   Arkbird GCS（Ground Control System）is a software specifically designed for Arkbird Autopilot, the aircraft flight can be monitored, controlled by computer, compatible to Arkbird 2.0 and Arkbird LITE Autopilot (it supports 50 waypoints, Note: Autopilot needs to be upgraded to 1.2010 or later firmware).

1.   Portable suite, readily open after being downloaded, user-friendly;

2.   Customized 433 serial module has the frequency hopping function(FHSS), 915 serial module has the forward error correction technique; with the design of plug and play, optimizing the compatibility with ground station program, free of all settings;

3.   Two sets of Arkbird Autopilot access to serial module enable the exchange of position, achieve the formation flight, display the position and altitude of the other aircraft on OSD, automatically tracking flight;

4.   Support the maps by several providers, including Google, Bing and Baidu Map, support the free saving of offline maps and free saving of zoom level in Frame Selected Area, with no need to worry that it is unusable in case of field operation with unavailable internet access.

5.   Support the import and export of waypoint table;

6.   Support multi-language.

7.   Support the function of track replay;

8.   Support the calibration of takeoff point, so that latitude/longitude deviation generated from different maps will be accurately matched by user's click.

9.   Support the measuring function;

10.   Allow for the setting of emergency point, multiple waypoint actions, Autopilot Channel 5, 6 can be used as waypoint actions.

11.   Various action instructions can be immediately executed.

12.   Reserve more upgrades.

Table of Contents

Ⅰ. Software Installation

1.Requirement for installation environment

This software is applicable to PC, which supports Windows XP, Windows 7, Windows8, Windows 10, but does not support Mac and Linux.

2.Use the program

Arkbird GCS.exe
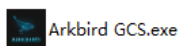
3.Install NET Framework 3.5

Because this software is developed on NET Framework 3.5, "NET Framework 3.5 seems to be missing" may be prompted when you open it, the cause to this case is that Windows XP does not contain this framework, but the original Windows 7 is default with this framework that you may directly use it.

While Windows 8, Windows10 contains the framework of a higher version, you may download and install it by following the prompt, or download it by searching ".NET3.5" in Google.

When you double-click to open it, "this software is risky" may be prompted by some anti-virus software or security guards, and select "Trust" and continue the operation, please use it at ease because the official software has no malicious program.

**4.Install the serial port driver**

CP210x_VCP_Win_XP_S2K3_Vista_7.exe
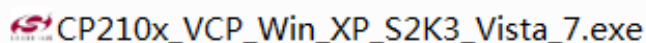
Ⅱ. Hardware Connection

As shown in the figure, use the supplied cable to connect the serial module to Autopilot RX and TX port, black and brown lines are ground wires, close upwardly to the side of Autopilot LOGO.

In the menu of OSD Settings, go to CTL Control Settings, select "CustomMode" as "WayPoint", in switching the waypoint mode (CH5>50%, 30%<CH6<75%).
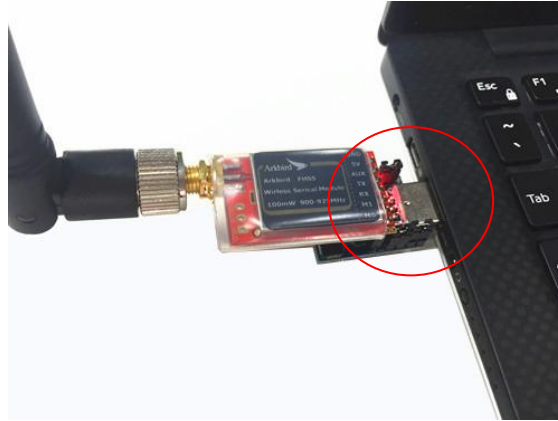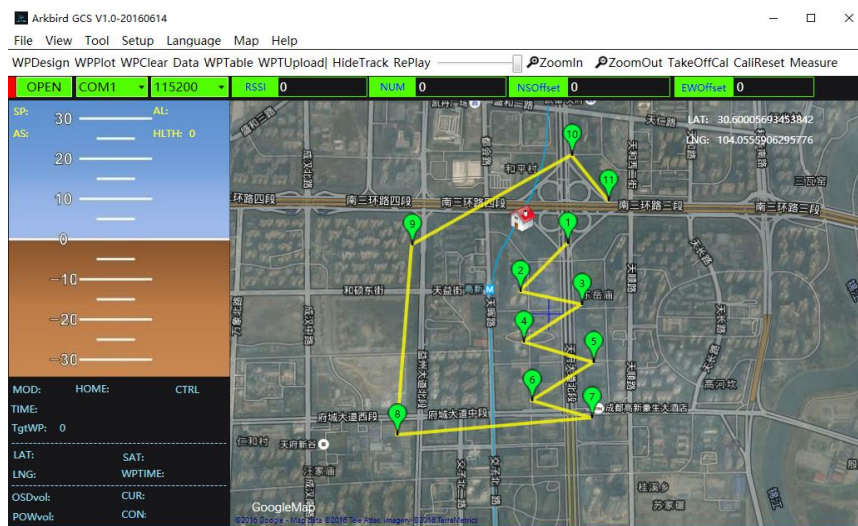
Use the supplied USB adapter cable. Short-connect all 3 jumper caps and make the serial module in communication mode.

