

Safety instruction

I. At all time, always point the FT10 Spitfire nozzle in a safe direction, with the drone as the center of the circle, the radius of 10 meters in a circular area can not have human and animal activity to avoid unnecessary injury.

II. FT10 Spitfire is professional equipment. Please do not add alcohol or any other liquid use or training before the operator knows the skilled use of the method. After knowing all the functions of the use of the process, operator can fill the bottle with water for simulation training, and then finally refilled with alcohol for practical use. Alcohol is flammable and volatile, please use in an open environment. Please do not refill alcohol in the hot sun in summer, and pay attention to static electricity when refilling alcohol in winter. When testing with alcohol, try to test it in the evening or cloudy days, it will be easy to observe the flame burning situation.

III. Please operate without any liquid before first use and use an empty fuel bottle for equipment testing.

IV. For flight safety, please perform the drone center of gravity calibration operation in a windless environment after filling the fuel bottle with water

without installing disposable carbon dioxide cylinders.

V. DO NOT add anything to the fuel. Prevent damaging the equipment or blocking the pipeline.

Warnings

CZI FT10 Spitfire is professional equipment. It must follow the safety instructions of professionals. Non-professionals are forbidden to use it, because misuse or carelessness may lead to **serious casualties**. Please keep this manual in a safe place for future use.

It is your responsibility to ensure the safe use of the FT10 Spitfire and this user manual is designed to help you learn how to use the FT10 Spitfire properly.

Keep your FT10 Spitfire in a safe place. Use the FT10 Spitfire only when you are certain that you fully understand this manual and can operate it properly. You must know how to use the FT10 Spitfire safely. If you have any doubts about your own safe operation or use of FT10 Spitfires, you should consult the manufacturer for guidance.

If there is any hardware problem with CZI FT10 Spitfire products, please return to the factory and contact after-sales service. Do not disassemble and repair by yourself, otherwise you will lose the warranty and

maintenance qualification.

Warning - Please take the time to read and understand the following safety rules before using your FT10 Spitfire.

Safety Rules

I. Again, always point the Spitfire of FT10 Spitfire in a safe direction.

With the drone as the center of the circle, no human or animal activities are allowed in the circle area with a radius of 10 meters, so as to avoid unnecessary injuries.

II . Always determine the environment around the fire target. For example, fire prevention measures should be taken in the environment with more combustible materials, such as carrying enough fire extinguishers and forming isolation belts to ensure the safety of the environment around the fire target. If the environment around the fire target cannot be guaranteed, FT10 Spitfire operation should be stopped to prevent fire accidents.

III. In the fire spiting operation, beware of spitfire targets caused by the occurrence of collateral fire accidents, such as textiles, plastics and other combustible substances burning after dripping lead to ground fire, spark to expand the combustion point.

IV. FT10 Spitfire using alcohol as fuel, in the outdoor sunlight, the flame is not clear and the visibility is low.

V. After filling alcohol and pressurized, DO NOT appear in front of the Spitfire.

VI. FT10 Spitfires are not allowed to be used in bad weather, which will interfere with the flight safety and fire safety of the drone.

VII. When working at low altitudes within 2 meters, part of the fuel of FT10 Spitfire may not burn sufficiently, which will drip to the ground and be ignited.

VIII. FT10 Spitfires largely use 75% alcohol as fuel. If you purchase a large amount of alcohol for reserve, please strictly follow the regulations on storage, custody and use, and strictly manage the use in a centralized manner.

IX, When refilling alcohol, it should be done in a cool and ventilated environment. Wearing electrostatic discharge (ESD) gloves to prevent explosion caused by spark or static electricity.

X. To avoid fire accidents, you need to be careful when using it and pay attention to the safety of spiting fire.

XI. During the formal operation, do not set the gear immediately after the completion of pressure. You can adjust the pressure gear only when you fly to the target object to be cleaned.

XII. After adding alcohol and pressurizing, whether the gear is adjusted or not. If you want to terminate the Spitfire operation, please unscrew the pressure relief screw on the premise of safety, and wait until the internal pressure of the Spitfire is completely released. The fuel bottle release rod can be operated and the fuel bottle can be pulled out only when there is no open fire around. **Note!!! If the operation is terminated after adjusting the gear for a long time, because the carbon dioxide is partially dissolved in alcohol, the fuel overflow may occur after the fuel bottle is pulled out. You can put some towels or paper towels on the ground in advance without panic.**

X III. When the Spitfire is not operated, please lock the Spitfire through the remote control in time to prevent disoperation.

X IV. When handling, transporting, storing, pressurizing or cleaning the FT10 Spitfire, please ensure that the device is not connected to the power supply and is not filled with disposable carbon dioxide cylinders and fuel.

X V. The FT10 Spitfire has a mechanical rotating structure, there is a risk of hand clamping and other related risks. Please install and operate the FT10 Spitfire in strict accordance with the operating instructions.

X VI. Ensure that the operator uses the FT10 Spitfire when he/she is in normal mental state and has no behavioral disorder. Do not use the FT10 Spitfire after using drugs or alcohol.

X VII. The equipment contains high-power laser beam. Do not irradiate

human parts, which may cause unnecessary injury.

X VIII. FT10 Spitfire should be stored in a separate and safe place.

X IX. Do not modify or change the FT10 Spitfire. Modifying or changing the FT10 Spitfire may cause it to malfunction or become unsafe, and will lose the warranty service.

X X. Always pay attention to the software firmware version information on the official website to ensure that the FT10 Spitfire firmware is the latest version when used.

X XI. In case of any abnormal situation during use, please immediately disconnect the power supply and open the pressure relief valve, stop using, and submit it to a professional for treatment.

Matters needing attention

- I . At all time, always point the FT10 Spitfire nozzle in a safe direction, with the drone as the center of the circle, the radius of 10 meters in a circular area can not have human and animal activity to avoid unnecessary injury.

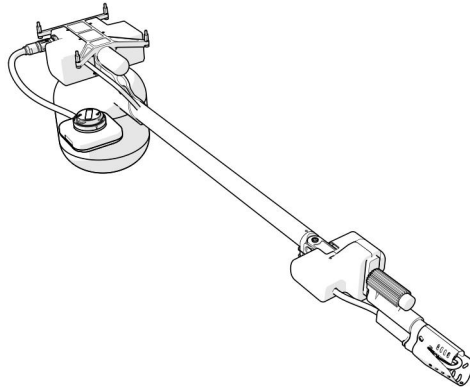
- II . The FT10 Spitfire is a professional equipment. The operator should not add alcohol or any other liquid for use or training before being proficient in using the method. After mastering the use process of all functions, carry out the simulation training of adding water to the fuel bottle, and finally add alcohol for actual use. Alcohol is flammable and volatile. Please use it in an open environment. Do not add alcohol in the hot sun in summer, and pay attention to static electricity when adding alcohol in winter. When filling the alcohol learning test, try to choose the evening or cloudy day, so as to observe and understand the flame burning situation in time and have a clearer understanding of FT10.

- III. For flight safety, the aircraft should calibrate its center of gravity in a windless environment with FT10 fully loaded.
- IV. It is forbidden to add anything to the fuel. Prevent damage to equipment or blockage of pipeline. Before use, please clean and replace the filter screen on the fuel bottle device.

