

AH3A

User Guide



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Contact Information

SUZHOU CHANGFENG INSTRUMENTS CO.,LTD.

NO.33 Heshun Road, SIP, SuZhou City, Jiangsu Prov, CHINA 215122

Phone: 0086-0512-67246502, 0086-0512-67261491

Fax: 0086-0512-67261491

Email: sz_cfi@163.com

Registering Your AH3A

Please send an email to sz_cfi@163.com to register your AH3A. Registering your product with CFI ensures that your contact information is up-to-date. This helps verify product ownership, can expedite warranty claims, and allows us to notify you in the event a service bulletin is published for your product. You can also optionally sign up to receive other CFI news and product announcements. CFI will not share your contact information with third parties or send you announcements without your explicit consent.

Please provide the following information when registering:

- Product model;
- Product serial number;
- Purchase date;
- Purchase location or store or distributor;
- Do you accept our service announcement for the AH3A;
- Do you accept our CFI news and announcement for other products.

Limited Warranty

CFI warrants this product to be free from defects in materials or workmanship for one (1) year from date of shipment. CFI will, at its sole option, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labor. The customer is, however, responsible for any transportation cost. This warranty does not cover failures due to abuse, misuse, accident, improper installation or unauthorized alteration or repairs.

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1. Safety information

Lithium battery related safety incidents are much more likely to occur during the charging process or transportation. With this consideration, we do not supply the AH3A with batteries. Batteries, if needed, can be purchased by users from professional battery suppliers. It is recommended to use power banks with capacity greater than 1000 mAh – preferably those with clear indication of the remaining capacity. A full capacity of 1000 mAh can keep the AH3A working for at least one hour. The USB port on the back of the AH3A can be used to connect to a 5V DC power bank. We enclose a cable with dual USB male plugs for connection. There is also an optional bag for holding the spare battery. The power bank and its bag should be placed in a safe place on the aircraft - such as the side of the cockpit, i.e., anywhere the batteries can be easily found and taken off the aircraft but will not fall off or be thrown out involuntarily. The purpose of taking out the battery is to charge it on the ground with mains electricity, like many power banks used in mobile devices such as mobile phones.

The normal usage of the AH3A only needs the power supply on aircraft, 10 ~ 30 VDC voltage. It is only when the power supply on aircraft fails, the AH3A will switch to source power from the standby battery/power bank.

2. Product Profile & Installation

The AH3A LCD Attitude Indicator & Standby Instruments System built-in a GPS system and a MEMS pressure sensor, together with a 3.5 " LCD display. It is also externally connected with the Attitude Heading Module (AHRS). The product includes AH3A host and AHRS module.

The AH3A can display the following parameters:

- ATTITUDE(Pitch & roll)
- SLIP
- HEADING
- ALTITUDE
- AIRSPEED
- VERTICAL SPEED

Factory mode is set to use barometric to determine altitude and airspeed, not at the GPS altitude and ground speed. This default setting is considered more suitable for conventional flying usage. The Pitot and Static ports of the AH3A should be connected to the aircraft Pitot-static system in this case. The AH3A can also be set to GPS altitude and ground speed mode. Heading, GPS altitude and ground speed are all derived from GPS therefore depend on the correct functioning of GPS.

The AH3A uses MicroSD card as the storage solution - enabling large data storage capacity and can store flight records for tens of thousands of hours. Stored flight records can be exported via USB portal.

It is an n-in-1 gauge. As a backup instrument, it integrates attitude indicator, altimeter, airspeed indicator and compass. It also has vertical speed and slip indication.

The AH3A can be used as a digital supplement to the traditional aircraft dashboard. It not only adds the artificial horizon, but also has more accurate altimeter, airspeed indicator, vertical speed indicator, compass and slip indicator as backup and reference. It also enables the aircraft to store flight records and stride into the era of digital display.

As the product has not obtained the airworthiness certification of CAAC, FAA, EASA or other regulatory agencies, All critical flight information is presented for reference only and must be verified by the use. It can not be used to replace any required flight instruments in type certification aircraft unless the AH3A is certified together with the aircraft or supplementary certification for this purpose.