Ⅲ. Software Application

5.General interface

◆ Note the source of map (Google, Bing, Baidu) before editing the waypoint;

◆ In the left-sided List of Parameters, pay a special attention to the health value of Autopilot, Autopilot Control (roll angle, elevation angle, throttle control value given by the Autopilot) and waypoint time;

◆ "Latitude, longitude" in the right upper corner of the map indicates the mouse's point;

6.Language Switch
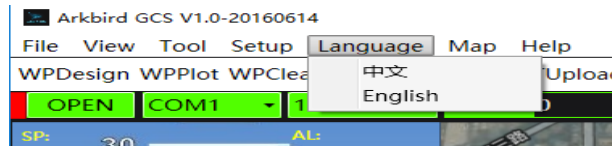
You can see the supported languages in the menu button of "Languages" in the menu bar.

7.Map Switch
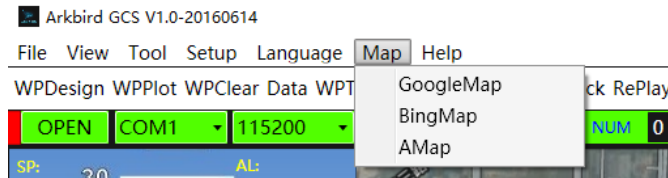
Click on "Map" to select and switch to the desired map source, it is recommended to use Google Map. The first loading is slow which takes about 20 seconds.

8.Save Offline Map

Arkbird ground station can buffer the map files like most of other ground stations, buffer the map into the system cache folder simply by zooming in/out the window, automatically loaded when disconnected from the network.

But there is risk of easily losing caches, so we provide the offline saving of the frame selected map, so that we can open the map from time to time, from place to place, free from the dependence on network access.

Select the appropriate map source, hold down ALT, press on the left mouse button to frame-select the area. Then click "Save Map" in "Files", select the "Save Level", "Save To" to save the map offline.

(Error message will pop up if you don't hold down ALT but directly select "Save Map")
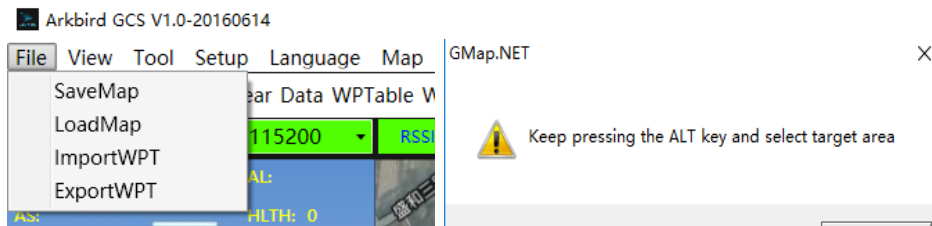
Select the appropriate zoom level (the higher the zoom level is, the slower the saving is), click on "No" to skip this zoom level, click on "Cancel" to select the hard disk position.
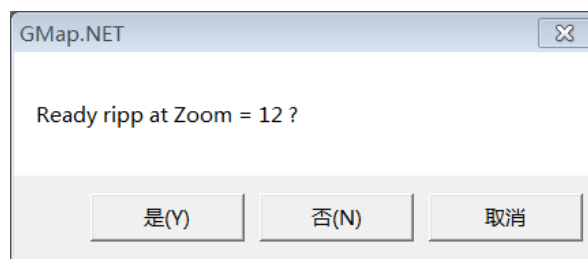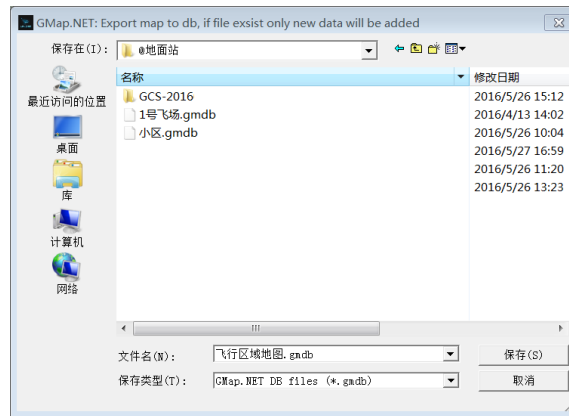
9.Calibrate Takeoff Point

