

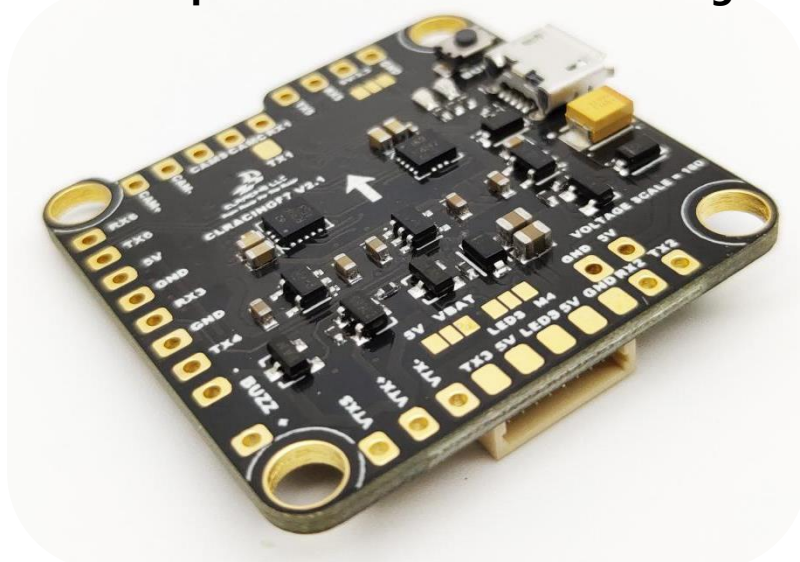


# CLRACINGF7 DUAL V2.1

## The Flight Controller for RACERS

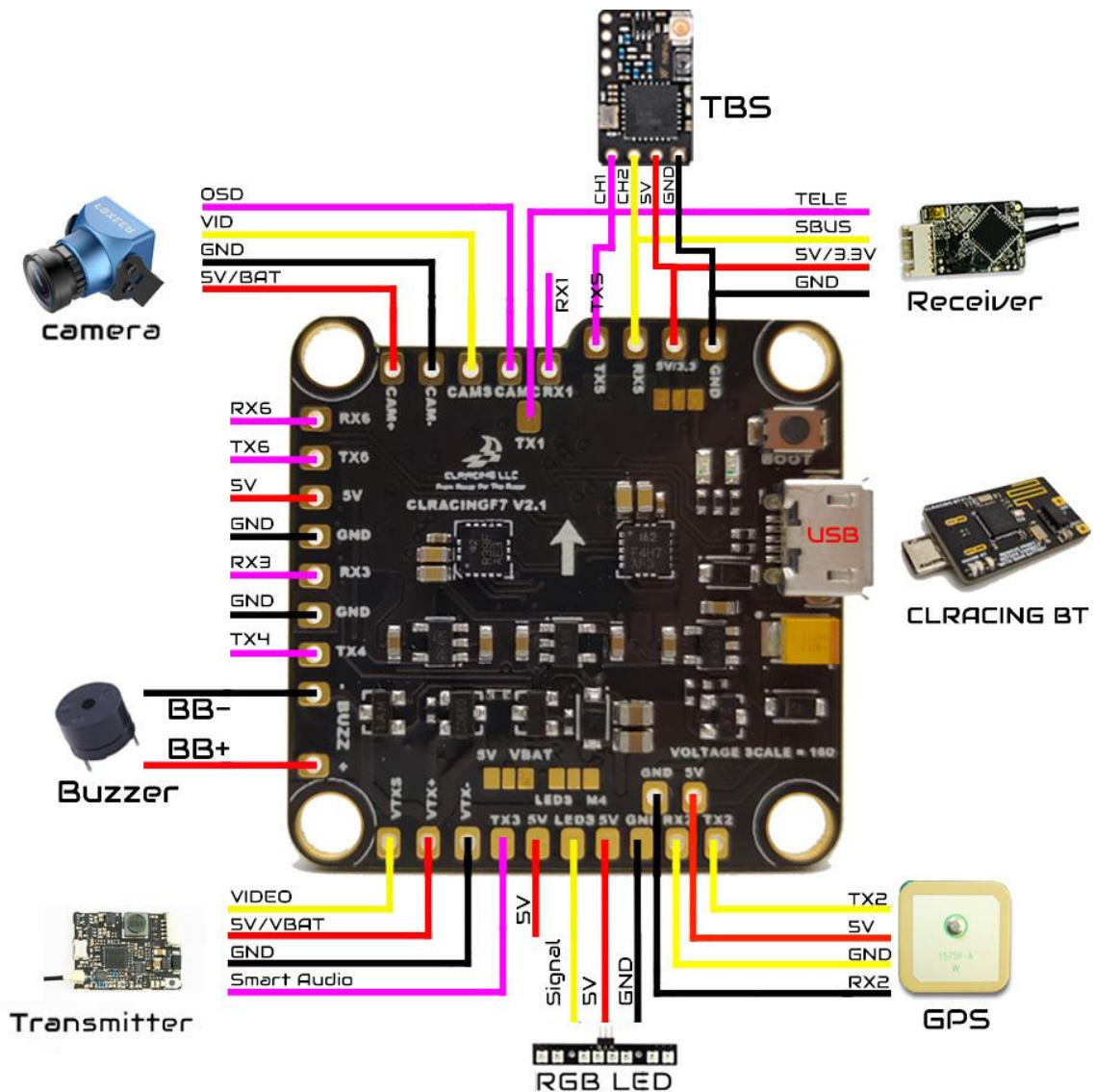
### Main Features

1. MCU: STM32F722RET6216MHz
2. DUAL 6-Axis ICM20602 Separated Interrupts
3. Build in Beta flight OSD
4. Up to 8S(36V) direct battery power
5. Build in Voltage monitoring resistor
6. Build in 5V/3A BEC and 3.3V/250mA for system
7. Led strip share 5V with 5V/3.0A BEC
8. 5V OR VBAT, camera and VTX POWER VIA Pit Switch
9. 6 Full UARTS: UART1, UART2, UART3, UART4, UART5, UART6
10. Build in Camera Control pin with necessary resistor and capacitor near camera connection
11. Buzzer pads for external buzzer
12. VBAT Polarity protection
13. Build in 32MB Blackbox flash chip
14. M4 Can be selected either led strip signal or M4 signal for RPM filtering
15. **plug and play with CLRACING BT Module. No extra battery needed.**  
**Flight controller will power the BT module through usb.**

