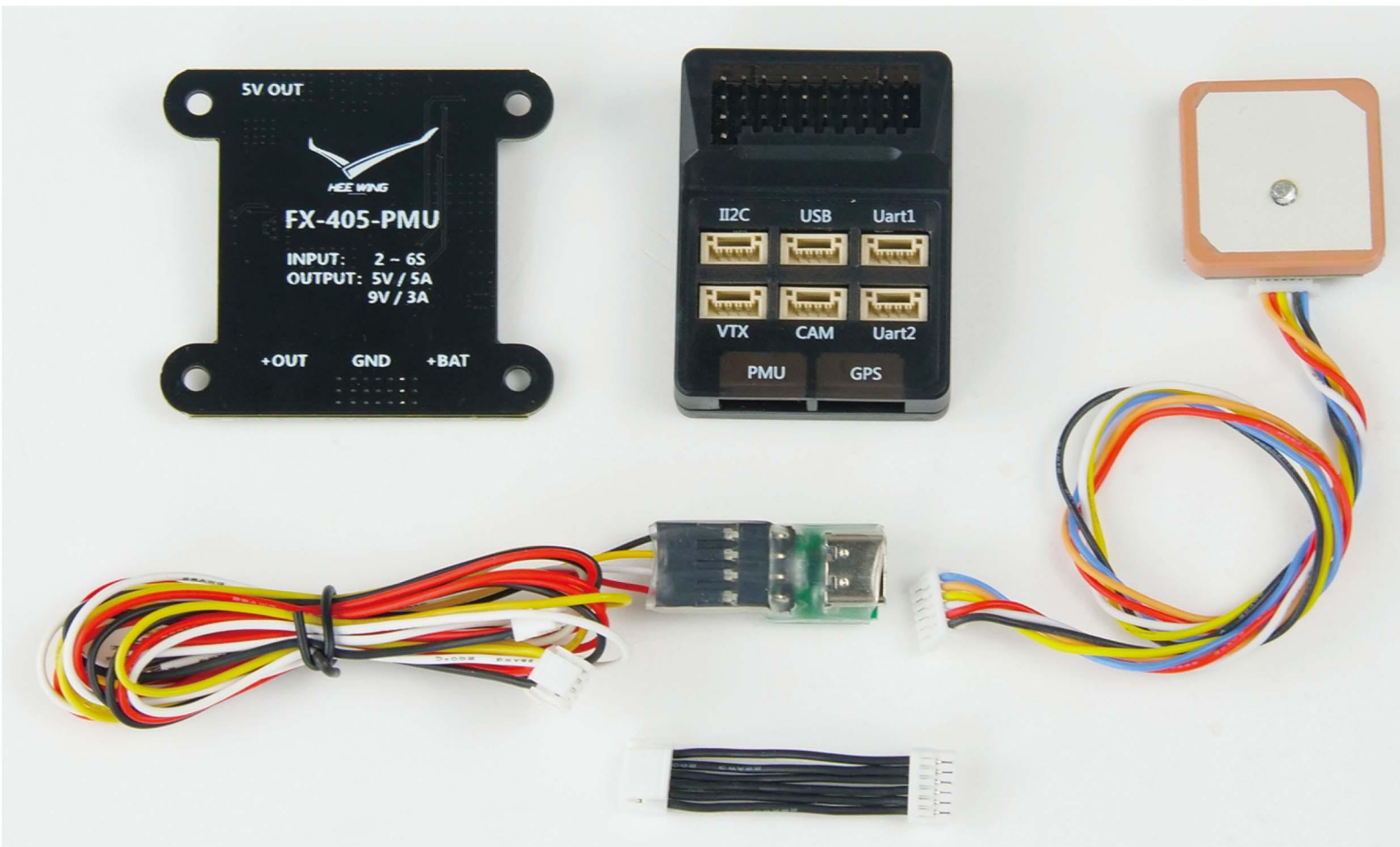# FX-405 Flight Controller User Manual

Welcome to choose **HEE WING FX-405 Flight Controller**, please read the manual to complete your setting.