If any deviation of takeoff position is displayed, please calibrate the takeoff point before taking off to make the flight more accurate.

The aircraft icon will appear after the successful serial connection, then click on "TakeoffCali" in the menu bar, the red icon will appear on plane. Then drag the red icon to the current position of aircraft, click on "Save Calibration".
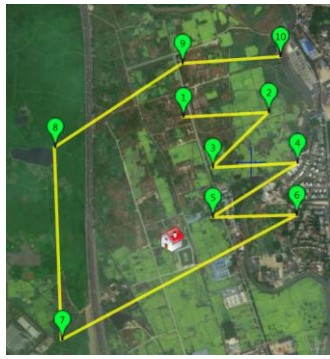

10.Measure Distance

Click on "Measure", select the starting point and destination point, the message box of distance measurement will pop up.

11.Waypoint Planning

(Note: As the same point may be at different positions in different maps, please make sure that you have selected the correct map source before waypoint planning).

Click on "WPDesign" , click the left mouse button for waypoint planning on the map, and click the right mouse button to end the planning. The first point that the mouse clicks on is "Emergence Point", mark the following points as 1, 2, 3…

12.Modify Waypoint Table

The following table will pop up after ending "WPDesign" or clicking on "WPTable"), you can change the altitude and action for each waypoint.

The settings box of "flight Altitude" and "Action" in the left upper corner is used for bulk changes. Input the action code in the designated point to set the waypoint action, notice the altitude is the relative altitude with respect to the takeoff point automatically saved in Autopilot.

Click on "Export WPTable" to save as a file.

For safety concern, you are only allowed to drag the waypoint or double-click to delete the waypoint in the master interface after opening "WPTable", minimize this window and edit WPs in main window.

13.Export/Load Waypoint Table

After the waypoint planning, you may export the Waypoint Table, or click on "File" button->Export Waypoint Table, there are two export formats of Waypoint Table, one is XML and the other is XLS of Excel, it is recommended to export this file in XML, which can be also opened in Excel.

Note: The corresponding map source will be automatically switched when reading the Waypoint Table.
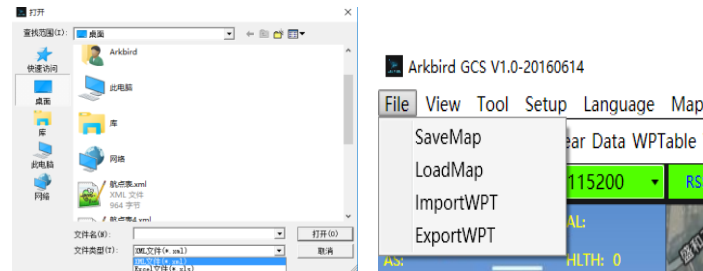
14.Upload Waypoint Table

The uploading requires: 1. The serial port connected; 2. The Waypoint Table has been imported or planned.

Downloading will be immediately initiated when Autopilot receives the uploaded Waypoint Table, the ground station will verify if it is the original one, if so, uploading is successful, otherwise uploading is failed.

15.Waypoint Flight

Autopilot's serial module state indicator LED (blue) is default as unlit; after it makes a communication with the ground station, the blue indicator slowly flashes; after the ground station uploads the Waypoint Table, the blue indicator quickly flashes; Then switch the input control amount to waypoint mode (CH5 high, CH6 middle), the aircraft will fly by the Waypoint Table in ground station instead of by 4 waypoints in OSD setting.

