AheadX™

ASHIL

AheadX Simulator Hardware In the Loop

Flight Manual V1.0

Version Information

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AheadX™
可信赖的飞行机器人

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Advice：Reference information

Tips：Information that may need

Attention：Need to pay attention to this situation

Warning：Requirements must strictly enforce

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1 Product introduction

ASHIL(AheadX Simulator Hardware In the Loop) is a complete set of system for flight simulation, enabling manual and autonomous flight simulations, it can be widely used in drone training, teaching and other occasions

The system is equipped with excellent flight simulation platform, Flight maps have airports around the world, with high picture quality, rich details, it can simulate a variety of weather conditions, suitable for testing various aircraft performance (such as wind resistance, etc.)

Rich aircraft model can be applied to many kinds of simulation needs, including multi-rotor, fixed-wing, quad-plane etc, and the accurate physical model creates a real flight experience. Whether remote control flight or advanced adjusting parameters, the users can fully feel its exquisite details.

The System contains many flight modes, which can be applied to different-stage users' training, from novice pilots to experienced professional pilots, they can find their own ways to flight training and rapidly improve their professional skills to prepare for the next flight mission.

The installation and use are extremely simple, plug and play, without any tedious configurations. And the software design is simple, only need a few steps, users can quickly experience an autonomous flight.

2 Features and applications

2.1 Features

- detailed physical plane model, including quad-plane, fixed wing, multi-rotor, helicopter, etc.

- realistic physical special effects such as vibration, stall, spiral, crash, etc.

- a variety of flight modes, including visual remote control flying, beyond visual range autonomous flight, etc, for each phase of the unmanned aerial vehicle (uav) training task.

- strong flight control algorithms, perfectly fit various models' automatic take-off and landing, fly mission, emergency protection, etc.

- detailed flight environment simulation, covering the global airports, flght is in a real world.

- can simulate the wind, thunder, rain, snow, etc weather effects, support random weather.

- simple to install and use, only needs several steps to experience the fun of flight.

2.2 Applications

- personal learning: improve the ability of remote control flying, advanced parameter adjustment, make you become a flight master

- university application: unmanned aerial vehicle (uav) teaching, through simulation training to deepen the students' understanding of the uav principle and improve their learning interests.

- training institutions: visual and beyond visual flight training can rapidly improve the students' flight ability.

3 Flight Simulation

3.1 Flight

Follow the following flight example to complete a fast, automatic flight experience.

3.1.1   Automatic flight process

3.1.1.1   Preparation before the flight

Step 1: Loading XPLANE8 CD-ROM file

step 2: Open the ASHIL Console software, click the button No.1 to open the Xplane. After the successful operation, click button No. 2 to connect the console and Xplane, then click button at upper right corner of the console to select actual computer serial number matching to equipment's COM5. Then click on the button No.3 to open the serial console and establish communication between console and ASHIL. After all connected, you can minimize the window.
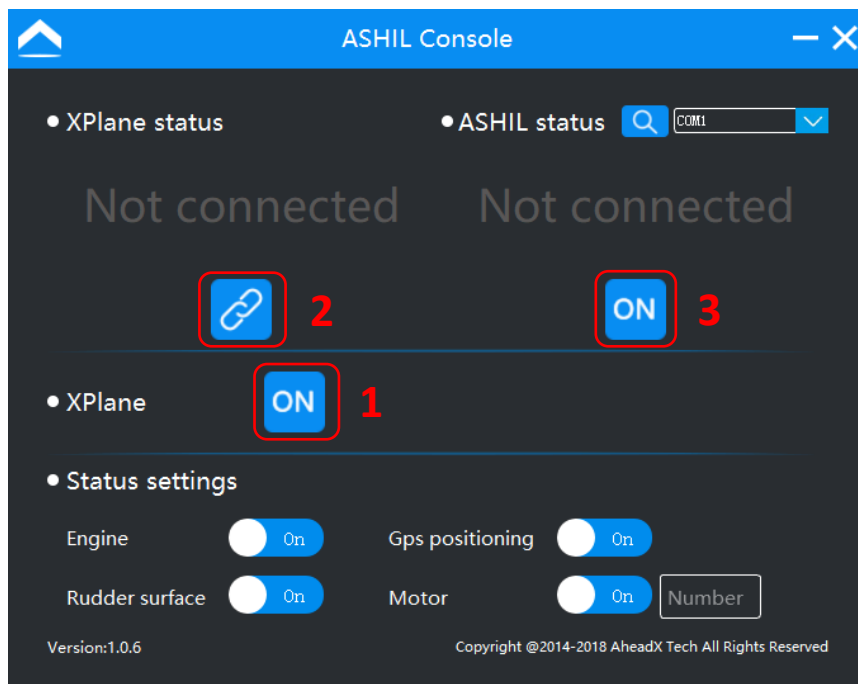
After a successful connection, the window is as follows:

step 3: Open the XPLANE interface, click file->Open Aircraft, select path Aircraft->AheadX-> AX_FW_XXXXXX to load AheadX's fixed wing aircraft model, press the key "A" to switch the third-person perspective, key "-" to enlarge and key "=" to narrow perspective, and the direction keys to change the angle of view.

