COREWING™

F405 WING MINI V2

USER MANUAL V2.1

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Specification overview

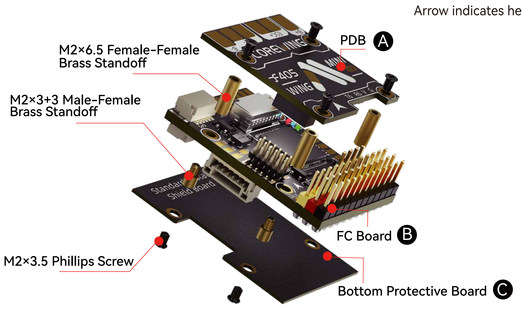
Product Name	CoreWing F405 WING MINI V2
TOP Board	CoreWing F405 WING MINI V2 Top/Bottom Protective Board
FC Board	CoreWing F405 WING MINI V2 FC Board
PDB	CoreWing F405 WING MINI V2 PDB
USB Extender	CoreWing Wireless USB Extender SE
Wireless Configuration	Supported
Firmware Support	iNav/ArduPilot
Power Input	2S-6S
Dimension	37(L) x 26(W) x 14(H) mm
Weight	19g（including Wireless USB Extender SE）

Part 1-Overview

Standard Shield Board Installation

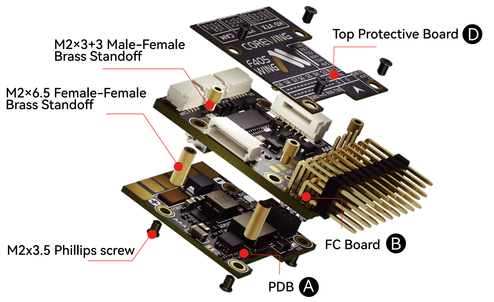
Standard FC Orientation

Arrow indicates head



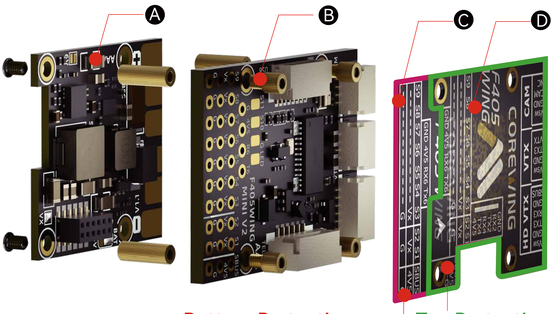
Reverse Shield Board Installation

Inverted FC Orientation



Assembly Instructions

1. Assemble Ⓐ(PDB Board) and Ⓑ(FC Board), align the pin headers,and secure with screws and standoffs.
2. For standard FC orientation, assemble Ⓒ(Bottom Protective Board).
3. For inverted FC, assemble Ⓓ(Top Protective Board).



Bottom Protective Board for Standard FC Orientation

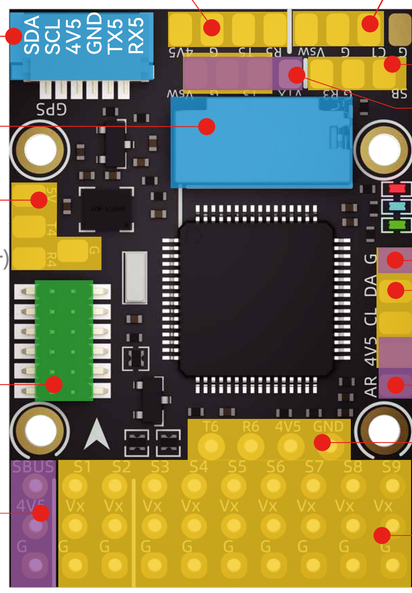
Top Protective Board for Inverted FC Orientation

CoreWing F405 WING MINI V2 vs. SpeedyBee F405 WING MINI				
Category		CoreWing F405 WING MINI V2		SpeedyBee F405 WING MINI
Hardware or Features	Input Voltage	7~28V(2~6S LiPo)		7~26V (2~6S LiPo)
	Barometer	SPA06-003		SPL06-001
	IMU	BMI270		ICM-42688
	FC Firmware (iNav / AP)	CoreWingF405WINGMINIV2		SPEEDYBEEF405WING
	VTX Power On/Off Feature	Supported		Not Supported
	Camera Switching Feature	Not Supported		Supported
Serial Ports	Wireless Board Serial Port	Uses USART1	The DFU conflict issue has been resolved, allowing firmware updates without disconnecting peripherals.	Uses USART6
	Receiver Serial Port	Uses USART6		Uses USART1
	VTX Serial Port	Uses USART3		Uses UART5
	GPS Serial Port	Uses UART5		Uses USART3
Serial Ports DMA Support			USART1, USART6 (Supports additional high-speed peripherals)	USART1 only
PWM Interfaces	S1-S10		Supports PWM/DShot（DMA）	Supports PWM/DShot(DMA)
	S11		Supports PWM	Supports PWM/DShot(DMA)
	S12 (LED Interface)		Supports PWM	Supports PWM/DShot(DMA)
Wireless Board	Wireless Board	CoreWing Wireless USB Extender SE		SpeedyBee Wireless USB Extender
	Parameter Tuning	Supports ArduPilot (AP) expert tuning, iNav expert tuning		Supports SpeedyBee APP iNav expert tuning and iNav Quick Setup
	Firmware Upgrade Function	Supports wireless FC firmware updates via CoreWing app.		Not supported
	Supported Modes	BLE/WiFi-AP (Alternating green & white breathing LED) BLE/WiFi-STA (Alternating green & purple breathing LED)		BLE (Green LED) WiFi-AP (White LED) WiFi-STA (Purple LED)
	Supported Indicator	RF wireless status indicator, FC connection status indicator		Wireless status indicator

