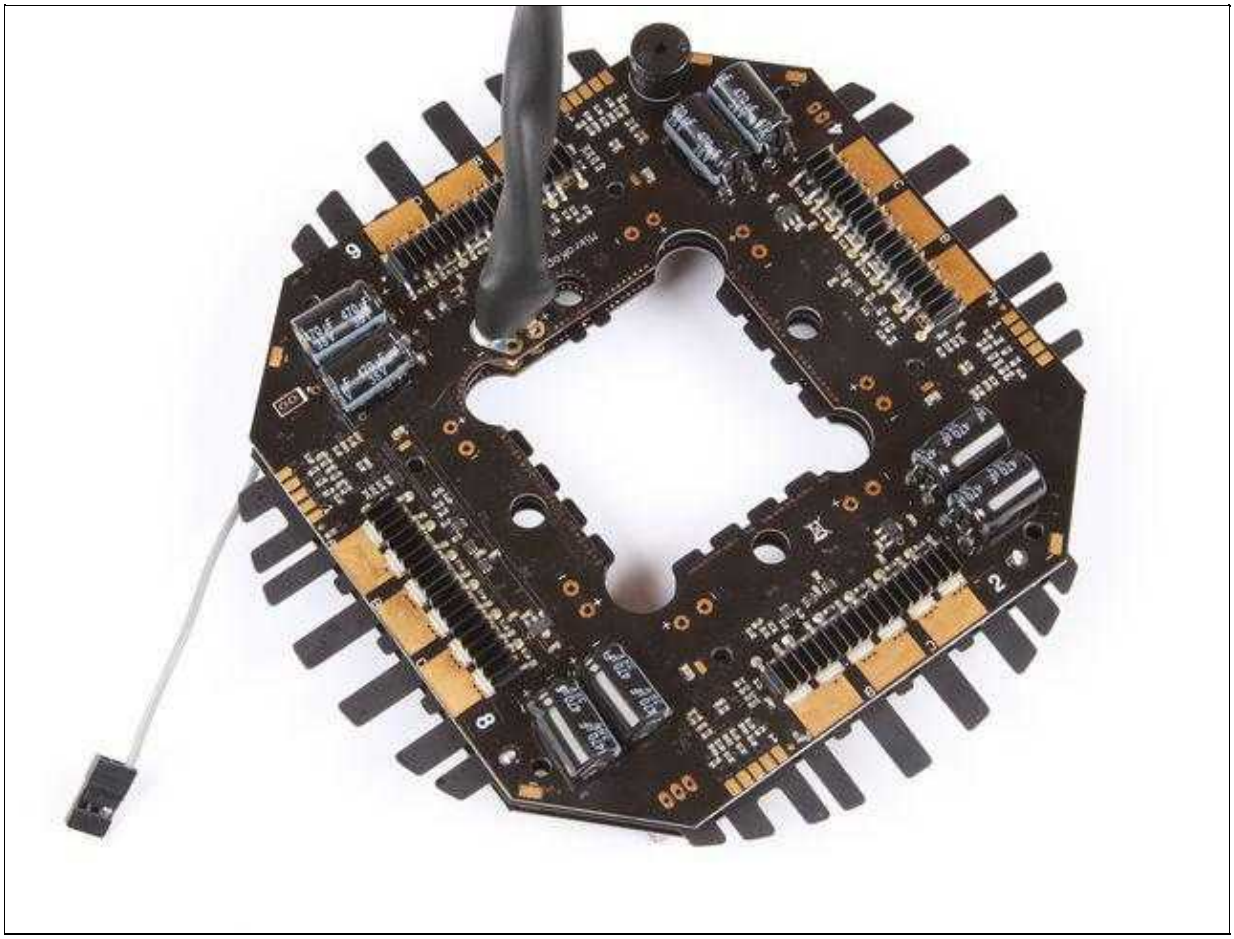
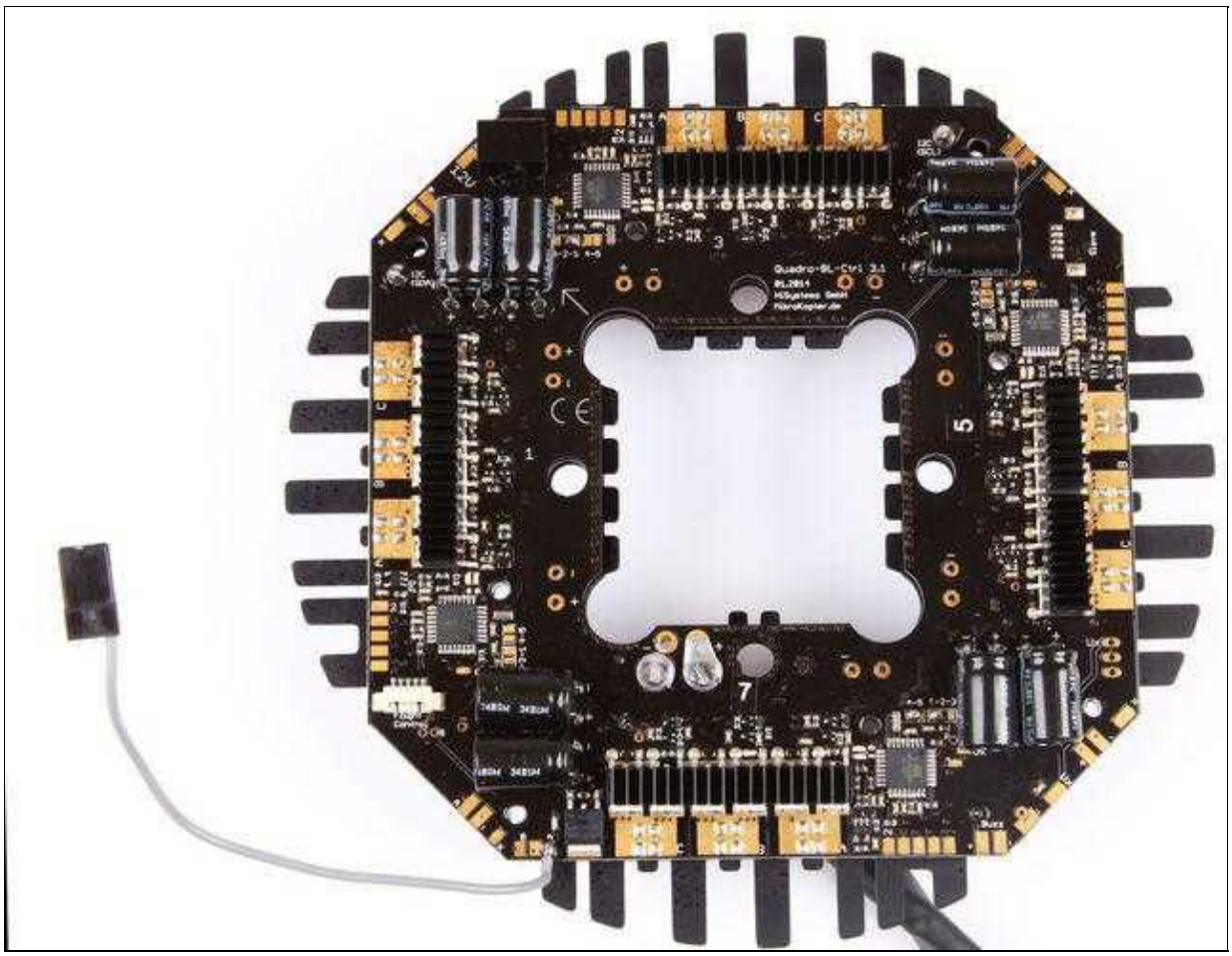
Inhaltsverzeichnis

