

en/FlightCtrl_ME_2_1

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LotharF
MikroKopter.de

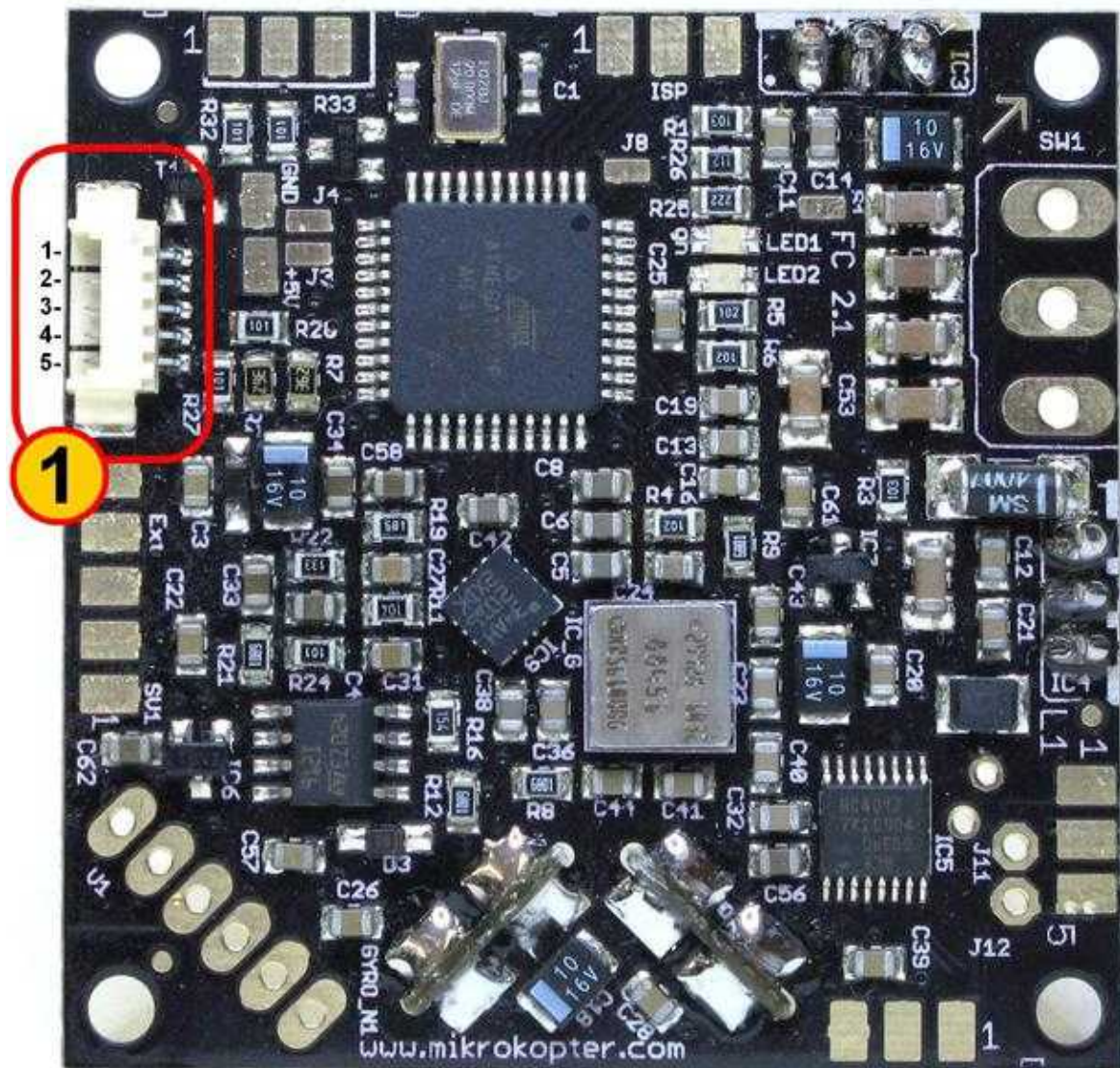
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1 Flight Ctrl V2.1

[Shoplink](#)