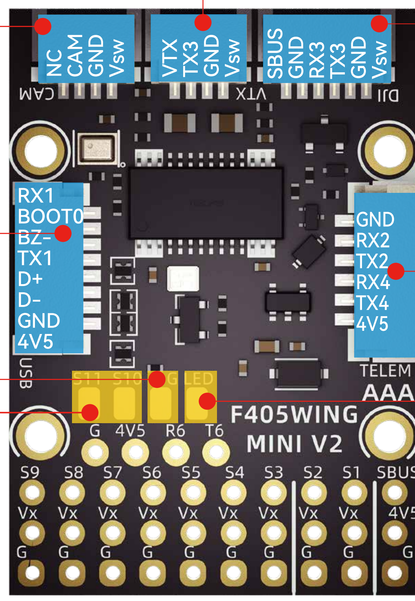
Part 2-Hardware description

Interface Layout Diagram

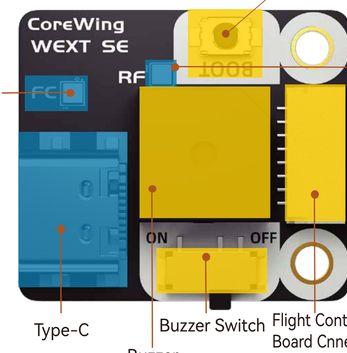
FC Board Front



FC Board Back



Wireless USB Extender SE Front



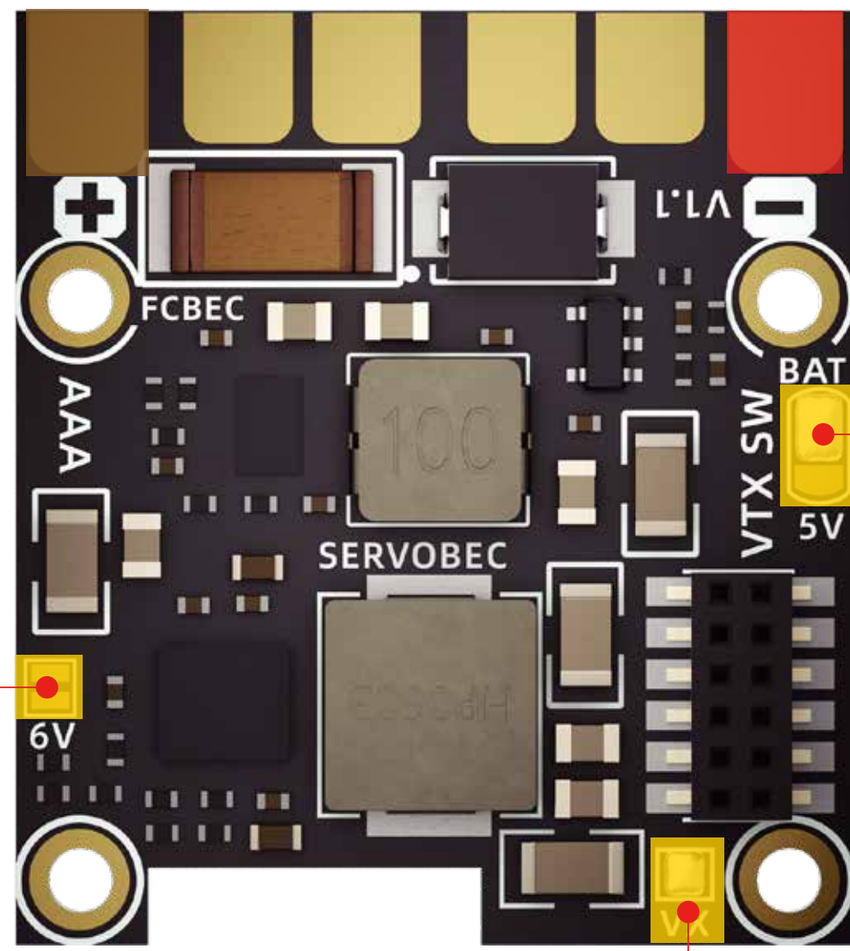
BOOT Button
Press and hold the BOOT button while powering on to enter DFU mode for firmware flashing. When the FC is powered on and operational, the BOOT button also controls other functions of the wireless board.

Wireless Status Indicator (RF)
Switching modes: Hold BOOT button for 6 seconds.

Mode	RF Status Indicator	Instruction
Low-Power Bluetooth BLE/ WiFi-AP Dual Mode	Green-White Breathing	BLE or WiFi-AP not connected
	Green LED Solid On	BLE Connected (Wi-Fi mode disabled automatically)
	White light Solid On	WiFi AP Connected (BLE mode disabled automatically)
Low Energy Bluetooth BLE/ WiFi-STA Dual Mode	Green-Purple Breathing	BLE or WiFi-STA not connected
	Green LED solid on	BLE Connected (Wi-Fi mode disabled automatically)
	Purple LED Solid On	WiFi-STA Connected (BLE mode disabled automatically)
Wireless Off	RF LED Off	Wireless Functions Disabled
BOOT pressed.	Blue LED Solid On	Detected BOOT button press.
Switching modes	Yellow LED Solid On	Mode Switched Successfully

Scan the QR code to view the user guide.