FC Dimension: L44.3mm W34.3mm   H13.7mm
FC Input Voltage: 5V
FC weight:
PMU Input Voltage: 7.4v ~ 22.2v

PMU   FC   GPS   Data cable   PMU cable

Connecting with radio
1.RC_IN connector is default for receiver, it supports to use SBUS, IBUS, PPM directly
2.How to use CRSF
3.Recover from CRSF
Attention: after setting, it requires to restart FC to make it effective

Unlock
1.ARMING_CHECK = 0
All unlock condition checks are turned off by default, please ensure GPS, Sensor and all are ready before take off.
2.Unlock method
Rudder stick goes to right and keep holding, motor will going to Idle mode.
Attention: Please take off the propellers to test before setting all functions.
3.Lock method
Rudder stick goes to left and keep holding, motor stop spin.
Attention: do not touch the plane in lock mode, please stay in safe distance.

Loss of control protection
1.Ensure the loss of control protection has been correct set before take-off.
If using SBUS or other digital protocol, FC can automatic identify the loss of control protection, but it also highly recommend you to do the simulation test in ground.
2.Returning will prioritize use fixed wing mode after losing control, and convert to VTOL mode to land when approaching the HOME position.

Serial Interface
1.Serial Interface1 default mavlink1
2.Serial Interface2 default mavlink2

IIC
Default is ASP5033

MSP Display Port OSD
Avatar DJI O3
Connecting method 1:
Use Serial Interface 1 or Serial Interface 2: Both RX and TX connected
SET:
OSD_TYPE = 5
SRIAL2_PROTOCAL = 42
Wires connection:
Data cable connecting to Serial Interface, power cable connecting to VTX or CAM
Connecting method 2:
Use Serial Interface 5
SET:
OSD_TYPE = 5
SRIAL5_PROTOCOL = 42
Wires connection:
Due to the Serial Interface 5 is in VTX socket, only one socket is needed, which consists of three wires: Air Unit RX, positive pole, and negative pole, Air Unit TX no need to connect

MSP OSD
DJI V2
Use Serial Interface 1 or 2: Both RX and TX connected
SET:
OSD_TYPE = 3
SRIAL2_PROTOCOL = 33
MSP_OPTIONS = 0
Wires connection:
Data cable connecting to Serial Interface, power cable connecting to VTX or CAM
How to set analog and digital simultaneously output
OSD_TYPE = 0

First fly
Step 1:
Connect the remote control, calibrate, and set the mode
Step 2:
Calibration of sensors, 6 sides calibration, horizontal calibration
Step 3:
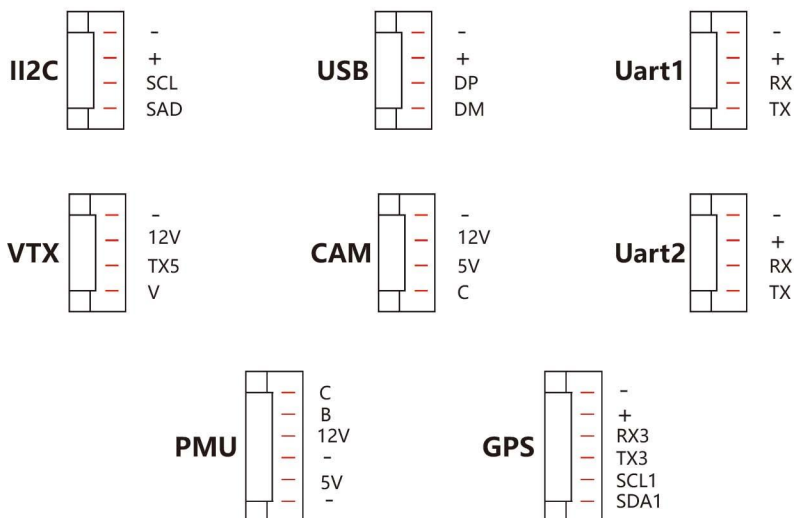Ensure the GPS has positioned, calibration of compass
Step 4:
Switch to VTOL STAB mode, ensure the aircraft can be controlled; Switch to VTOL LOITER mode, ensure the aircraft can be positioned.
Step 5:
Switch the mode from VTOL to FBWA, ensure the conversion working properly, then switch the mode from FBWA back to VTOL