If the AH3A is set to ground speed, GPS altitude and GPS vertical speed mode, these parameters are GPS-derived, so their indications WILL BE DIFFERENT from the airspeed, altimeter, VSI, and heading instruments in your aircraft panel. The AH3A's GPS-based indications shall be considered as reference information.

Main technical parameters:

- Monitor size: 86 x 86 x 34.6mm;
- Monitor weight: 0.30kg;
- Active display area: 70.08×52.56mm²(3.5");
- Resolution: 320×240;
- LCD: TFT;
- Brightness: 800 cd/m²;
- Viewing angle: 60° left & right & up, 55° down;
- Working voltage: 10~30 VDC;
- Power: <3W(at 12V);
- Storage: MicroSD card;
- Operating temperature: -20~+70°C;
- Storage temperature: -30~+80°C;
- Humidity: ≤ 40°C, 85%RH Max



Figure 1

Figure 1 shows the back of the AH3A. The USB port is used to connect **5V** standby power supply (battery / power bank). It can also be used to transfer the flight data stored on the MicroSD card. There are two barometric ports on the right hand side. The upper one is the Pitot port, and the lower one is the static port. There is also a DB9 power supply & AHRS module socket on the right side. The golden part on top of the AH3A is the GPS antenna. Please do not shield it.

Note: There are also a very small number of LSA with metal skins on the nose. In this case, the GPS signal will be completely shielded, and the AH3A cannot be used, or there will be no heading indication when using the AH3A. When the AH3A is set to ground speed, GPS altitude and GPS vertical speed mode, there will be no corresponding indication. The corresponding indication would be '- - -'.

Definition of DB9 power& AHRS module plug:

Pin 1, 2, 3 and 5# are respectively connected to the red, green, yellow and black wires of AHRS module, pin 7# is connected to the positive power supply on the aircraft, and pin 9# is connected to the negative power supply. When leaving the factory, AHRS module has been connected to the DB9 plug and led out 7# (to the power supply +) with red wire and 9# (to the power supply -) with black wire.

Figure 2 shows the front and main display of the AH3A. The micro USB port on the top is for data transfer only. This USB port is not for connecting to the standby power supply (battery/power bank). In the middle of the upper is the power switch of the AH3A. When the switch is toggled to "O", neither the power supply on the aircraft nor the standby power supply (battery / power bank) is used.

Click on the settings symbol in the upper left corner of the interface  to enter the settings menu.



↑ !!Screw in 3mm from the orifice ↑

Figure 2

Installation information 1: The AH3A adopts the installation dimension of traditional instruments - can be installed directly in the gauge mounting hole with the hole diameter of 3-1/8 "(80mm), without modifying the instrument panel or just modifying the screw hole diameter. **Note:** There are two mounting screws attached to the mounting

holes - at the left and right hand side of the instrument below the display screen. The screw-in depth of the two screws is strictly limited. The screw-in depth should not exceed **3mm** from the end of the screw hole. Excessive length and forced screw-in may cause permanent damage to the display screen located behind the screw hole.

Installation information 2: The AHRS module can be installed in two ways.

1). **Normal installation(This installation mode is preferred).** That is, the AHRS module shall be installed in a stable place with small vibration, no shielding and interference of magnetic field and no rain, keep away from iron, nickel, magnet, engine and other magnetic materials (above 0.5m). The bottom plane of the AHRS module should be horizontal when the aircraft is flying horizontally, and the north direction of the AHRS module should be completely parallel to the longitudinal axis of the aircraft. Four corners shall be fixed with non-ferrous screws, and the tightening torque of four screws shall be basically the same. The cable shall be fixed but shall not generate traction force to the module, so as to avoid vibration of the module due to the traction of the cable. If it is installed on the bracket, the bracket must be stable, rigid and non-magnetic. It must be strictly avoided that the strong magnetic materials such as magnets and motors are within 10cm, otherwise the measurement accuracy of the AHRS module will be irreversibly affected.