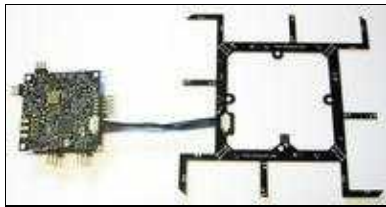
1.1 Top Side



1.1.1 Molex-Connector to connect to power distribution board

1 - Molex Connector

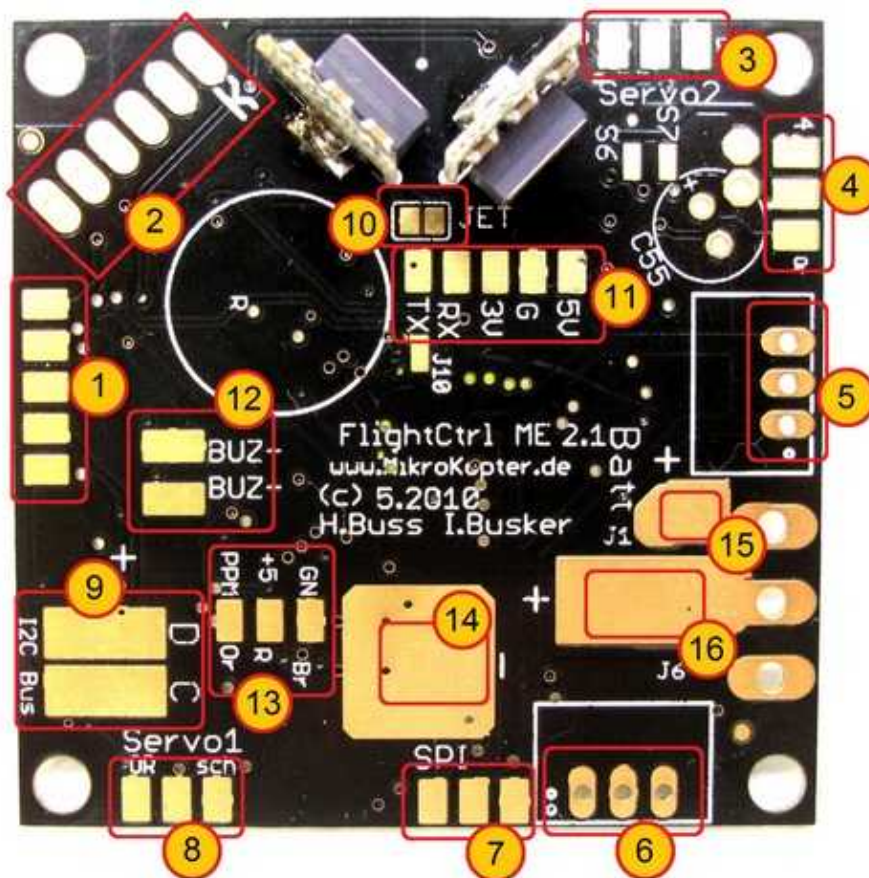
- Connections from top to bottom:
 - 1 - Ground (GND FC and Buzzer)
 - 2 - + Buzzer
 - 3 - I2C Bus (D)
 - 4 - I2C Bus (C)
 - 5 - +12V



- [suitable connector for the Molex cable](#)
- [suitable Molex cable](#)

If you are using this new connection you will be unable to install a power switch for your Flight Controller. The MikroKopter will then get turned on by connecting your Lipo battery. (All MK with more than 4 engines do that anyways).

1.2 Bottom Side



- 1 - 10pin connector for MK-USB or [NaviCtrl](#) connection
- 2 - Pressure Sensor (cut out of sensor connector points to the right)
- 3 - 6pin connector for servo 2 and Servo 3
- 4 - 6pin connector for servo 4 and servo 5
- 5 - DC/DC voltage regulator 5v Recom for Flight Controller
- 6 - DC/DC voltage regulator 5v Recom for servos
- 7 - 6pin connector for [NaviCtrl](#)
- 8 - 6pin connector for servo 1 and switchable J16/J17 connectors
- 9 - I2C connector (C/D) for BL Controllers
- 10 - JET (If you are using the Jeti Satellite receiver you will have to bridge these two connectors)
- 11 - 5pin connector (5V, GND, 3,3V, RX, TX)

- **Connection for Jeti receiver:**

- ◆ Connect PPM cable to #13, bridge the 2 connectors on #10 and connect RX

Connection for Spektrum Satellite::

- ◆ Connect the orange Receiver cable on 3,3V, black to G and gray to RX

12 - connection for the buzzer (BUZ-/BUZ+)

13 - Connection for PPM receiver (GN-brown, +5V-red, PPM-orange)

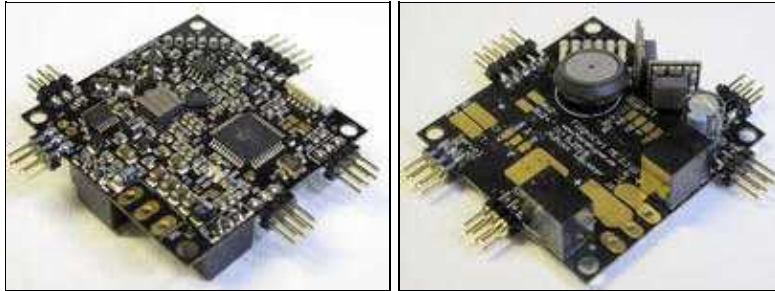
14 - Ground (GND) connection for the Flight Controller


15 - Positive (+) connection for the Flight Controller (if a power switch is being used)

16 - Positive (+) connection for the Flight Controller (without a power switch)

2 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](#).