step 4: open the AheadX Space station software, access to the ASHIL equipment COM1 to software, search and select the corresponding serial port, click ON, then the button in the red box will become activate and blue, click it to synchronize the flight data. At last click the orange button below to enter the main ground station interface:
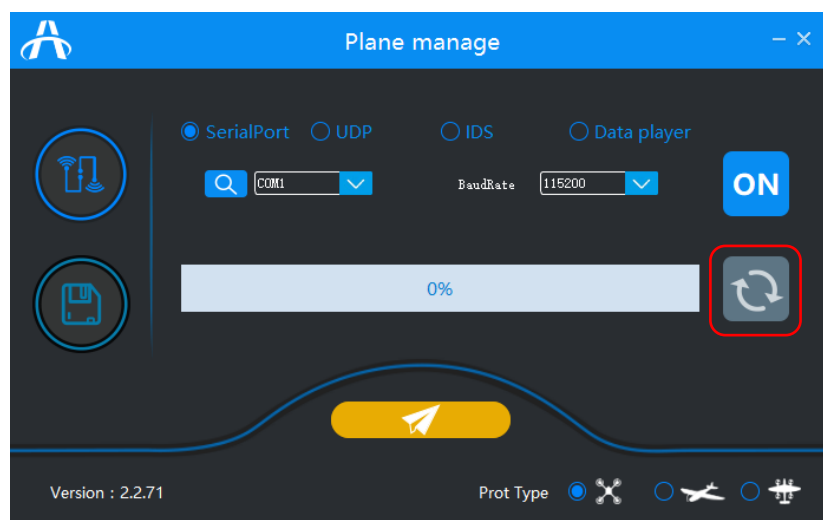
step 5: set the home point

Before the flight, you must draw the home point and the landing route, otherwise the plane will not be able to take off.
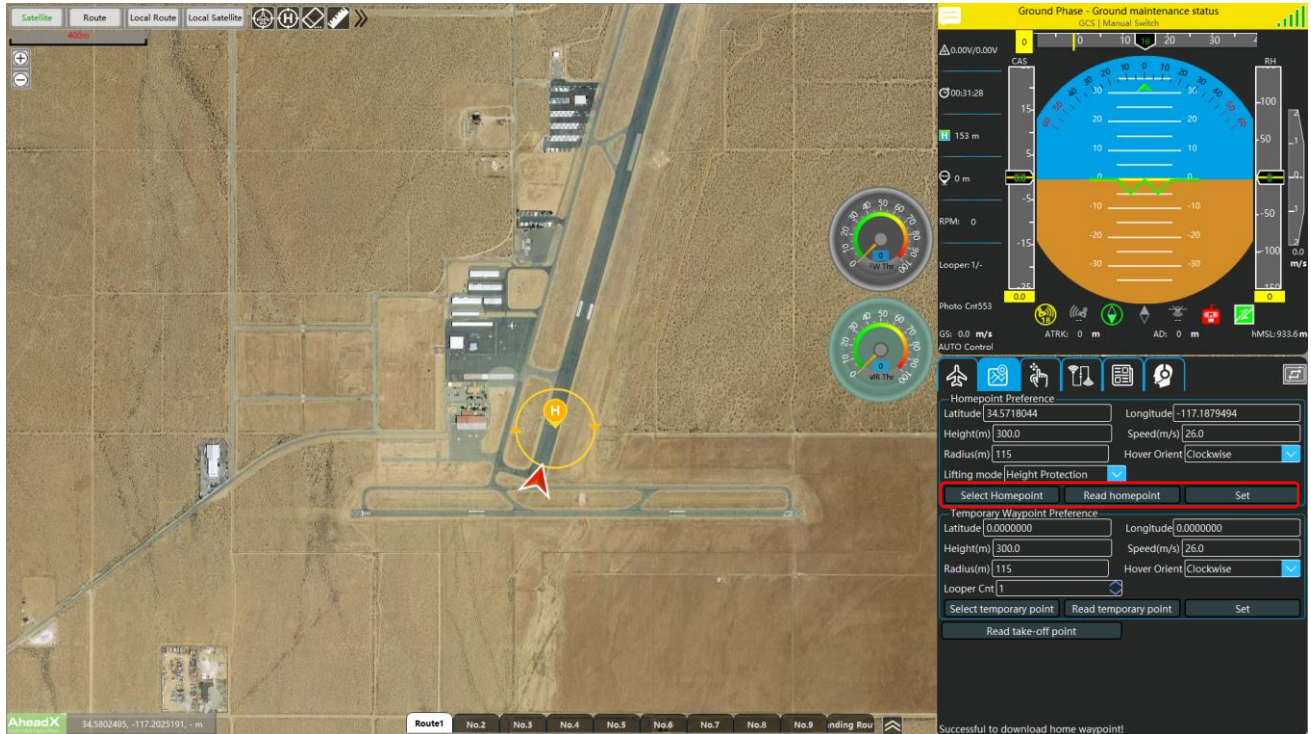