PDB Back



VTX Power Jumper Options

- Default battery voltage output
- 5V Output

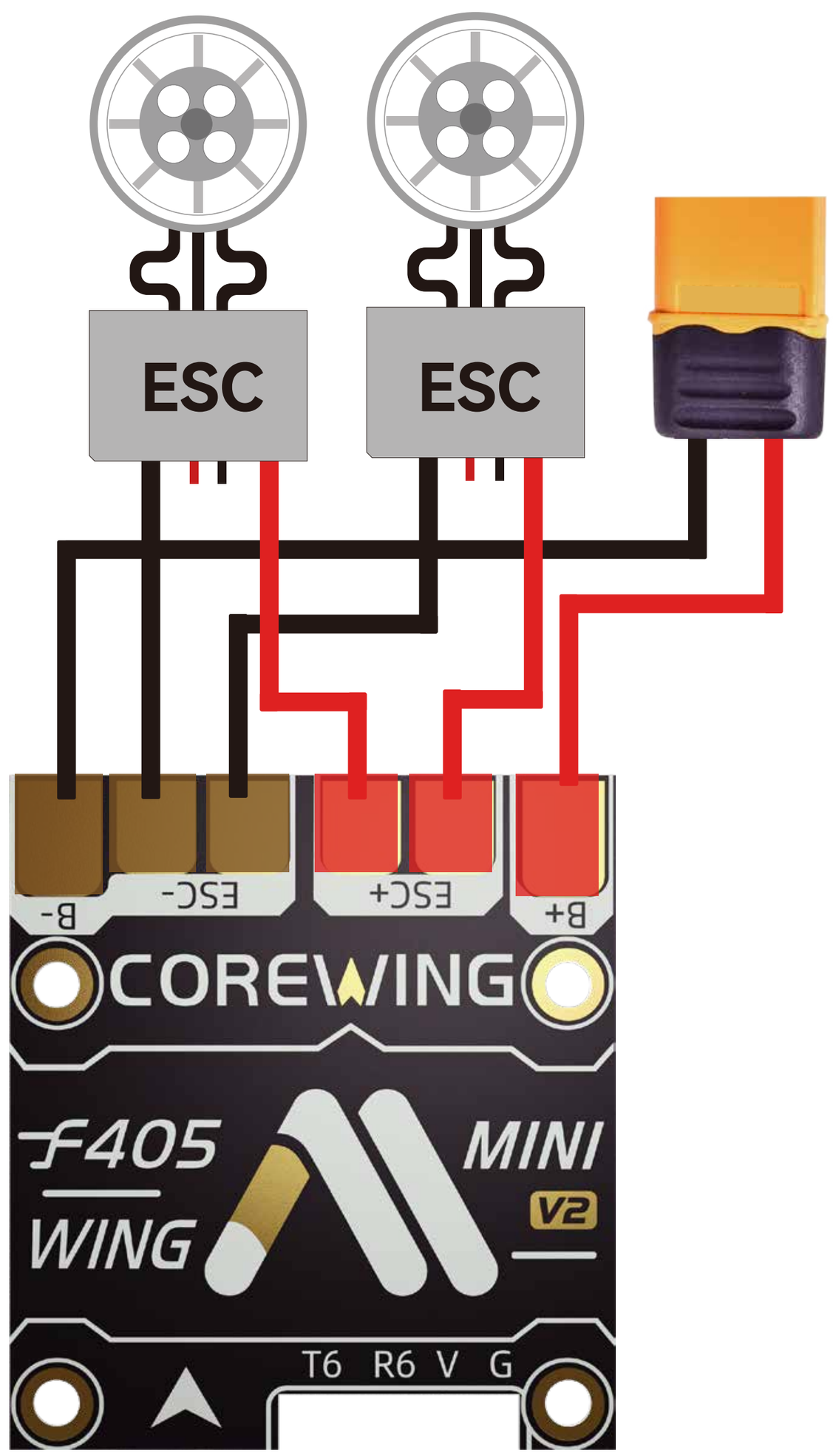
Servo BEC Voltage Jumper Options

- Default 5V Output
- 6V Output

Servo BEC Power Source Jumper Options

- Default servo BEC power supply
- ESC BEC power supply

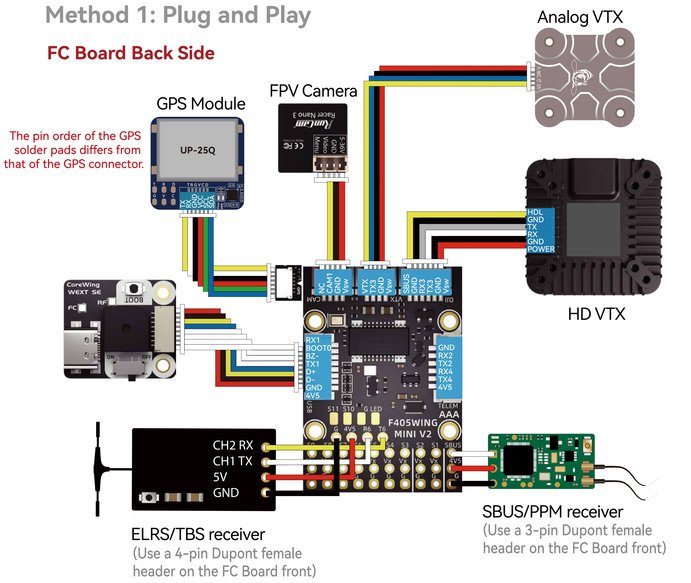
PDB Front



FC Board Peripheral Connections

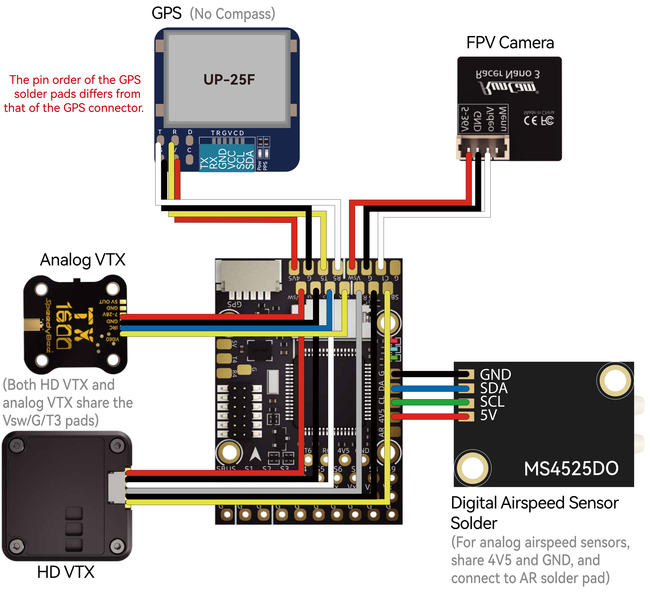
Method 1: Plug and Play

FC Board Back Side



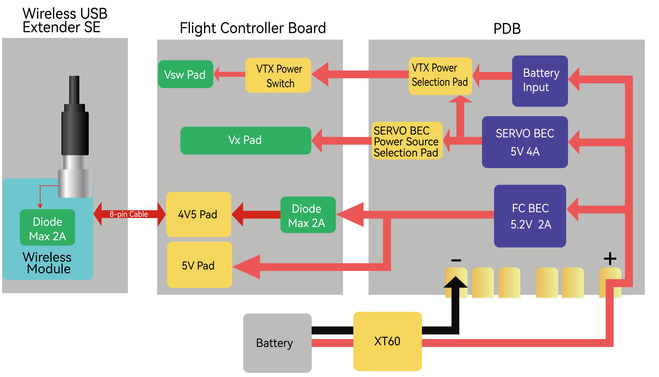
Method 2: Direct soldering

FC Board Front



Power Supply Architecture

The system power supply architecture is shown below:



Pad	Power Source	Voltage	Power Supply Description
Vsw Pad	Battery Input or Servo BEC	Switchable **5V/BAT**	When the Servo BEC is set to BAT, the VSW output becomes battery voltage. Make sure the camera can operate within the battery voltage range.
Vx Pad	Servo BEC	Switchable **5V/6V**	⚠ Warning: Do not connect the ESC BEC power wire to the Vx pins unless the jumper has been removed. Failure to do so may damage the ESC or BEC.
5V Pad	FC BEC	Fixed **5.2V**	The FC BEC provides a continuous output of 2A and a peak of 3A. The onboard chip is ≤1A, the GPS/receiver is ≤ 0.1A, and the wireless controller is ≤ 0.1A. It is recommended that the total current draw of all additional peripherals not exceed 0.8A.
4V5 Pad	FC BEC (via Diode)	**4.5-5.0V**	

Power Supply Recommendations:

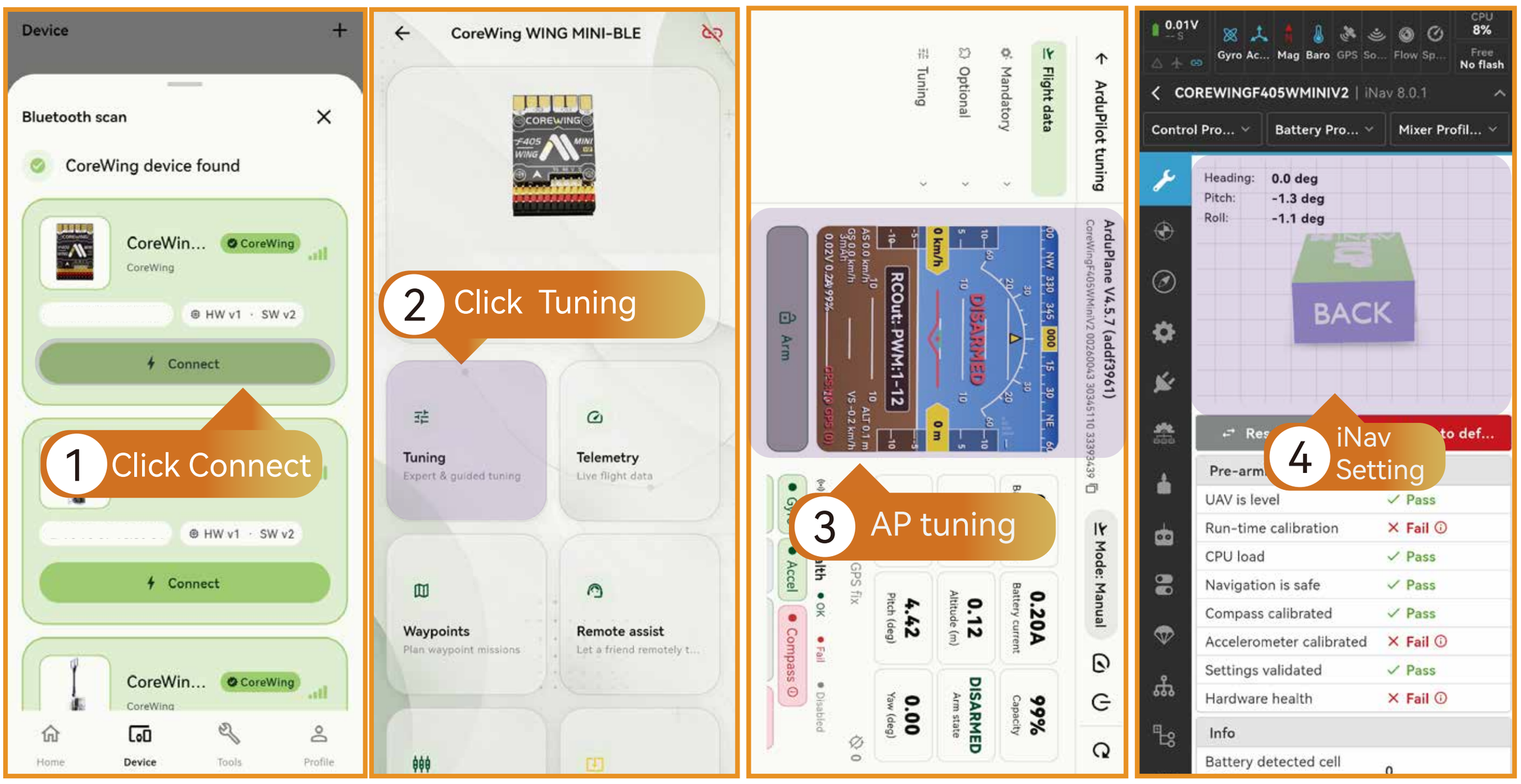
1. For Digital VTX with Wide Voltage Support: It is recommended to use the default battery-voltage VSW output
2. For 5V VTX: Use the 5V power supply from the SERVO BEC for Vsw. In this configuration, use no more than four 9g servos to avoid insufficient current.
3. For 64mm / 70mm EDF Airplanes: The SERVO BEC power supply may not provide sufficient current of both the servos and the retractable landing gear. It is highly recommended to use an external BEC to power the servos.

Part 3-Firmware upgrade and APP connection

CoreWing App Connection

Supports connecting ArduPilot/iNav firmware to the app:

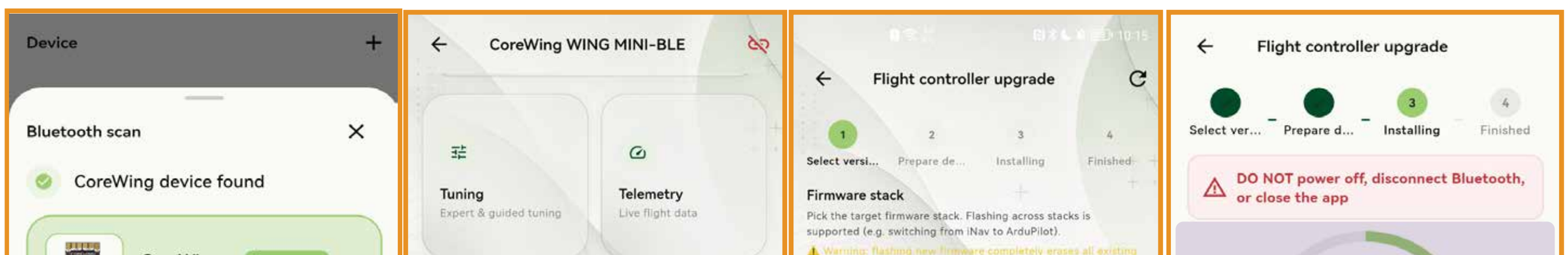
Observe the color of the wireless status indicator. When the LED is breathing green-white or green-purple, open the APP and follow the connection steps.



Firmware Update

Supports updating FC firmware via the CoreWing app:

Search for the device, click “Connect”, then click “Firmware Upgrade”. Select the firmware type and version, and wait for the FC update to complete.



Steps to Update Computer Firmware

①Press and hold the BOOT button while connecting the FC to your computer via a USB cable.
②Open the INAV Configurator on your computer and navigate to the "Firmware Flasher" page. Select the FC target as **"COREWINGF405WMINIV2"** and proceed with flashing the firmware.
③To flash the ArduPilot firmware, follow the same steps as above: select “Load firmware from local computer,” then flash the firmware.

Part 4-Specifications

Item	COREWING F405 WING MINI V2 Flight Controller
MCU	STM32F405， 168MHz , 1MB Flash
IMU (Gyro & Accelerometer)	BMI270
Barometer	SPA06-003
OSD Chip	AT7456E
Blackbox	Supports SDSC/SDHC MicroSD cards (4-32 GB, FAT16/FAT32). SDXC is not supported. In iNav, only 4 GB of storage can be recognized and used.
UART	6 ports: USART1 to wireless board, USART2, USART3, UART4, UART5, USART6
I2C	1x for compass / digital airspeed sensor
ADC	3x: voltage, current, analog airspeed
PWM	12x (9x pin headers + 2x solder pads + 1x "LED" pad)
ELRS/CRSF Receiver	Supported, connected to USART6
SBUS	Onboard SBUS inverter, USART2-RX
FC Status LEDs	3x LEDs: blue and green FC status LEDs, and 3.3V power LED
Supported Firmware	iNav: COREWINGF405WMINIV2 ArduPilot: COREWINGF405WMINIV2

Item	COREWING F405 WING MINI V2 PDB
Input voltage range	7~28V(2~6S LiPo)
Battery Voltage Sensor	Connected to FC VBAT, divider ratio 10K:100K
Battery Current Sensor	90A continuous, 215A peak, connected to FC Current. Scale: 195 in iNav, 51 A/V in ArduPilot
TVS Protective diode	Yes
FC BEC	DC 5.2V ±0.1V, 2A continuous, 3A peak. Powers FC, receiver, GPS, airspeed sensor, telemetry module, etc.
VTX/Camera BEC	Default powered by battery input or built-in 5V BEC (shared with 5V 4A Servo BEC). Can be switched to 5V via solder jumper (uses Servo BEC output).
	Select voltage based on VTX/camera input range. Ensure enough current for servos and VTX when using 5V.
Servo BEC	DC 5V ±0.1V, 4A continuous, 5A peak. Can be set to 5V/6V via solder jumper to power servos.

Item	CoreWing Wireless USB Extender SE	
Indicator	Status	Description
RF Wireless LED (Hold the BOOT button for 6 seconds to switch modes)	RF	BLE mode Supports Connection to the CoreWing APP
	RF	WiFi-AP mode Supports connection to the CoreWing APP and other ground stations that support UDP and TCP
	RF	WiFi-STA Mode Supports Ground Stations with UDP and TCP Support
FC Status LED	FC	Wireless board is receiving FC data normally (Solid orange)
	FC	With both the FC board and wireless board powered off, press and hold the BOOT button while powering on. Release the button when the FC LED turns solid cyan. The FC board is now in DFU mode.
	FC	Flashes blue during wireless firmware update
	FC	Flashes red when wireless board cannot receive FC data

Part 5-Common Settings

Flight Controller Inverted Installation

Hardware Connection

If the flight controller is installed in the standard (upright) orientation, the default parameters can be used without modification.
If the flight controller is installed upside down (with the PDB facing downward and the top protective board facing upward), configure it as follows.