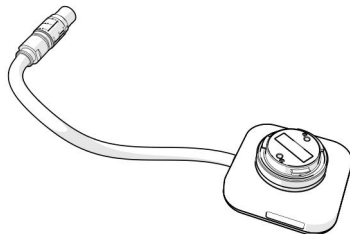
User Manual

I. Major Hardware

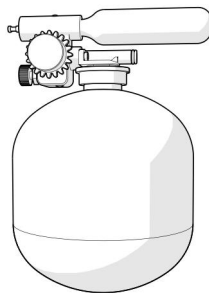
1, FT10 Main Engine



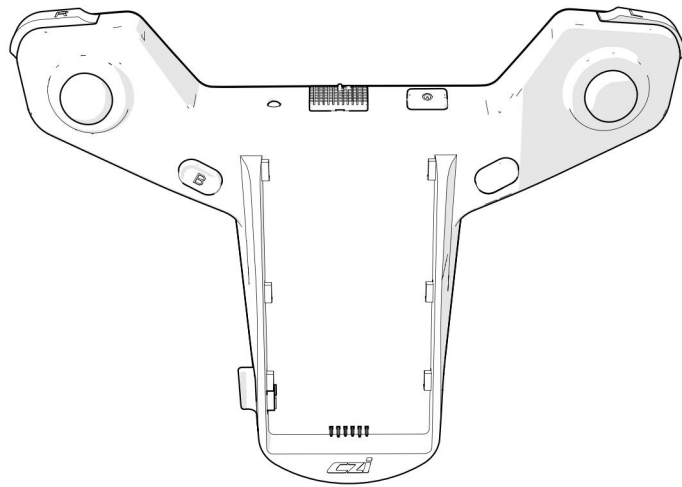
2, FT10 Controller



3, Fuel Bottle and pressure regulating valve

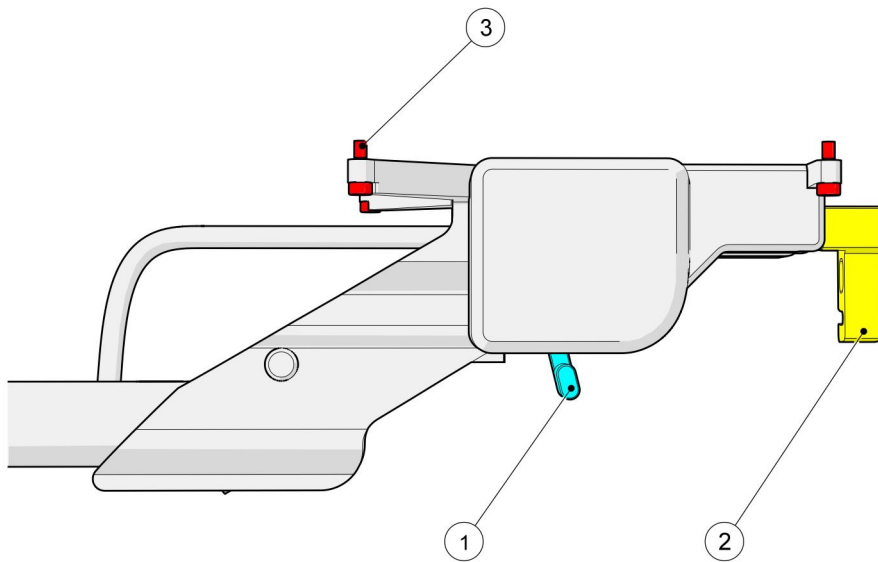


4, Extended Remote Control



II. Hardware Setup

1, Major Engine

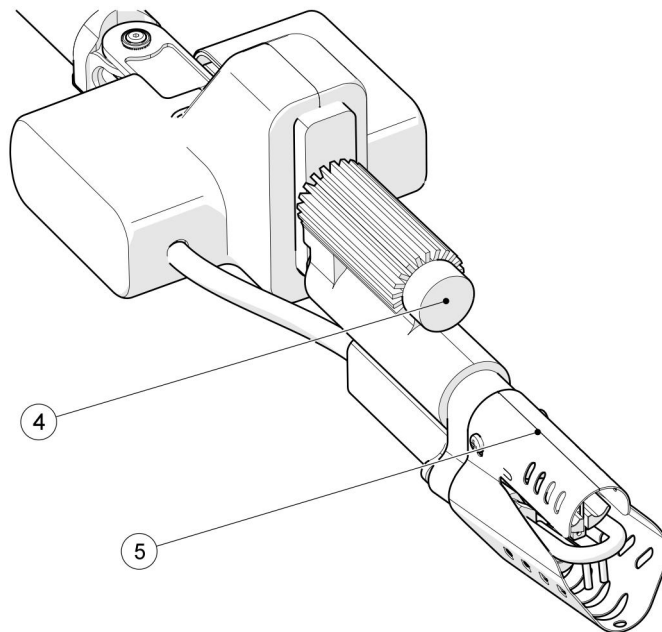


①. Fuel Bottle Release Rod

②. Rotary locking lever

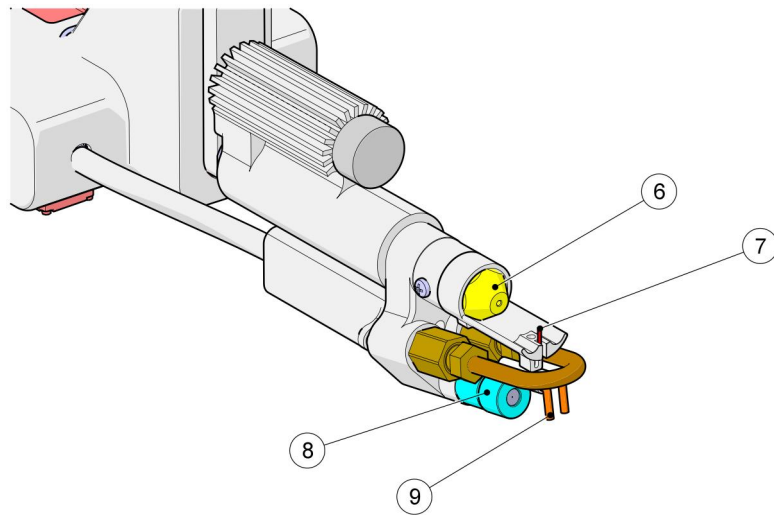
③. Anti-release set screws

2, Introduction of FT10's nozzle



④. Auxiliary Targeting Laser

⑤. Windshield



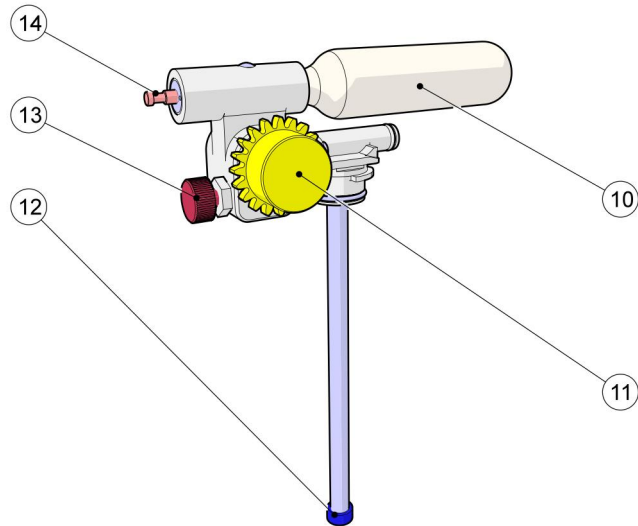
⑥. Main Nozzle

⑦. Auxiliary ignition pin

⑧. Gasification nozzle

⑨. Electric arc ignition head

3, Introduction to the regulator assembly



⑩. Disposable carbon dioxide cylinder

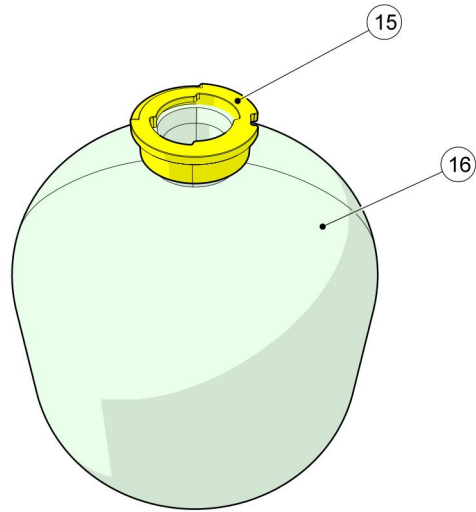
⑪. Regulating gear

⑫. Fuel filter screen

⑬. Pressure relief screw

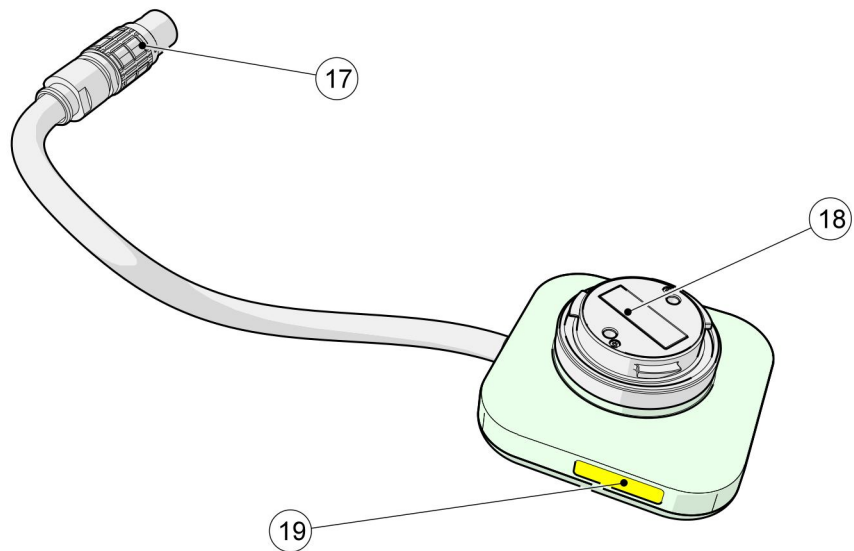
⑭. Puncture needle

4, Fuel bottle assembly



⑮ Bottle top adapters 16. Fuel bottle body

5, Spitfire Controller



⑰ Spitfire connection plug

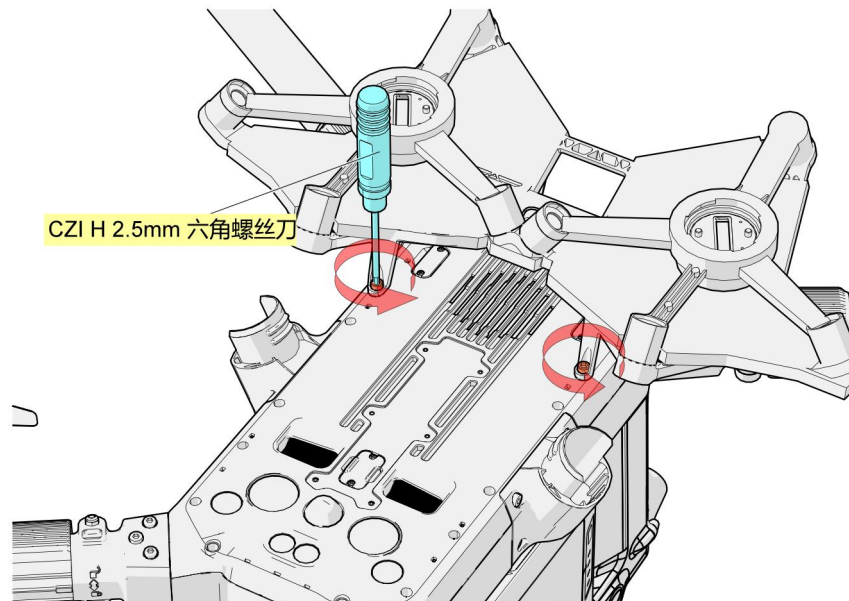
⑱ Payload Adapter ring

⑲ SD card port

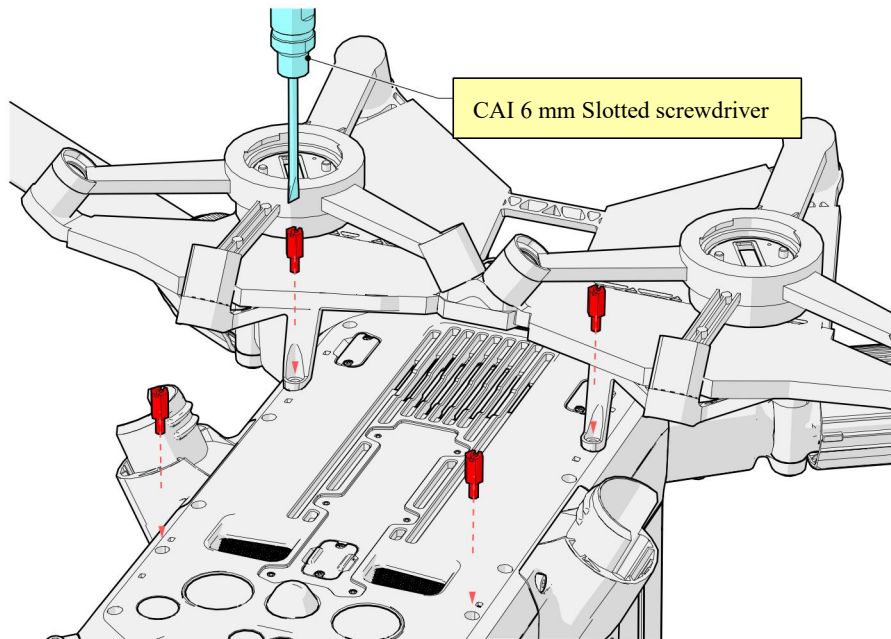
III. Checking equipment before use

- 1, Unscrew the two pan-mounted screws on the underside of the drone

CAI H 2.5 mm Hexagon screwdriver

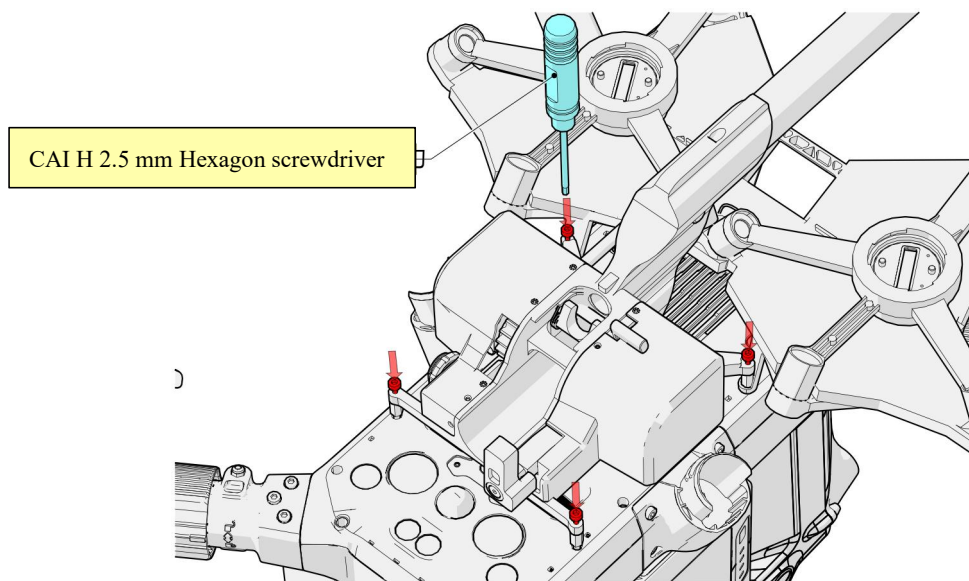


2, Install four transfer screws on the machine belly. Before



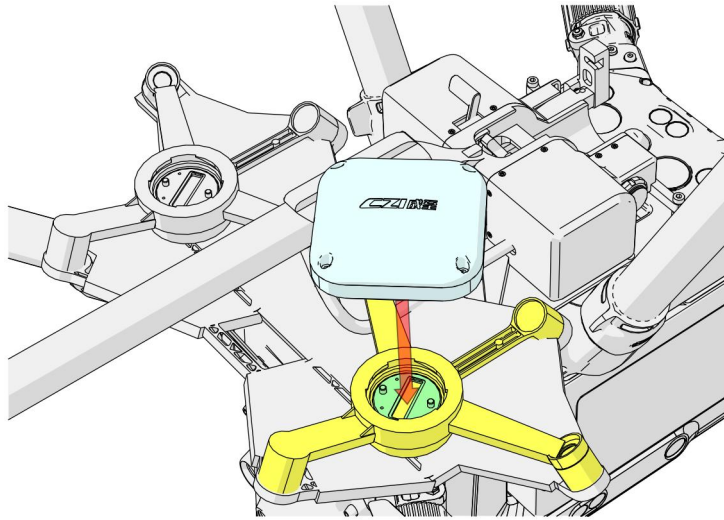
installation, daub proper amount of screw glue on the threads of transfer screws

3, Place the Spitfire mainframe on the bottom of the drone.

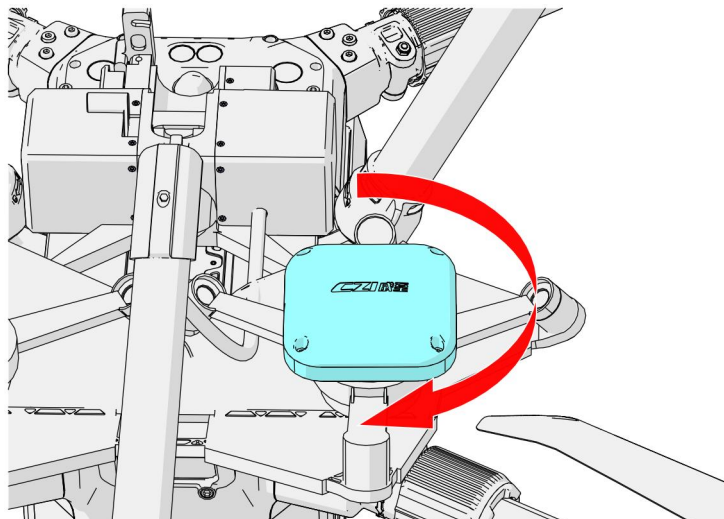


4, Installation of the control box.

