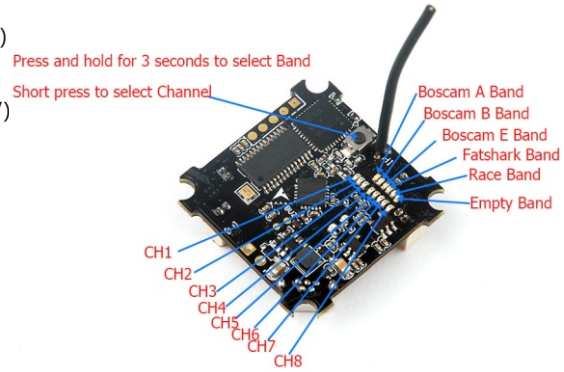
# Beecore VTX brushed flight controller for Tiny whoop

## 1.Specifications:

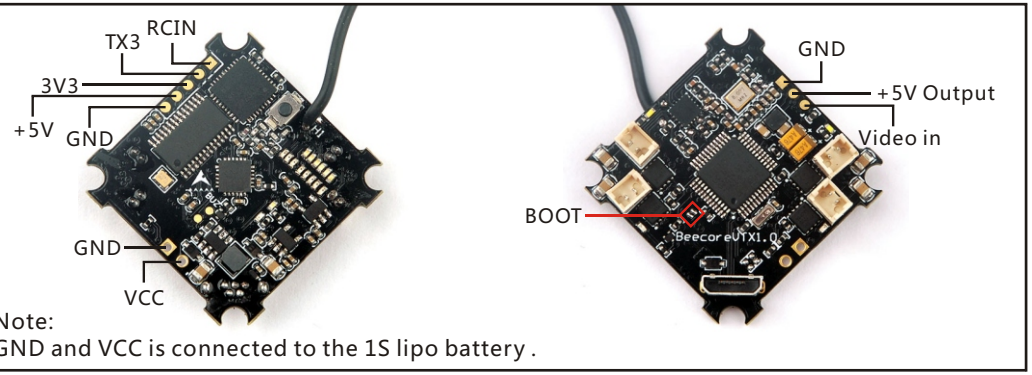
MCU: STM32F303CCT6 (72MHZ, 256K FLASH)
Sensor: MPU-6000(SPI connection)
Power supply: 1S battery input (DC 3.5-4.35V)
Built-in Betaflight OSD(SPI Controll)
Built-in 5.8G 25mw 48ch vtx
Smartaudio function ready
Heading LED Ready
Mount hole distance: 26mm * 26mm
Board size:29mm*29mm
Board weight: 4.0 g




## 2.Features:

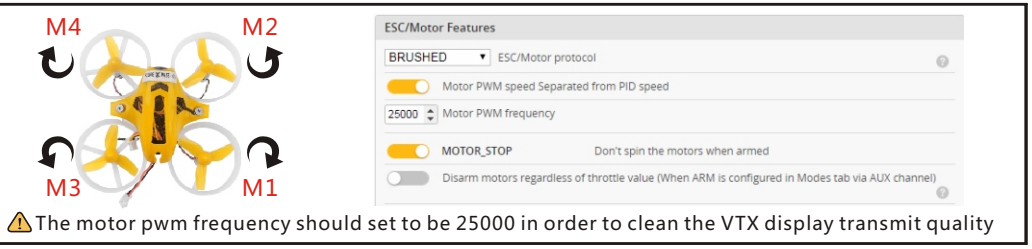
With 4 large current NMOS transistors, operating current of up to 10A each
Built-in OSD(Using F3 MCU controls OSD over SPI bus in DMA mode)
Smartaudio ready, you can change the VTX channels by your radio sticks
PPM/SBUS/IBUS/DSM2/DSMX ..etc protocol receiver compatible
Best for Tinywhoop style brushed frame , perfect flight controller replacement for Kingkongrc/ LDARC Tiny6/6x/7/7x/8/8x

## 3.Connection diagram:




Note:
GND and VCC is connected to the 1S lipo battery .