homing point can be set up on the right Panel, if the model parameters have been synchronized in the ground station interface, it can be set with the default parameters. click "Select HOMEPT", and move the mouse to the map on the left side of the interface to select home point, then click "Set" on the right side to upload the home point(home point is generally set near the aircraft's current position, when fixed-wing or quad-plane taking off, it will climb to a certain height and then hover around the home point, when multi-rotor taking off, it will not fly to the home point, you need to set the "Home Circle" order, then it will fly to the home point to hover there. This point should be set every time the equipment starts).
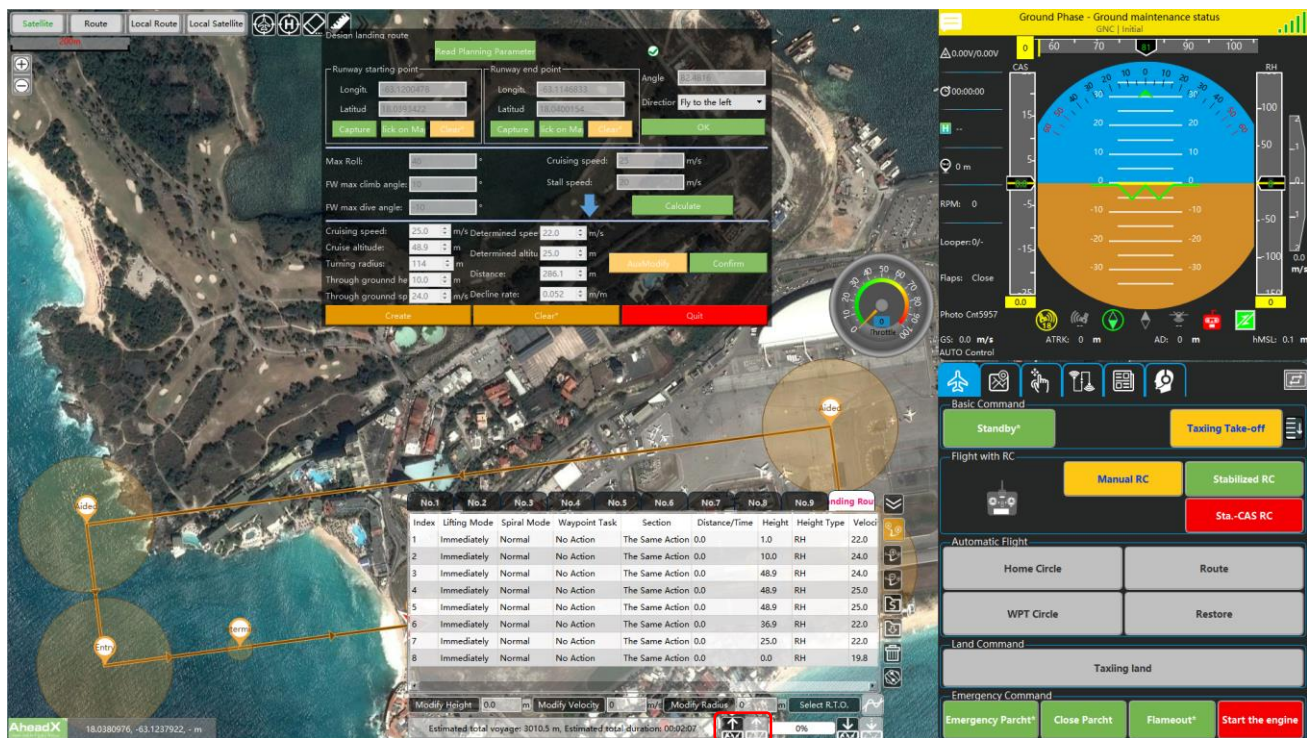
Step 6: Set the landing route

Fixed-wing:

Set the Taxiing land route:
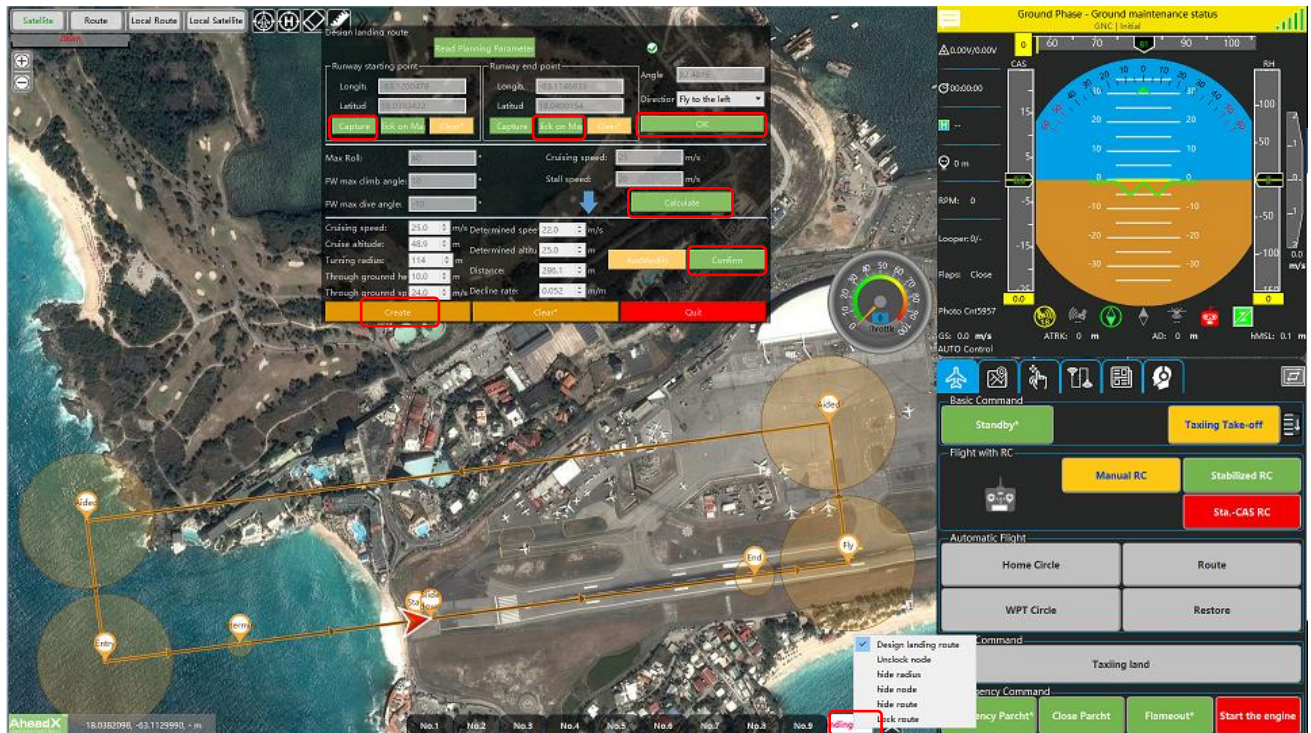
Right click on the "landing route", select "design landing route", then click "read planning parameters", if it is successful, there will be a green hook right the button. click the "capture" button to set the current position as a start point, and click the "Click on Map" button to select a point on the map to set the end point of the runway (start point and end point determine the running direction. The distance can be appropriately set, generally a few hundred meters. the end position should be set before the aircraft). After choosing the overshoot direction, click ok-> calculate-> Confirm -> generate, and then click the button in the red box to upload the flight rote as the picture below.
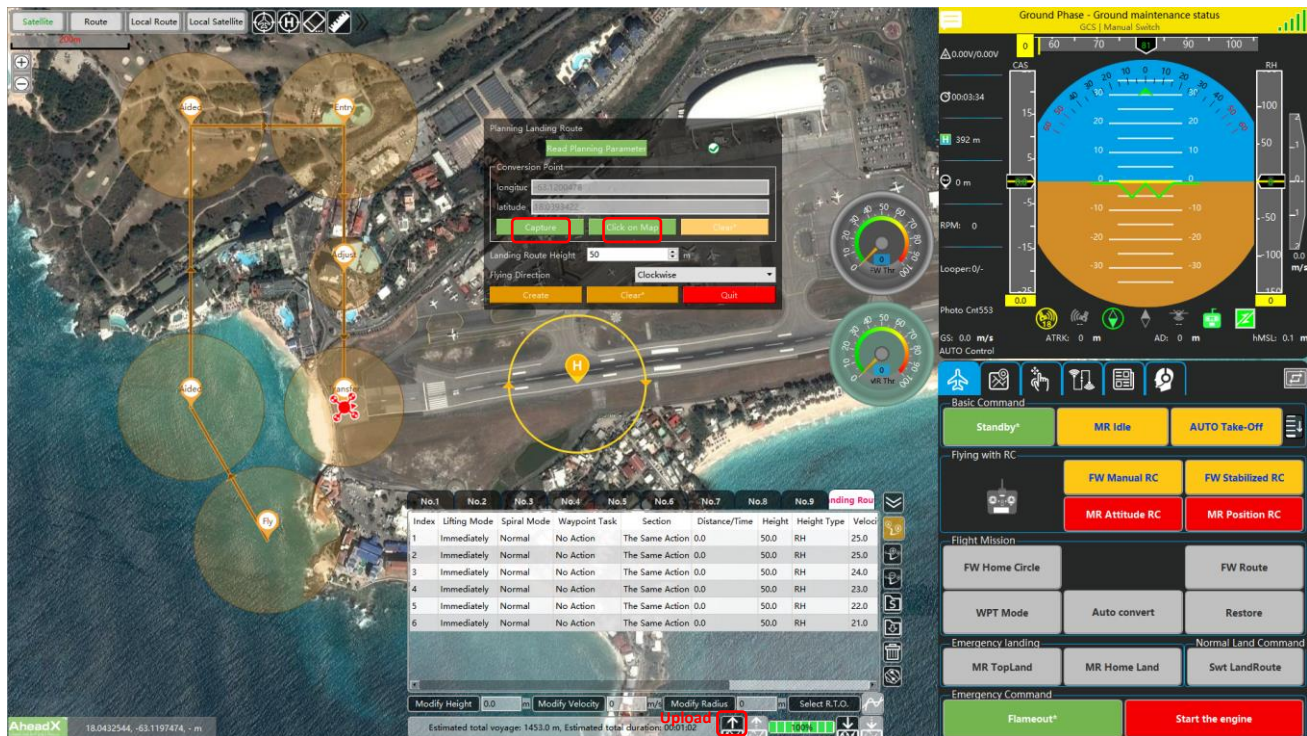
Quad-plane：

Set the landing route:

Right click on the landing route, select "Design landing route", then click "Read Planning Parameter", if it is successful, there will be a green hook right that button. click the "Capture" button to set the current position as landing point or click the "Click on map" then select a point on the map

as landing point. After choosing the overshoot direction, click "Creat", and then click the button to upload the route as the picture above.

Multi-rotor:

No need to set the landing route.
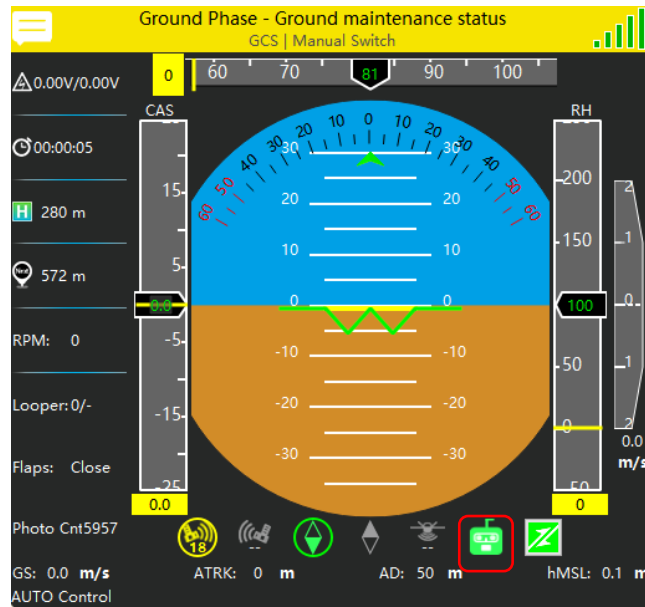
Step 7:

Simply set of mission route:

Support multi-mission route planning, quadplane and fixed wing for nine mission routes, one landing route. muti-rotor for ten mission route;

When you select the route, click "Draw route" to select the point on the map, you can individually edit the parameter or edit them together.