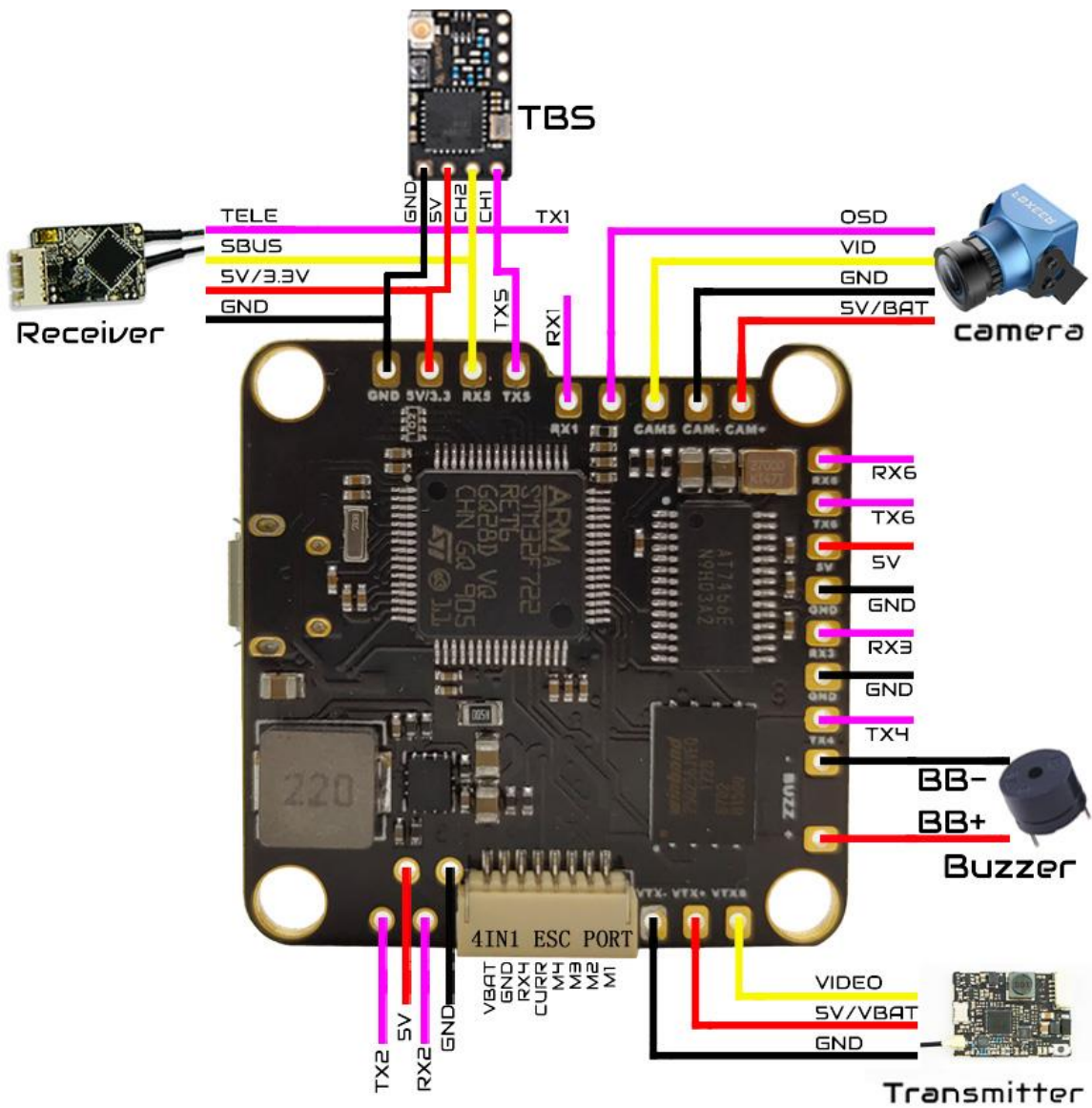


# General Overview

