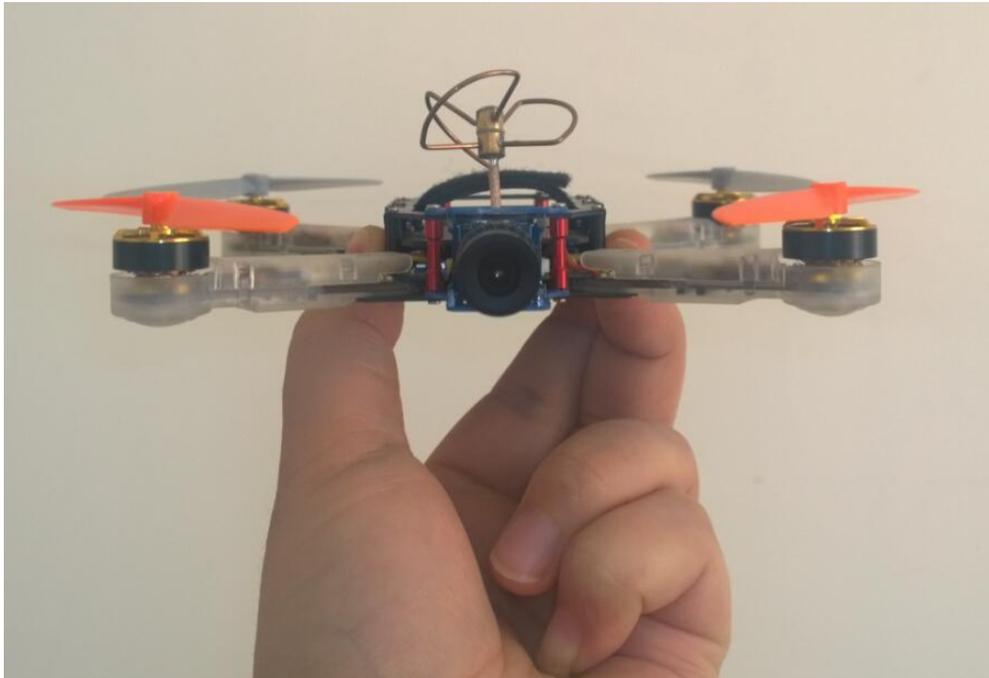


Hermit 145 V2 Micro brushless FPV quadcopter



Hermit 145 V2 is a newly designed micro FPV quadcopter of only 158mm (Diagonal from motor center to motor center), its small size can make it fly in a relatively confined space easily. It is installed a 5.8G/300mw analog video transmitter (VTX) supporting 40 channels, an analog camera(120°), a flight control board supporting CleanFlight and BaseFlight firmware), a buzzer, three onboard full color LED tail lights, a compatible receiver (three options), a DCDC power, a integrated control board with OSD etc. In addition, its camera is orientation adjustable.

Features:

- 1) Weight: 84.0g (not including battery)
- 2) Flight weight: 112.0g (450mAh/25C/7.4V); 128g (850mAh/25C/7.4V)
- 3) Flight time: 9 minutes (450mAh/25C/7.4V); 12 minutes(850mAh/25C/7.4V)
- 4) Working voltage: 7V~8.4V (2S)
- 5) Diagonal from motor center to motor center: 158mm
- 6) Propeller diameter:90mm
- 7) ESC: MU-3A-L1(max working votage:8.4V)
- 8) STM32F103CBU6 main control/72MHz
- 9) Support an outside compass, sonar and GPS
- 10) Camera angle adjustable:+/- 25°
- 11) It uses brushless micro motors of high efficiency (5.6g, 4000KV)
- 12) There are 3 options for the integrated receivers: compatible DSMX/DSM2 receiver; compatible FUTABA SFHSS receiver, compatible FlySky AFHDS receiver (we are developing other compatible receivers at the moment)

Other features:

- 1) The battery can be changed and mounted by only one hand
- 2) Binding operation can be done by one hand too.