1 Version "Cool"

YOu can get the *Double Quadro 2XL - Combi* also as Version **Cool** with heatsink:





Shoplink: [Doppel Quadro V3 - Cool]

INFO for soldering on the *Doppel Quadro V3 - Cool*
The *Doppel Quadro V3 - Cool* has glued heatsink on the FET's. The glue becomes liquid again at temperatures> 175°C.
When you (maybe to long) soldering the motor leads, the glue may liquefy and loosen the heatsink on the FET.
If a heat sink has come loose, it can remain on the liquefied adhesive. This is firmly back after ~3 minutes and final strength after about 60 minutes.

2 Double Quadro V3 - Combi

2.1 power

- voltage : 10 to 30V -> 3 -7S Lipo
- 6 -layer PCB for optimal heat dissipation . 70u copper layers make the entire circuit board to the heat sink .
- current: up to 60A (per BL-Unit / Peak) and 240A (all together / Peak) with appropriate cooling
- current limiting and temperature limiting
- Active freewheeling -> less power loss

2.2 Fast response with speed control

- rapid acceleration and braking of the propeller. Active and seamless braking gives the speed precisely and quickly on the new setpoint .
- return energy to the lipo when braking. Seamless transition from acceleration to braking
- significantly faster control with speed control

2.3 Other Features

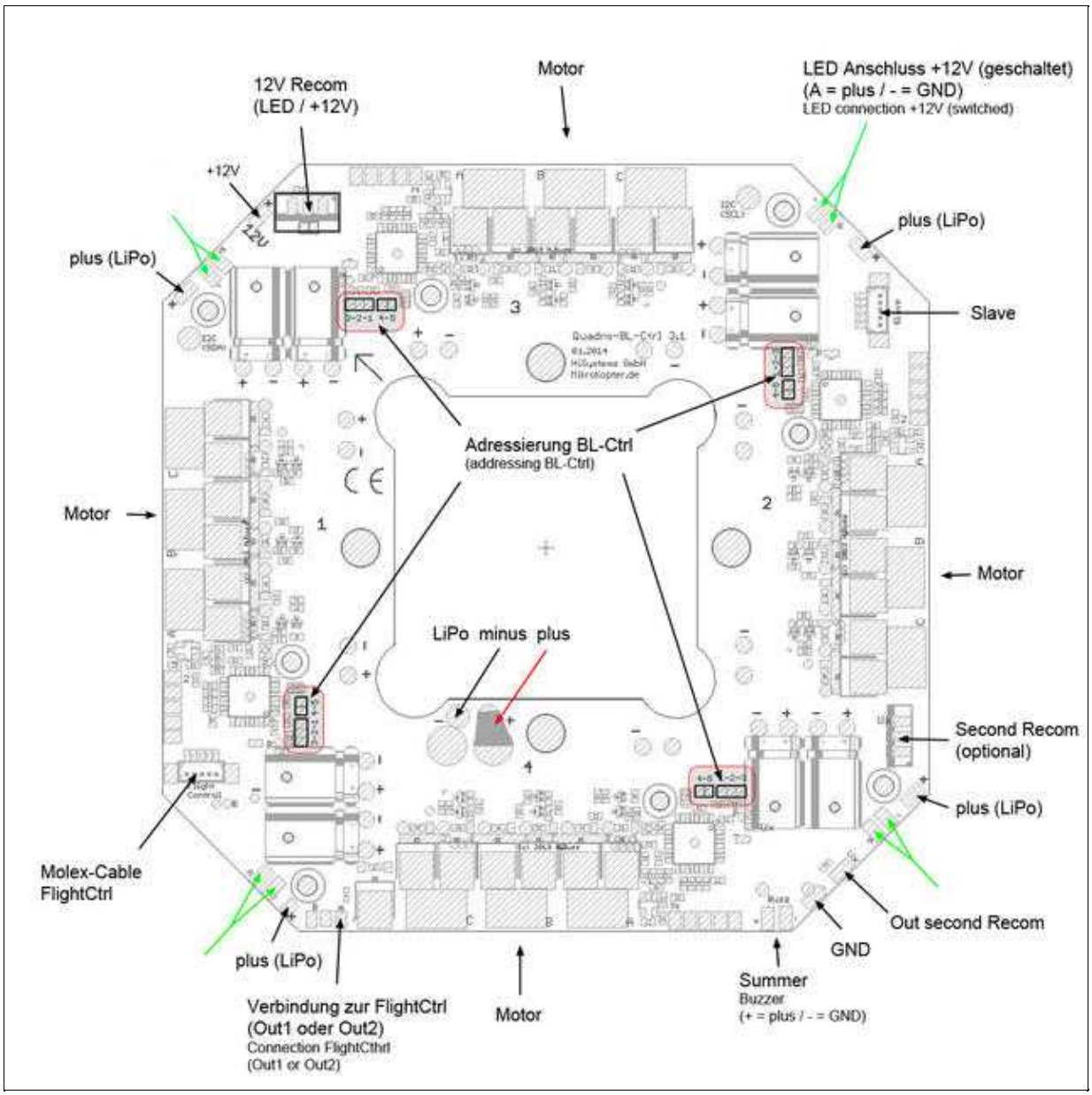
- Integrated 12V voltage regulator for external LED-Supply
- Switchable LED output -> LEDs can flash in case of undervoltage
- Adjustable motor timing in several steps of 13-28° - compatible with the most common BL motors
- Adjustable switching frequency (10kHz - 20kHz)
- PPM to 500 Hz with simultaneous I2C - bus operation for telemetry and data logging
- Integrated 12V stabilization for LED lighting and other 12V appliances
- Switchable outputs for lighting -> ZB The blinking lights at low voltage
- Software adjustable direction of rotation
- Adjustable current and temperature limits
- Adjustable start-PWM
- Silent Start: test tone at startup can be disabled