Connectors:

II2C	-
	+
	SCL
	SAD

USB	-
	+
	DP
	DM

Uart1	-
	+
	RX
	TX

VTX	-
	12V
	TX5
	V

CAM	-
	12V
	5V
	C

Uart2	-
	+
	RX
	TX

PMU	C
	B
	12V
	-
	5V
	-

GPS	-
	+
	RX3
	TX3
	SCL1
	SDA1

II2C(blank)   USB :adjust parameter   Uart 1 :Digital VTX

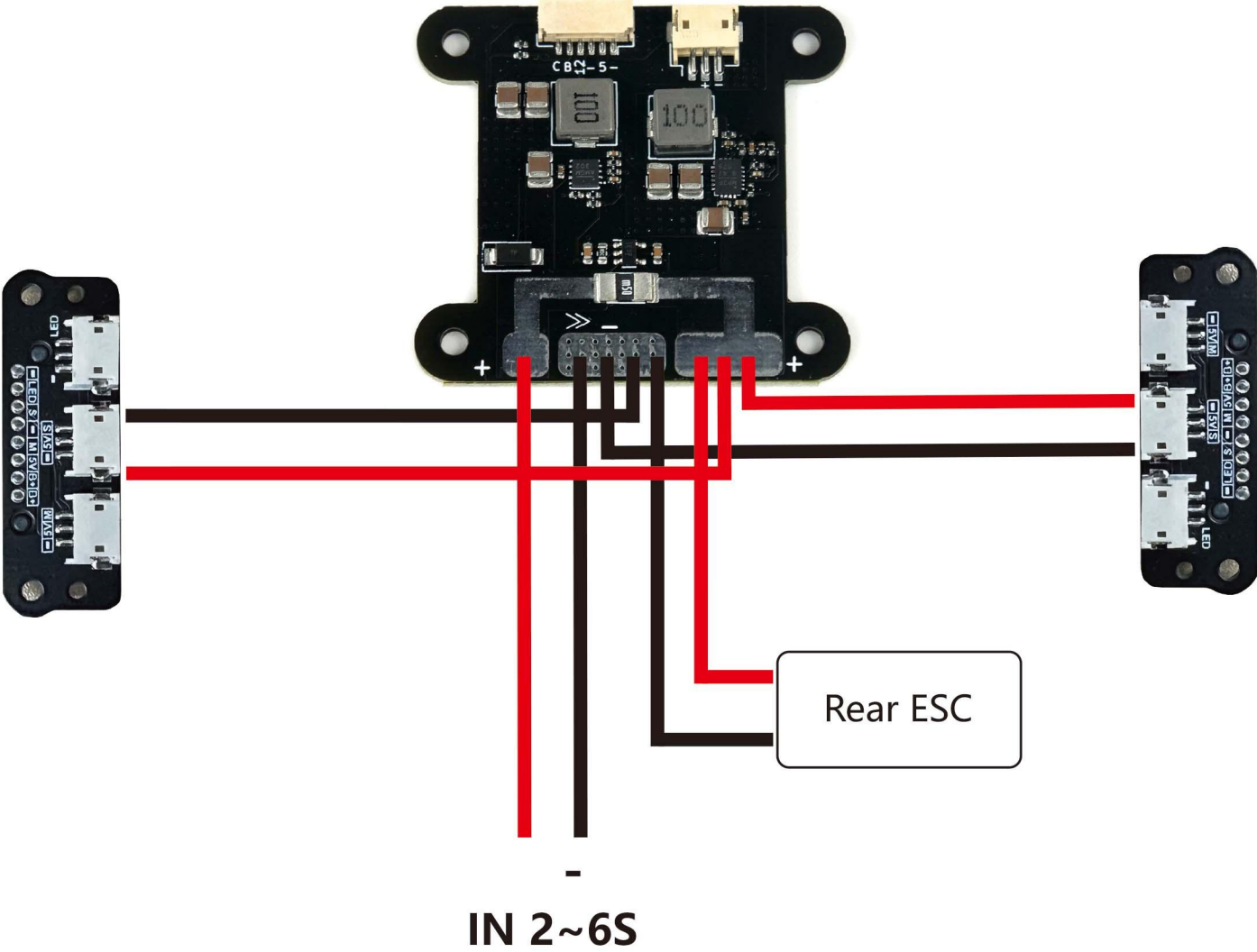VTX:Analog VTX   CAM:Camera   Uart 2: Digital VTX
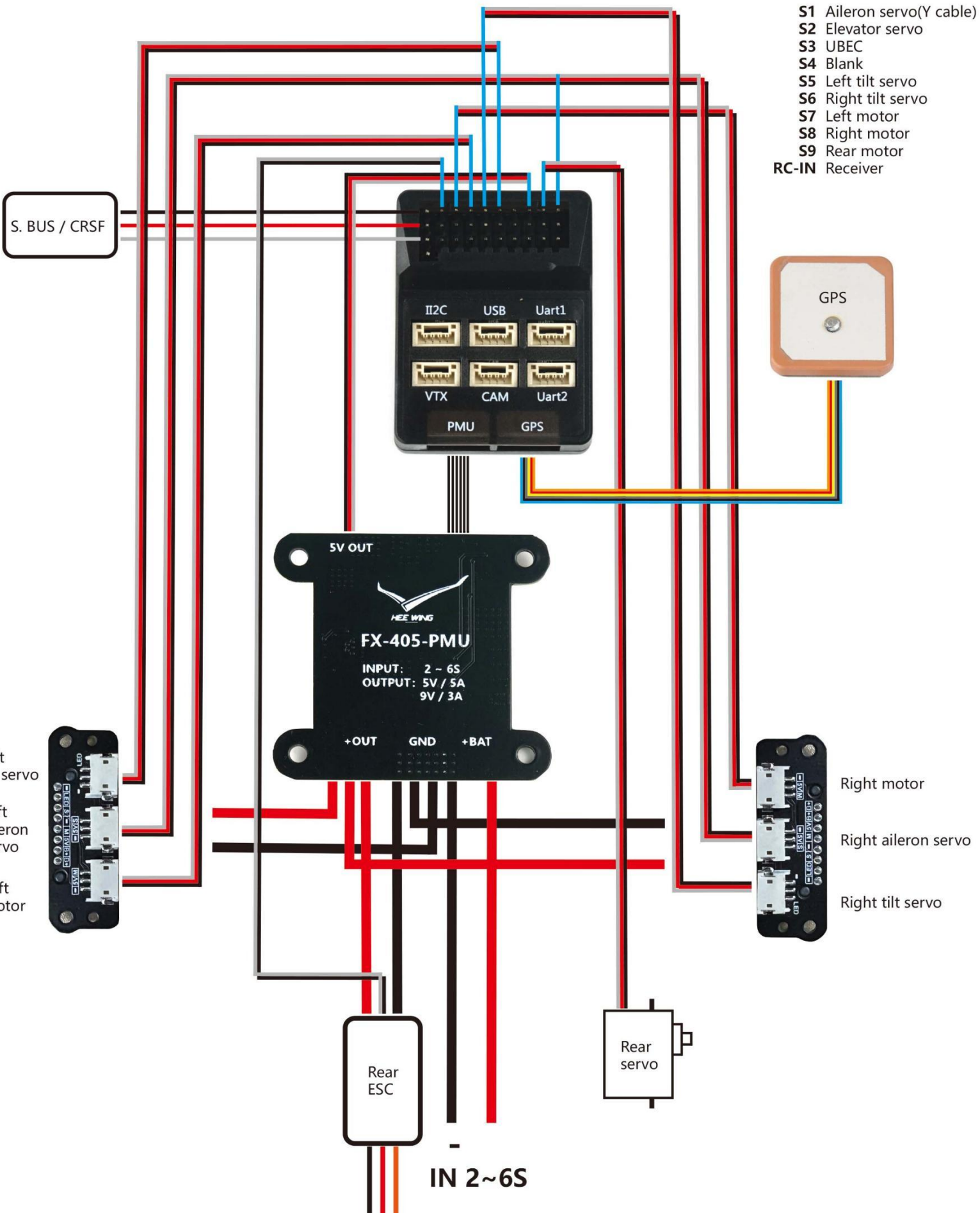
PMU   GPS