In switching to the waypoint mode, the countdown of waypoint safe time (WP SAFE TIME) will automatically start, once the countdown is zero, the waypoint mode (CH5 High, CH6 Middle) will automatically change to the return mode (SAFE TIME is default as 120 minutes), please set WP SAFE TIME as 0 if you need to close the return countdown.

In waypoint flight, the aircraft will fly to No.1 waypoint, switch to the next waypoint within the designated distance to the waypoint, (the distance of switching to the next waypoint can be set in Waypoint Menu "NEXT WP IN (m)" of Autopilot OSD, default as 30m), when it reaches the distance, the execution of waypoint action will be triggered if set.

The waypoint action CH5/6 "High"=outputs 1,900us (equivalent to 100% rubber amount of remote controller), "Middle"=1500us (50% rubber amount) and "Low" =1100us (0% rubber amount) pulse width respectively. If the Autopilot does not receive CH5/6 control command, it will be controlled by OSD menu settings (which can be set as PTZ control or Channel 7/8/9/10 output, with reference to OSD User Manual). If you trigger the waypoint action, or click on "Immediate Execution" to execute CH5/6 channel action, the ground station will take over the control of CH5/6.

The fastest turning to waypoint will decide how to steering the plane, so aircraft may turn left or turn right ;the altitude control mode is to firstly climb to the altitude of destination point, then flying at this altitude .

The aircraft will circle at the last waypoint (set this waypoint action as "Return" if you need to return);

In switching "Waypoint Mode", if you open the throttle safe function, ESC will beep to alarm in an altitude less than 10m and in a distance smaller than 30m, but no throttle outputs to avoid hitting the hands.

In each flight, test the waypoint mode within the visible range, observe the position, altitude of aircraft and the "Autopilot control value" in ground station (roll control angle, elevation control angle, throttle value), view if the aircraft flies correctly or not, please switch to the manual mode in case of anomaly.
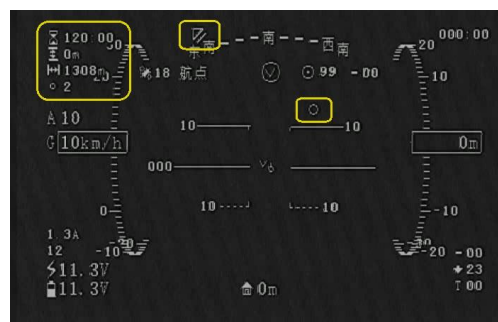

switch to waypoint mode , OSD's upper left will display: WayPoint Time, current coordinates to the waypoint Altitude , Distance, waypoint Number, the upper end of the compass will display the waypoint position (to the left or right up and down arrow) , radar coordinate system with small flashing a circle shows the location of the waypoint .
As for the connection of two-airplane formation, in radar coordinates flashing an arrow indicates the position of the other side airplane.
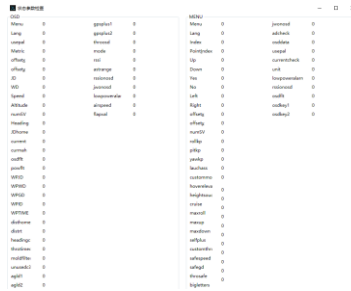
16.Immediate Execution

Click on "Immediate Execution" to allow the aircraft to immediately execute the corresponding action.
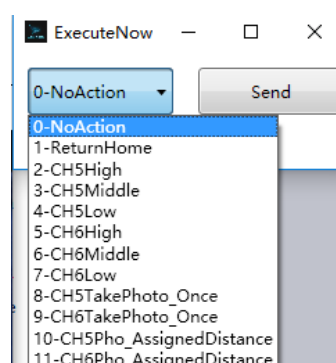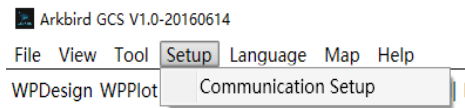
17.Check Parameters

You may view the flight altitude parameters of various aircrafts which are received by current ground station by clicking on the button "Check Parameters", as shown below (common user may not need to concern):