2). **Backplane installation.** When necessary and the environment permits, the AHRS module can be pasted on the backpanel of AH3A, with ↑ north pointing to the right side of the screen (the front of the product and the altimeter side of the main screen), and the cable can be cut properly. If the backplane installation is selected, after the AHRS module is fixed with the host, a magnetic compass 3D calibration **shall be conducted** for the whole AH3A. See 3.2.5 Attitude and heading calibration interface for details.

3. Instructions for use

Put the switch on the top of the interface to I and wait a moment for the AH3A to initialize. When AH3A self check finds that the device is abnormal, **Error▼** will pop up on the top right of the screen, click ▼ to pop up the list of abnormal devices,  and click ▲ to fold the list.

3.1 Graphic Elements

Figure 3 shows the main screen of the AH3A. On the left of the screen is the airspeed indicator. The current speed is shown in the black box. The airspeed units are km/h or mph or knots. The GPS-based speed indicator can also be selected. When the speed is the ground speed, 'GPS' will appear above the black speed indicator box.



Figure 3

On the right of the screen is the altimeter and the vertical speed indicator. Large black box shows the current altitude. Long press the current height for 5 seconds to set the current height to zero. The altitude unit can be switched between m and ft. Small black box shows the vertical speed indicator, the corresponding units are m/s and kft/min. Below the altimeter is the reference barometric. The reference barometric unit has a choice of mbar or inHg. Click on the reference barometric box and  buttons will pop up on the top of it. Press them to adjust the reference barometric value. The altimeter and vertical velocity indicator can also be selected as GPS-based. When based on GPS, the indicated altitude is the altitude and there is no reference barometric displayed and 'GPS' appear above the altitude black indicator box.

In the middle of the main screen is the pitch indicator area,  is the aircraft sign, one short scale for pitch every 5 ° and one long scale for every 10 °. The upper part is the roll indicator dial, one scale for every



10 ° between 0 to $\pm 30^\circ$ and one scale for every 15 ° between ± 30 to 60 °, and the yellow ▲ is the roll indicator. The bottom of the main picture are slip/skid indicator. The factory set indication range is $\pm 10^\circ$, and the maximum indication range can be set to $\pm 30^\circ$.

The upper part of the main screen is the heading scale, and the black box shows the current heading. The default is magnetic heading. Click the heading value in the black box, and the heading will be cycled between magnetic, true north and GPS track heading. When True North is selected, a white T will appear on the right side of the black box. When the AH3A built-in GPS module is not well positioned by the satellite, the T will be red; When GPS is selected, the word "GPS" will appear outside the left side of the black box. At this time, the heading is based on the GPS track heading. When the GPS module is well positioned by the satellite and the moving speed is greater than 1.5 m/s, the heading value will be displayed. Otherwise, - - - will be displayed. The upper right corner shows the strength symbol for the satellite signal. When the satellite positioning is not successful, there is a red X on the symbol. When the satellite positioning is successful, X disappears, and the strength symbol is filled from left to right according to the strength of the satellite signal. Click the satellite signal symbol to pop up the current longitude and latitude display, and click it again to close it. Click the longitude and latitude display to cycle the longitude and latitude format.



The upper left corner is the settings symbol. Click on it to enter the settings menu.

Click in the lower left corner of the screen to pop up a slider, and slide right/left to increase/decrease the screen brightness.

3.2 Set up

3.2.1 Settings menu

From the main screen, click on to enter the settings menu. The following settings and selections can be made in the setting menu(Figure 4):

Setting interface of the next layer: click **ASI SETUP**, **ALT & VS**, **ATT SETUP**, **ATT CALI** and **SYSTEM** to enter the corresponding setting and calibration interfaces respectively. Click **En | 中** to switch between Chinese and English display, and click **Return** to go back to the main screen.



Figure 4

3.2.2 Airspeed settings menu

Click **ASI SETUP** on the Settings menu to enter the airspeed settings menu (Figure 5).