S1 Aileron servo(Y cable)
S2 Elevator servo
S3 UBEC
S4 Blank
S5 Left tilt servo
S6 Right tilt servo
S7 Left motor
S8 Right motor
S9 Rear motor
RC-IN Receiver

These connectors are for T1 Ranger, please adjust according to your actual need if you are using other brand planes.

Rear ESC

-

IN 2~6S

Wiring Diagram

S1 Aileron servo(Y cable)
S2 Elevator servo
S3 UBEC
S4 Blank
S5 Left tilt servo
S6 Right tilt servo
S7 Left motor
S8 Right motor
S9 Rear motor
RC-IN Receiver

S. BUS / CRSF

II2C   USB   Uart1

VTX   CAM   Uart2

PMU   GPS

GPS

5V OUT

HEE WING

FX-405-PMU

INPUT: 2 ~ 6S
OUTPUT: 5V / 5A
           9V / 3A

+OUT   GND   +BAT

Left tilt servo

Left aileron servo

Left motor

Right motor

Right aileron servo

Right tilt servo

Rear ESC

Rear servo

IN 2~6S

遥控器设置

Download or read assemble guide in www.heewing.com
Download ArduPilot firmware from Ardupilot homepage

Warning:
VTOL default parameters is free share and only for reference, HEE WING do not take any responsibility or obligation for this parameter. It is strongly recommended that players must strictly adjust according to their actual flight environment and needs!
More information of this firmware server and its content, please take a look at:
https://ardupilot.org/ardupilot/index.html

1、Open the software, select "Ardupilot" in the upper right corner and click connect

2、Default is S.BUS receiver, if you are using CRSF receiver, please set in the CONFIG. Search SERIAL6_PROTOCOLCOL, change the value to 1, Default change to 23.

1、Select "Ardupilot"
2、Connect

2、Change to 1 Default23
1、SERIAL6_PROTOCOLCOL
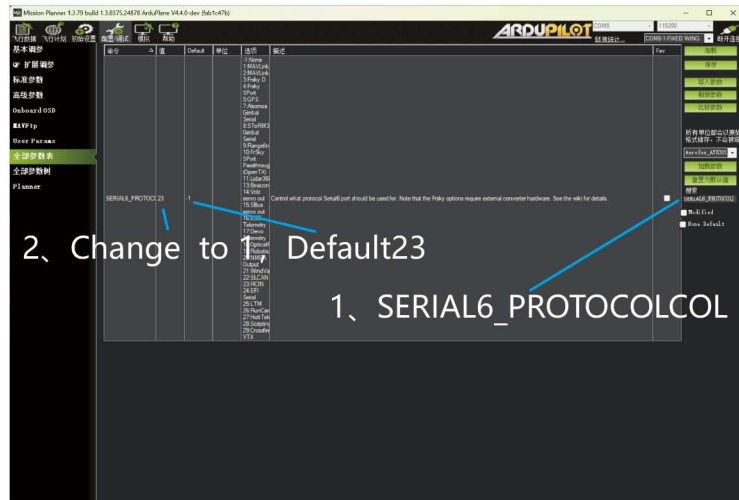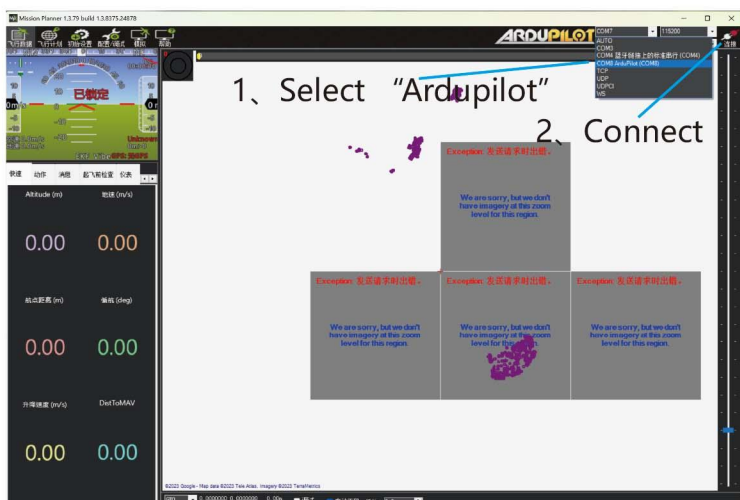
3、In the upper left corner, find the SETUP(Mandatory hardware) Radio Calibration, click to calibrate your radio, you need to move your radio sticks, and switch CH5/CH6, so the FC can identify your radio signal, click when done.