18. Communication Setup

You can click on "Setup" in the menu bar to select the function "Communication Setup" to customize the communication mode,
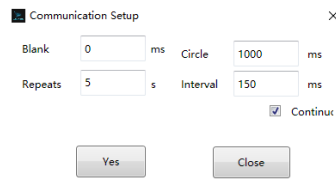
Ground station is applicable to the half-duplex serial module, there are 2 working modes: continuous downloading or request the times of downloading. (It is recommended to use the default continuous downloading which is combined with Arkbird serial module through the program optimization):

A. Continuous downloading:

Select the "continuous downloading"; the ground station uploads the settings only once, Autopilot is always in a state of downloading and waiting for the data uploading from the ground station by reserving some blank time in each period. This can enhance the stability of communication and lessen the impact due to the loss of request packet. (it is default that 5 packets are downloaded per second, the interval is set as 150ms, when the parameter "Upload Interval" is invalid)

Blank time: it refers to the empty time reserved at the beginning of every period for the receipt of ground terminal information.

B. Request times of downloading:

Cancel the "continuous downloading", the ground station requests the data packet by the upload interval setup and the Autopilot downloads the request packet after the receipt.

"Circle"

It refers that ground station sends a request packet every period and request to download the designated plane's information.

"Repeats" and "Interval":

It refers to the number of packets downloaded from the airborne end to ground station within the request interval.

19.Track Replay

In default, the map will display the flight track of current flying aircraft and you can click on "HideTrack" to hide it.
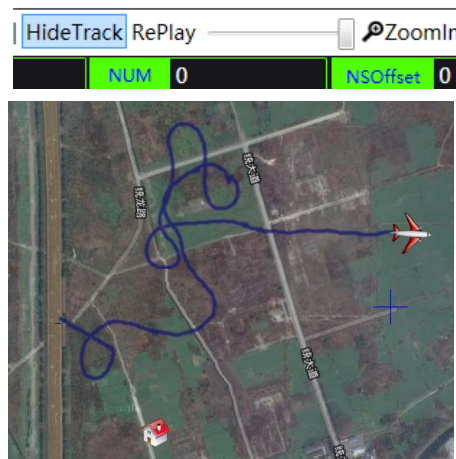
When the serial port is disconnected, you can click on "Track Replay" and then control the replay progress through the right scroll bar.

**20.Change Serial module Frequency Point**

Arkbird 433 module has been set upon delivery, default in 434Mhz (frequency hopping: +-0.5Mhz), 915 module has a frequency point of 916.2Mhz, it can be set in the following way if you need to replace the frequency point and avoid interference:
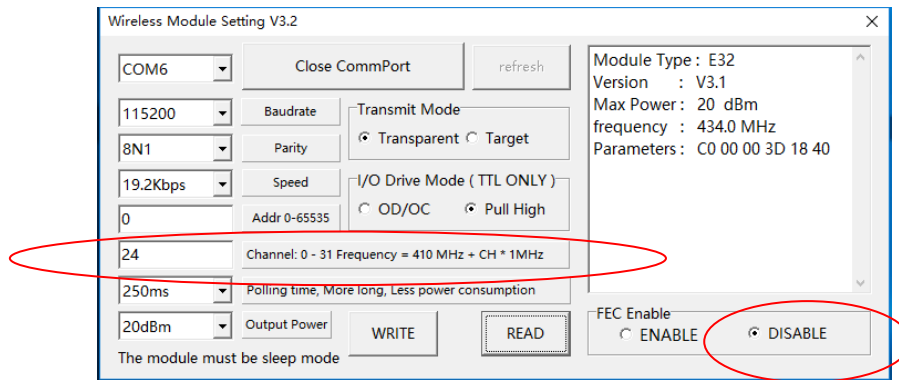