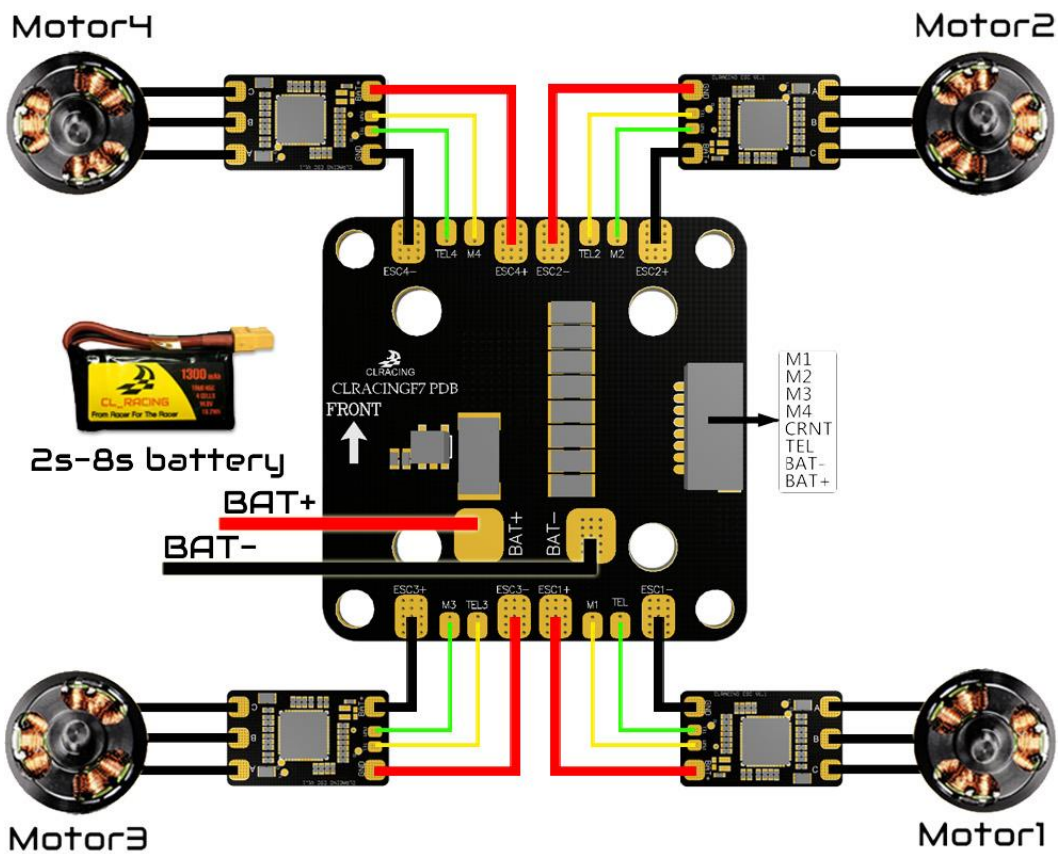
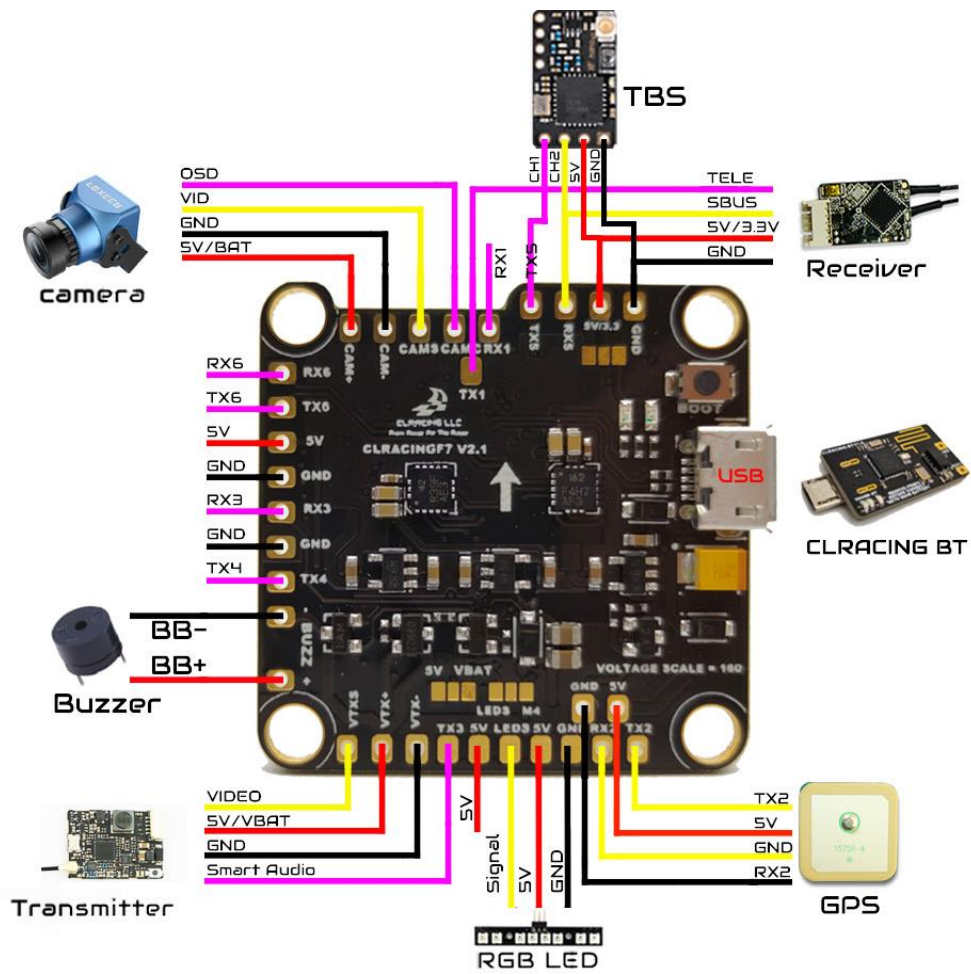
## 1. FC TOP VIEW