3.1.1.2 Flight

3.1.1.2.1 Auto Flight operation for fixed wing
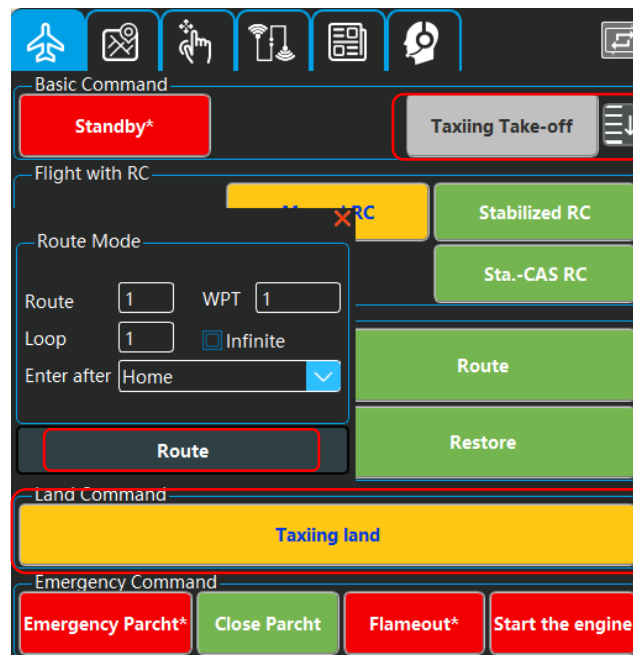
Note:you must click forth when there is "*" on the button, twice is enough for the other button

Step 1: Taxiing take off

Plug remote controller to the SBUS-IN port of the device. If connected successfully, the remote control state flag will turn to green. Then double click the "C.A. takeoff" button, enter the Taxiing state. Press the key "B" to release the brakes of the plane. At the same time, fully push the throttle stick of the remote controller. The plane begins to accelerate, when the airspeed reaching the takeoff speed,

the plane will take off from the ground. When climbing to a specific height, it will fly to the home point to circle for the order, then you can release the throttle stick.
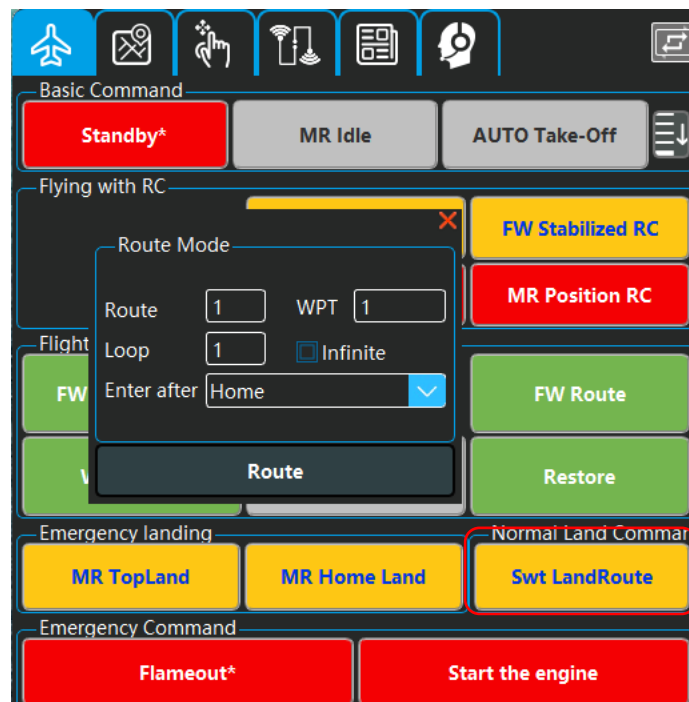
Step 2: Mission flight phrase

Click the "Route" button, select the target route point, the number of loops and the end mode, then double click "Route" button of the secondary menu, the plane will fly to the target route.

Step 3: Taxiing land route

Double click "Taxiing land", the plane will fly to the landing route, if it is too high, the plane will hover to low its height before reaching the entry point. When the height is suitable, it will enter the land route. Slippery landing has four period when it is near the ground, ramp down, glide down, rolling flattening and grounding.
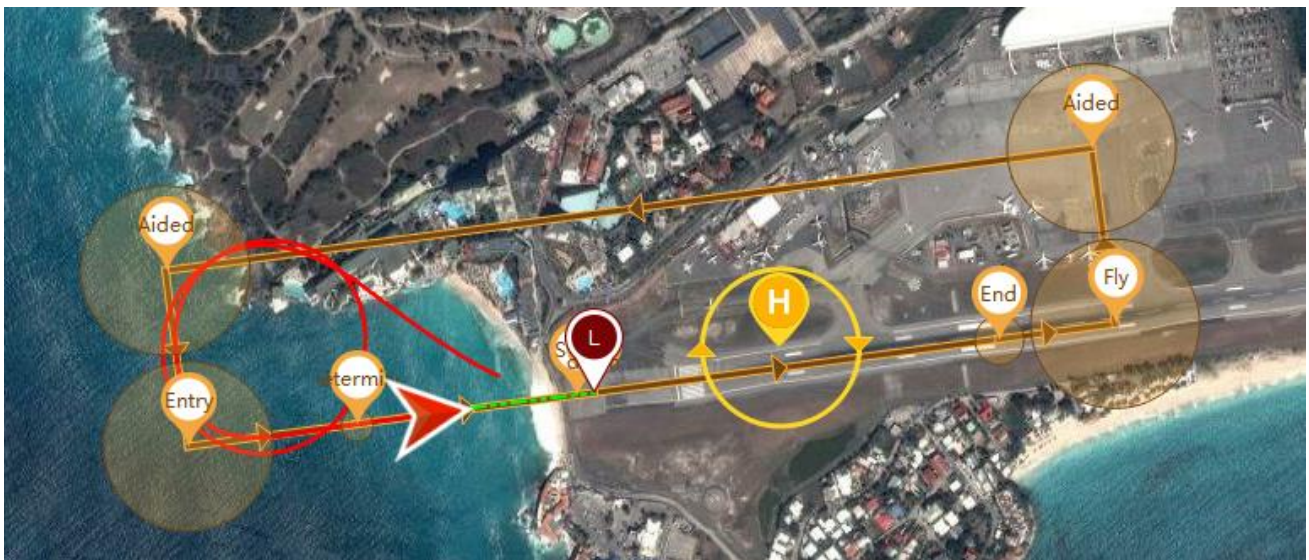
3.1.1.2.2　　Auto flight operation for Quad-plane