2.4 Interface

- various interfaces for setpoint input (I2C, PPM (500Hz) , serial)
- Integrated current measurement measurement of the actual current and the used capacity on the Mikrokopter control
- voltage and temperature measurement with data transmission to the ground station and data logging
- 11-bit resolution (2048 steps)
- various feedback to the MikroKopter-FlightCtrl (blocked motor , power limiting , etc.)
- extented configuration options (eg current limit , temperature limit , ...)
- two LEDs per BL-Ctrl (OK and Error)
- all BLCs are already adressed (address 1-8)
- I2C bus access possible in PPM mode - for data logging and telemetry in PPM mode
- status messages are transmitted to the FC (engine blocks , Current, Self-test error ...)
- current measurement up to 75A per controller
- Convenient configuration of the BL controller via FC

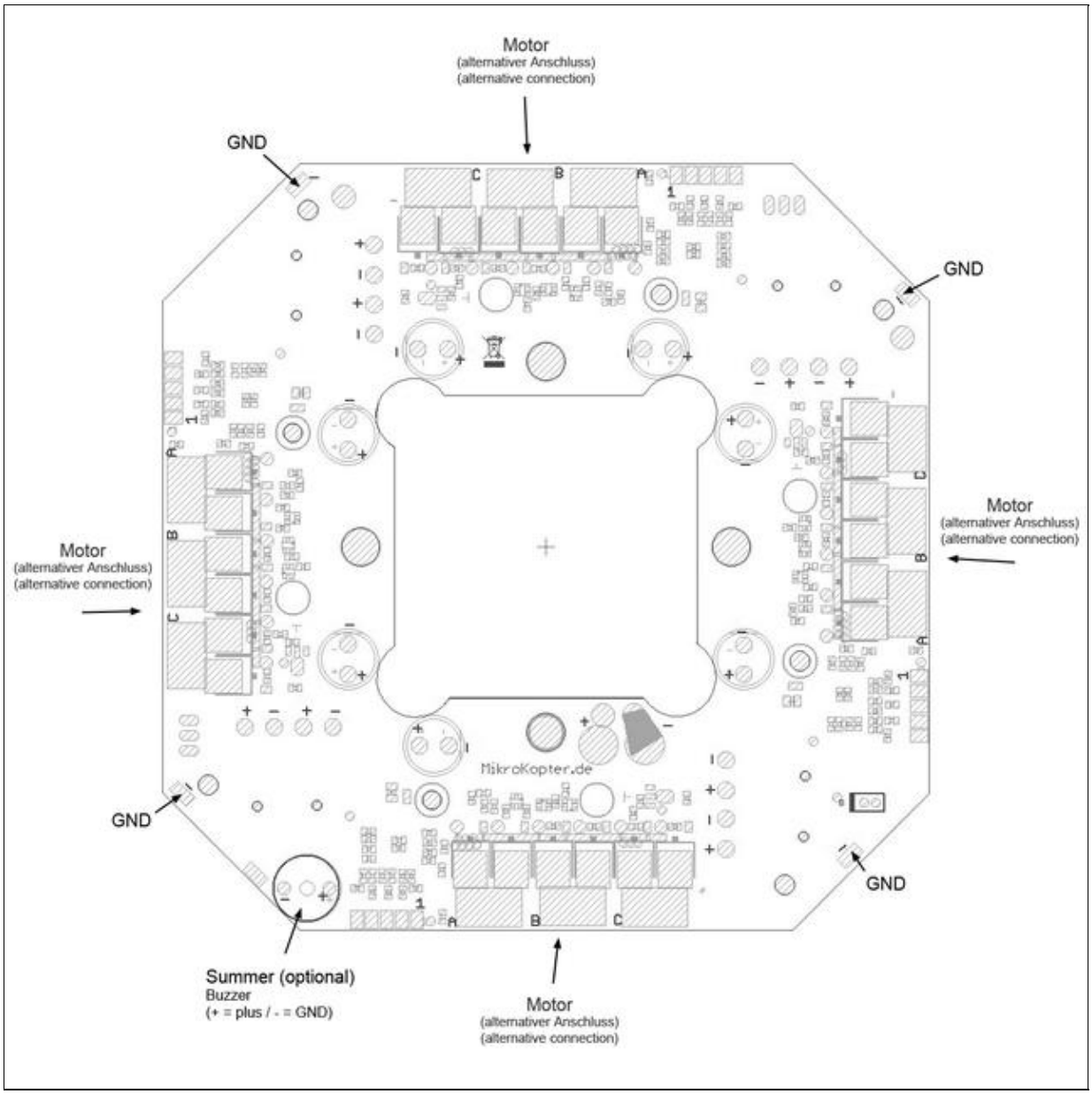
3 Connections

3.1 Top



(to enlarge -> click on image)