4、Ensure all your switches of flight mode is correct
1 QLOITER(VTOL) 4 FBWA(Fixing plane)
6 QRTL(Return to launch)

1、SETUP
2、Mandatory radio calibratin
3、Start to calibrate
5、Click when done
4、Move sticks and switch CH5/CH6
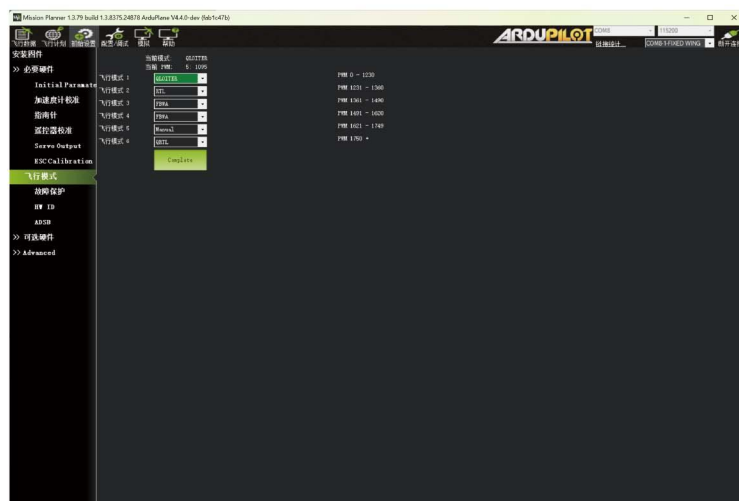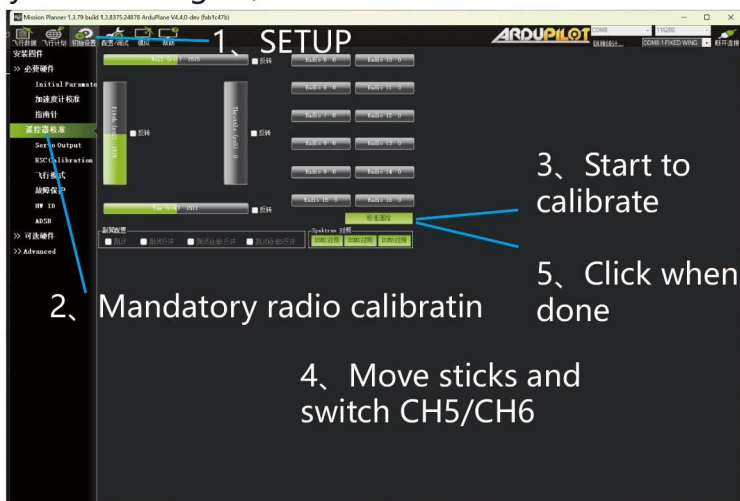
Warning:

The FC already set default parameters for T1, but it's only for your reference, please check and adjust before fly depends on the actual flight environment and needs. Always respect the rules provided by your local remote control aircraft organization. Choose an appropriate flying site consisting of a large open space to ensure the safety of yourself, others and your model. Please ensure all channels and functions all running properly before fly. The equipment and any electronic products on the aircraft cannot be completely reliable, and our company is not responsible for any direct or indirect losses or consequences caused by the use of this product