Functions for hardware

- 1) The integrated analog 5.8G/300mw video transmitter supports up to 40 channels (frequencies)
- 2) Supports ONESHORT125 high speed ESC mode
- 3) Supports changing ESC parameters or upgrading ESC firmware through flight control board
- 4) Supports setting up OSD parameters and upgrading OSD firmware;
- 5) Customer can add or change many kinds of compatible receiver according to their request.

Binding operation:

- 1) If what you ordered is the following receiver on your Hermit 145 V2 (old receiver, only compatible with DSM2-7CH), its binding operation is the following:
Press the binding switch on the receiver (green LED is on), then power FC board, release the binding switch, the green LED on the receiver flashes quickly (the receiver enters binding mode);
Press the binding switch on the DSM2 transmitter and then turn on the power;
When the fast flashing LED on the receiver is off and then comes to steady bright on, it indicates the binding is succeed, or repeat the above process.
- 2) If what you ordered is any receiver (new version receivers) from the following picture, its binding process is like the following:



(From left to right: DSMX/DSM2-7CH compatible receiver; Futaba SFHSS-8CH compatible receiver; Flysky AFHDS-8CH compatible receiver)

Power Hermit 145 V2, long press the binding button on the compatible receiver, when the steady on red LED turns to flashing, release the binding button and it enters binding mode. Then make the transmitter enter binding mode (please check the binding mode on the manual of transmitter you are using), when the fast flashing red LED on the receiver stays steady on, it shows the binding is succeed, or repeat the above process.

Operation on how to change the frequency of 5.8G analog video transmitter:

The VTX frequency includes a group of frequency and its sub frequency, in this case, changing frequency needs to take 2 steps: 1) set up a frequency group; 2) set up sub frequency.

After Hermit 145 V2 is powered, all the 6 LED lights indicating VTX working come to on and then flash two times (the flashing LED ON/OFF status shows the working frequency of VTX). Long press the set switch till LED3 changes from ON to OFF, then release the switch (the ON/OFF status of the 6 LEDs shows the present working frequency of VTX) and it enters setting up mode for group frequency (the

yellow LED-A, LED-B and LED-C shows the mode), the yellow LED ON/OFF status will be changed by short press the switch each time, when the wanted frequency group comes out, long press the switch till all the LEDs are on the off status, then release the switch and enter the setting up mode for sub frequency (the red LED1, LED2 and LED3 shows this mode), short press switch each time can change the red LED ON/OFF status, long press the switch when the wanted sub frequency comes out till all of the LED are on OFF status, then 6 LEDs flashes two times (the flashing LED ON/OFF status shows the working frequency of VTX), which indicates the frequency setting up is finished.

Note: if what customer wants is to only set up frequency group or sub frequency, just long press the setting up switch when it enters group frequency setting or sub frequency setting, and then it enters next process.

Check the frequency operation of 5.8G analog VTX:

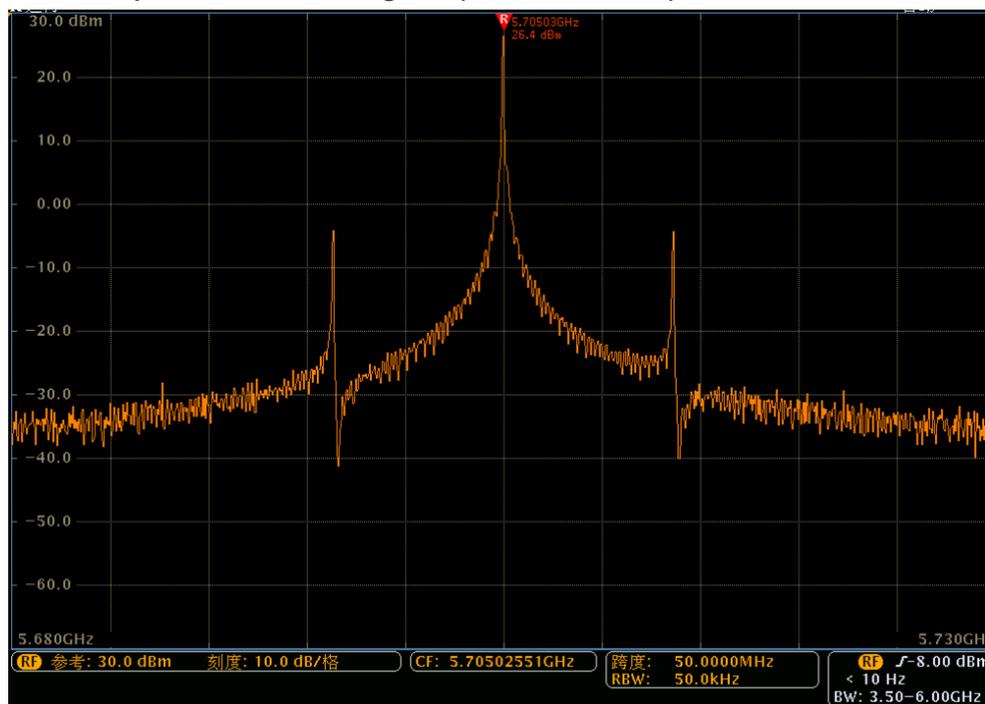
After Hermit 145 V2 is powered, all 6 LEDs come steady on and then flashes two times, then short press the switch and release it, the ON/OFF status of all 6 LEDs indicates the working frequency of VTX.

The corresponding table for LED status and VTX working frequency (40 frequencies)

Group frequency (yellow LED)	Sub frequency (red LED)							
LEDA,LEDB,LEDC	LED1,LED2,LED3							
	000	001	010	100	011	101	110	110
000	5740M	5760M	5780M	5800M	5820M	5840M	5860M	5880M
001	5865M	5845M	5825M	5805M	5785M	5765M	5745M	5725M
010	5733M	5752M	5771M	5790M	5809M	5828M	5857M	5866M
011	5705M	5685M	5665M	6545M	5885M	5905M	5925M	5945M
101	5658M	5695M	5732M	5769M	5806M	5843M	5880M	5917M

Note: "0" means LED OFF; "1" means LED "ON"

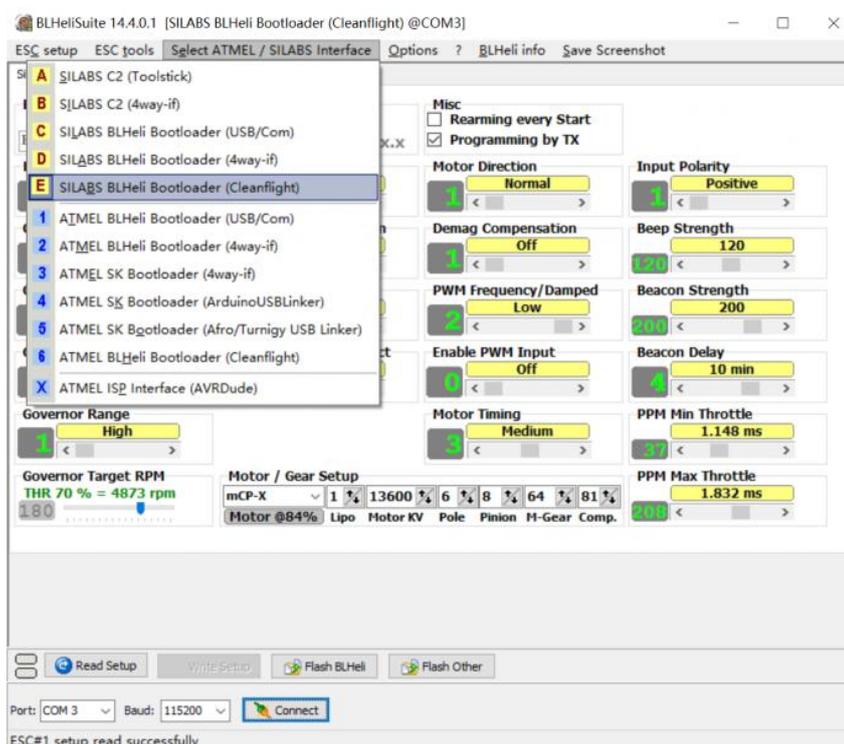
Power test picture for 5.8G analog VTX (26.4dBm@5.705G):