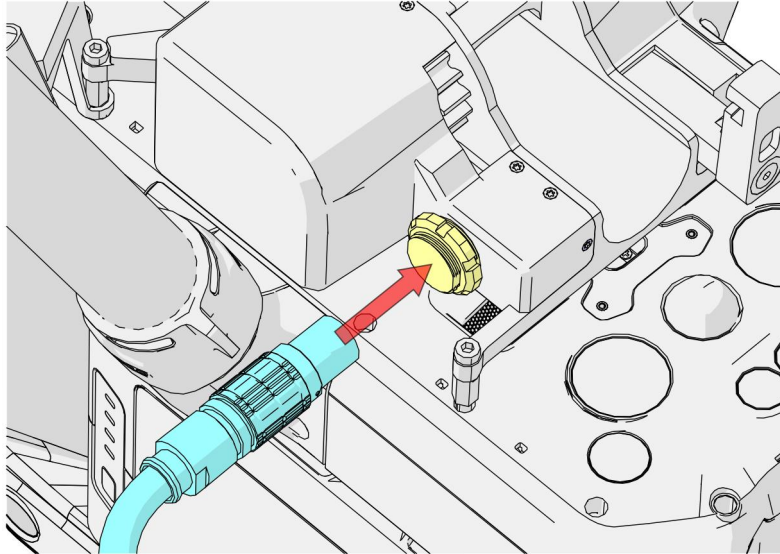
① Install the control box, align the bayonet and press down vertically.



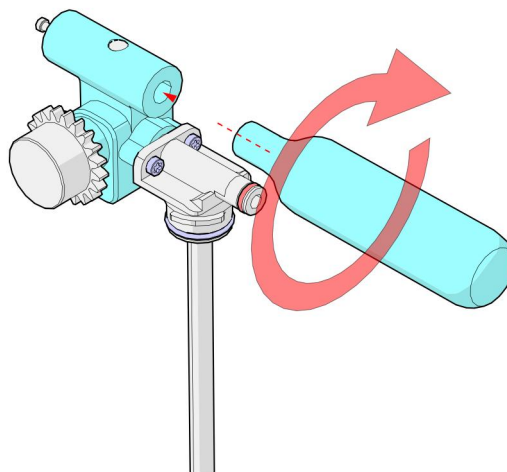
② After reaching the lowest position, turn the control box clockwise



③ Connect the control box.

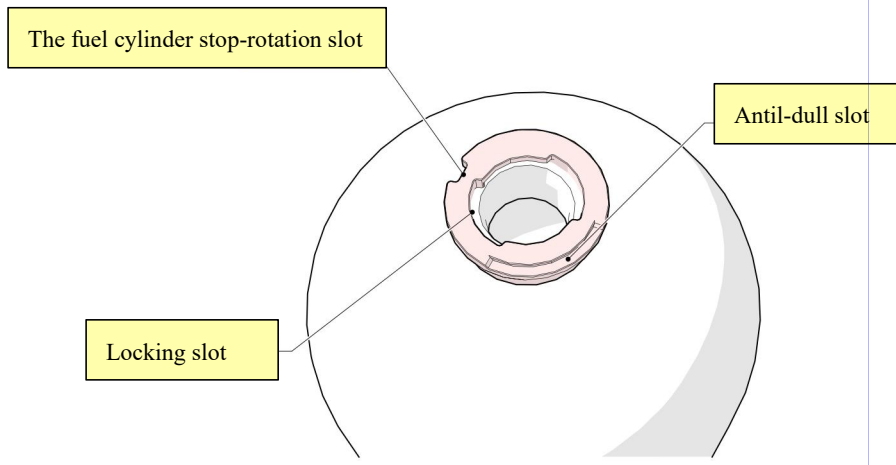


5, Disposable carbon dioxide installation

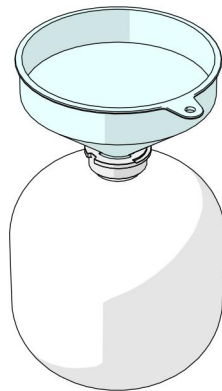


6, Regulator fuel bottle assembly

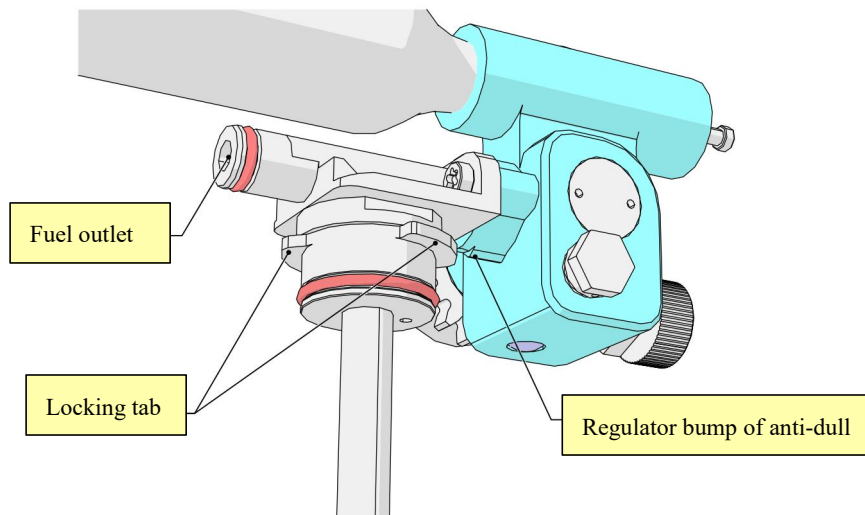
(1) Introduction of fuel bottle mouth



(2) Add the fuel, do not add too much alcohol which lead to overflow.

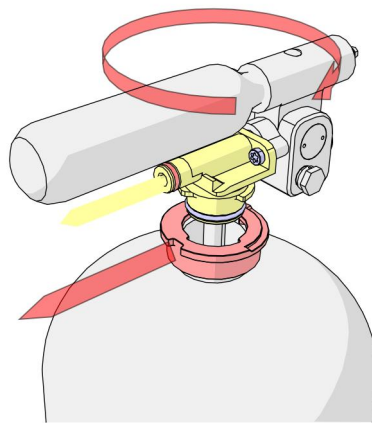


(3) Introduction to regulators

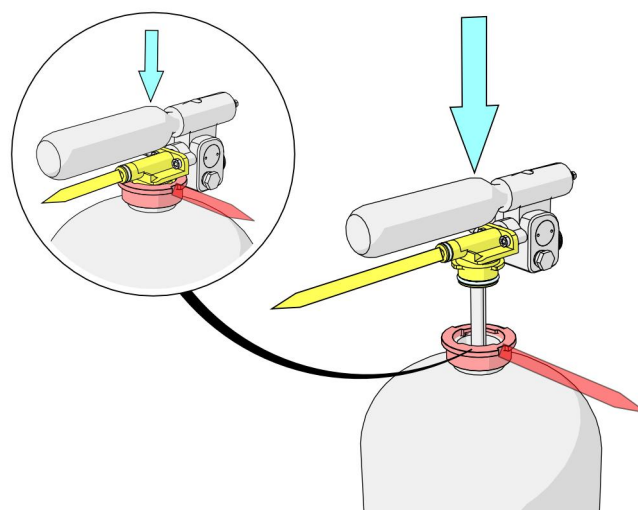


(4) Regulator fuel cylinder assembly

a) Fuel cylinder regulator alignment: The fuel cylinder stop-rotation slot opening is in the same direction as the fuel outlet, and then the regulator is rotated 90 degrees clockwise so that the locking tab and locking slot correspond.

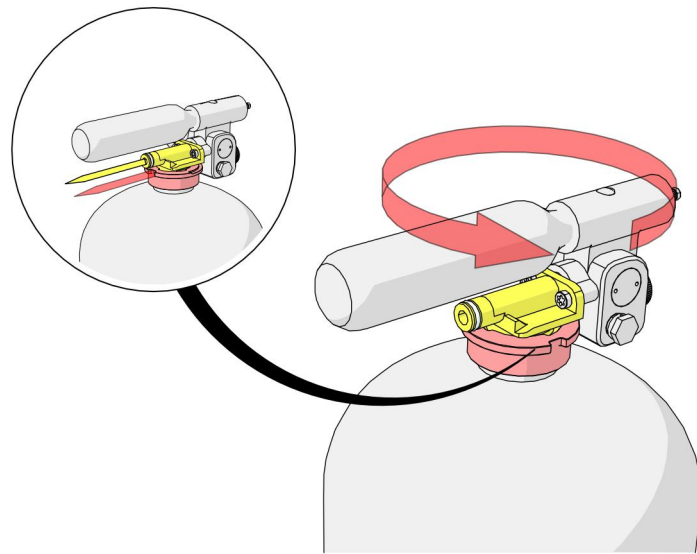


b) At this time, the fuel port and fuel stop groove are at 90 degrees, and press down the regulating valve assembly until it can't be pressed further.

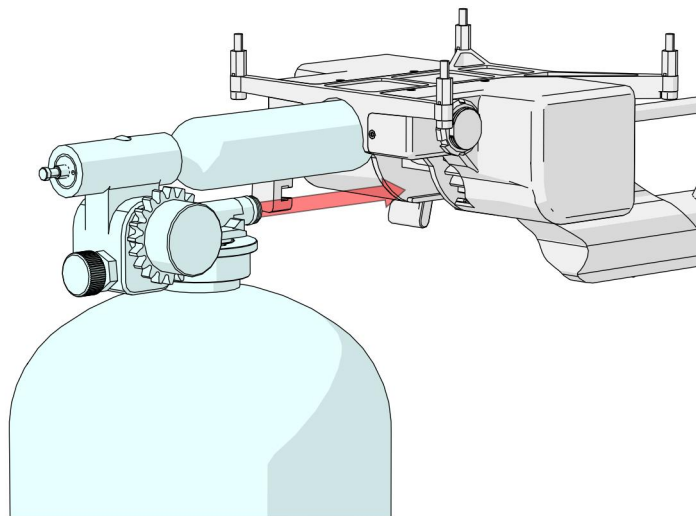


c) Fix the fuel bottle with one hand, and rotate the pressure regulating valve assembly 90 degrees counterclockwise with the other hand, so that the fuel

port and the fuel bottle stop groove are in the same direction



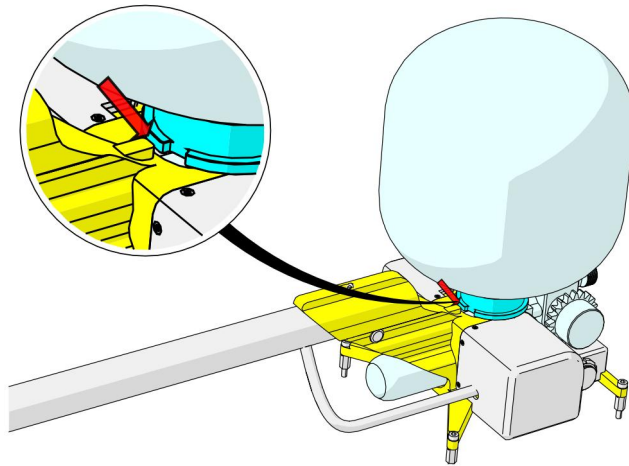
(5) Insert the fuel bottle assembly of the pressure regulating valve into the main engine and push it firmly into place



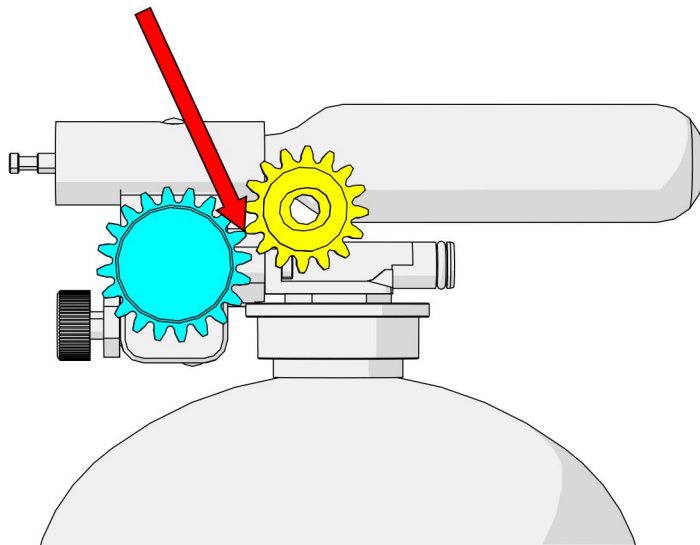
a. Check whether the fuel bottle can't be extracted directly. Please check the following two points if it can be extracted directly