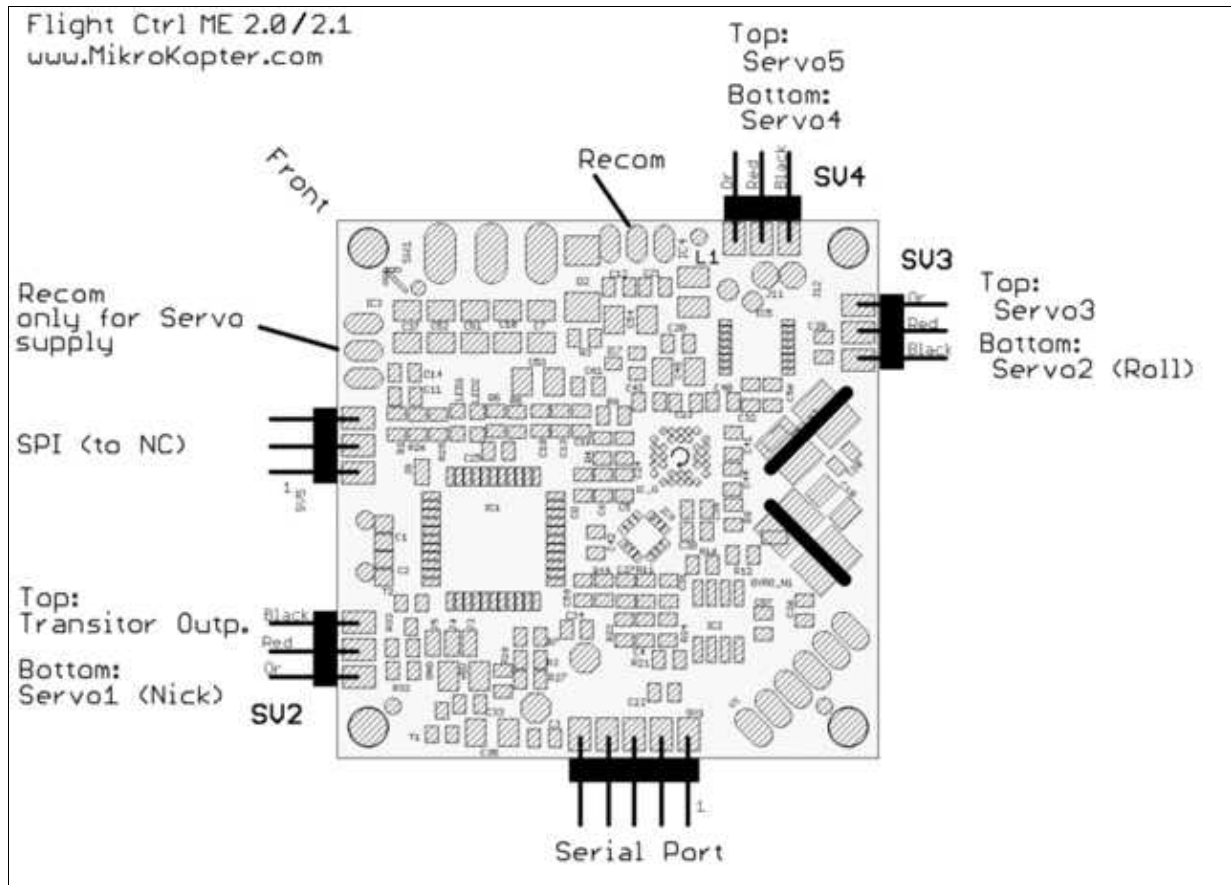
The buzzer is connected directly to the appropriate solder points of the powerboard (Buzzer / -).

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.

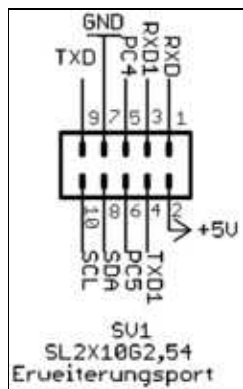
 When mounting the [FlightCtrl](#), the printed arrow shows to the rigger No.1 (red rigger). The PCB populated side facing up.

3 Connections



(FC2.1 and FC2.0 are identical except the new Molex Connector)

3.1 Connectors SV1



3.2 Connectors SV2

Upper Row (switchable outputs)

Pin1: 100mA switchable output with NON Open Collector for LED's, Programmable with MK Koptertool with J16.

Pin3: +5 Volt

Pin5: 100mA switchable output with NON Open Collector for LED's, Programmable with MK Koptertool with J17.

Lower row: Nick-Servo Output

Pin2: Servo 1 output (for Nick-Servo camera stabilization)(adjustable via MK Koptertool)

Pin4: +5V

Pin6: GND

Attention: the servo outputs get activated after the calibration of the gyros. Push the throttle lever in the upper left corner until you hear the buzzer and the green LED turns off.