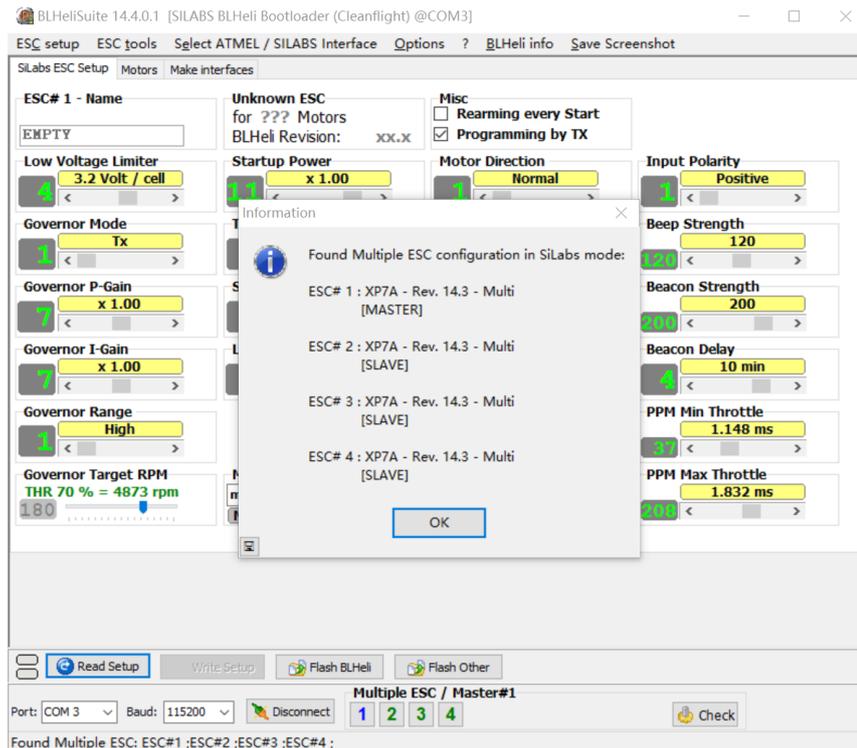
How to change the parameter of ESC and update the firmware of ESC:

You can change the ESC parameter and update its firmware when the firmware of Hermit 145 V2 is Cleanflight NAZE V1.12 version or above and the firmware of ESC is BLHeli v12.0 version or above. The detail operation is the following:

- 1) Turn the tail switch on Hermit 145 V2 to “FC”, connect the power and connect the quadcopter to computer by USB cable.
- 2) Open BLHeli GUI software on your computer (ensure that CP2102 driver was installed and the connection with CleanFlight GUI was disconnected), select SILABS BLHeli Bootloader(cleanflight), and then select the serial number of Hermit 145 V2 (different computer comes with different serial number)



- 3) Click “connect” on BLHeli GUI, then click “Read Setup”, the following picture appears, click “OK”, then you can change the parameter of ESC and update the firmware of ESC.
- 4) Click “connect” on BLHeli GUI, then click “Read Setup”, the following picture appears, click “OK”, then you can change the parameter of ESC and update the firmware of ESC.



Note: The updated firmware should be BLHeli V12.0 version or above, otherwise, you can not change or update ESC firmware through Hermit 145 V2.