- ◆ When the fuel bottle is inserted, it rotates to a certain extent, which causes the fuel bottle anti-rotation groove and the main support can not

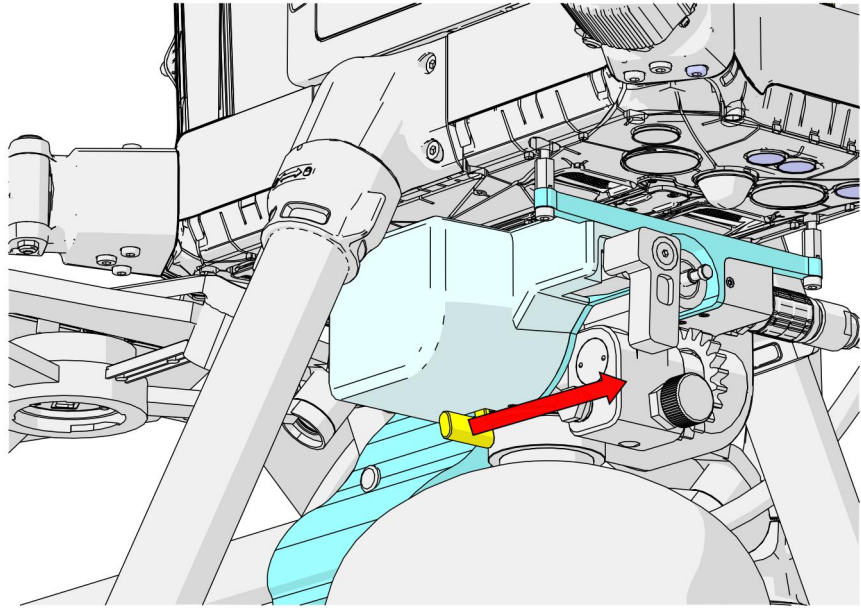
be inserted, and the fuel bottle can be inserted when it is rotated in place



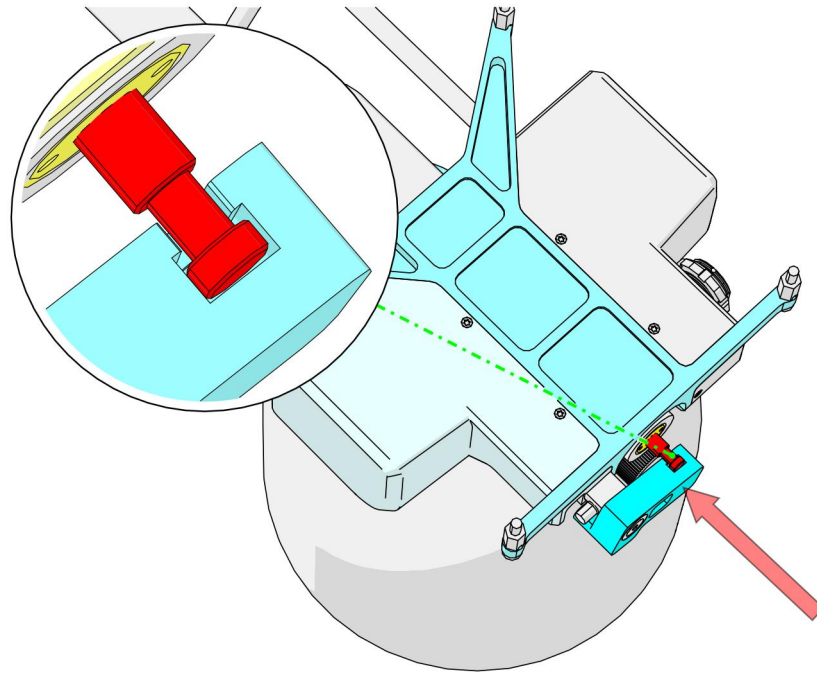
- ◆ Adjust the dislocation of the pressure regulating gear, push it to the manual rotating gear to solve it.



- ◆ The remote controller prompts “the bayonet is not in place”. Pull the unlocking lever back

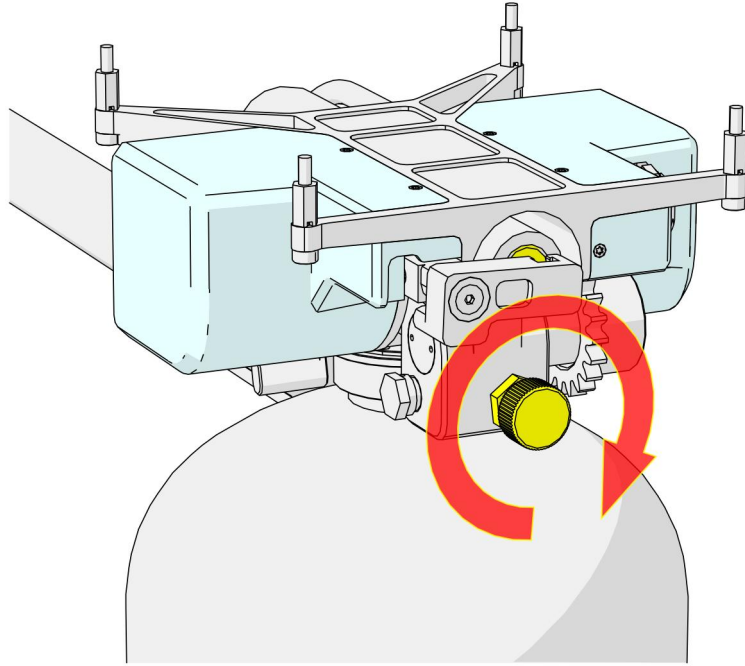


(6) Rotate the rotary locking lever backward for 90 degree, to clip the tail of the puncture needle into the slot at one end of the rotary locking lever. Finally, push the selector locking lever forward.



Note: When nesting is not possible, push the puncture needle forward to right place. Then adjust the rotary locking lever back and forth.

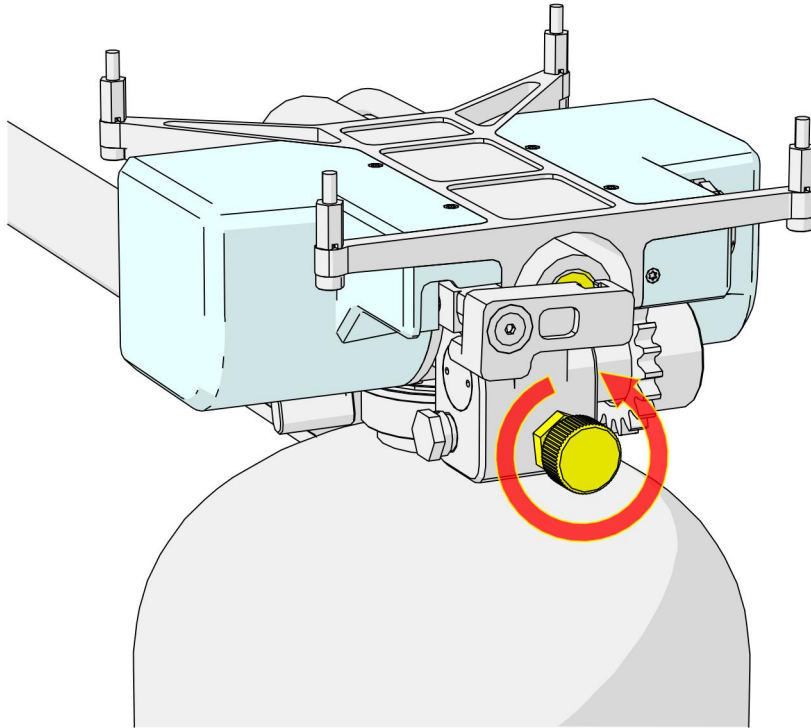
(7) Check and tighten the pressure relief screw



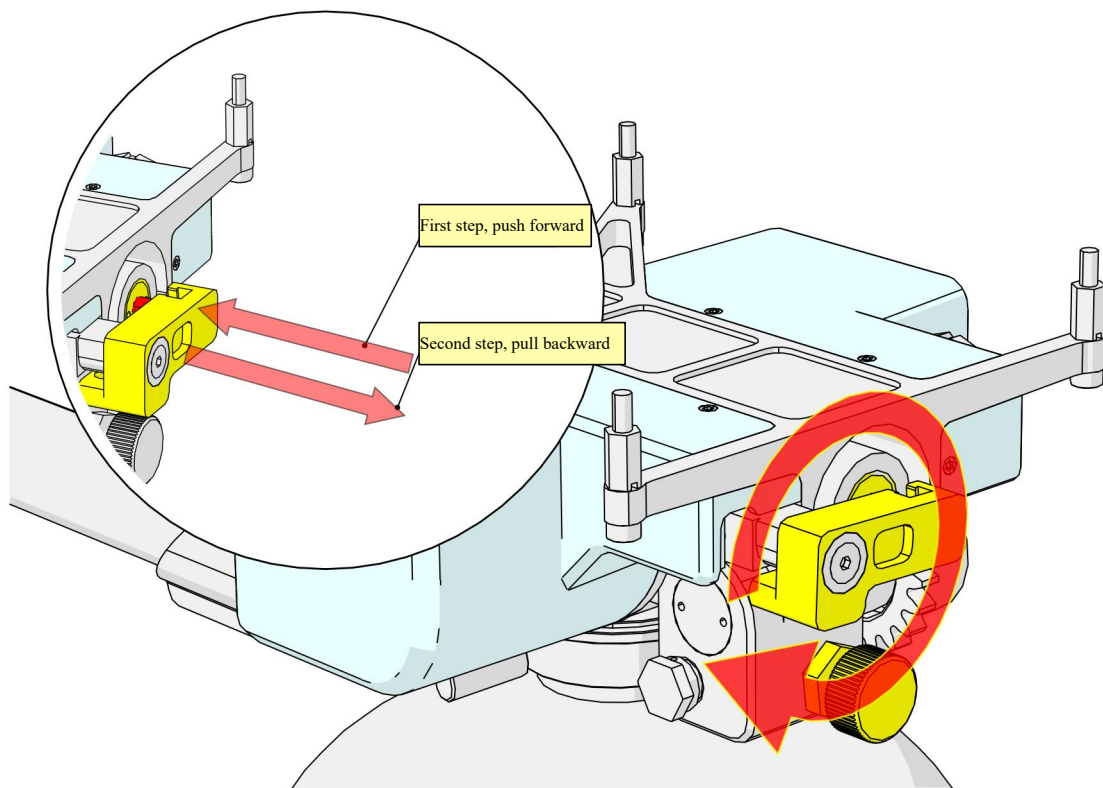
The hardware part is ready after checking above. The next step is to complete the pressurization, pressure regulation and fire spraying through App.

Fuel cylinder and disposable gas cylinder replacement tutorial

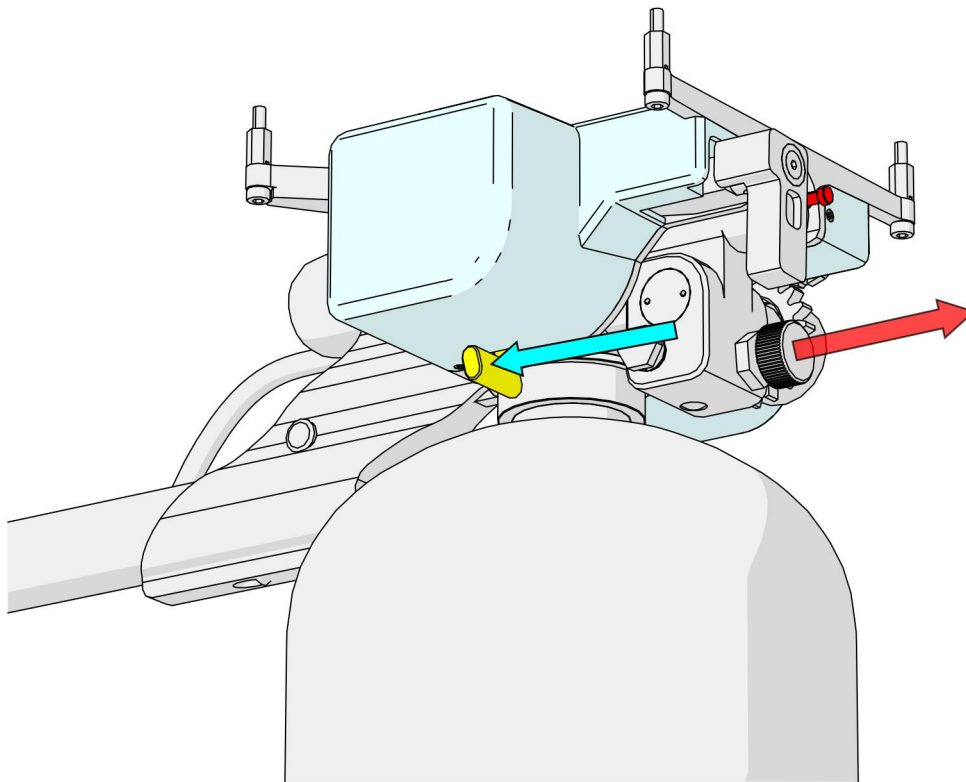
- 1, Loosen the pressure relief screw to release the excess pressure in the system



2, Push the rotary locking lever forward, then pull the rotary locking lever backward and rotate it 90 degrees clockwise.