3.3 Connectors SV3

Upper row: Servo 3

Pin1: Servo 3 output

Pin3: +5V

Pin5: GND

Lower Row: Roll-Servo Output

Pin2: Servo 2 Output ([Setting in Koptertool](#))

Pin4: +5V

Pin6: GND

3.4 Connectors SV4

Upper row: Servo 5

Pin1: Servo 5 output

Pin3: +5V

Pin5: GND

Lower Row: Servo 4

Pin2: Servo 4 output

Pin4: +5V

Pin6: GND

4 Receiver Connection

Please note, that you have to choose the right receiver in the settings under "Channels".

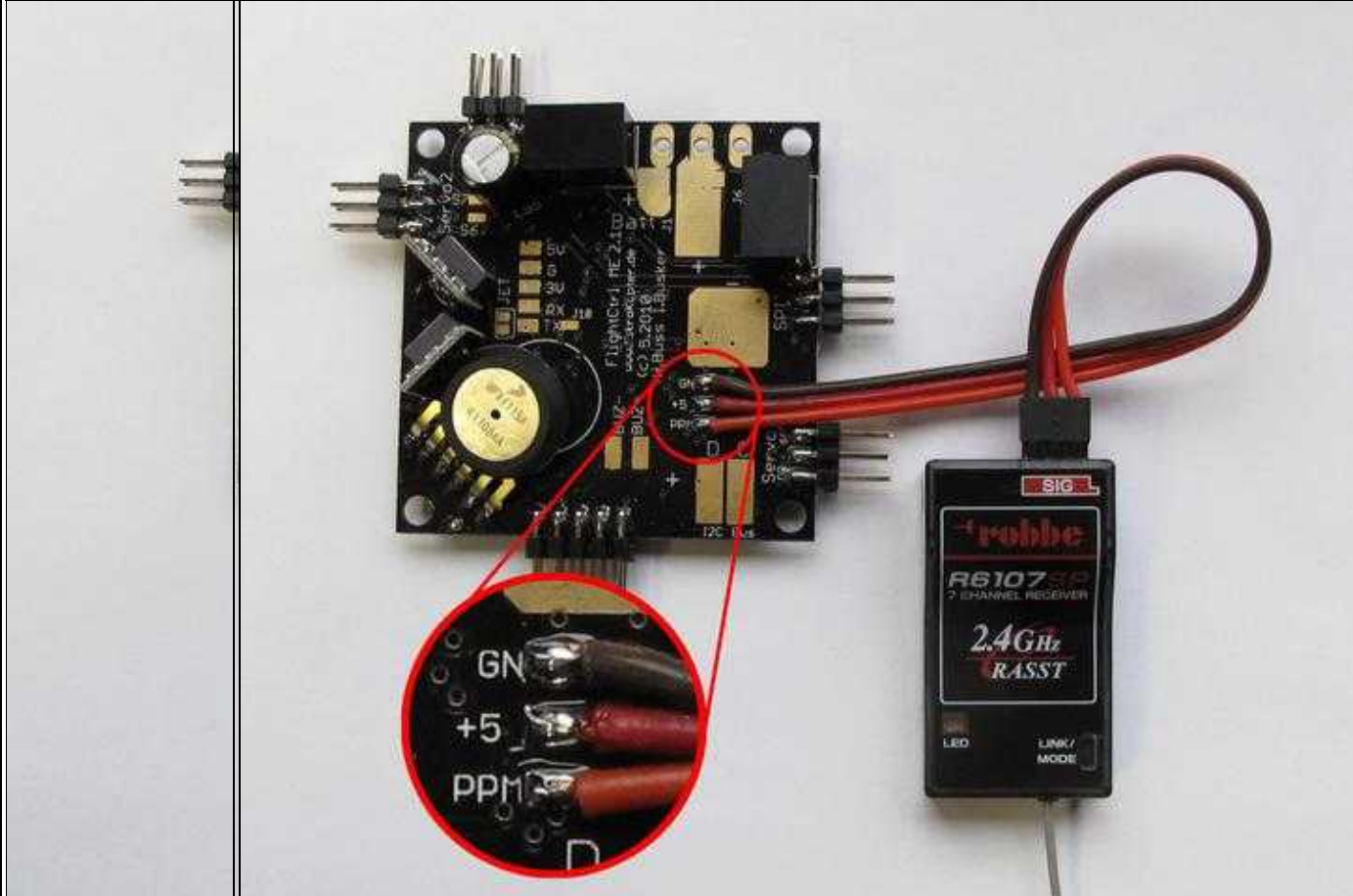
4.1 Standard PPM-Receiver

Examples:

- [DSL4TOP](#) (35/40MHz)
- [R6107SP](#) Futaba 2,4GHz

Connection:

PPM - sum signal		
Pad	Function	Cable color
GN	GND/Minus	Black
+5	Plus 5V	Red
PPM	data connection	Orange