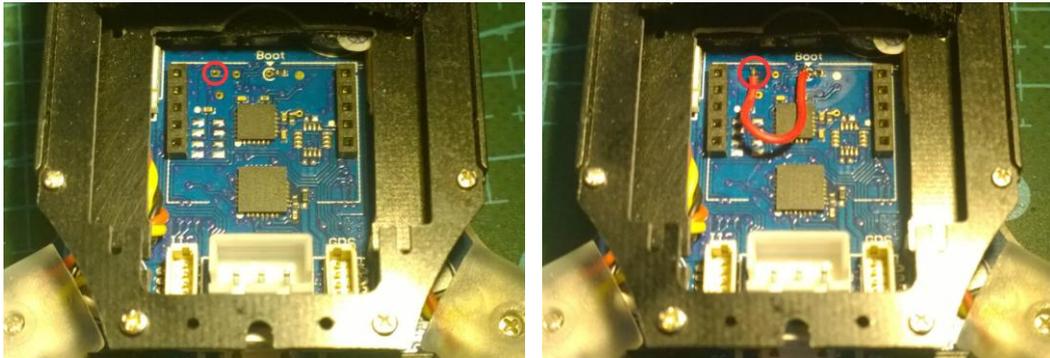
How to change parameter of FC and update firmware of FC:

- 1) Turn the tail switch of Hermit 145 V2 to "FC", connect the quadcopter to computer through USB cable
- 2) Open CleanFlight GUI software on computer (ensure that CP2102 driver was installed and the connection with BLHeli GUI was disconnected), click "Connect", the following picture appears, then parameters of FC can be changed now.

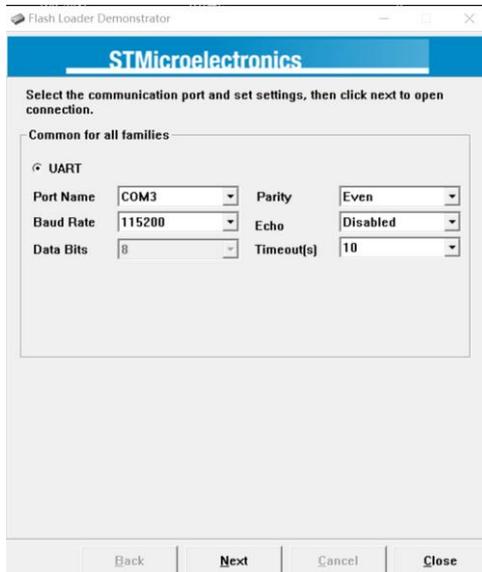


- 3) Click "disconnect" and then click  on the left of Cleanflight GUI, if the firmware is loaded locally, you don't need to select the hardware version; If the firmware is loaded online, you need to select the hardware version first, and then click "Load Firmware[Online]", after loading, click "Flash Firmware"

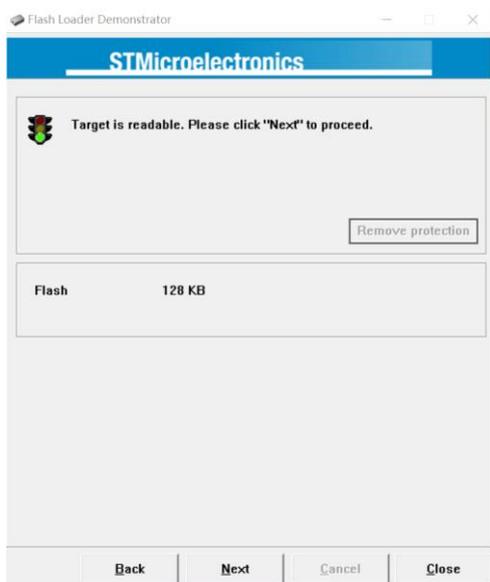
- 2) Remove the receiver from Hermit 145 V2
- 3) Short connect "Boot" port with the port inside red round by cable.