3.2 Bottom



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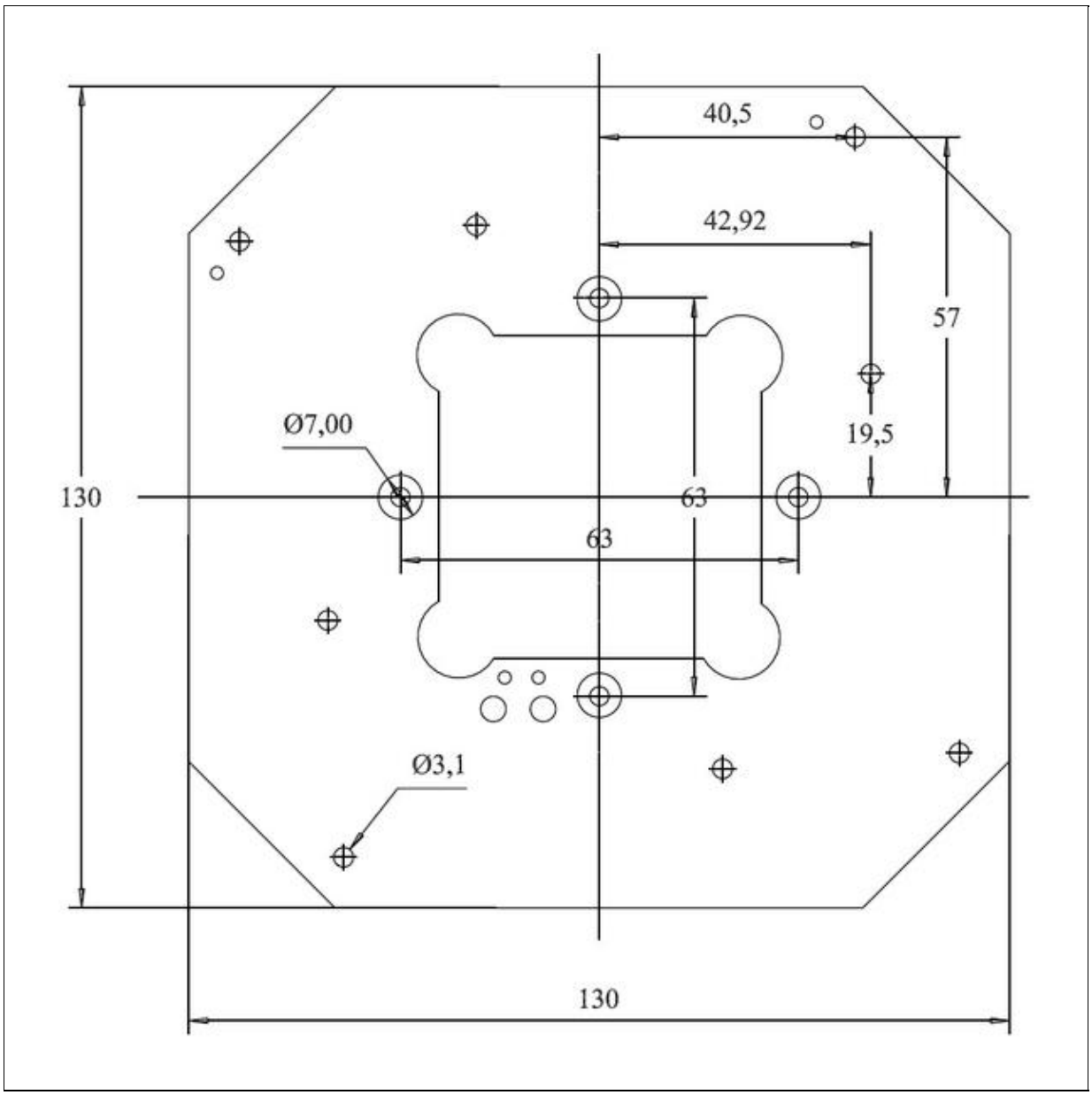
INFO:
If you buy the "Double Quadro 2XL - Combi" from the MK-Shop, the buzzer is already installed.

3.3 Drills



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DXF (CAD-File)

(to enlarge -> click on image)