3 , Push the fuel bottle release lever forward and pull back the pressure relief screw at the same time, the fuel bottle can be withdrawn.



Check if the device is working properly before use.

1. Once the hardware is ready, complete the pressurization action via the remote control and adjust the pressure to 2 positions. After a few seconds, open the pilot valve by tapping the thunderbolt symbol on the remote control and after a few seconds check if there is a sound of air flowing out of the spit. When you hear the sound, tap the thunderbolt symbol to close the pilot valve, then tap the separate fuel jet button to check for a larger jet of air coming out of the jet and tap to close the jet.

2. After checking the nozzle, manually unscrew the pressure relief valve and check if the pressure relief is normal.

Simulation training

1, Attach the disposable CO₂ cylinder and fill the fuel bottle to pure water.

2, After repeating the pressurization and regulating process, tap the lightning icon to open the pilot head valve and check if water mist is produced at the nozzle, then close the pilot head valve and open the independent fuel injection button again to see if the water flow is normal, then close it. Repeat several times until the water is all sprayed.

3, When the water spray is finished, unscrew the pressure relief screw to release the excess pressure, you can refill the disposable carbon dioxide cylinder and carry out the flight water spray training.

4, When you have mastered the process, you can fill the alcohol to carry out spit fire operations.

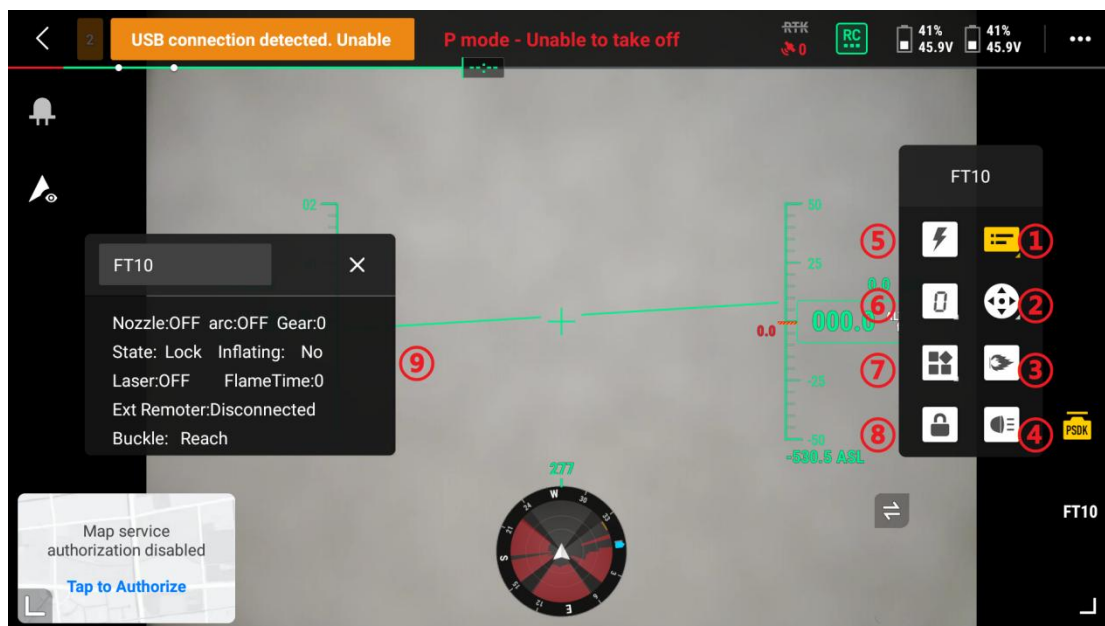
5, Repeat the pressurization and regulating process, tap the lightning icon to open the pilot head valve, check whether the nozzle has water mist produced, then close the pilot head valve, open the independent jet fuel button again to see whether the water flow is

normal, then close it. Repeat several times until the water is all sprayed.

6, when the water spray is finished, unscrew the pressure relief screw to release the excess pressure, you can reload and replace the disposable CO2 cylinder, and carry out the flight water spray training.

7, Once you have mastered the process, you can fill them with alcohol and carry out fire-breathing operations.

Pilot Software button introduction



- ① On/off FT10 operation menu on pilot.
- ② Gimbal movement: nozzle steering adjustment, "Rotate the rocker" mode is "M300 remote control" to operate Nozzle steering movement.
- ③ Spit fire on/off: one key press to spit fire, to open fuel jet and ignite at the same time.
- ④ Fuel jet on/off: Nozzle spray fuel, if ignite also on, will open spit fire at the same time.

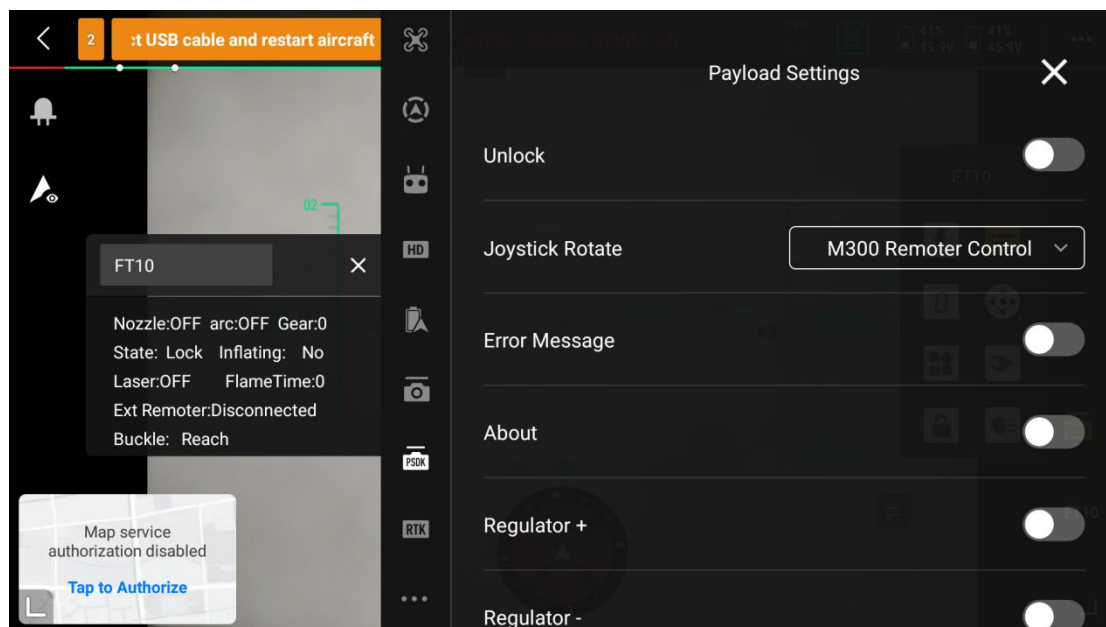
⑤Ignite on/off: Nozzle will spray mist fuel and ignite. If Fuel jet is on, will also open ignite at the same time.

⑥Pressure regulators adjustment: After pressurization, the regulator is adjusted in four positions according to the regulator position parameter 0123, with the optional fine adjustment mode allowing fine adjustment of the pressure.

⑦ Other functions on/off: including "laser" , " pressurization" and "close all" buttons.

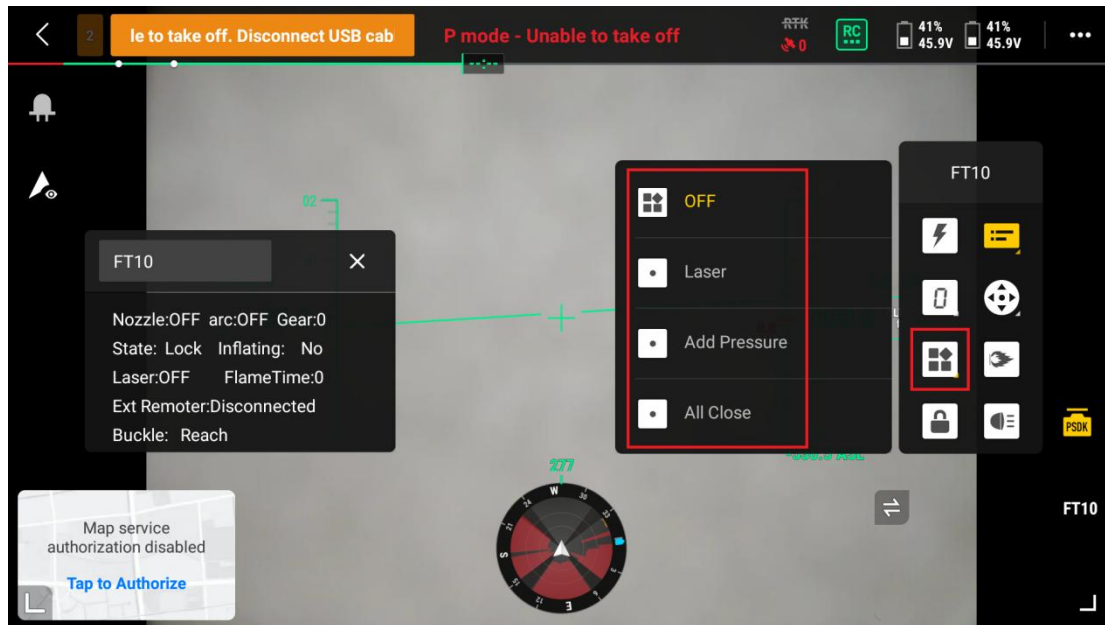
⑧Lock on/off: lock on/off, after lock off, can operate. Lock on will close all functions, except for laser.

⑨Pilot suspension window loading information



- 1) Unlock: Lock the unlock switch. The function button operation can only be performed after unlocking. When changing to lock, all functions except laser will be turned off.
- 2) Rotate remote lever; The nozzle turning operation mode can be selected by using M300 remote control pan-tilt knob or FT10 extended remote control right rocker.
- 3) Error message: When an error occurs, the error message is displayed in the suspension window which load information.
- 4) Regulating Valve for increase: increase pressure when regulating valve in adjustment mode.

- 5) Regulating Valve for decrease: decrease pressure when regulating valve in adjustment mode.



- 1) None: Default button.
- 2) Laser: Turn on/off laser.
- 3) Pressurize: The fuel cylinder pressurization operation can only be carried out after the fuel cylinder is connected, and the pressurization cannot be repeated after the pressurization is completed.
- 4) Turn off all: Turn off all function switches

Introduction to Pilot suspension window loading information

Nozzle: whether the nozzle is turned on

Fire: Whether the pilot switch is turned on

State:

- 1) Zeroing: nozzle steering gear initialization
- 2) Lock: the function button is not operable
- 3) Unlock: function button is allowed to be operated
- 4) Fire spout: Fire is sprayed, the fuel injection switch and the ignition switch are both open.

Gear: current pressure gear

Laser: Whether laser switch is turned on

Pressurize: display the pressurization status

Time for fire spout: Starting timing when the pressure regulating valve and fuel injection switch are opened. The fuel tank can be normally disassembled only after it is more than 60s

Extend remote: extend remote connection status

Snap-fit: Whether the snap-fit of fuel bottle is in place

Number: the position value of motor located

Buzzer sound event:

Single “drip” sound: FT10 responds to function operation.

Intermittent “drip” sound: FT10 is in the process of igniting, spraying fuel or spraying fire.