The following actions can be made in the ASI settings menu:

- **Airspeed mode.** Switch between **Pitot** and **GPS** to select air speed based on barometric system or ground speed based on GPS. When GPS mode is selected, barometric settings are automatically hidden.
- **Switch airspeed units.** Click the first button on the right to switch the speed unit between km/h and mph and knots.
- **Airspeed Calibration.** The aircraft Pitot system may have some error, resulting in some error between the values indicated on the instrument and the actual airspeed. AH3A designed the airspeed correction function. If a constant error is observed in the Pitot system, you can click the and keys in the Airspeed Calibration box, and click +/- once, the correction coefficient is added or subtracted by 1%. The maximum correction

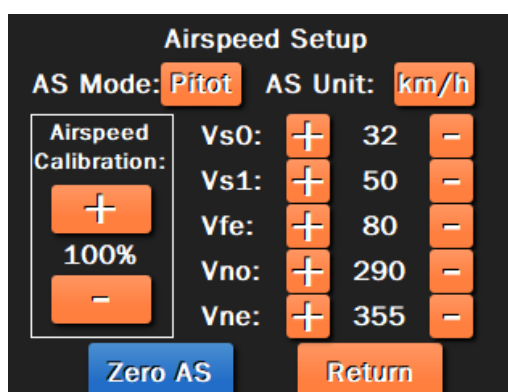


Figure 5

range is $\pm 30\%$. That is to say, the correction coefficient can be 70%-130%.

- **Zero correction.** If the airspeed shown in AH3A does not read 0 when the actual airspeed is 0, click on **Zero AS** in the lower left corner of the screen to make the airspeed display zero. Please note that while calibrating, the pressures at the 'P' and 'S' ports must be equal. It is recommended to connect temporarily the two ports with a tube.
- **Adjust the airspeed colour marked.** Click the **+** and **-** keys corresponding to Vs0 to Vne etc. to adjust the colour marked of each section of airspeed. The mark values of each model or even each aircraft may be different, so when an AH3A is installed on your aircraft for the first time, it is recommended that you modify or confirm the factory set mark values.

Click **Return** to go back to the previous layer screen.

3.2.3 Altimeter and Vertical speed indicator settings menu

Click **ALT & VS** on the Settings menu to enter Altimeter and Vertical speed indicator settings menu (Figure 6).

The following actions can be made in the ALT & VSI settings menu:

- **Altitude mode.** Switch between **Pitot** and **GPS** to select altitude&VSI based on barometric system or based on GPS. When GPS mode is selected, barometric settings are automatically hidden.
- **Switch altitude&VSI units.** Click the second button on the right to switch the altitude unit between m and ft, and the vertical speed unit between m/s and kft/min.
- **Change the range of VSI:** change the maximum indicated range. The default value is 10m/s or 2000ft/min. Click the third button on the right to change the range of VSI.
- **Switch the reference barometric unit.** Click the fourth button on the right to switch the reference barometric unit between mbar and inHg.
- **Baro now.** Displays the current the static system barometric measured by AH3A.
- **Altitude clearing.** Click on the blue button **ZERO ALT** on the left, the AH3A will take the current barometric value sensed as the local barometric value. In airports without a control tower, this is a good and practical method.

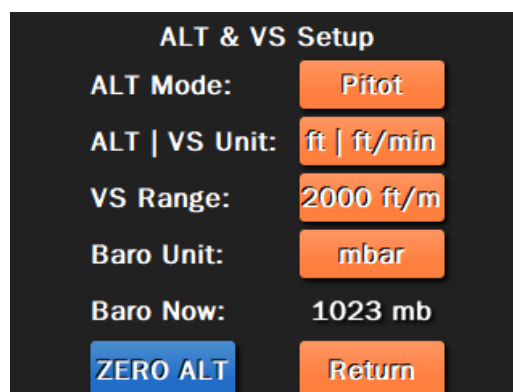


Figure 6

Click **Return** to go back to the previous layer screen.

3.2.4 Attitude settings menu

Click **ATT SETUP** on the Settings menu to enter the attitude settings menu (Figure 7).