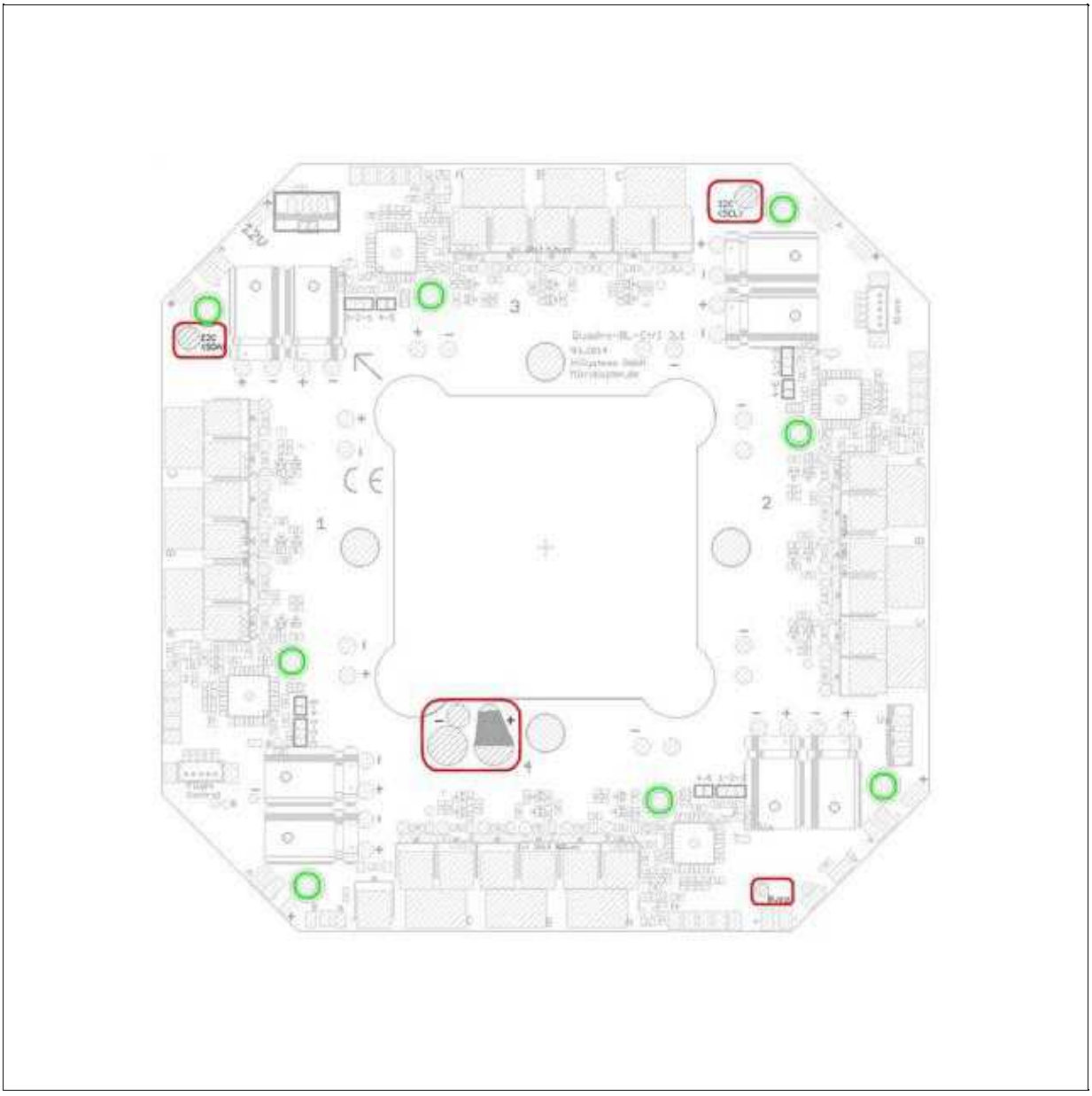
3.4 Connections

- Connection to the FlightCtrl
  - ♦ => Use the 5-lines Molex-Cable FlightCtrl
- LiPo-Connection
  - ♦ => LiPo plus / minus
- switched LED Stripes connections (4x)(switched by Out1 or Out2 of the flight control)
  - ♦ => Plug the gray connector cable int Out1 or Out2 of the FC to use switchable LED-Lights
    => A / -
- Stabilized 12V supply
  - ♦ => +12V / -
- Motor 1-4
  - ♦ => Motor outputs 1-4 / A, B, C
    => Color "Black", "Gray", "Blue" shows how to connect the cables of the MK motors. => You can either solder the cables on the top or the bottom side.
- Addressing
  - ♦ => If you purchase the double-quadro unit in the shop, the BL-Ctrls are already addressed from 1-8. The addresses are marked on the boards
    => General adressing the BL-Ctrl (See Address)
- LiPo-Voltege outputs (for low currents up to 3A)
  - ♦ => plus (LiPo)
- Optional
  - ♦ => Second Recom -> You can add a second voltage converter (for example 5V)
  - ♦ Slave
    - ◊ => Not used
- Buzzer
  - ♦ => The buzzer is directly connected to the Board

4 Connection Double Quadro

The double quadro consists of two quadro boards. They are connected by solder wires in these points:

- I2C (SCL)
- I2C (SDA)
- Buzz (Summer +)
- LiPo +
- LiPo -



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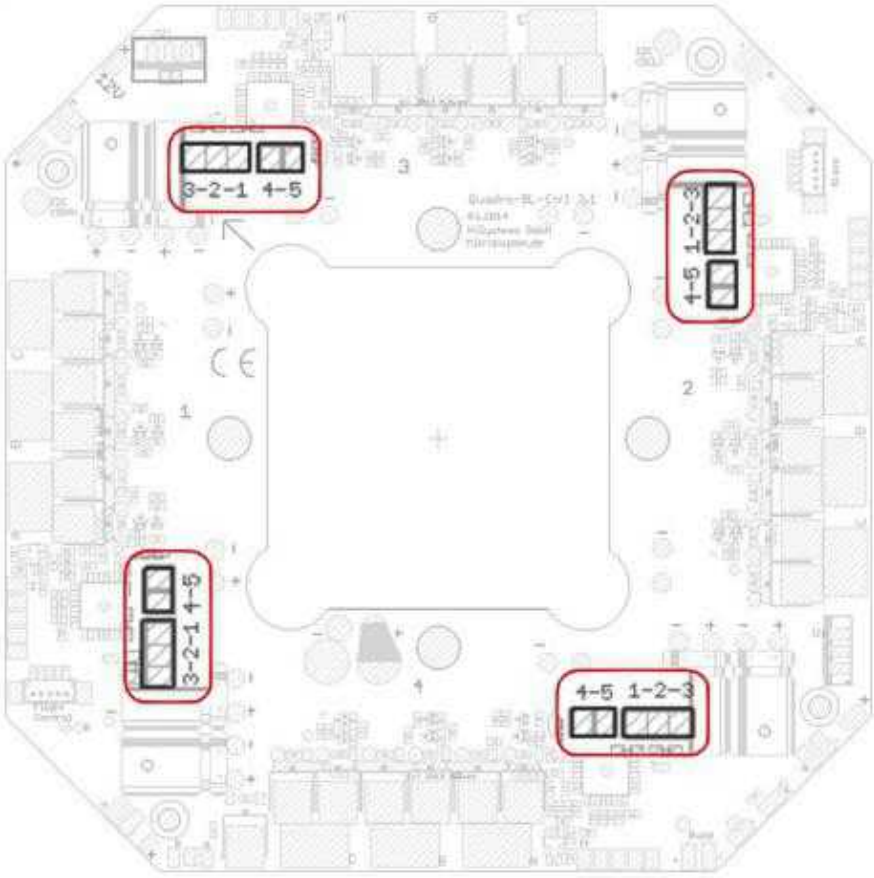
5 Addressing

The addressing of the individual BL-Ctrl in the distribution board is done by a solder jumper:

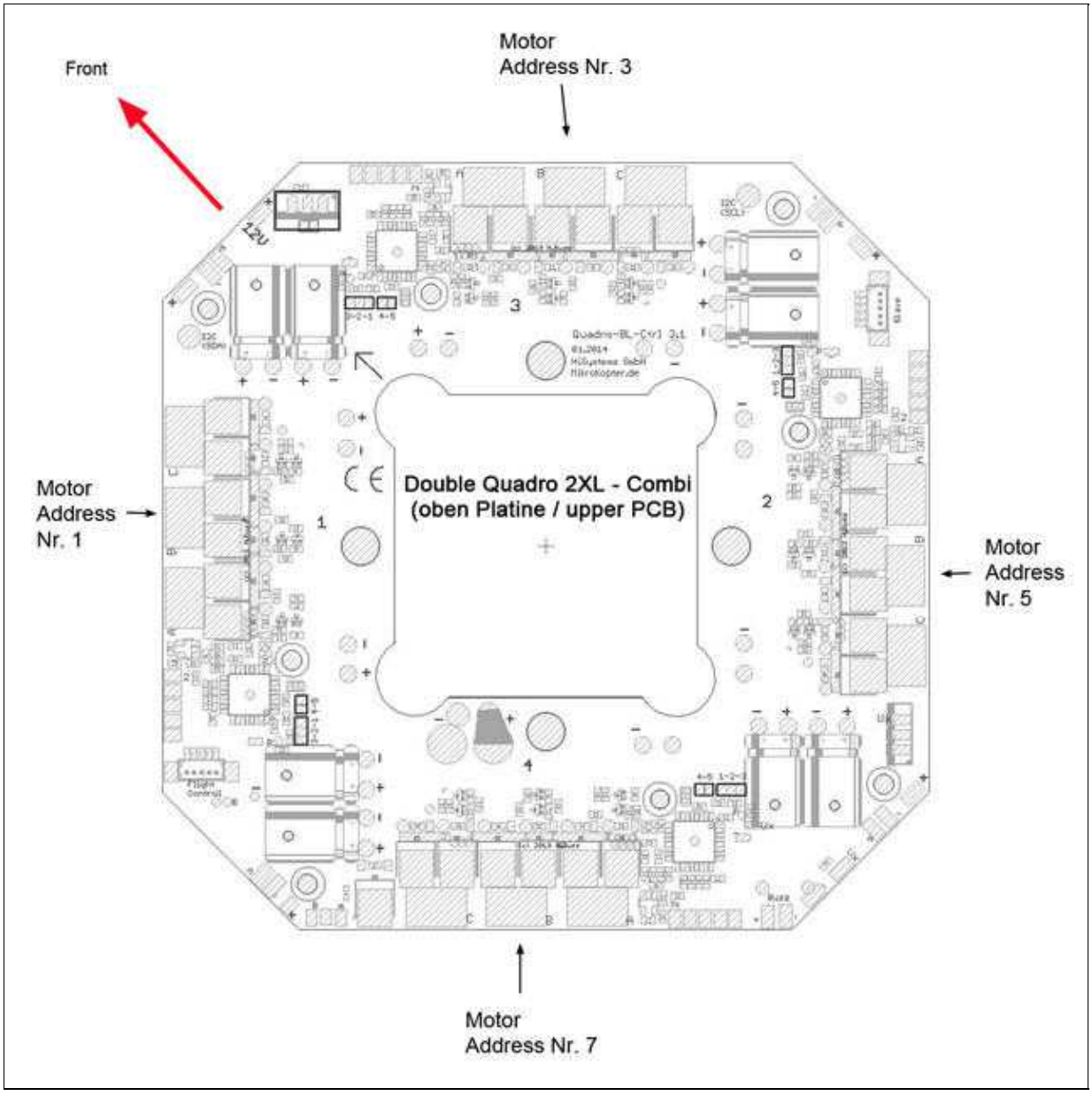


Here you can see how to set the solder jumper:

(to enlarge -> click on image)

5.1 Motor address + connection

Here you can see how the address for each motor should be set at the upper and lower board:
(If you buy the "Double Quadro 2XL - Combi" at the MK-Shop the addresses are set like you see here)



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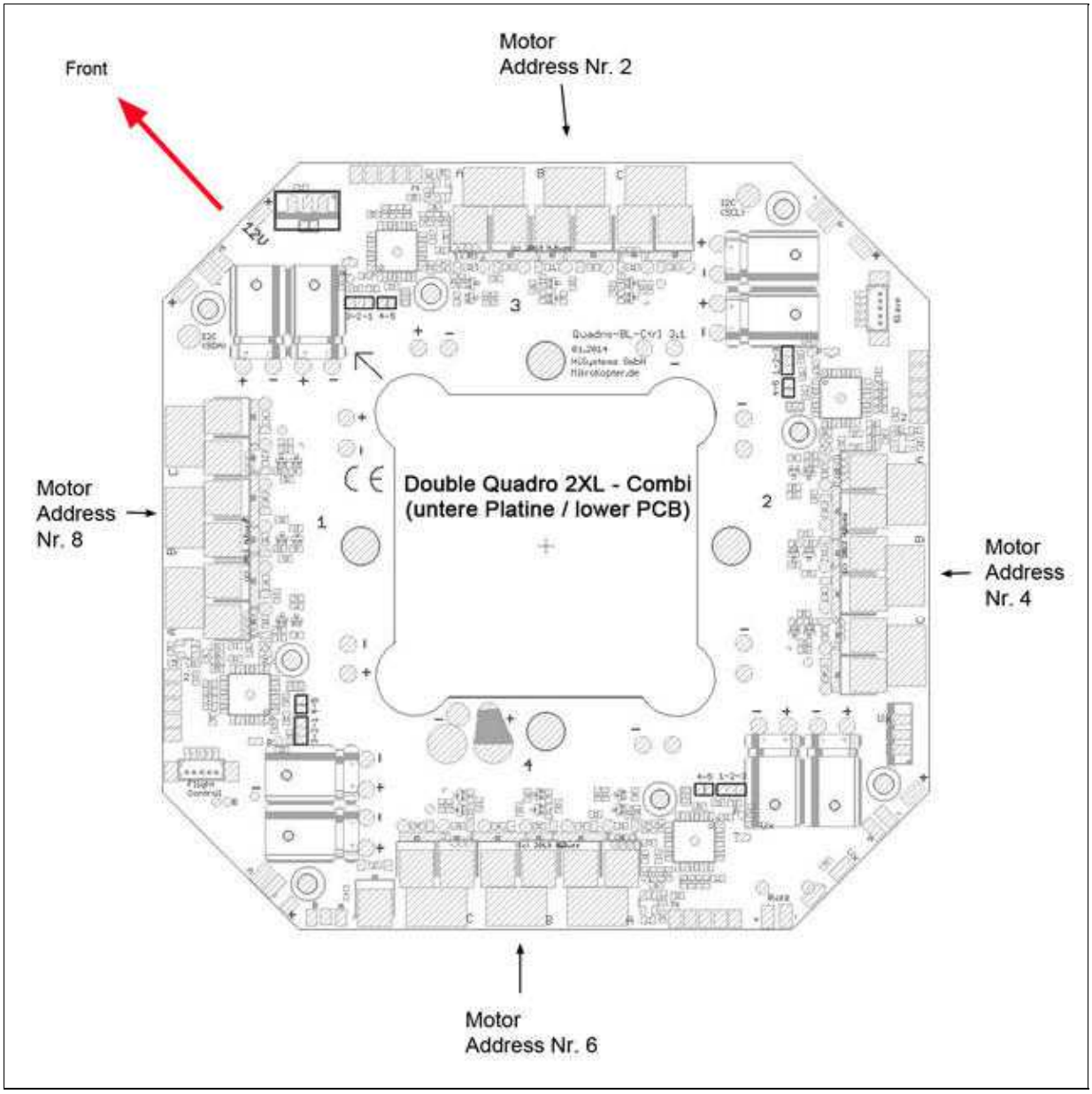