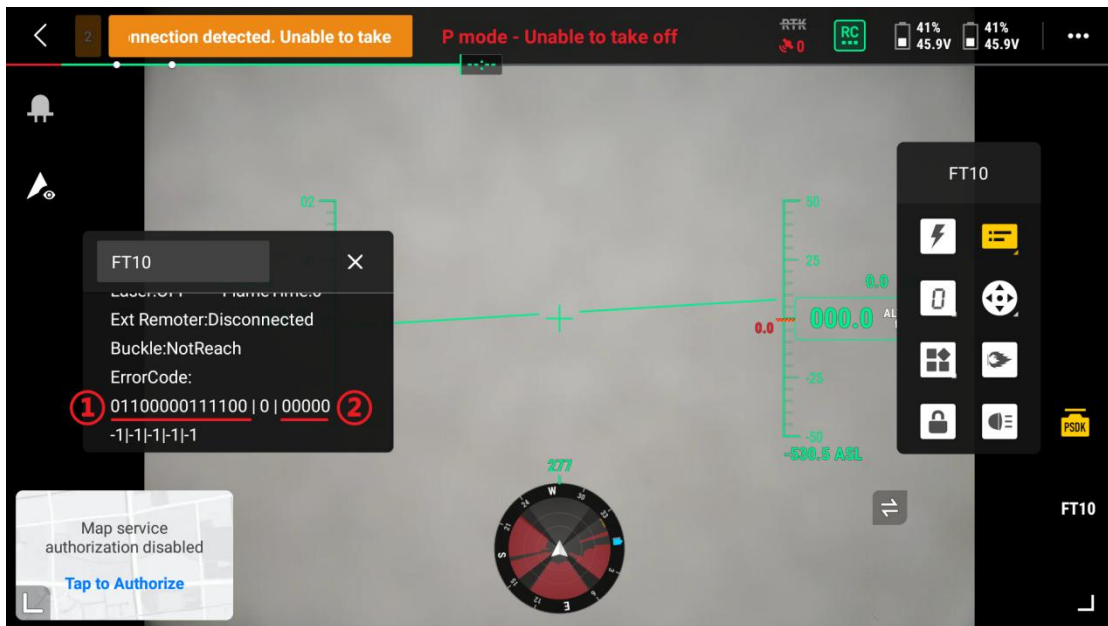
Rapid “drip” sound: FT10 detects abnormality and sends out error alarm.

Error alert:

There is “self-recovery error” and “critical error” for F10 error alert.

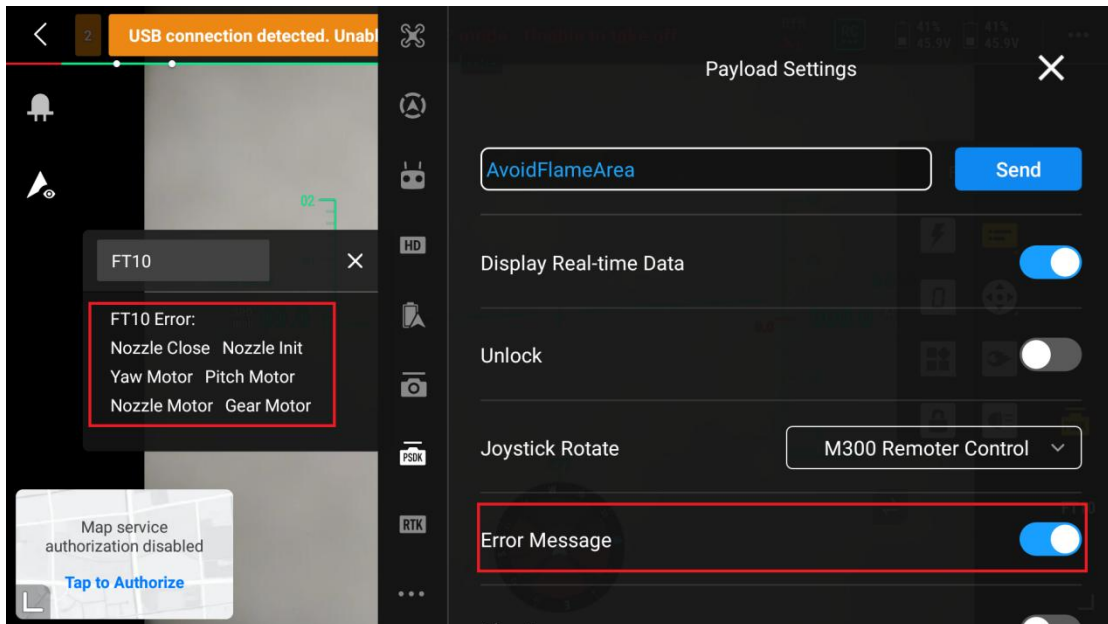
“Self-recovery error” is caused by FT10 detecting the abnormality of the aircraft platform, such as the remote controller is not connected, the aircraft returns, the aircraft drops rapidly, the power is too low, and the aircraft avionics system is abnormal. The alarm will be automatically removed after the aircraft platform returns to normal.

“Serious error” is caused by FT10's detection of its own hardware and structure errors, such as motor abnormality, fuel bottle removal while pressurizing, and ignition voltage abnormality. After detecting “serious error”, FT10 will turn off all switches that operate normally and keep trying to turn off abnormal function switches. After the occurrence of “serious error”, FT10 must be restarted before operation.



- 1) Critical error code. The number 1 showing means an exception.
- 2) Self-recovery error code, exception when it is not 0.

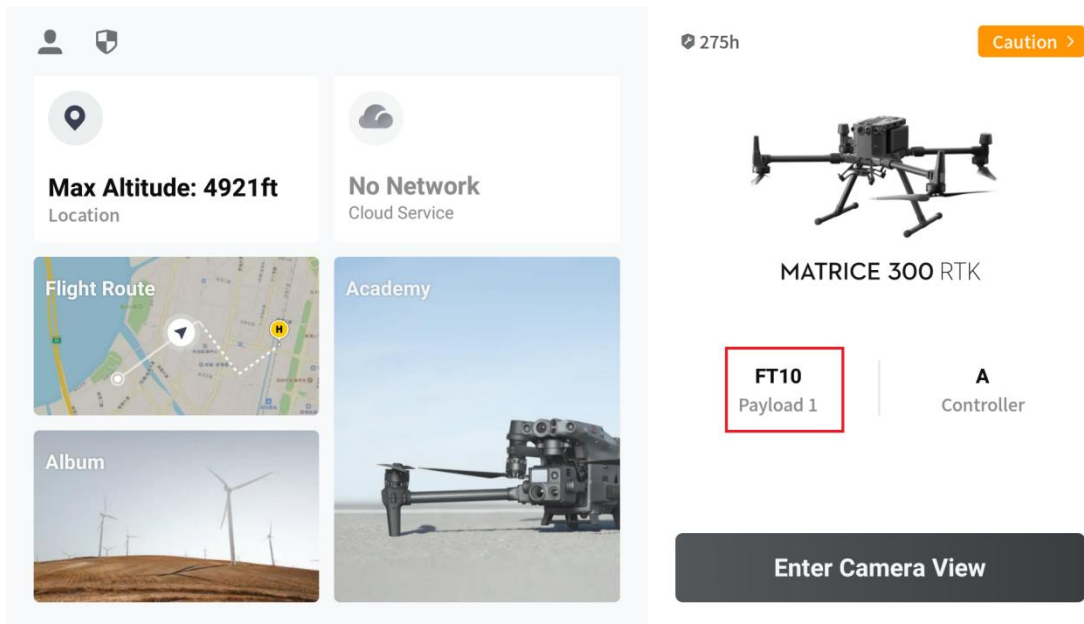
Open the error message display button to display the error message in the floating window.



Operation on Pilot 2:

1. Install FT10, press the power button to start FT10, open Pilot2 to

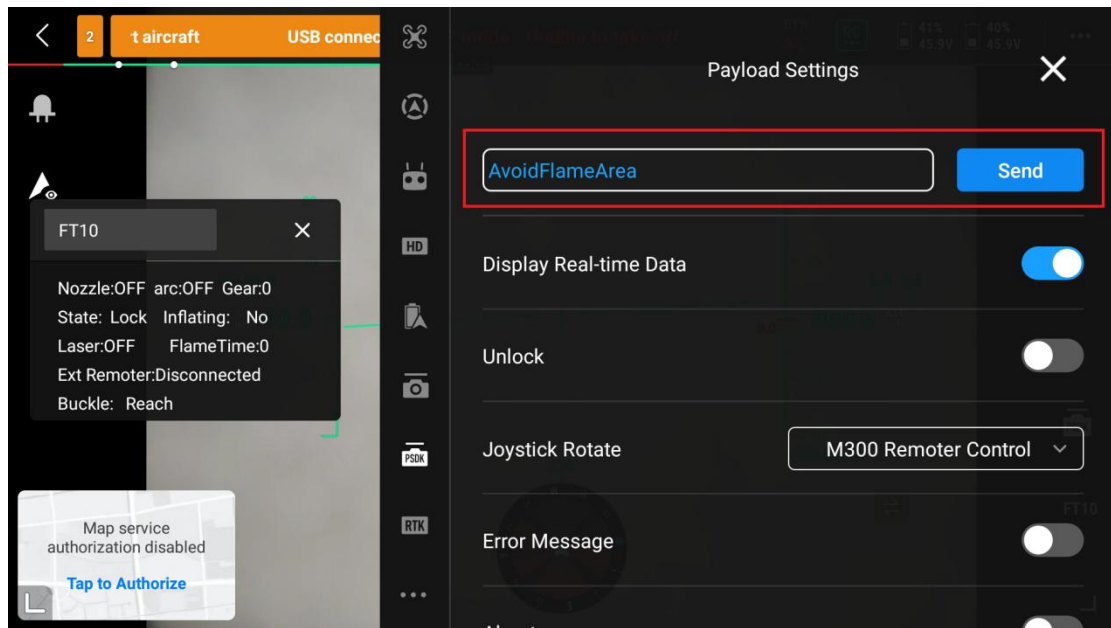
enter the flight interface, and wait for Pilot2 to recognize the FT10 load.



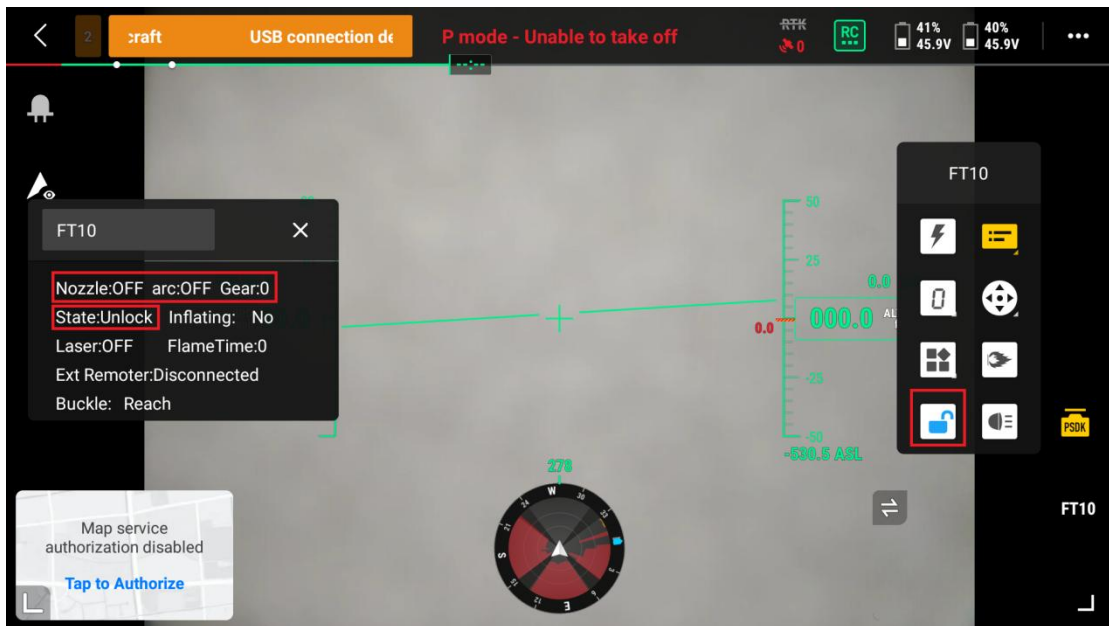
2. After the FT10 initialization is completed and there is no error alarm, install the pressure regulating valve assembly and check whether the pilot suspension information box displays “the buckle is in place”. If the display is not in place, check whether the pressure regulating valve assembly is installed in place.