Remove 2 jumper caps in the right lower corner to make the serial module in the setting mode.
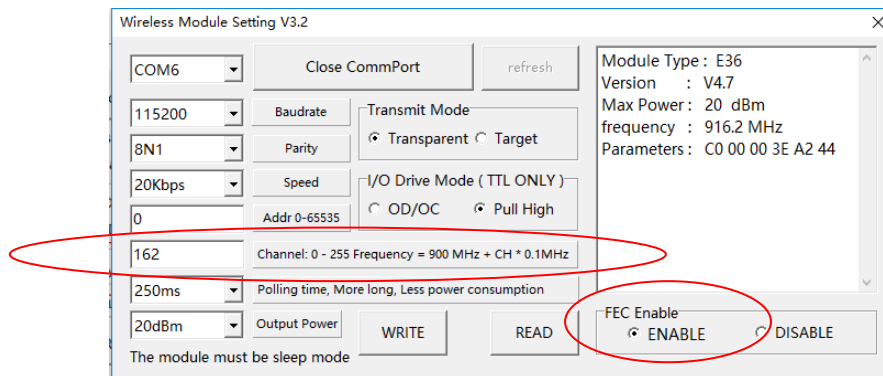
Open the software of serial module setting, select the serial port to click on "Read" and click on "Write" after changing the information channel. Do not change other parameters for the avoidance of problems.
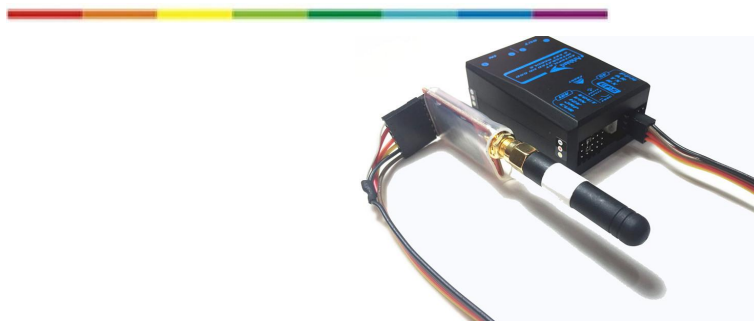

RF_Setting_EN_V3.2.exe
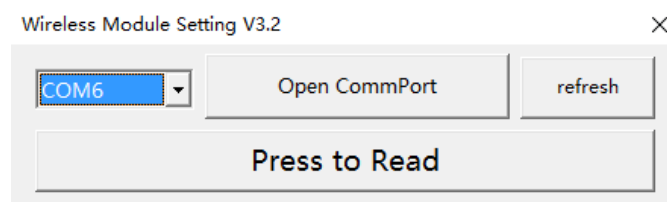
433 module default settings

915 module default settings

Ⅳ. Exchange of Coordinates for Two Aircraft Formation

If two sets of Arkbird-OSD Autopilot are connected to Arkbird serial module interface, it can achieve the exchange of coordinates as the other's waypoint, OSD displays the position, tracking formation can be automatically done in switching the waypoint mode. (It cannot be simultaneously used with the ground station software)

It is recommended that firmware version of two Autopilots should be consistent for the avoidance of communication failure. Select "CustomMode" as "Waypoint", it will automatically fly by tracking the coordinates of the other aircraft in switching waypoint mode (CH5>50%, 30%<CH6<75%).

Ⅴ. Troubleshooting

1. You cannot open the software because it prompts "missing .NET"

Download .NET in Microsoft official website by following the prompt, or directly download it by searching ".NET3.5" in Google.

2. The data transmission is slowly updated , RSSI is less than 80%

The communication speed is relatively slow when the Autopilot is just powered on; it is recommended to click on "Communication Setup", then click "OK" to re-upload the communication parameters, or close the serial port and reopen it to set up a connection. Or Power on the Autopilot each time before opening the ground station to maintain the connection at all times.

3. when you open serial module setup software , will display incomplete (pls see below picture)

This is caused by the operating system text display is too large, Please open "Control Panel" – "Display Options" –"Enlarge or shrink the text and other items"– set the text size range between " small (S) to 100%" is ok.

Ⅵ. Attention

Please read through carefully:

1.   The design purpose of autopilot is to keep balance of flight, it is not able to manipulate plane or prevent stall. You must have sufficient experiences of fixed wing to control the flight.

2.   The autopilot is only for small-scale RC model. For safety concern, please do not install in plane for aerial photography which might fly over crowd.

3.   Please install the autopilot depends on your demands and check the condition before flying every time.

4.   Any equipments and electric products on the plane couldn't be completely reliable, please using this system following the instruction. The system provider is not responsible for any direct or indirect loss and consequence caused by using this product.

///

For any opinion or suggestion, please send e-mail to Arkbird@foxmail.com and we look forward to listening to your opinion for the continuous improvement of our product!