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INFO:
The cables for the motors on the lower PCB (Adr. 2, 4, 6, 8) can also be soldered on the bottom of the lower PCB!
You can use the "normal" Okto mixer that you find in the KopterTool.

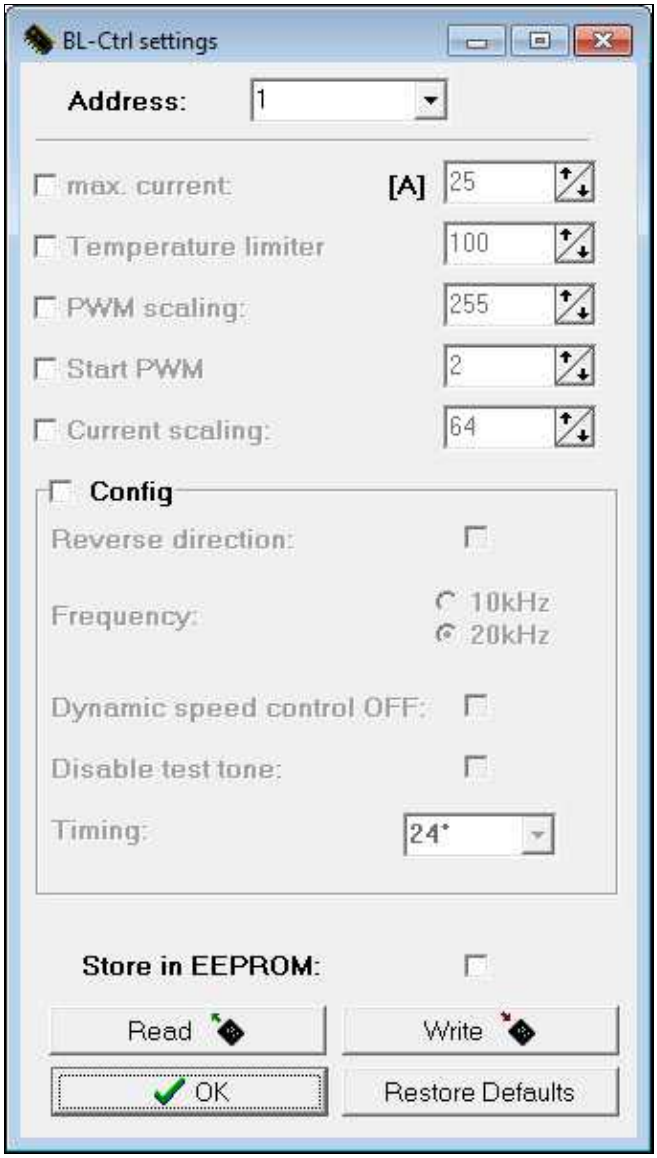
6 Settings

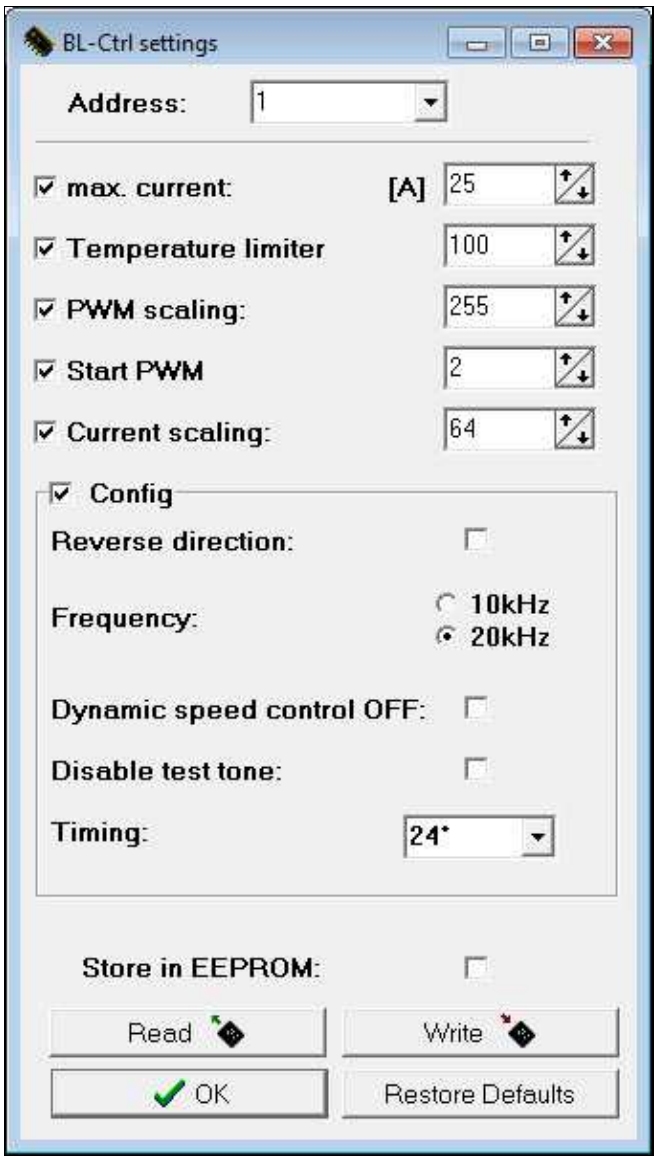
IMPORTANT: To change the Settings of the BL-Ctrl V3.0 you need a Software version since V2.02a (KopterTool, FlightCtrl, NaviCtrl)!