Note:you must click forth when there is "*" on the button, twice is enough for the other button

Step 1：take off

Double-click the "AUTO Take-Off" button, the plane enters the MR climbing phase. When the plane reaches the target height, it will transform to the fixed-wing mode and continue climb. After climbing to the target altitude, the plane will fly to the home point, taking off completed till now.
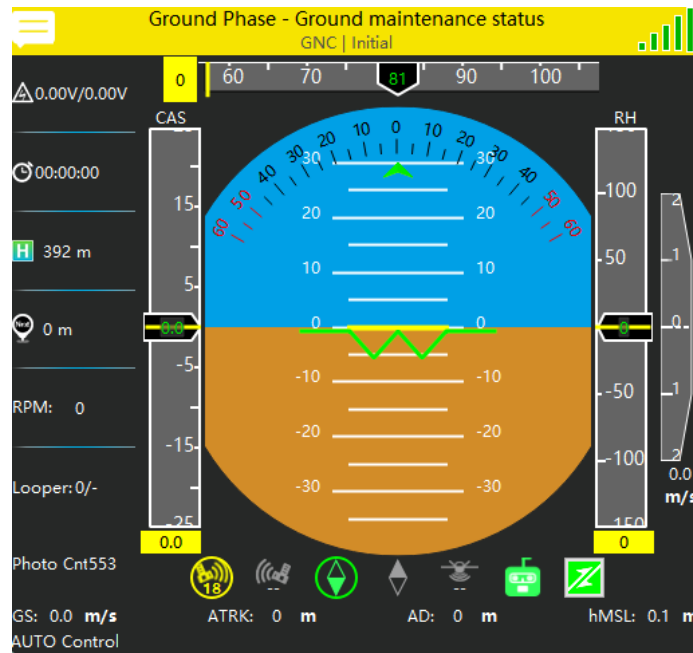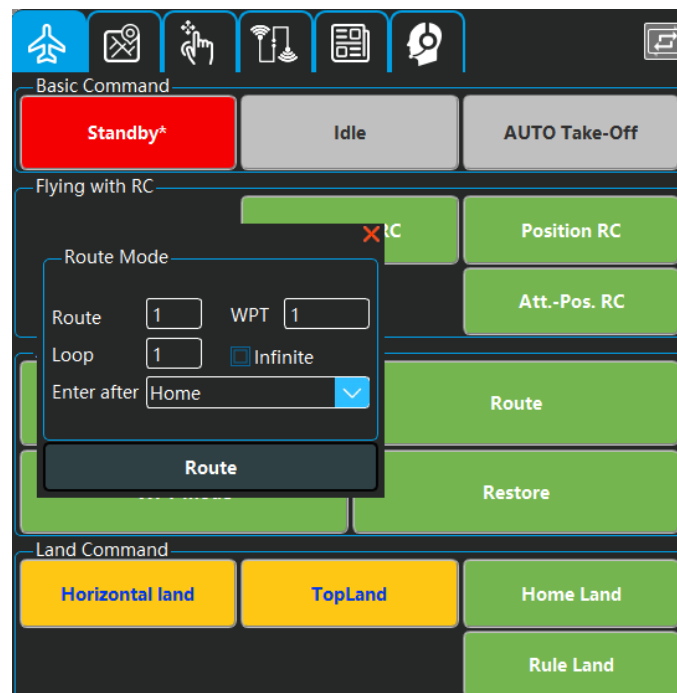
Step 2: Mission flight phrase

Click the "FW route" button, select the target route point, the number of loops and the end mode, then double click "Route" button of the secondary menu, the plane will fly to the target route.

Step 3: landing phrase

Double click the "Swt LandRoute" button, and the plane will fly to the landing route. If the plane is currently at a high altitude, it will hover to lower itself before reaching the entry point and then enter the landing route. When the flight reaches the last point of the route, it will transform automatically to the MR mode and land.

3.1.1.2.3   Auto Flight for Multi-rotor

Note:you must click forth when there is "*" on the button, twice is enough for the other button

Step 1: take off

double click "AUTO Take-Off" button to enter the MR climbing phase. When it reaches the target height, it will hover . Taking off completed till now.

Step 2: Mission flight phrase
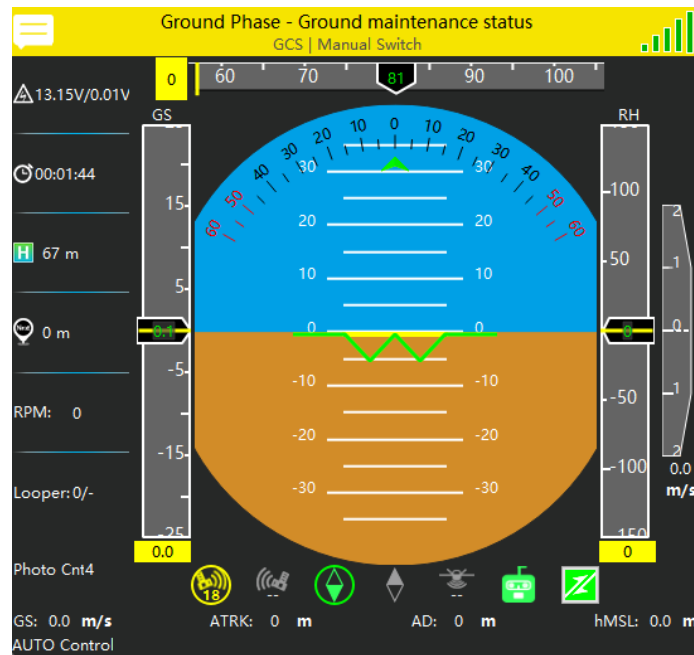
Click the "Route" button, select the target route point, the number of loops and the end mode,

then double click "Route" button of the secondary menu, the plane will fly to the target route.