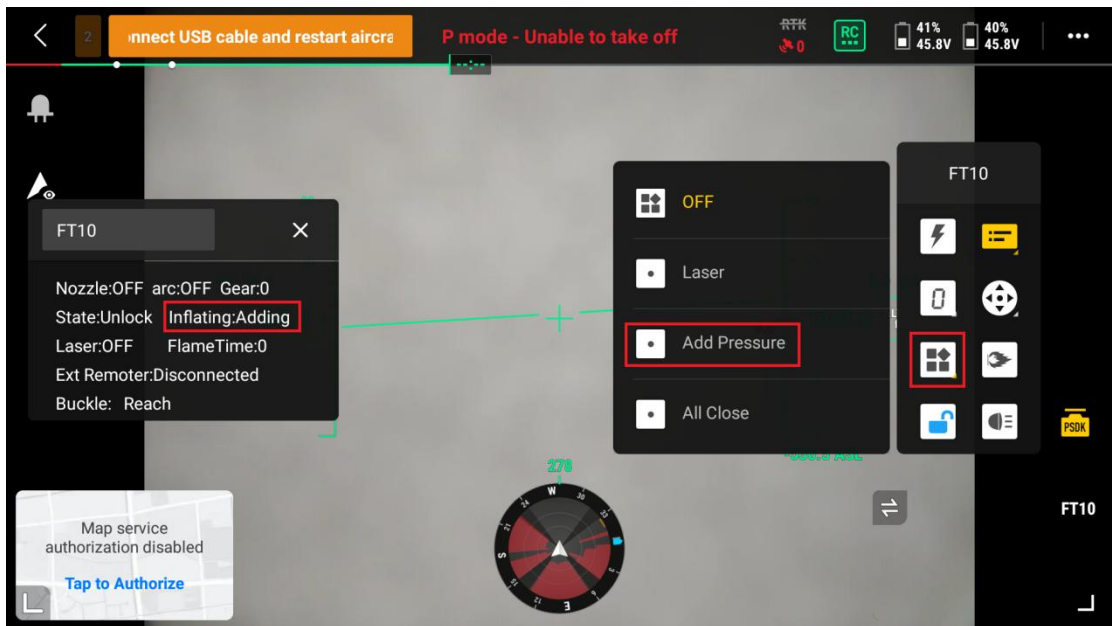
3. For security verification, enter “Avoid the area of fire spraying” in the Pilot text input box and click Send. FT10 can be performed once after power-on.



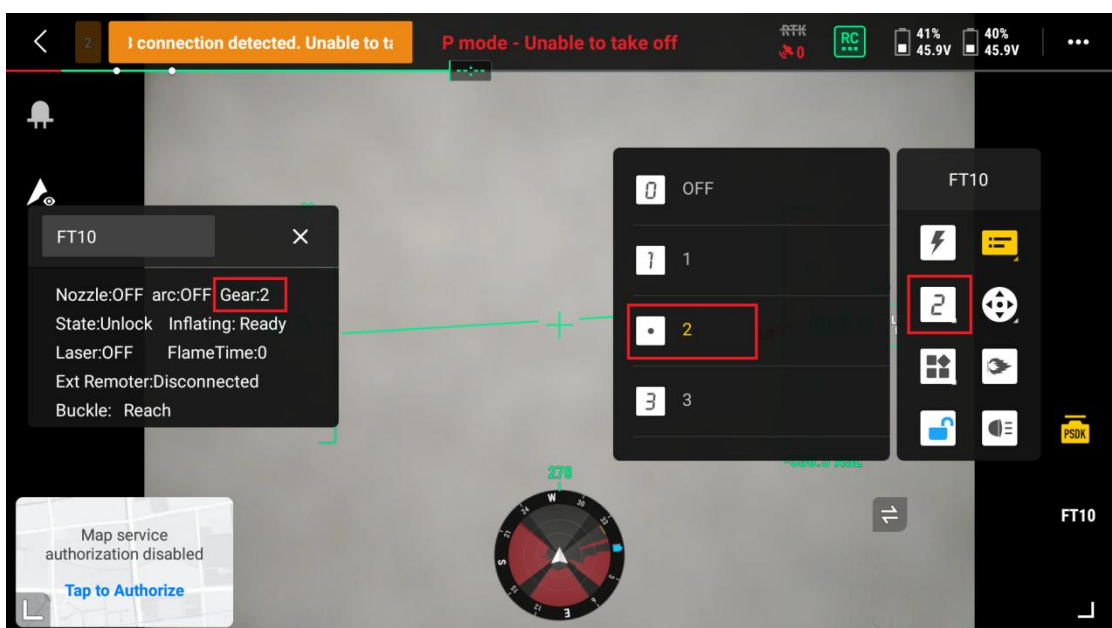
4. Turn off the “fuel injection switch”, “pilot switch” and “fire injection switch”, and turn on the “lock unlock switch”. Check whether the corresponding switch is closed at the load information suspension window. The next step can only be carried out when all are “off”.



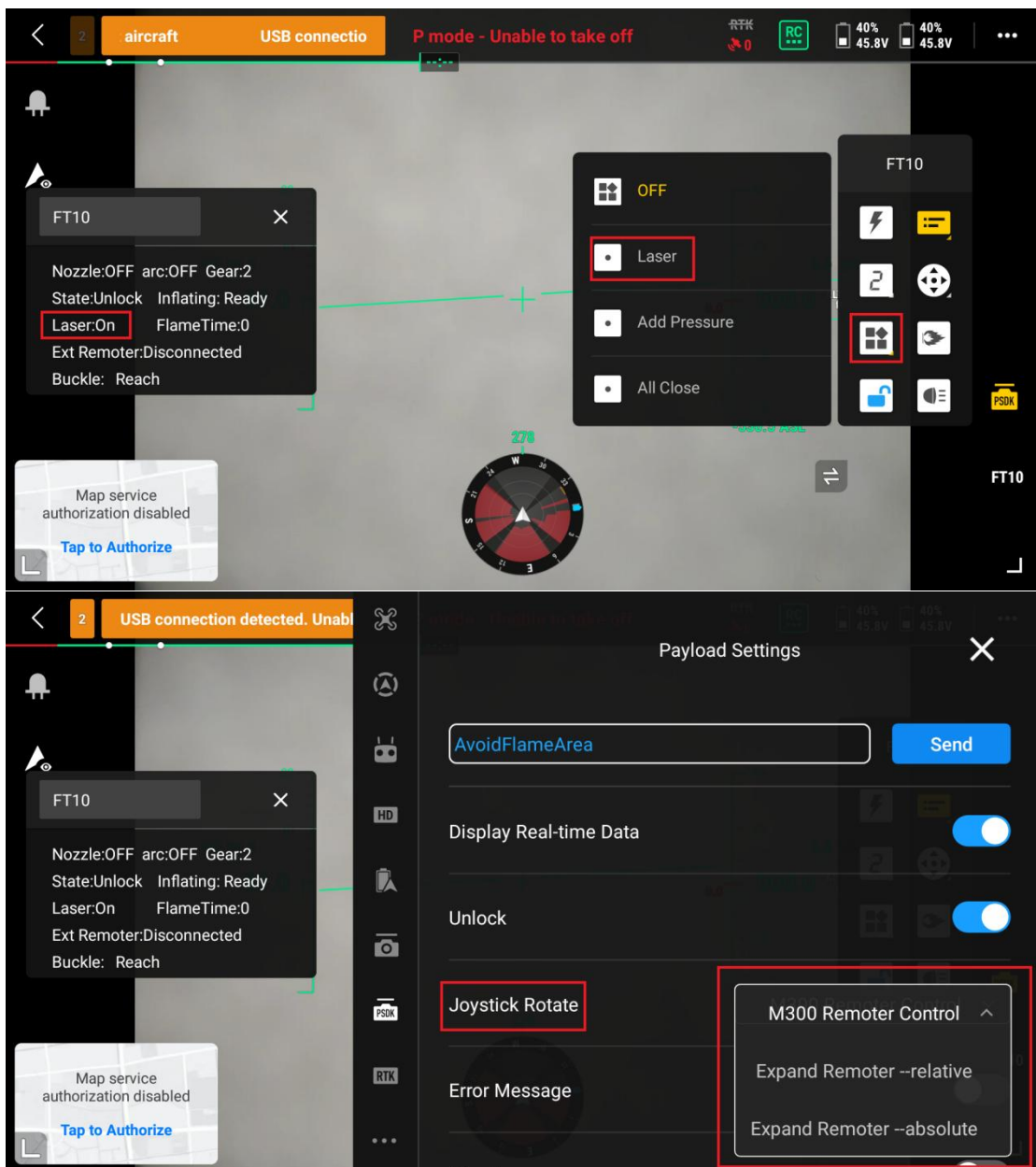
5. Click “Other function switch” to expand the function list, and click “Pressurize” to pressurize. At this time, the information suspension window displays “pressurizing”, and the next step can only be carried out after the information suspension window displays “pressurizing completed”. Do not remove the fuel bottle when it is under “pressurizing”, otherwise “serious error” will be triggered. If it is necessary to remove it when it is under “pressurizing”, the "all off" function shall be executed to stop pressurizing, and the fuel bottle shall be removed after "not pressurizing" is displayed.



6. Click the "pressure regulating valve gear" button and select the corresponding gear to adjust the pressure. If the "fine adjustment" mode is selected, the pressure can be adjusted by "pressure regulating valve plus" and "pressure regulating valve minus", and check whether the display of the information suspension window is consistent with the selected gear.



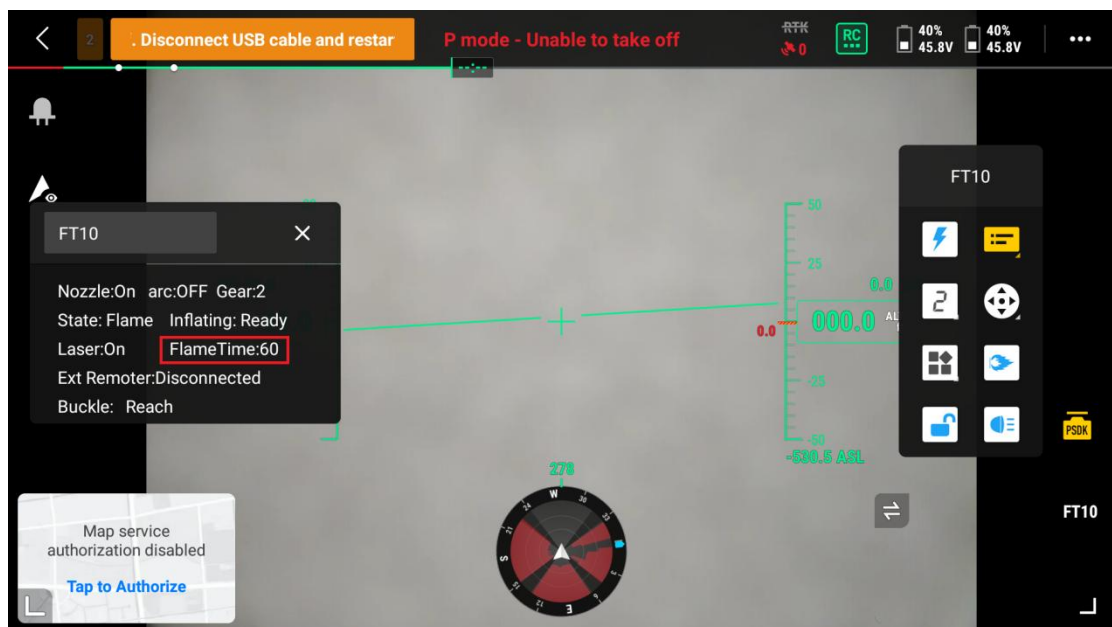
7. Click the "Other function switch" button, click the "Laser" button to turn on laser aiming, select the "Rotate rocker" mode, and turn the nozzle to aim at the target through the corresponding rocker.