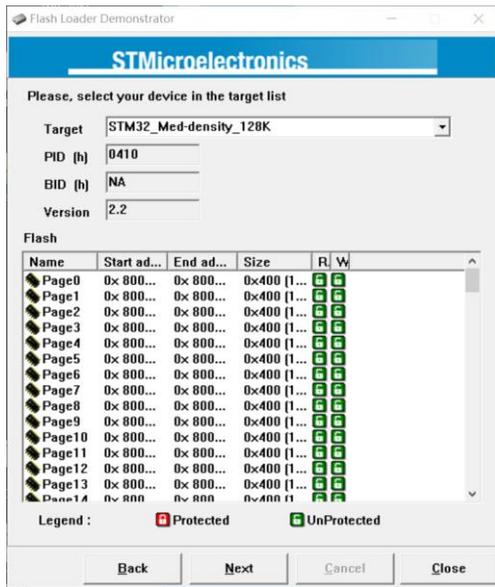
- 4) Download the wanted firmware from this link: <https://github.com/cleanflight/cleanflight/releases>
(Firmware on Hermit 145 V2 is V1.12.0-RC1 cleanflight_NAZE.hex)
- 5) Connect Hermit 145 V2 with computer by USB cable, then open Flash Loader Demo software (ensure that Cleanflight GUI software is closed), follow the operation of the following pictures:



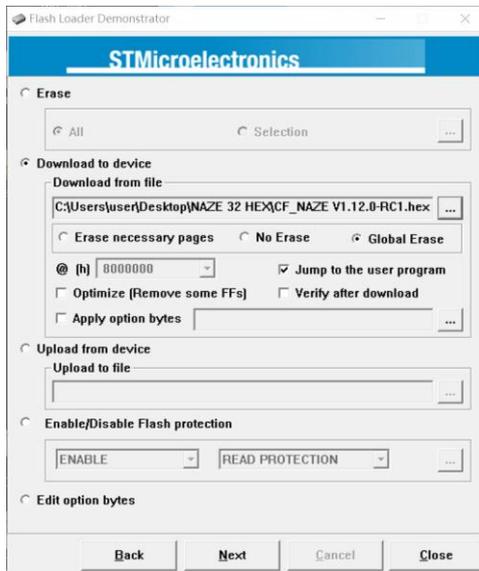
Click "Next"



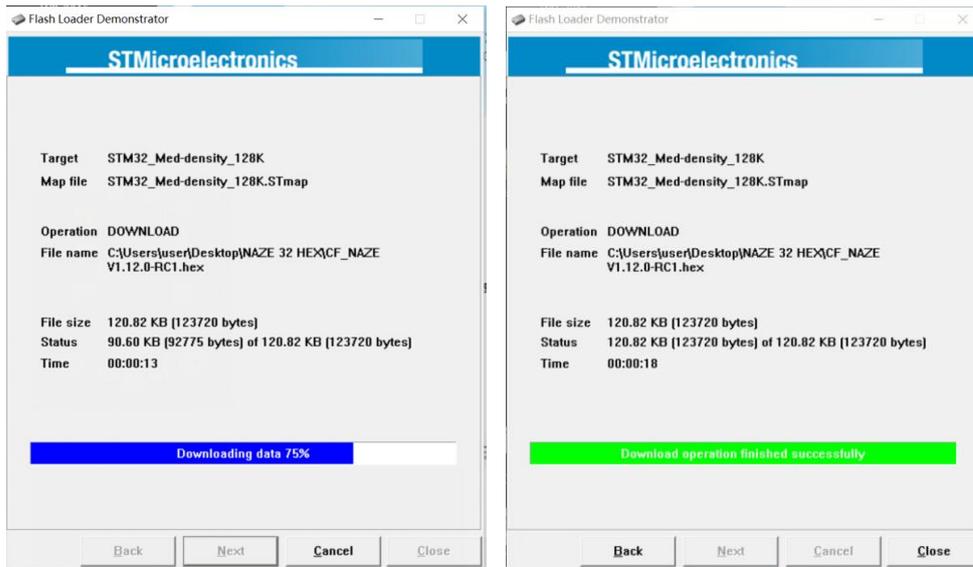
Click "Next"