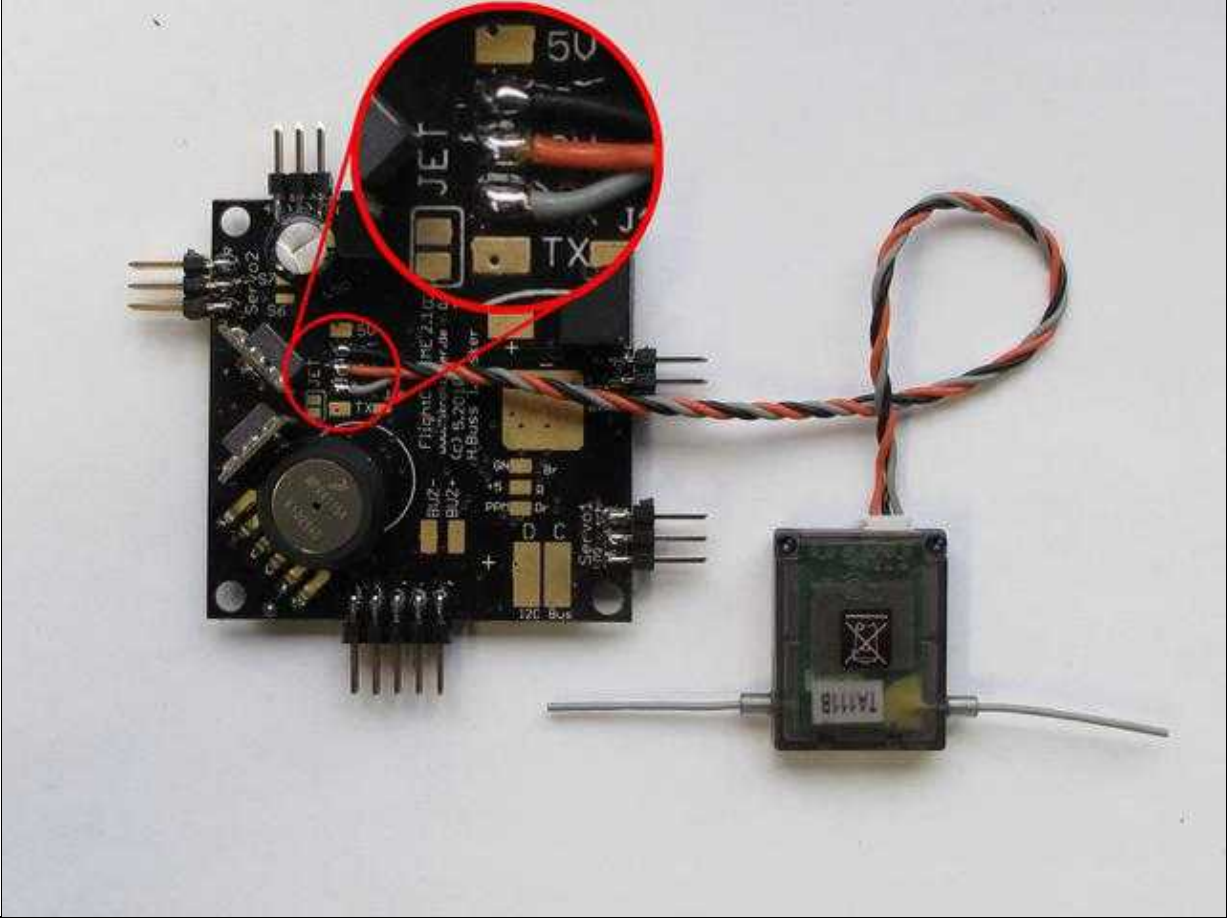
Click to enlarge the image

4.2 Spektrum Satellite Receiver

The 3,3V power connection for the satellite receiver is on the bottom side of the Flight Controller.

Connection:

2nd serial port connection		
Pad	Function	Cable color
G	GND/Minus	Black
3V	Plus 3V	Orange
RX	data connection	Gray