INAV Settings

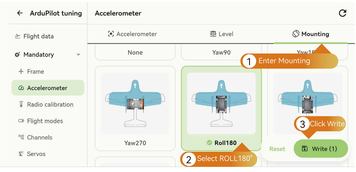
Open the CLI tab and enter the following commands:

```
set align_board_roll = 1800
save
```

Click send. The flight controller will save the parameters and automatically reboot.

ArduPilot Settings

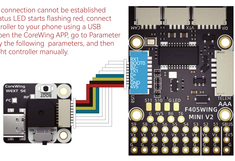
In the parameter settings of the CoreWing APP, click on Accelerometer Calibration, enter Set Flight Controller Orientation, select ROLL180°, and click Write.



Wireless Tuning Setup

Hardware Connection:

If the wireless connection cannot be established and the FC status LED starts flashing red, connect the flight controller to your phone using a USB data cable. Open the CoreWing APP, go to Parameter Settings, verify the following parameters, and then restart the flight controller manually.



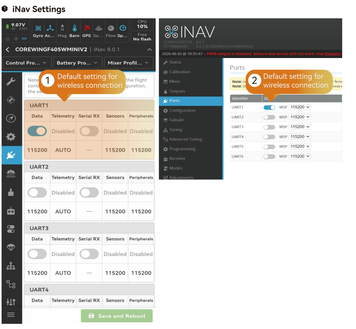
1 iNav Settings

Connect directly using the default settings.

2 ArduPilot Settings

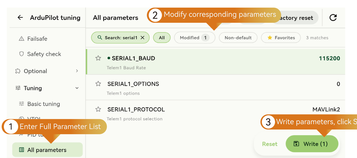
Connect directly using the default settings.

iNav Settings



ArduPilot Settings

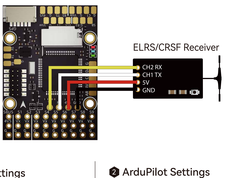
SERIAL1_BAUD	115	Set wireless connection default baud rate to 115200
SERIAL1_OPTIONS	0	Set Serial 1 working mode to default
SERIAL1_PROTOCOL	2	Set Serial 1 protocol to MAVLink2



Receiver Settings

ELRS/TBS Receiver

Hardware Connection:
Solder the receiver using a 4-pin single-ended DuPont cable,and plug the DuPont cable into the corresponding pins.



1 iNav Settings

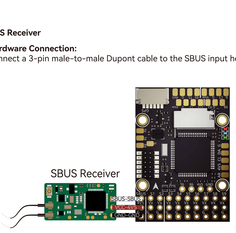
Recognized automatically with the default settings.

2 ArduPilot Settings

Recognized automatically with the default settings.

SBUS Receiver

Hardware Connection:
Connect a 3-pin male-to-male Dupont cable to the SBUS input header.



1 iNav Settings

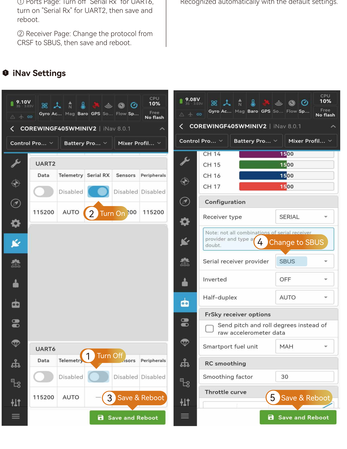
① Ports Page: Turn off "Serial Rx" for UART6, turn on "Serial Rx" for UART2, then save and reboot.

② Receiver Page: Change the protocol from CRSF to SBUS, then save and reboot.

2 ArduPilot Settings

Recognized automatically with the default settings.

iNav Settings



● **PPM Receiver:**

Hardware Connection:

Connect a 3-pin male-to-male Dupont cable to the SBUS input header:

PPM receivers are only supported in Nav version 3.x and below.

❶ iNav Settings
Not supported by iNav

❷ ArduPilot Settings
Recognized automatically with the default settings.

● GPS Settings

● **Hardware Connection**

Adjust the pin order of the GPS cable according to the interface definition of your GPS module.
The UP! 25Q GPS module is recommended.

❶ iNav Settings
On the GPS page, enable GPS for navigation and telemetry, then save and reboot. Pixe-7 does not feature NMEA and only supports UBLOX.

❷ ArduPilot Settings
Supports both UBLOX and NMEA GPS protocols, with the default parameter set to the UBLOX protocol. UBLOX, MBX, NR, and MTK3 solutions are automatically recognized without any configuration required.

● **iNav Settings**

● Compass (Magnetometer) Setup

● **Hardware Connection**

The UP 25Q GPS module with a built-in QMC5883L compass is recommended. Install the GPS module away from power wires, motors, ESCs, and cables carrying high currents, and ensure it is securely mounted—avoid placing it on the frame arms or near any metal parts.
Fixed-wing aircraft may use a GPS module without a compass, while VTOL flying aircraft must use a GPS module with an integrated compass.

● **iNav Settings**

On the configuration page, select the appropriate compass option according to the compass model, then save and reboot.
Set the installation orientation as shown in the diagram below.

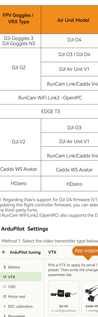
● **ArduPilot Settings**

1) Enter the compass calibration page in the *Ground Station* software and ensure the compass is detected correctly. If detected, select the compass from the enabled compass list. After the flight controller and GPS are securely installed, proceed to calibrate the compass.

2) After successful calibration, reboot the flight controller as prompted (no need to select the compass model or set the compass orientation).

● **iNav Settings**

● **ArduPilot Settings**



● HD VTX Settings

● **Hardware Connection:**

Use the DJI connection cable to connect to the HD VTX.

❶ INAV Settings
① In the Ports page, select the external device option MSP Displayport for UART3, then save and reboot.
② In the OSD page, scroll down to the Video Format option, select 8F43COMPAT, then save and reboot.

❷ ArduPilot Settings
① Enter the VTX configuration page of the *CoolWing APP*, and perform one-click configuration based on your FPV type.
② Alternatively, enter the Full Parameter List of the *CoolWing APP*, configure the following parameters, and reboot the flight controller.

● **iNav Settings**

For other HD video transmitter devices, please refer to the table below for the corresponding parameter settings.