Click "Next"



Load the already downloaded firmware or the firmware provided by us which is specially for our Hermit 145 V2, and then click "next"



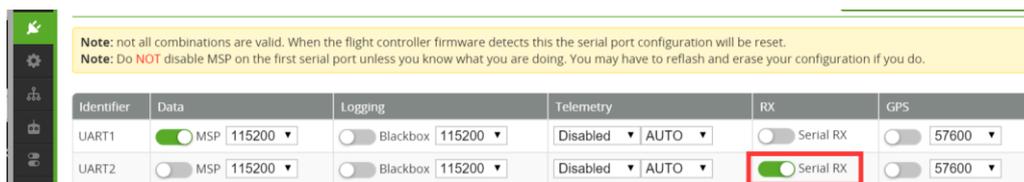
After it is finished, click “close”, Flash Loader Demo software is closed automatically.

- 6) Disconnect the USB connection between Hermit 145 V2 and computer, and remove the cable between “Boot” port and the port inside the red circle.
- 7) Connect Hermit 145 V2 with computer by USB cable, and open Cleanflight GUI, click “Connect”
- 8) Click “**Calibrate Accelerometer**” to calibrate the sensor
- 9) If the firmware is downloaded online in the fifth step, the firmware file needs to be matching the parameters of Hermit 145 V2 specially (customer can ask dealer for the file or change the parameter of “gyro_lpf” to “20HZ” by referring “setting up parameters for basic flight on Hermit 145 V2”; If the loaded firmware is provided by us which already includes basic flight parameters of Hermit 145 V2, then no additional parameters are needed. If customer wants to more free operation ways or wants to add more favorite functions, they can change the parameters accordingly.

Setting up parameters for basic flight on Hermit 145 V2:

If customer updated the firmware on which no basic flight parameter was included, setting up the basic flight parameter for Hermit 145 V2 should be done. Please make sure the tail switch on Hermit 145 V2 is turned to “FC”, the following is the set up:

- 1) UART2 set up:



- 2) ONESHOT125, RX and LED set up:

ESC/Motor Features

- MOTOR_STOP Don't spin the motors when armed
- ONESHOT125 ONESHOT ESC support (disconnect ESCs, remove props)
- Disarm motors regardless of throttle value (When arming via AUX channel)

Receiver Mode

- RX_PPM PPM RX input
- RX_SERIAL Serial-based receiver (SPEKSAT, SBUS, SUMD)
- RX_PARALLEL_PWM PWM RX input
- RX_MSP MSP RX input

Serial Receiver Provider

Note: Rememer to configure a Serial Port (via Ports tab) and choose a Serial Receiver Provider when using RX_SERIAL feature.

SPEKTRUM1024
SPEKTRUM2048
 SBUS
SUMD

Other Features

<input type="checkbox"/>	INFLIGHT_ACC_CAL	In-flight level calibration
<input type="checkbox"/>	SERVO_TILT	Servo gimbal
<input type="checkbox"/>	SOFTSERIAL	Enable CPU based serial ports
<input type="checkbox"/>	SONAR	Sonar
<input type="checkbox"/>	TELEMETRY	Telemetry output
<input type="checkbox"/>	3D	3D mode (for use with reversible ESCs)
<input checked="" type="checkbox"/>	LED_STRIP	Addressable RGB LED strip support
<input type="checkbox"/>	DISPLAY	OLED Screen Display
<input type="checkbox"/>	BLACKBOX	Blackbox flight data recorder
<input type="checkbox"/>	CHANNEL_FORWARDING	Forward aux channels to servo outputs

3) PID parameter set up:

PID Tuning DOCUMENTATION FOR 1.12.0

Profile: 1 PID Controller: MultiWii (2.3) Show all PIDs

Name	Proportional	Integral	Derivative	ROLL rate	PITCH rate	YAW rate
Basic/Acro				0.25	0.25	0.50
ROLL	2.0	0.030	23			
PITCH	4.0	0.030	23			
YAW	8.5	0.045	0			
TPA				0.00		1500
TPA Breakpoint						
Angle/Horizon	Strength (Angle)	Strength (Horizon)	Transition (Horizon)			
LEVEL	9.0	0.010	100			

4) Set up for receiver signal channel order:

Channel Map	RSSI Channel
AETR1234	Disabled
Default	
Futaba / Hitec	
JR / Spektrum / Graupner	

5) Flight mode set up



6) Parameter for gyro_lpf:

Enter CLI mode, input "set gyro_lpf=20HZ", click "Enter" on keyboard, and then input "save", click "Enter" on keyboard for saving.

```
Entering CLI Mode, type 'exit' to return, or 'help'

# set gyro_lpf=20HZ
gyro_lpf set to 20HZ
# save
Saving
Rebooting
```

Click  on the left top of CleanFlight, exit CLI mode.

Note: inputting "save" is a must after step 1 to step 5, otherwise, all the set up parameters will be invalid.

Editing OSD options:

The page for OSD can display or not display some parameters according to the request of customer. Please turn the tail switch to "FC" on Hermit 145 V2, the detail operation is the following:

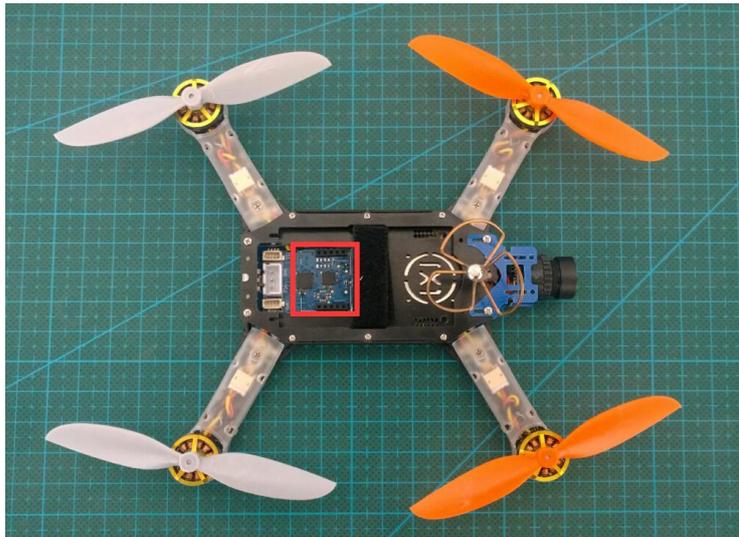
- 1) Connect Hermit 145 V2 with computer by USB cable.
- 2) Open MW OSD GUI software (please make sure that Cleanflight and BLHeli Suite GUI is closed first)
- 3) Click and get the COM port which Hermit 145 V2 is on (different computer will be different on port), MW OSD GUI will connect with the OSD hardware on Hermit 145 V2 automatically.



4) Set up OSD according to your request, click  and save the parameter.

The order way (send email to sales@overskycr.com) :

RTF:



(Note: There is no receiver on the Hermit 145 V2 above, the place of the red square is for receiver installation)

It includes:

- 1) A fully assembled Hermit 145 V2 (not including receiver)
- 2) A new version receiver with double antenna
- 3) 8 pcs of 90mm propeller (1.5mm hole)

Note:

- 1) Please tell us the receiver you want for your quadcopter when you place the order (three options: A-DSMX/DSM2-7CH compatible receiver; B-Futaba SFHSS-8CH compatible receiver; C- Flysky AFHDS-8CH compatible receiver)
- 2) Only RHCP clover antenna is available.