## 2. FC BOTTOM VIEW

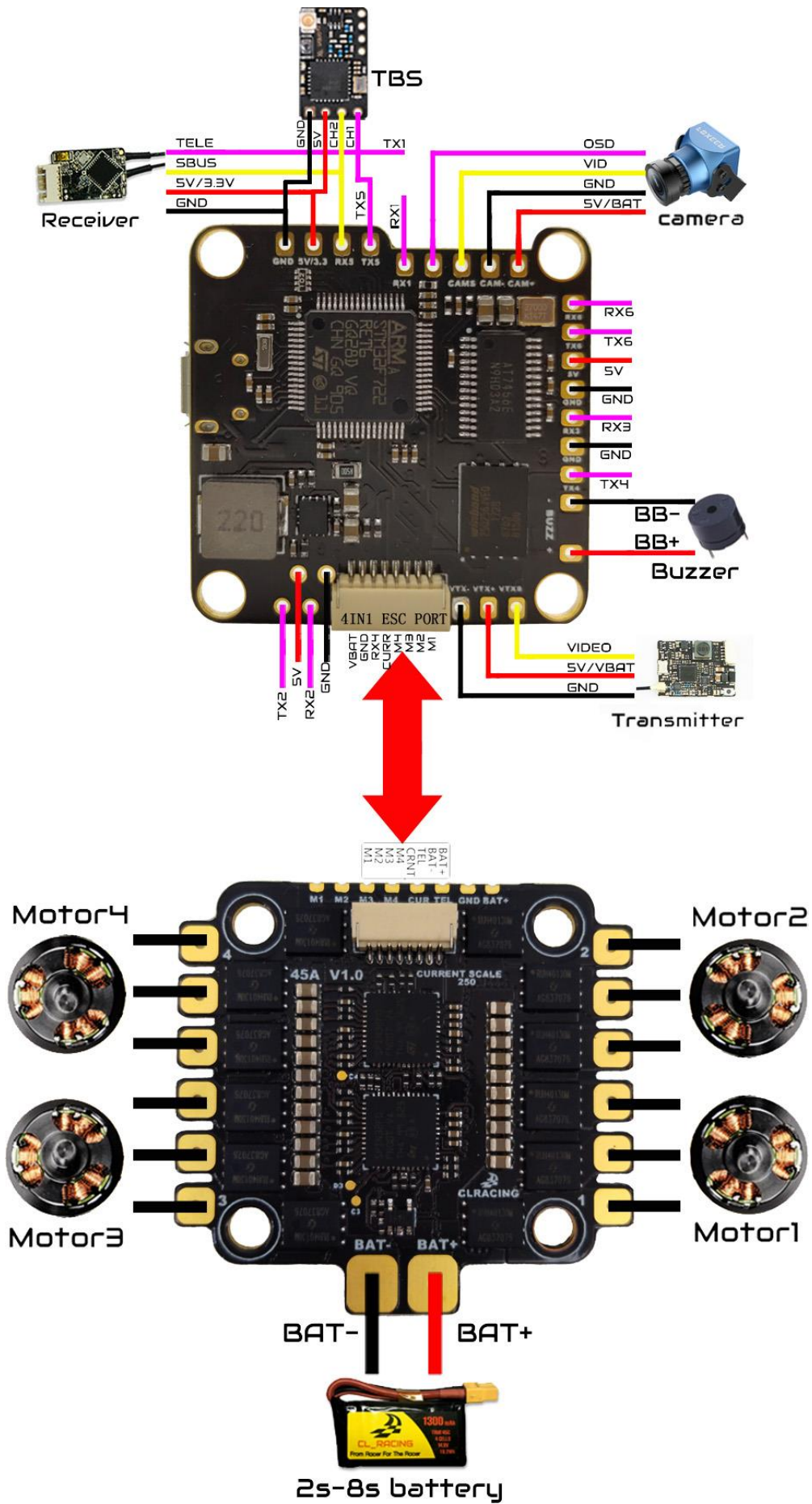


### 3. FC + 4in1 ESC





## 4. FC + 4in1 ESC



Pad Name	function	Pad Name	function
VBAT	POWER VBAT+	TX1	UART1 TX
GND	GROUND VBAT-	RX1	UART1 RX
CAM+	VBAT+ or 5V	TX2	UART2 TX
CAM-	GROUND VBAT-	RX2	UART2 RX
CAMC	CAMERA OSD PIN	TX3	UART3 TX
CAMS	CAMERA SIGNAL	RX3	UART3 RX
VTXS	VTX SIGNAL	TX4	UART4 TX
VTX+	VBAT+ or 5V	RX4	UART4 RX
VTX-	GROUND VBAT-	TX5	UART5 TX
LED_S	RGB LED SIGNAL	RX5	UART5 RX
BB+	BEEPER +	TX6	UART6 TX
BB-	BEEPER -	RX6	UART6 RX
ON	VTX POWER CONSTANT ON	5V	5V OUTPUT FROM FC
PIT	VTX POWER CONTROLABLE FROM RADIO		

# BETAFLIGHT SETUP

## 1. Sbus

Choose UART 5 AS Serial RX, Solder your sbus signal to RX5 pad

Ports Wiki

Note: not all combinations are valid. When the flight controller firmware detects this the serial port configuration will be reset.  
Note: Do NOT disable MSP on the first serial port unless you know what you are doing. You may have to reflash and erase your configuration if you do.

Identifier	Configuration/MSP	Serial Rx	Telemetry Output	Sensor Input	Peripherals