FPV Goggles / VRX Type	Air Unit Model	Ports Page		OSD Page
		UART1Port	Peripherals / Protocol	Video Format
DJI Goggles 3 DJI Goggles N3	DJI O4	UART3	MSP Displayport (Peripheral)	BF43COMPAT
DJI G2	DJI O3 / DJI O4	UART3		
	DJI Air Unit V1	UART3		
	RunCam Link/Caddx Vista	UART3		
RunCam WiFi Link2 - OpenIPC		UART3	Set as MSP port	/
DJI V2	EDGE T3	UART3	MSP Displayport (Peripheral)	BF43COMPAT
	DJI O3	UART3	DJI FPV VTX (Peripheral)	/
	DJI Air Unit V1	UART3		
	RunCam Link/Caddx Vista	UART3	MSP Displayport (Peripheral)	AVATAR
Caddx WS Avatar	Caddx WS Avatar	UART3	MSP Displayport (Peripheral)	HDZERO
HDzero	HDzero	UART3		

※ Regarding iNav's support for Dji O4 firmware (V1.60.0100): iNav 8.0.1 has fixed the DJI OSD error issue. After upgrading the DJI O4 firmware, you can select DJI FAKON for the video format and choose iNav font for the OSD display.
※ RunCam WiFi Link2 OpenIPC also supports the DJI_NATIVE video format.

● **ArduPilot Settings**

Method 1: Select the video transmitter type below based on your hardware for one-click configuration:

Method 2: Go to All parameters to manually configure the corresponding VTX parameters:

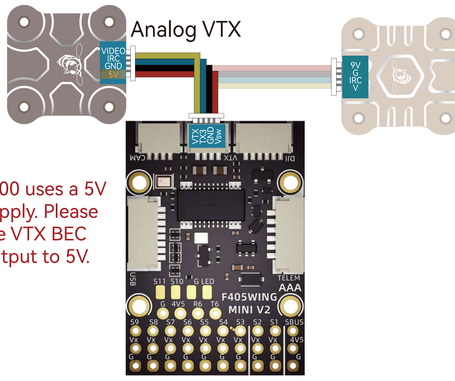
FPV Goggles / VRX Model	Air Unit Model	Parameter Settings		
DJI Goggles 3 DJI Goggles N3	DJI O4	SERIAL3_BAUD	115	Set Serial 3 baud rate to 115200
DJI G2	DJI O3 / DJI O4	SERIAL3_OPTIONS	0	Set Serial 3 working mode to default
	DJI Air Unit V1	SERIAL3_PROTOCOL	42	Set UART3 Protocol to MSP VTX
	RunCam Link/Caddx Vista	MSP_OPTIONS	4	Set to use Betaflight font rendering mode
RunCam WiFi Link2 - OpenIPC	RunCam WiFi Link2 - OpenIPC	OSD_TYP	5	Set OSD mode to MSP OSD
DJI V2	DJI O3			
Caddx WS Avatar	Caddx WS Avatar			
HDzero	HDzero			
EDGE T3	EDGE T3	SERIAL3_BAUD	115	Set Serial 3 baud rate to 115200
		SERIAL3_PROTOCOL	32	Set Serial 3 protocol to Hdzero
DJI V2	DJI Air Unit V1	SERIAL3_BAUD	115	Set MSP OSD default baud rate to 115200
		SERIAL3_OPTIONS	0	Set Serial 3 working mode to default
		SERIAL3_PROTOCOL	33	Set Serial 3 protocol to DJI FPV
	RunCam Link/Caddx Vista	MSP_OPTIONS	0	Use polling mode
		OSD_TYP	3	Set OSD Mode to MSP

For more detailed settings, please refer to the following link:
https://ardupilot.org/plane/docs/common-msp-osd-overview-4.2.html

Analog VTX Settings

Hardware Connection

Use the VTX connection cable to connect the SpeedyBee TX800 or TX ULTRA analog VTX.



*The TX800 uses a 5V power supply. Please adjust the VTX BEC power output to 5V.

❶ iNav Settings

① Ports Page: Under UART3, select "Peripherals", then choose the IRC Tramp option. Save and reboot.

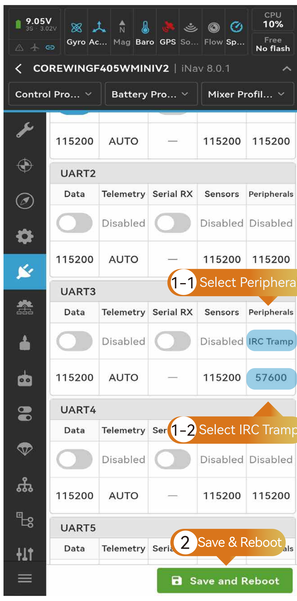
② Configuration Page: Scroll down to the VTX features section, select the required function, then save and reboot.

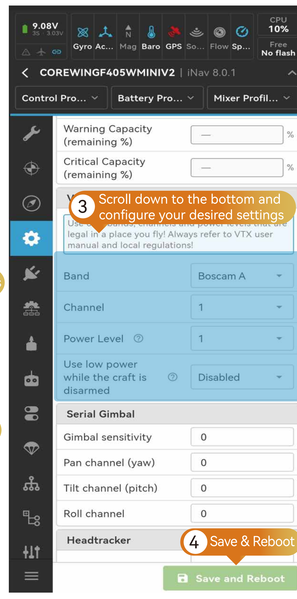
❷ ArduPilot Settings

① Enter the VTX configuration page of the CoreWing APP, select your VTX type, and perform a one-click configuration.

② Alternatively, enter the full parameter list in the CoreWing APP, configure the required parameters manually, and reboot the control board.

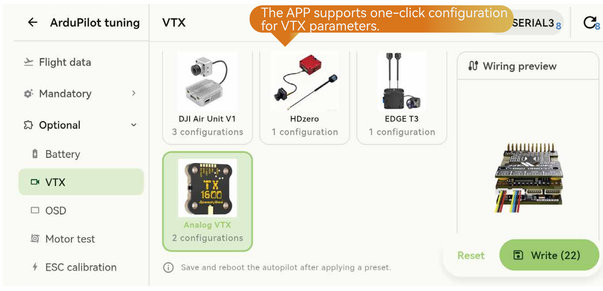
❶ iNav Settings



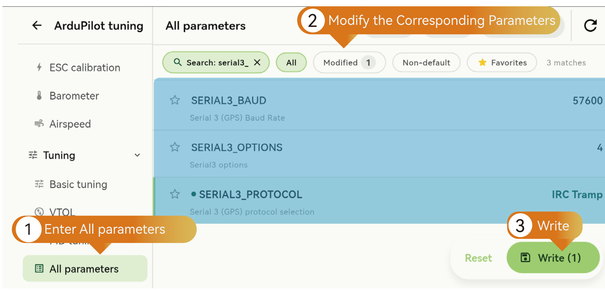


❷ ArduPilot Settings

Method 1: Choose the video transmitter (VTX) type below to perform a one-click configuration based on your VTX type.



Method 2: Go to the All parameters to set the corresponding VTX parameters.