Step 3: Landing phrase

Double click "Horizontal land", the plane will only maintain its posture to land horizontally;

Double click "TopLand" and the plane will land at the current position;

Double click "Home Land", the plane will maintain the current height and flies to the landing point to land;

Double-click "Rule Land". If the plane is lower than the set height, it will climb to the set height and fly to the landing point.

3.1.2   Remote Control Flight Instruction

3.1.2.1   Remote Controller

If the Controller is supplied by AheadX，you can use it directly, just by connecting it to the SBUS-IN port of the device.
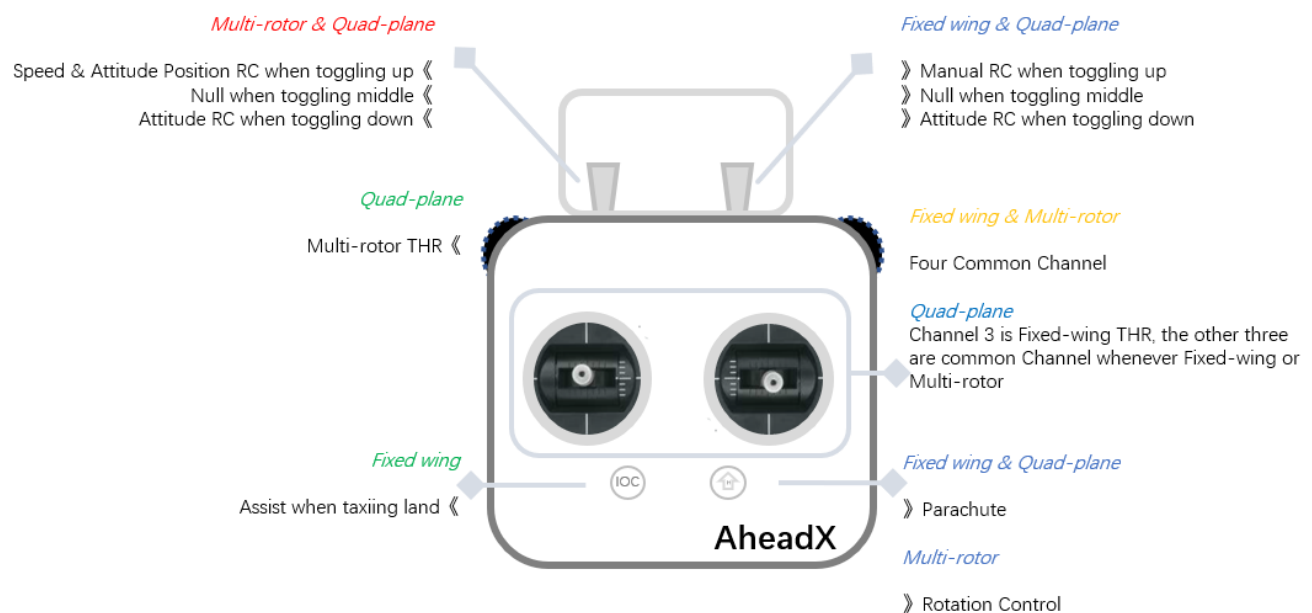
If the controller is made by Futaba, you nend to connect the receiver which has SBUS port such as R6208SB, R7008SB to the ASHIL device by Adapter Cable. The controller needs further configuration. Please refer to the manual of AheadX GNC Controller Configuration.

3.1.2.2　Multi-rotor&fixed-wing Remote control

Select home point and set it, when the plane is at standby mode, the remote control will not be available. you need to sends remote control command by the ground station　(Multi-rotor double click "IDLE", fixed wing double click "Manual RC" or "Stabilized RC") When equipment is in autonomous phase, the remote control can be used freely.

3.1.2.3　Quad-plane Remote Control

Select and set the home point, double click the "IDLE" button, the rotors wil idle rotate. Put the rotor throttle wheel a bit higher than the median, and the plane gets into the Attitude control mode and climbs from the ground. When it reaches a certain altitude, loose the wheel, the plane will hover.. At this time, continuously give the fixed wing throttle more than 90%, when the speed reaches the transform speed, the rotor will stop and the plane will switch to the fixed wing mode.

During the landing phase, reduce the fixed wing throttle to 0%. When the airspeed is reduced to the transform airspeed, the multi-rotor will be automatically started.

Remark：For more detailed flight instructions, please refer to the AheadX flight control series product user manuals.