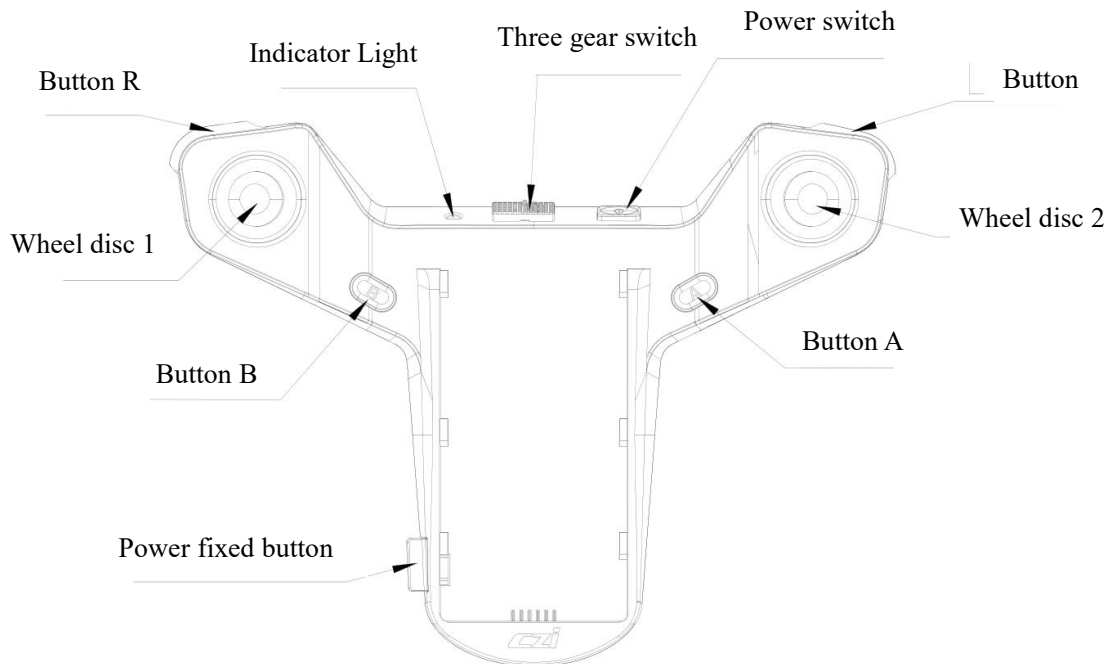
8. If fire spout needed, click the "Flame Spraying Switch" button to spray fire, or separately click the "Fuel Spraying Switch" and "Ignition

Switch" to spray fuel or ignite fire

9. After the completion of fire injection, ensure that the fuel injection time reaches 60 seconds and there is no fuel left, then loosen the pressure relief valve knob to ensure that there is no air pressure in the fuel bottle, and then remove the pressure relief valve assembly to complete the operation. If it is necessary to operate again, refill the fuel and replace the carbon dioxide cylinder, and then start from step 2. If the fuel injection time is less than 60 seconds, it is uncertain whether there is still pressurized fuel or if the operation is terminated in advance in case of abnormal conditions, it is necessary to move FT10 to an open area free of combustibles, take protective measures, then release the pressure relief valve knob, remove the fuel power unit and quickly pour the spilled fuel into the container.



Extended remote operation



Unlock: Turn the three-gear switch from the first gear to the third gear

Lock: Turn the three-gear switch to the first gear

Turn off all: R button

Laser: L button

Operation for turning nozzle: rocker 1

Spout fire: Press button A and B at the same time


Turn off the fire: button A or B


Pressurization: rocker 2 rotates clockwise at the speed of 2 seconds per cycle

Pressure gear adjustment: rocker 2 moves left and right

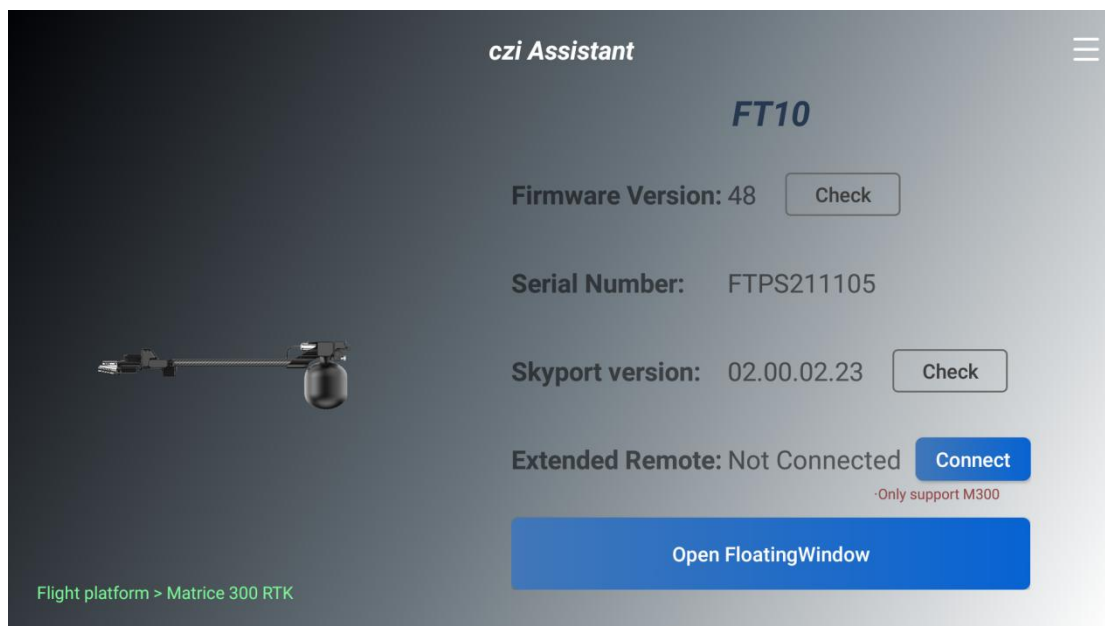


Bluetooth communicates with the load normally

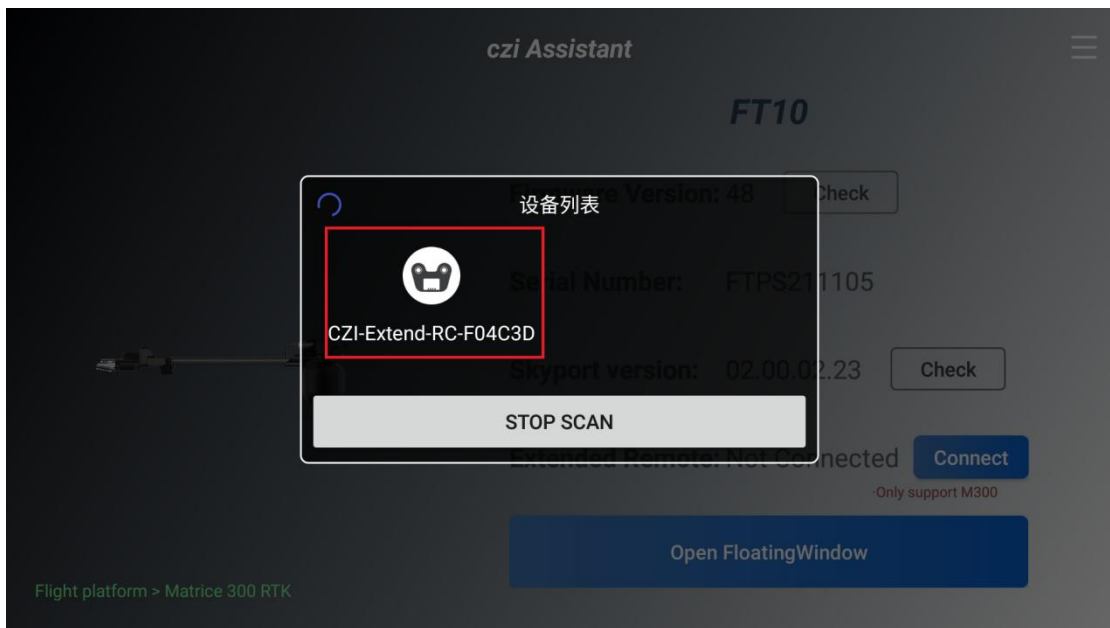
 Bluetooth disconnected

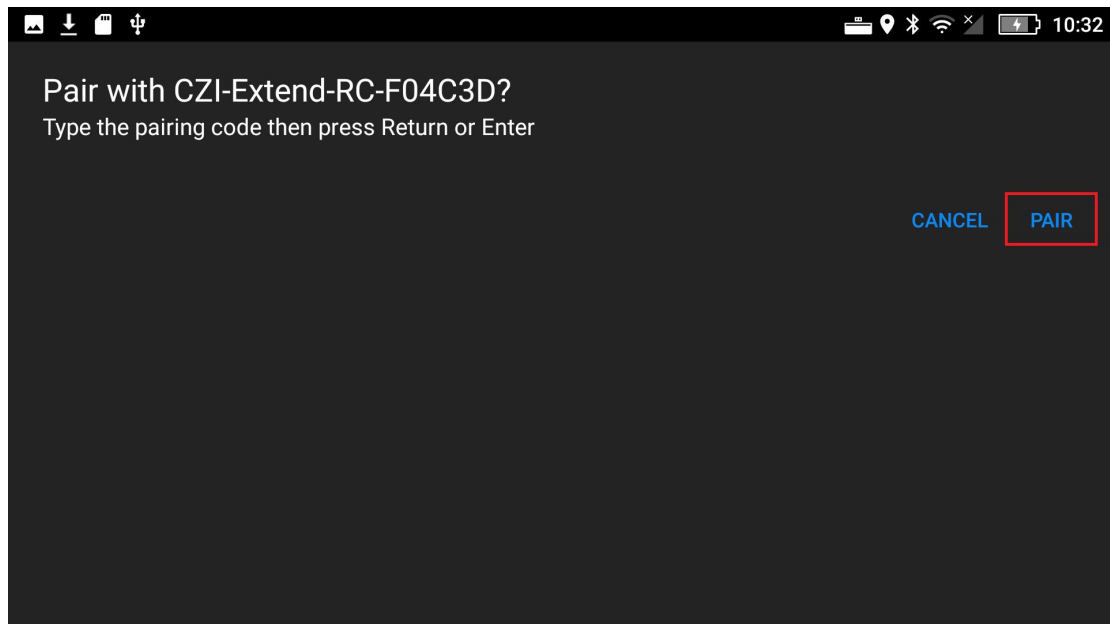
 Load disconnected

1. Install and turn on FT10, expand the remote power supply, open the software "czi Assistant" to the suspension window, and wait for czi Assistant to pop up the FT10 interface information.

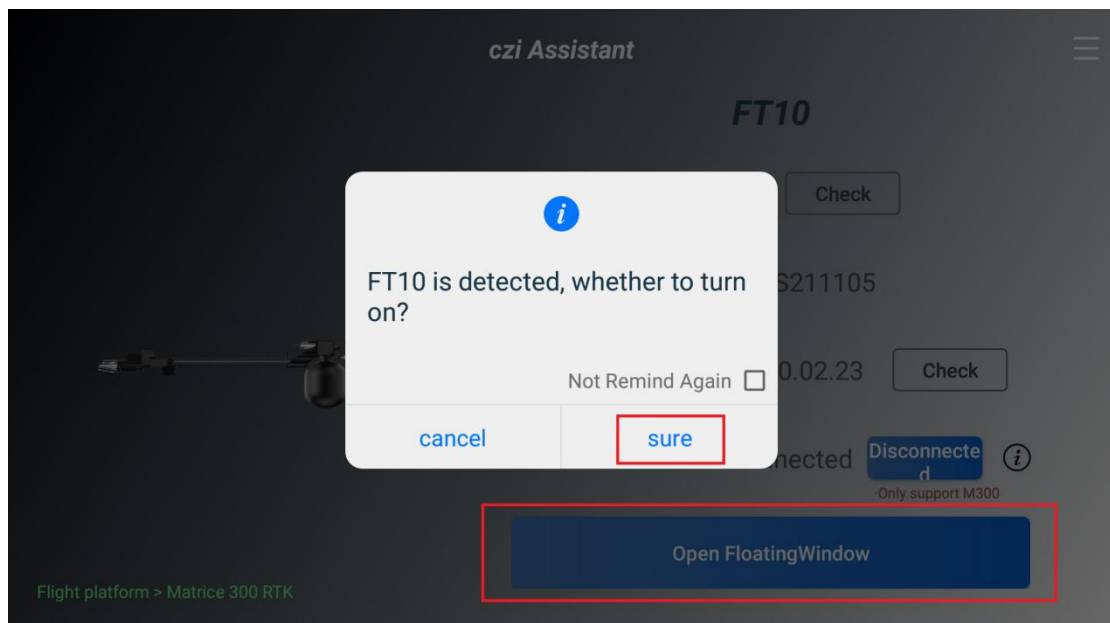


2. Click the "Connect device" button to pop up the Bluetooth search box, and click the extended remote control to be connected. If you connect for the first time, a pairing confirmation interface will pop up, and you can select pairing. No connection operation is required for subsequent use, and the czi Assistant will automatically connect the last used device.





3. Click "Open the suspension window", confirm to open the suspension window, and enter the Pilot flight interface. If the FT10 the suspension window which loads information shows that the extended remote control is connected, you can use the extended remote control to control FT10.



Update firmware

1. Use CZZN or czi Assistant to update online.
2. Go to official website of czi to download firmware to IF card to update