SERIAL3_BAUD	57	Set IRC default baud rate to 57600
SERIAL3_OPTIONS	4	Set Serial 3 operation mode to Half-Duplex
SERIAL3_PROTOCOL	44	Set Serial 3 protocol to IRC Tramp
VTX_ENABLE	1	Enable analog video transmitter function, reboot required after setting
VTX_OPTIONS	10	Enable Pitmode to prevent VTX from overheating (Pitmode until armed and Unlocked)
VTX_MAX_POWER	800	Maximum power, depending on the VTX used

If the VTX supports SmartAudio, the following settings are required:

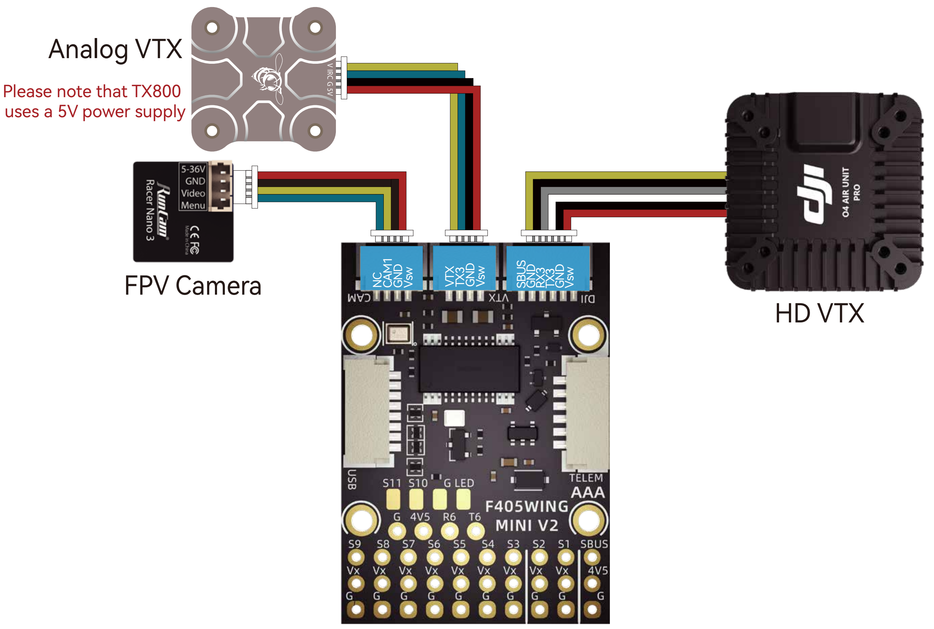
SERIAL3_BAUD	4	Set SmartAudio default baud rate to 4800
SERIAL3_OPTIONS	4	Set Serial 3 operation mode to Half-Duplex
SERIAL3_PROTOCOL	37	Set Serial 3 protocol to SmartAudio

For more detailed settings, please refer to the following link:
https://ardupilot.org/copter/docs/common-vtx.html

VTX Power ON/Off Switching Function

Hardware Connection

Connect the video transmitter (VTX) and camera respectively, as shown in the diagram below.

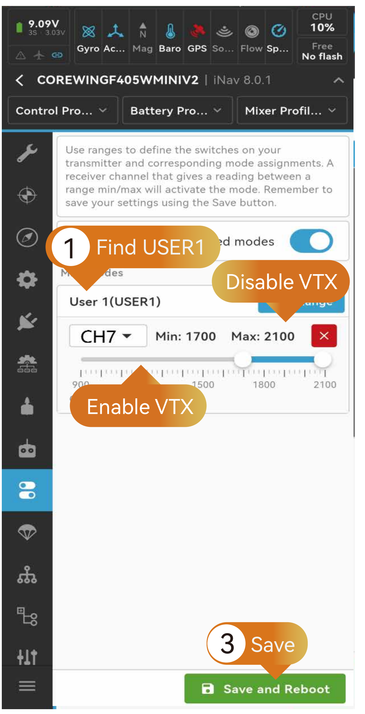


1 iNav Settings

① On the Modes page, scroll down to the "USER1" option and click "Add Range".

② Select the RC channel used to control VTX power on/off, and drag the blue slider bar to choose the desired range. (The white range enables the VTX, while the blue progress bar disables the VTX).

③ Click Save.



2 ArduPilot Settings

①Enter the All parameters in the CoreWing APP, configure the following parameters, and then manually reboot the flight controller.
Configure the VTX power pin as a relay function:
RELAY1_FUNCTION = 1;
RELAY1_PIN=81;
RC X_OPTION=28;

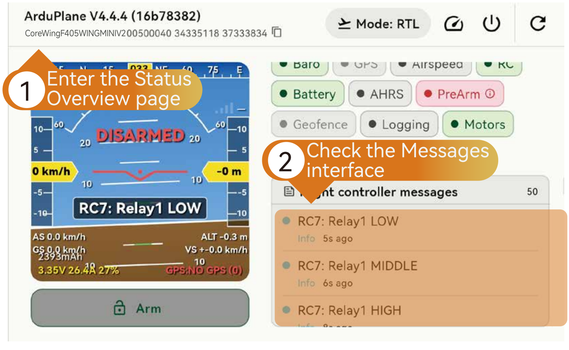
②When the switch's PWM value is below 1200, the VTX power turns ON; when it is above 1800, the VTX power turns OFF.

RELAY1_FUNCTION	1	Enable the function of Relay 1. The control board must be powered off and rebooted after setting.
RELAY1_PIN	81	Configure the relay function pin.
RC X_OPTION	28	Set the switch channel for control, where "X" is the channel you choose. For example, if using channel 7 for control, Set RC7_OPTION=28.

※ The above parameters apply to ArduPilot 4.5.7. Parameters may vary across different firmware versions.

***If correctly configured, flipping the channel switch will display the following operation messages in the Flight Data Messages interface of the Mission Planner ground station:**

Message Display	Status
RELAY1 LOW	VTX ON
RELAY1 MIDDLE	VTX OFF
RELAY1 HIGH	VTX OFF



This message display is available in ArduPilot 4.4.x firmware versions, but is not available in ArduPilot 4.5.x firmware versions.
It is recommended to determine whether the setting is successful based on whether the VTX successfully powers on and off.

Part 6-Pin Mapping

iNav Mapping

UART			
USB		USB	
TX1 RX1	5V tolerant I/O	UART1	CoreWing Wireless USB Extender SE
TX2 RX2 SBUS	5V tolerant I/O	SBUS Pad	SBUS Receiver, SBUS Pad = RX2 (with Inversion Circuit)
		TX2	SmartPort Telemetry, enables Softserial_Tx2
TX3 RX3	5V tolerant I/O	UART3	MSP DisplayPort / DJI OSD / VTX
TX4 RX4	5V tolerant I/O	UART4	USER
TX5 RX5	5V tolerant I/O	UART5	GPS
TX6 RX6	5V tolerant I/O	UART6	ELRS/TBS Receiver

PWM		TIMER	iNav Plane	iNav MultiRotor
S1	5V tolerant I/O	TIM4_CH2	Motor	Motor
S2	5V tolerant I/O	TIM4_CH1	Motor	Motor
S3	5V tolerant I/O	TIM3_CH3	Servo	Motor
S4	5V tolerant I/O	TIM3_CH4	Servo	Motor
S5	5V tolerant I/O	TIM8_CH3	Servo	Motor
S6	5V tolerant I/O	TIM8_CH4	Servo	Motor
S7	5V tolerant I/O	TIM8_CH2N	Servo	Servo
S8	5V tolerant I/O	TIM2_CH1	Servo	Servo
S9	5V tolerant I/O	TIM2_CH3	Servo	Servo
S10	5V tolerant I/O	TIM2_CH4	Servo	Servo
S11	5V tolerant I/O	TIM12_CH2	Servo	Servo
S12/LED	5V tolerant I/O	TIM1_CH1	LED	LED