USB VCP	<input checked="" type="checkbox"/> 115200	<input type="checkbox"/>	Disabled   AUTO	Disabled   AUTO	Disabled   AUTO
UART1	<input type="checkbox"/> 115200	<input type="checkbox"/>	SmartPort   AUTO	Disabled   AUTO	Disabled   AUTO
UART2	<input type="checkbox"/> 115200	<input type="checkbox"/>	Disabled   AUTO	Disabled   AUTO	Disabled   AUTO
UART3	<input type="checkbox"/> 115200	<input type="checkbox"/>	Disabled   AUTO	Disabled   AUTO	TBS SmartAuc   AUTO
UART4	<input type="checkbox"/> 115200	<input type="checkbox"/>	Disabled   AUTO	Disabled   AUTO	Disabled   AUTO
UART5	<input type="checkbox"/> 115200	<input checked="" type="checkbox"/>	Disabled   AUTO	Disabled   AUTO	Disabled   AUTO
UART6	<input type="checkbox"/> 115200	<input type="checkbox"/>	Disabled   AUTO	Disabled   AUTO	Disabled   AUTO

Then in the configuration tab Choose

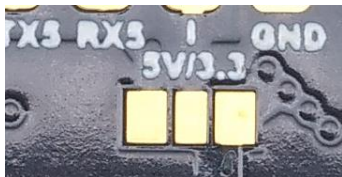
**Receiver**

Serial-based receiver (SPEKSAT, S) Receiver Mode

Note: Remember to configure a Serial Port (via Ports tab) and choose a Serial Receiver Provider when using RX\_SERIAL feature.