## 4.Mixer type and ESC/Motor protocol

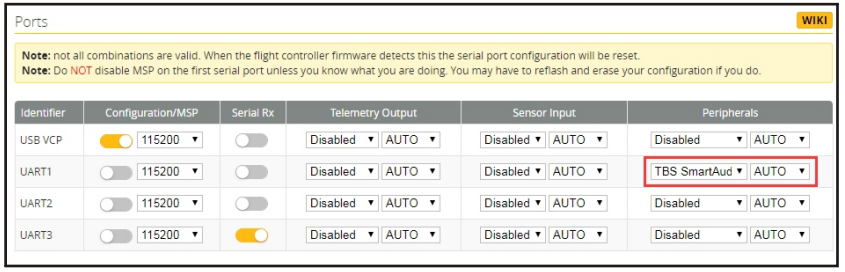


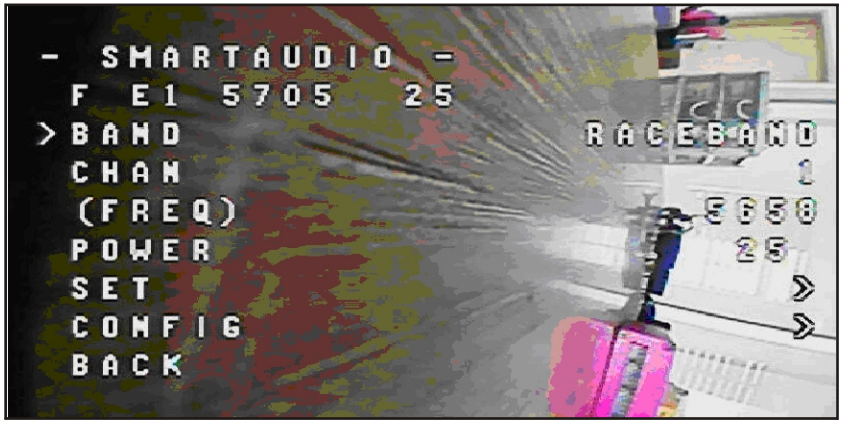

⚠The motor pwm frequency should set to be 25000 in order to clean the VTX display transmit quality

## 5.VTX channel list and Switch channel

| Band \ Channel | CH1 | CH2 | CH3 | CH4 | CH5 | CH6 | CH7 | CH8 |
|---|---|---|---|---|---|---|---|---|
| A(BoscamA) | 5865 | 5845 | 5825 | 5805 | 5785 | 5765 | 5745 | 5725 |
| B(BoscamB) | 5733 | 5752 | 5771 | 5790 | 5809 | 5828 | 5847 | 5866 |
| E(BoscamE) | 5705 | 5685 | 5665 | 5645 | 5885 | 5905 | 5925 | 5945 |
| F(Fatshark) | 5740 | 5760 | 5780 | 5800 | 5820 | 5840 | 5860 | 5880 |
| R(Race Band) | 5658 | 5695 | 5732 | 5769 | 5806 | 5843 | 5880 | 5917 |

There are 3 ways to switch the vtx channels:
1.Short press to choose the VTX channel, press and holding the button to choose the VTX Band (Can't save , it will lost the channel while power off)
2.Go to Betaflight CLI ,type the command:
Set vtx_band=3
Set vtx_channel=1
Set vtx_freq=5705
save
Notes: The vtx_freq should match the vtx_band and vtx_channle as the VTX Channel list shows.
For example, if you set vtx_freq=5732, you should set vtx_band=5 and vtx_channel=3
3.Enable Smartaudio for UART1, then move the stick of the transmitter (THR MID+YAW LEFT + PITCH UP) to enter OSD Menu, Enter to Features, then enter to VTX SA



## 6.Firmware update:

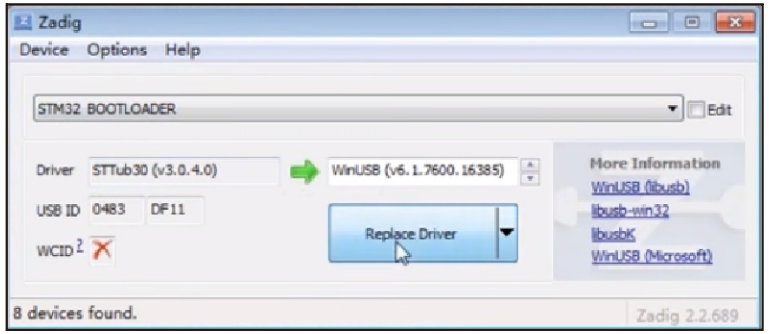
1.Install latest STM32 Virtual COM Port Driver http://www.st.com/web/en/catalog/tools/PF257938