***In iNav firmware, a maximum of 32 WS2812 LEDs are allowed to be controlled by default.**

ADC			
Voltage	10K:100K divider ratio 0~36V	Voltage ADC ADC_CHANNEL_1	voltage scale 1100
Current	0~3.3V	Current ADC ADC_CHANNEL_2	Current scale 158
Analog Airspeed	10K: 10K divider ratio 0~6.6V	Airspeed ADC ADC_CHANNEL_3	Analog Airspeed

I2C			
I2C1	5V tolerant I/O	Onboard Barometer	SPA06-003(recognized as DPS310 in iNav 8.0.1)
		Compass	QMC5883 / HMC5883 / MAG3110 / LIS3MDL
		Digital Airspeed Sensor	MS4525
		OLED	0.96"

ArduPilot Pin Mapping

USB	USB	SERIAL0	Console
TX1 RX1	USART1(DMA)	SERIAL1	CoreWing Wireless USB Extender Board SE
TX2 RX2 SBUS	SBUS Pad	BRD_ALT_CONFIG 0 (Default)	SBUS Receiver, SBUS pad = RX2 with onboard inverter circuit
	RX2		IBUS / DSM / PPM
	USART2	BRD_ALT_CONFIG 1 SERIAL2	USER
TX3 RX3	USART3	SERIAL3	MSP Displayport/DJI OSD/VTX
TX4 RX4	UART4	SERIAL4	USER
TX5 RX5	UART5	SERIAL5	GPS
TX6 RX6	USART6(with DMA)	SERIAL6	ELRS / TBS Receiver

***If using higher serial port baud rates (e.g., 921600), please use USART1 (UART1) or USART6 (UART6).**

PWM Channel	GPIO	Timer / Channel	Protocol/DMA	Timer Group
S1	PWM1 GPIO50	TIM4_CH2	PWM / DShot(DMA)	Group1
S2	PWM2 GPIO51	TIM4_CH1	PWM / DShot(DMA)	
S3	PWM3 GPIO52	TIM3_CH3	PWM / DShot(DMA)	Group2
S4	PWM4 GPIO53	TIM3_CH4	PWM / DShot(DMA)	
S5	PWM5 GPIO54	TIM8_CH3	PWM / DShot(DMA)	Group3
S6	PWM6 GPIO55	TIM8_CH4	PWM / DShot(DMA)	
S7	PWM7 GPIO56	TIM8_CH2N	PWM / DShot(DMA)	
S8	PWM8 GPIO57	TIM2_CH1	PWM / DShot(DMA)	Group4
S9	PWM9 GPIO58	TIM2_CH3	PWM / DShot(DMA)	
S10	PWM10 GPIO59	TIM2_CH4	PWM / DShot(DMA)	
S11	PWM11 GPIO60	TIM1_CH3N	PWM	Group5
S12	PWM12 GPIO61	TIM1_CH1	PWM	

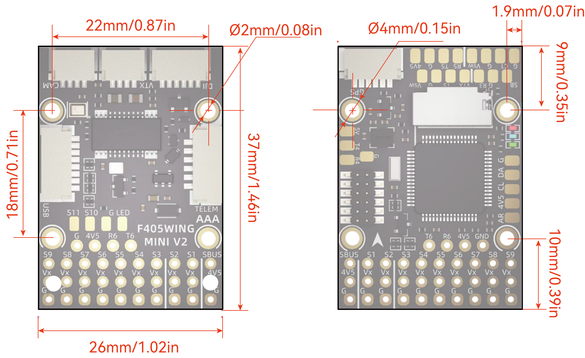
・S1~S10 outputs support both DShot and PWM. However, within the same timer group, once DShot is enabled for a certain channel, all channels in that same group will also enable DShot. We provide a 2+2+3+3+2 combination to make it easier to configure different types of aircraft.
・For example, in a single-motor fixed-wing aircraft, if DShot is enabled on S3, S4 will also be enabled; it is impossible to enable DShot on a single channel alone.
・For example, in a twin-motor fixed-wing aircraft, set the motors to channels S3 and S4 and enable DShot, while the remaining servo channels use the PWM protocol.
・In a Y3 VTOL (Vertical Take-Off and Landing) fixed-wing aircraft, set the three motors to channels S5, S6, and S7 and enable DShot, while the remaining servo channels use the PWM protocol.
・In a 4+1 VTOL fixed-wing aircraft, set the five motors to channels S5, S6, S7, S8, and S9 and

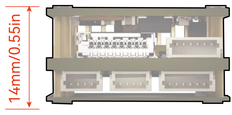
ADC				
Voltage	10K:100K Voltage Divider Ratio 0~36V	Battery voltage	BATT_VOLT_PIN	10
			BATT_VOLT_MULT	11.05
Current	0~3.3V	Current sense	BATT_CURR_PIN	11
			BATT_AMP_PERVLT	51
Analog Airspeed	0~6.6V	Analog Airspeed	ARSPD_PIN	15
			ARSPD_TYPE	2

I2C				
I2C1	5V tolerant I/O	Onboard Barometer	SPA06-003 (Identified as SPL06 in AP4.5.7)	
		Compass	COMPASS_AUTODEC	
		Digital Airspeed	ARSPD_BUS	0
		MS4525	ARSPD_TYPE	1
		ASP5033	ARSPD_TYPE	15

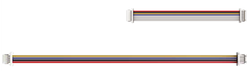
Part 7-Packaging

Size





CoreWing F405 WING MINI V2 PDB x1	CoreWing F405 WING MINI V2 FC board x1	CoreWing Wireless USB Extender SE x1
CoreWing F405 WING MINI V2 Top Protective Board x1	CoreWing F405 WING MINI V2 Bottom Protective Board x1	90-degree pin header (3x10) x1
Straight pin header(1x10) x3	M2×6.5 mm Female-Female Brass Standoff x5	M2x3.5 Phillips screw cross screw x10
White straight pin header(1x4) x1	M2×3+3 Male-Female Brass Standoff x5	35V 470uF Low ESR Capacitor x1



1. 8pin-SH1.0mm Wireless USB Extender Cable (160mm)

2. 4pin-SH1.0mm Analog VTX Cable (300mm)

3. 6pin-SH1.0mm GPS Module Cable without Connector on another end (250mm)

4. 6pin-SH1.0mm Digital VTX Cable (300mm)

5. 4pin-SH1.0mm to 3pin-JST1.25mm FPV Cam Cable (300mm)

6. 4-pin single-ended DuPont cable (150mm)

Part 8 – Warranty Information

Warranty Service (Within 30 Days)

① **Warranty Coverage:**
The Flight Controller Board, PDB, and Expansion Board are covered by a 30-day warranty from the date of delivery against non-user-induced defects and issues caused by official firmware.

② **Warranty Exclusions:**
The warranty does not cover:

- Consumable accessories such as cables and wiring.
- Products purchased through unauthorized channels.
- Damage caused by water ingress, impact, improper wiring, reverse polarity connection, unauthorized disassembly or repair, or installation of unofficial firmware.

Important Notes

- Products should be purchased through authorized channels. Please retain your proof of purchase for warranty claims.
- Read this manual before use and operate the product according to the instructions provided.
- Zhuhai CoreWing Technology Co., Ltd. reserves the right to the final interpretation of these warranty terms.

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