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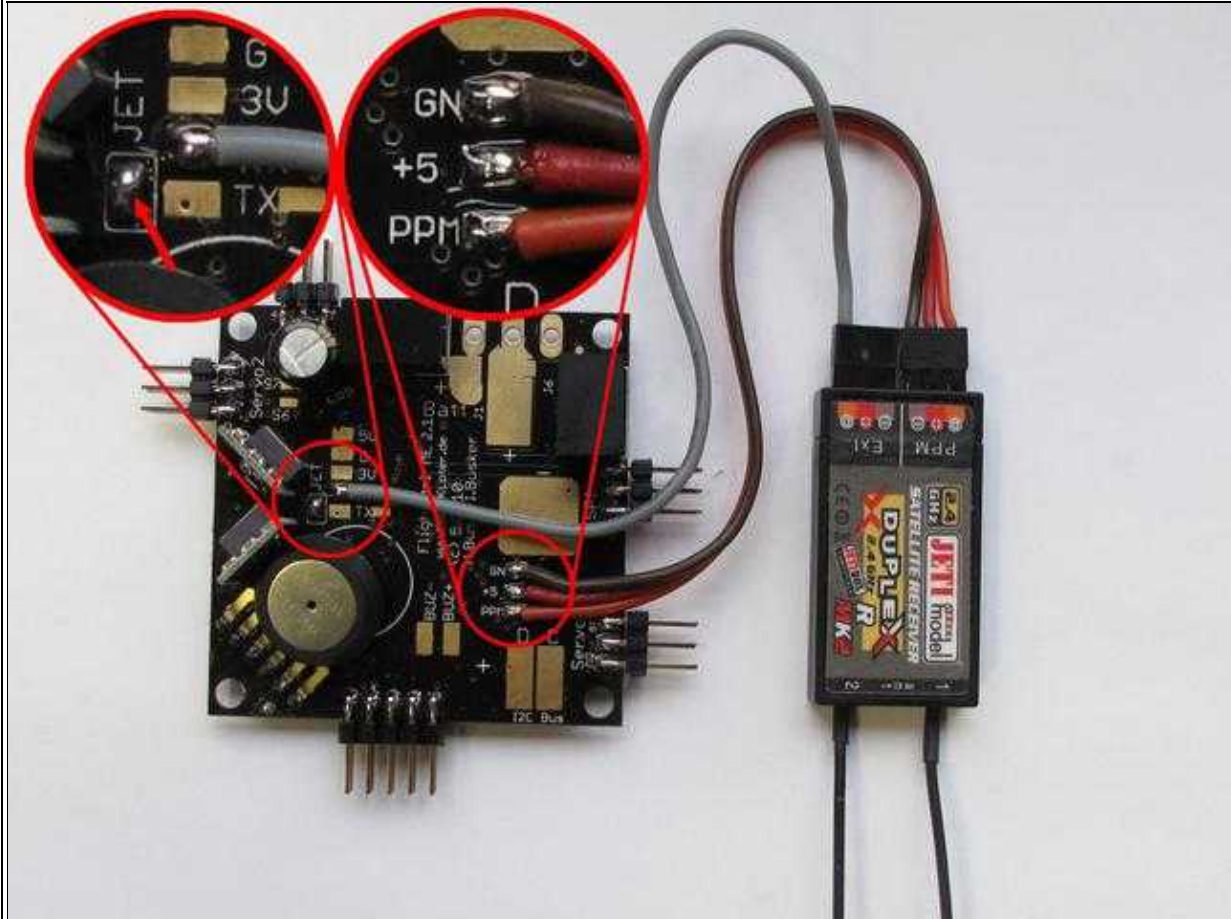
Also see: [Spektrum](#)

4.3 Jeti Satellite Receiver

The external diode is already integrated into the FC2.1 circuit and therefore will not have to get soldered.

Connection:

PPM - sum signal + Telemetry		
Pad	Function	Cable color
GN	GND/Minus	Black
+5	Plus 5V	Red
PPM	data connection	Orange
RX	Telemetry connection	User defined
JET	solder bridge for Telemetry	-



Click to enlarge the image

Also see: [JetiDuplex](#)