2.Install STM BOOTLOAD Driver (STM Device in DFU MODE)

3.Open Betaflight configurator and choose firmware target “OMNIBUS”,then select the firmware version

4.There are 2 ways to get in DFU Mode: 1). solder the boot pad and then plug USB to comuper 2). loading betaflight firmware and hit “flash”, then it will getting into DFU Mode automatically

5.Open Zadig tools to replace the drivers from STM32 Bootloader to WINUSB Driver

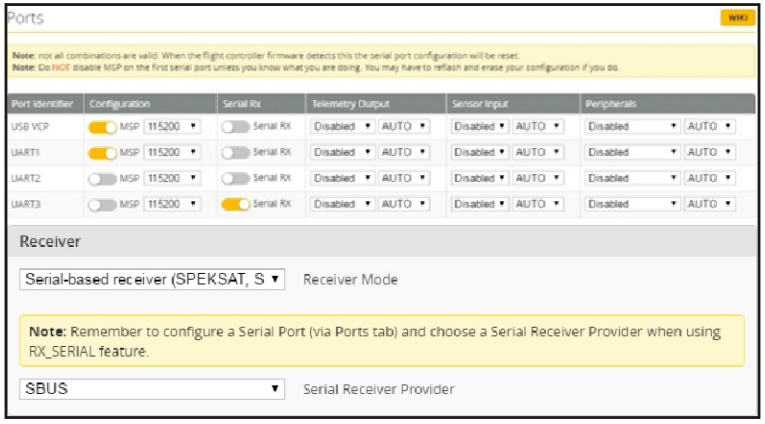



6.Reconnect the flight controller to the computer after replace driver done , and open Betaflight configurator, loading firmware and flash.

## 7.Receiver configuration:

1.SBUS Receiver:

Connect your SBUS receiver to [RCIN +5V GND] port; Enable Serial_RX for UART3 from the Port tab in Betaflight configurator, then select SERIAL-based receiver from the RECEIVER Mode and set the Serial Receiver Provider to be SBUS in Betaflight Configurator.



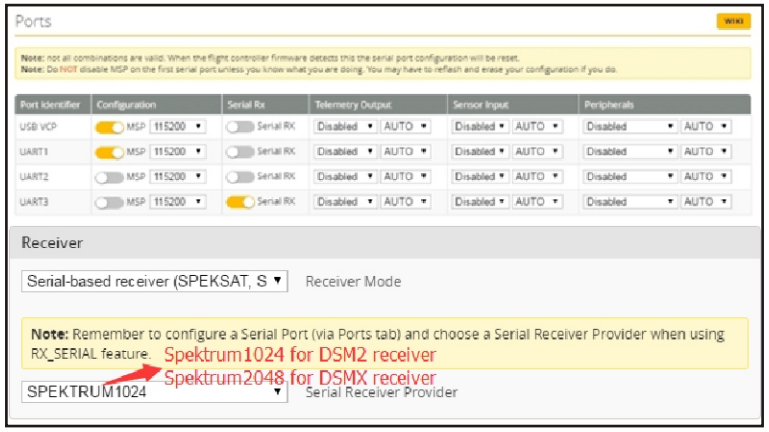

2.PPM Receiver:

Connect your PPM receiver to [RCIN +5V GND] port and then set the Receiver Mode to RX_PPM from the configuration in Betaflight configurator.




3.DSM2/DSMX Receiver

Connect your DSM2/DSMX receiver to [RCIN +3.3V GND] port, Enable Serial_RX for UART3 from the Port tab in Betaflight configurator, then select SERIAL-based receiver from the RECEIVER Mode and Select SPEKTRUM1024 for DSM2 Radio; Select SPEKTRUM2048 for DSMX Radio in Betaflight Configurator.




4.Flysky IBUS Receiver

Connect your IBUS receiver to [RCIN +5V GND] port, Enable Serial_RX for UART3 from the Port tab in Betaflight configurator, then select SERIAL-based receiver from the RECEIVER Mode and Select IBUS in Betaflight Configurator.