SBUS Serial Receiver Provider

## 2. RX Voltage selection Jumper



Solder on the left will output 5v , Solder the jumper on the right will output 3.3V

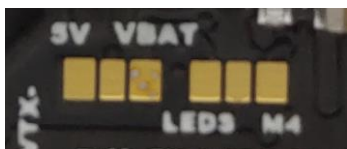
## 3. Smart port telemetry

Choose UART1 AS Smart port on the telemetry output, then go to CLI

Enter set tlm\_halfduplex = OFF, Save

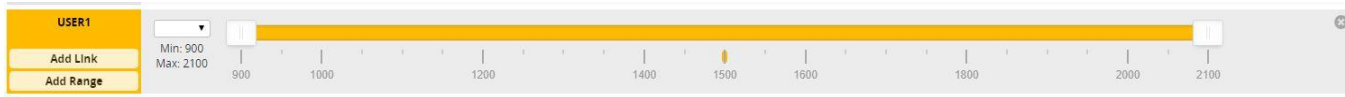
Identifier	Configuration/MSP	Serial Rx	Telemetry Output	Sensor Input	Peripherals
USB VCP	<input checked="" type="checkbox"/> 115200	<input type="checkbox"/>	Disabled   AUTO	Disabled   AUTO	Disabled   AUTO
UART1	<input type="checkbox"/> 115200	<input type="checkbox"/>	SmartPort   AUTO	Disabled   AUTO	Disabled   AUTO
UART2	<input type="checkbox"/> 115200	<input type="checkbox"/>	Disabled   AUTO	Disabled   AUTO	Disabled   AUTO
UART3	<input type="checkbox"/> 115200	<input type="checkbox"/>	Disabled   AUTO	Disabled   AUTO	TBS SmartAuc   AUTO
UART4	<input type="checkbox"/> 115200	<input type="checkbox"/>	Disabled   AUTO	Disabled   AUTO	Disabled   AUTO
UART5	<input type="checkbox"/> 115200	<input checked="" type="checkbox"/>	Disabled   AUTO	Disabled   AUTO	Disabled   AUTO
UART6	<input type="checkbox"/> 115200	<input type="checkbox"/>	Disabled   AUTO	Disabled   AUTO	Disabled   AUTO

## 4. Use True Pit mode for Team racing



**VBAT and 5V jumper control both VTX power and Camera Power. You must Select either VBAT(BATTERY POWER) or 5V for you VTX, and set up the pit mode switch in the mode tab(Betalight ) in order to get power to VTX and camera**

- a. if you want VTX and camera on all the time, Set the user1 mode as follow picture



**b. Set up the using switch to control Pit mode**

go to “mode tab “set USER1 on a AUX switch you prefer

**CAUTION:** when using PIT mode, FC power up will not power your VTX until you turn on the switch on your radio you assigned to the VTX PIT mode

5. Need to solder either M4 side or LEDS side for motor 4 signal. If there is not solder jumper, motor 4 will not have any signal. Both LEDS and M4 can be use for rpmfiltering. FOR BETAFLIGHT V4.1 and up just use M4 as motor 4 signal.



5.1 If you solder on the M4 side of the jumper, you don’ t need to do any resource mapping,

5.2 if you solder on the LEDS side of the jumper, do the resource mapping as follow

- Resource LEDS none
- Resource MOTOR 4 NONE
- Resource MOTOR 4 B01
- Save