4.4 HoTT Receiver

Since Software version V0.86

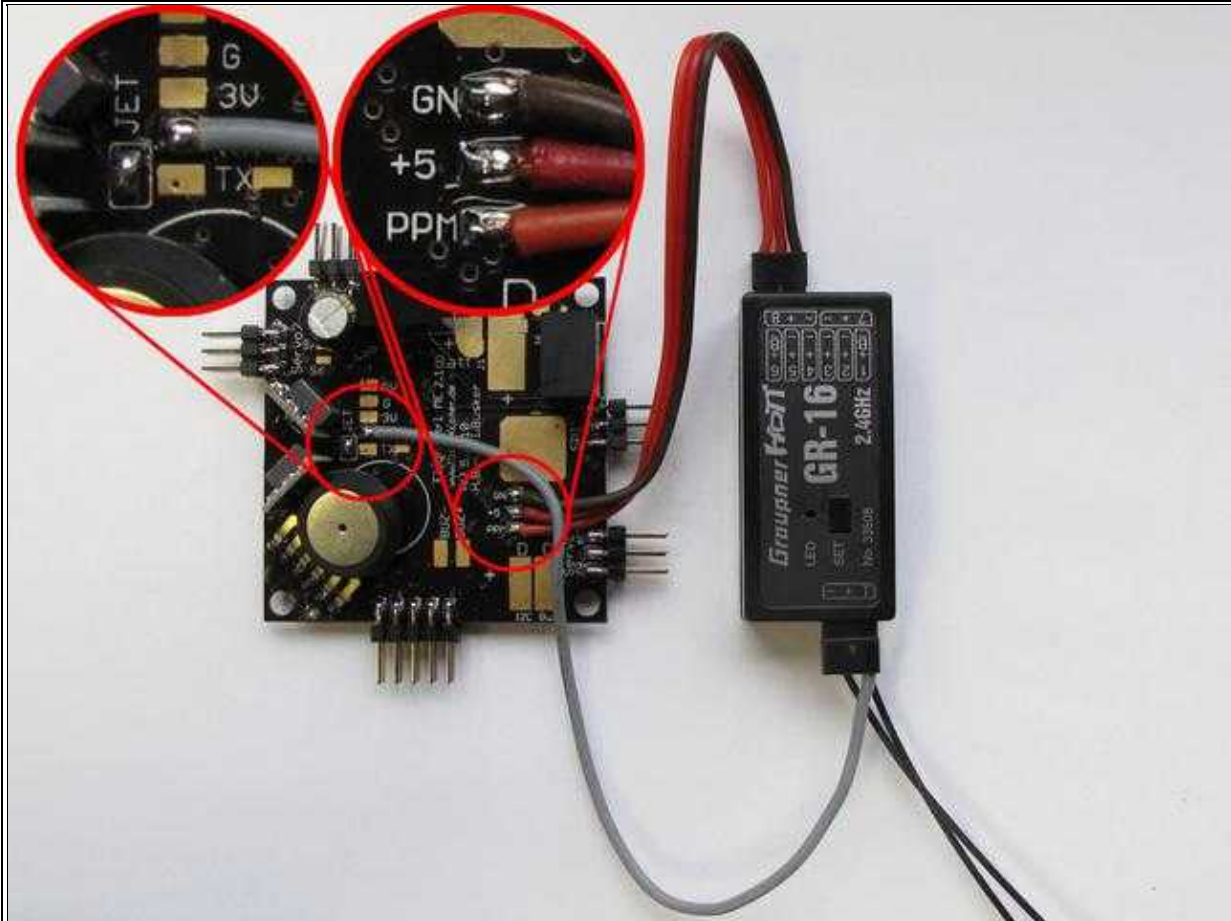
The HoTT receiver will also be connected to the PPM and RX pads of the [FlightCtrl](#). To send the telemetry a solder bridge on "JET" is needed.

More information about the HoTT-System you can find here: [HoTT](#)

Connection:

PPM - Sum signal + Telemetry

Pad	Function	Cable color
GN	GND/Minus	Black
+5	Plus 5V	Red
PPM	data connection	Orange
RX	Telemetry connection	User defined
JET	solder bridge for Telemetry	-