The following actions can be made in the Attitude settings menu:

- **Installation method.** The default state of AH3A is normal, that is, the AHRS module is installed separately. When the installation mode is pasted on the backplane of AH3A, click Normal to switch to the Back.
- **Attitude parameter correction.** When the AHRS module is installed and the aircraft is in a state that it imitate the horizontal in the sky and stable. if the angles are not zero, the attitude parameters need to be corrected. Click the heading **+**, **-** to correct the heading angle, and click the top-down **Zero** to zero set the pitch angle, roll angle and slip respectively. Click the Slip Range to change the maximum range displayed by the slip/skid indicator.



Figure 7

Click Reset to reset the above changes and zeros. Click **Return** to go back to the previous layer screen.

3.2.5 Attitude calibration menu

Click **ATT CALI** on the Settings menu to enter the attitude calibration menu (Figure 8).

These are two options in the Attitude calibration menu: magnetic compass calibration and gyro calibration.

Click **Compass Cali** to enter the magnetic compass calibration menu (Figure9).

When the AHRS module is in a certain magnetic interference environment, horizontal calibration is required; When the AHRS module is not used for a long time or there is obvious error, 3D calibration is required.

The figure shows the total magnetic field data in each axis direction. Before installing the AHRS module, it is recommended to rotate the AHRS module in an open place to check the change of the total magnetic field data "MagSum". If the change is large ($>\pm 5^\circ$), 3D calibration is required.

3D calibration. After the AH3A is powered on for 2 minutes, click to **start 3D calibration**, slowly rotate the AHRS module (together with the AH3A host if installed on the back of the AH3A host) 360° around the "Pitch" direction on the label, and at the same time rotate $\pm 90^\circ$ around the "Roll" direction, with the total time controlled at more than 60s. When the percentage on the screen reaches 100%, the calibration is completed. At this time, check the total magnetic field data "MagSum", if the change is $\leq \pm 2^\circ$ in each direction, The calibration effect is the best. Press **Cancel** to stop this calibration.

Horizontal calibration. When the AHRS module is installed and there are iron parts/magnets/radio stations 10cm around, horizontal calibration is required. Keep the aircraft to a state that it imitate the horizontal in the sky by supporting or hoisting.. After the AH3A is powered on for 2 minutes, click the horizontal calibration, and let the aircraft slowly rotate 360° in the plane for more than 20s. When the percentage on the screen reaches 100%, the calibration is completed. Press **Cancel** to stop this calibration. Press **Reset** to return to the status before this horizontal calibration. It is recommended to conduct horizontal calibration again after changing the installation position or conducting 3D calibration.

Click **Gyroscope Cali** to enter the gyroscope compass calibration menu (Figure10).

Gyro calibration. After the AH3A is powered on for 2 minutes, when the AHRS module is completely stationary, click **Start Gyro Calibration**, and the gyro calibration will be automatically completed after about 5s of inactivity.

Gyro self calibration. When the AHRS module is completely stationary for more than 5s, the gyro will self calibrate. If the value of each axis is less than $0.1^\circ/\text{s}$, manual calibration is unnecessary.

Click **Return** to go back to the previous layer screen.

3.2.6 System settings menu

Click **SYSTEM** on the Settings menu to enter the system settings menu (Figure 11).

The software version installed by AH3A is displayed at the top of the screen. The UTC Time transmitted by GPS and the Local(System) Time are also displayed. UTC time is displayed when the GPS module is positioned effectively,