Normally you have not to change the settings! If you have to to it you can do it like described:

- open KopterTool
- press button "Strg" on your keyboard and hold it down.
- Then "click" "Settings" in the KopterTool.

Now you will see the window of the BL-Ctrl V3.0.
INFO: only if you "click" and activate the single settings there you can change them.




BL-Ctrl settings
Address:
1
max. current:
[A]
25
Temperature limiter
100
PWM scaling:
255
Start PWM
2
Current scaling:
64
Config
Reverse direction:
Frequency:
10kHz
20kHz
Dynamic speed control OFF:
Disable test tone:
Timing:
24°
Store in EEPROM:
Read
Write
OK
Restore Defaults

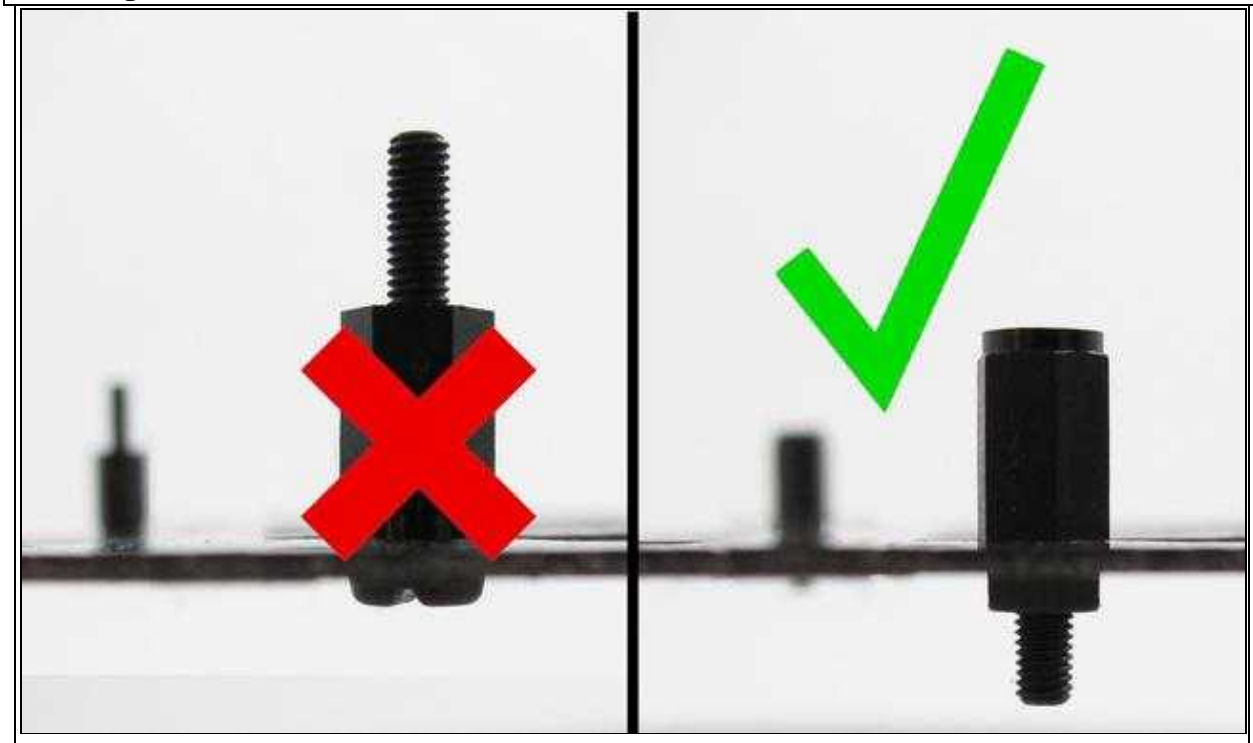
7 Mounting on Centerplate

To assemble the **Double Quadro V3 - Combi** or the **Double Quadro V3 - Cool** you need:

- 8x Spacer M3x10 (Link)
- 8x SNut M3 (Link)
- 8x Screw M3x16 (Link)

INFO: By firmly screwing any existing gaps between the heatsink and the FETs are closed!

Zum Vergrößern -> Bild oder Text anklicken



Step 1	Step 2

8 Error codes

The BL V3 performs a selftest during startup (test-tone). In case of an error, these are the blink codes:

- 1 "1" = Shortcut between A+ and B-
- 2 "2" = Shortcut between B+ and C-
- 3 "3" = Shortcut between C+ and A-
- 4 "E" = A doesn't go to high
- 5 "F" = B doesn't go to high
- 6 "G" = B doesn't go to high
- 7 "H" = A doesn't go to low
- 8 "I" = B doesn't go to low
- 9 "J" = C doesn't go to low
- 10 "K" = Overcurrent when switching to low
- 11 "L" = Overcurrent when switching to high
- 12 "Q" = Cross-circuit between low and high
- 15 overcurrent while starting the motor
- 16 error current measurement
- 17 error voltage measurement
- 18 error temperaturen measurement

9 SW-Update

If there is a new Software for the BL V3, here you can see how to update the BL: Update

10 FAQ

10.1 Motor connection

The motors can be connected either on the top-side or on the bottom-side. You can ignore the small (pre-)soldered points on the top-side.

10.2 Buzzer

The buzzer is directly soldered into the Board

10.3 Adressing

If you purchase the double-quadro unit in the shop, the BL-Ctrls are already adressed from 1-8. The adresses are marked on the boards

10.4 What is the gray 1-line cable for?

Plug the gray connector cable into Out1 or Out2 of the FC to use switchable LED-Lights

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- KategorieMK-Baugruppe/de