Click to enlarge the image

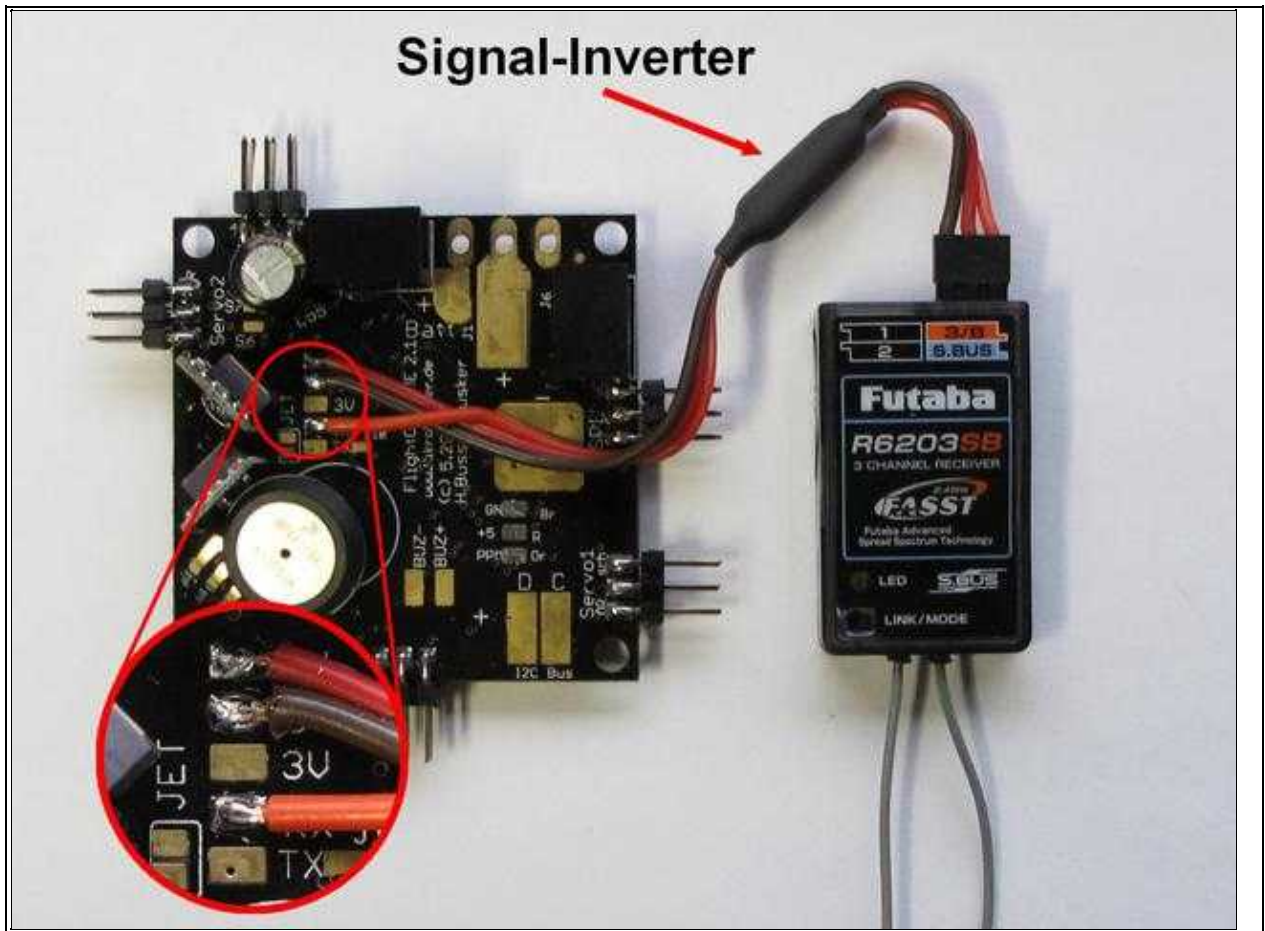
4.5 Futaba S.Bus Receiver

Since Software version V0.88 / [FlightCtrl](#) V2.1

A S.Bus receiver can be connected with a signal-inverter to the [FlightCtrl](#).
The needed Signal-Inverter you can get here: [Shoplink](#)

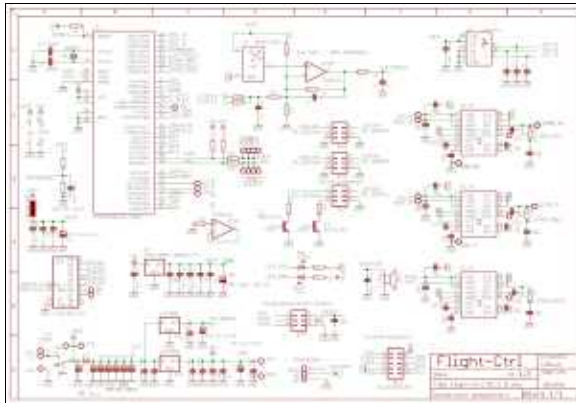
Connection:

2nd serial port connection		
Pad	Function	Cable color
5V	Plus 5V	Red
G	GND/Minus	Black
RX	data connection	Orange



Click to enlarge the image

5 Wiring Diagram



⚠ The usage of [MikroKopter](#) Software is only permitted on original [MikroKopter](#) hardware.

6 Hardware Changes since V2.00

- new controller with double the flash memory (ATMEGA1284P)
- Molex-connector for easy power distribution board connection
- integrated power supply for Spektrum Satellite receiver
- JET connector bridge for easy usage for JETI down-link
- Adjustable resistor for pressure sensor to accommodate 2000-3000 meters in elevation depending on weather
- resistor adjustment for I2C Pull-Ups.
- Protection diode for Buzzer
- new black color

6.1 What's included and what has changed compared with V2.0

- Pressure Sensor MPX4115A is included
- 2 power regulators (recom or similar) are included to supply your flight controller and servos with power
- power switch is NOT included and has to get ordered separately

7 Other

- the boot loader for FC2.1 is not public domain and can not be read out thanks to our good friends in china.
- a [AtMega1284](#) Prozessor with programmed bootloader is available [here](#)
- under no circumstances is it allowed to program or delete the ISP with Atmel programmers

8 Software Development

- For software development for the new [AtMega1284](#) processor and you need the [WinAVR-20060421 Compiler](#) and a [special Patch from H&I](#).
- In addition, in the makefile of the project, change the processor to "MCU = ATMEGA1284P".

9 Upgrade for 5S and 6S LiPo

Should a 5S or 6S Lipo be used instead of a 4S Lipo, the Recoms regulator must be replaced with an appropriate Traco DC/DC regulator.

Furthermore, all electrolytic capacitors in the input area should be exchanged with 25V-rated types. All reconstructions of the [FlightCtrl](#) board are taken at your own risk.

- The voltage regulator must be replaced with one of a correspondingly high input voltage range (e.g. [Traco TSR1-2450](#)) as the Recoms only permits up to 18V input voltage. Costs about €9.
 - All SMD capacitors in the input area should be rated to 25V. However, the Kerko - subject to availability upon placer - also only 16V. (yes, the FC is also sold as a max. 4s in the shop) If in doubt, replace.
 - Exchange the large radial leaded capacitor "C55" for a 330µF/25V type.
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- [KategorieMK-Baugruppe/en](#)