3.2 Xplane 8 Basic Operation

3.2.1　Common shortcuts

Key B: Brake（some large fixed wings need to release the brake when taking off）

Key W：Cockpit perspective

Key A：Third person perspective

Key -（no small key board）: Narrow the perspective

Key =：Enlarge the perspective

Key O：Display the flight track

Key up/down/left/right：move the perspective

Key Ctrl+1（single engine）：restart the engine
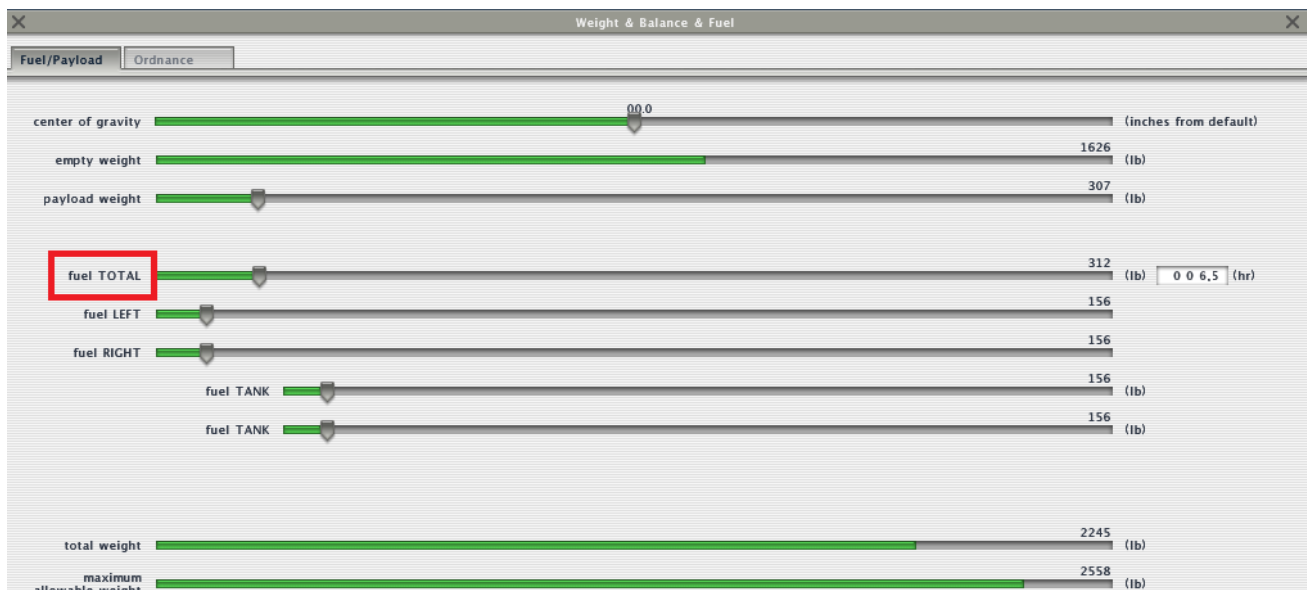
3.2.2　Common Operation

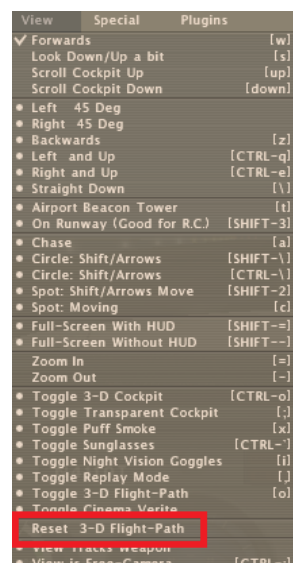load the flight model: toolbar-> File->Open Aircraft->select the aircraft and reload it.

Change the time：toolbar->Settings->Date&Time.

Select the airport：toolbar->Location->Select Global Airport.

fueling：toolbar->Setting->Weight&Balance&Fuel->fuel TOTAL, drag it to fuel.

Clean the track：toolbar->View->Reset 3-D Flight-Path

Common airport code：ZBAA (Capital international airport of China), KSBD(San Bernardino

International Airport, rich environmental details），KAPV(Apple Valley airport, with valley terrain).

4 After-sales service policy

1. The products of our company are in accordance with the national 'three guarantee' , which provide free maintenance, replacement and return service for products that meet the warranty conditions (only products purchased in mainland China).

2. Within 7 days from the date of sale, the equipment performance problem can be exchanged or returned. And we will provide free maintenance for one year.

The following conditions shall be met when exchenging or returning:

Be able to provide effective purchase certificate, document and number;

The machine serial number, factory label and other signs are not be torned up or changed.

There is no man-made failure.

Do not belong to the replacement and free

The product serial number bar code or model does not conform to the product itself;

The product has been disassembled and transformed by the non-official authorized personnel;

Damage caused by the third party components which has not been recommended by our company;

The man-made impact, burnout, water immersion, freezing, mechanical damage, and damage etc.;

Failure or damage not caused by product design, technology, manufacturing, quality;

The matching U disk and other accessories.

One year warranty period

From the beginning of the day of purchase, a year (including the day of maturity), is the warranty period for the goods.

Failure caused by the quality problem of the commodity, it can be repaired free, and it will cause impact, burnout, water immersion, freezing, mechanical damage and breakage caused by the human quality problems.

The time limit for free software upgrading: life long free.

The cost of mailing should be provided by users during the warranty period.(Our company will bear the cost of the return.)

The following items are included in the one year warranty:

Warranty item		service content	service standard
technical support	400 hotline	The technical support engineers provide professional artificial service, and is responsible for solving difficult problems and faults.	7×8 hours
	Remote assistance	Using remote assistance methods to help customers to debug, solve faults, etc.	5×8 hours
	Customer service mailbox	Various kinds of manual services are provided to solve various problems such as customer product application, failure declaration, demand feedback, business and so on. Customers can choose their own service according to their habits.	7×8 hours
	Wechat、QQ		

Beyond the warranty period, our company provide conpensable maintenance services.

For after-sale issues that do not belong to the category of return or free warranty, customers need to pay for repairs, including maintenance costs, replacement parts costs and express fees.

The above principle of exchange and warranty must provide effective warranty documents while enjoying the service, otherwise it will not be dealt with.

The ultimate interpretation of this warranty is reserved by AheadX.