Figure 8

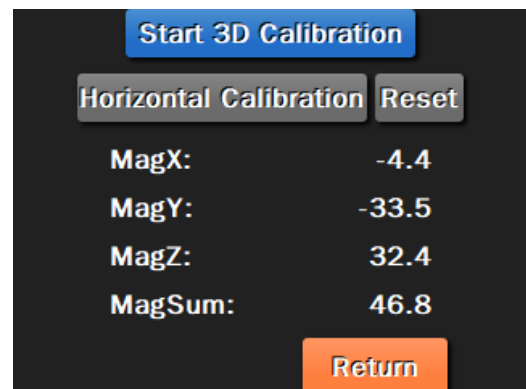


Figure 9

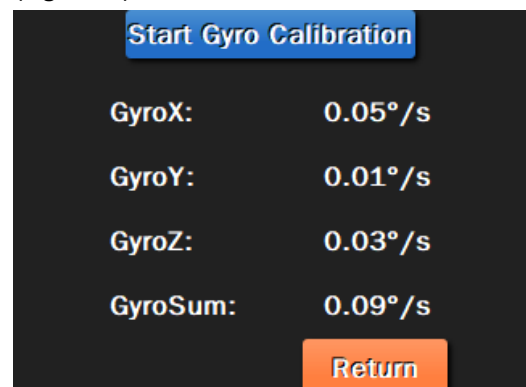


Figure 10

otherwise, 1999-1-1...-1. The system time is automatically synchronized to Greenwich Mean Time.

The following actions can be made in the system settings menu:

- Time zone settings. According to your time zone, click the **+** and **-** keys to adjust the time zone, the eastern zone is +, the Western Zone is -.
 - Click **Storage** to enter the storage menu. This menu displays the remaining space of the internal memory. Click **Format** to initialize the memory. Click **Return** to go back to the previous layer screen.
 - The gray button in the middle is the system demo status switch key. Click to switch between **Demo off** and **Demo on**, i.e., to make the system switch between normal working state and demo state.
 - Click **Update** to enter the software update screen, click **Password** to enter the password setting screen.
- Click **Return** to go back to the previous layer screen.

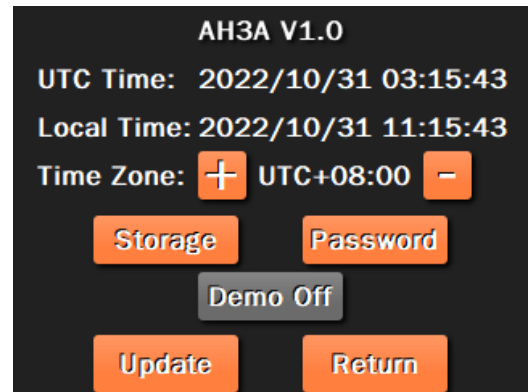


Figure 11

3.2.7 Password settings

See Figure 12, Password Setting screen. The factory password is blank, so it is not necessary to enter the password when entering the setting menu. The password can also be 1~10 digits. Enter the new password and press **OK** to save the new password. The password must be entered the next time you enter the setting menu. Press **Cancel** to stop this set.

If you forget your password, you can connect AH3A to your computer first, and then turn on the power switch of AH3A, and AH3A will be identified as a USB flash drive. You can skip the password input by creating a new file named "clearpassword.txt" in the UpdateFiles folder. You can restore the password function by resetting the password and then deleting this file.

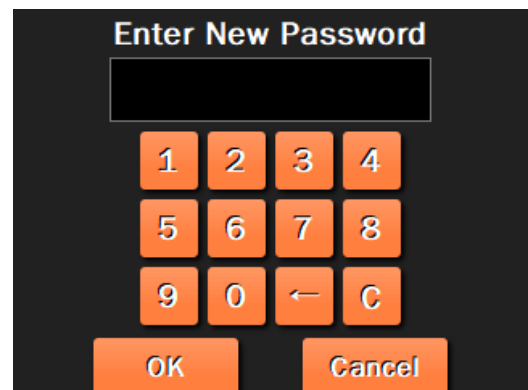


Figure 12

3.2.8 Upgrade software

See Figure 13, Password Setting screen. Prepare a microUSB cable to connect to the microUSB interface on the front of AH3A, insert the other end of the cable into the computer, and then turn on the power switch of AH3A. The computer will identify AH3A as a USB flash drive, copy the new software to the UpdateFiles folder, click **Upgrade** to enter the software upgrade interface, press **<**, **>** to find the upgrade software, click **Start** to start the upgrade, and the program will restart automatically later. Click **Return** to go back to the previous layer screen.

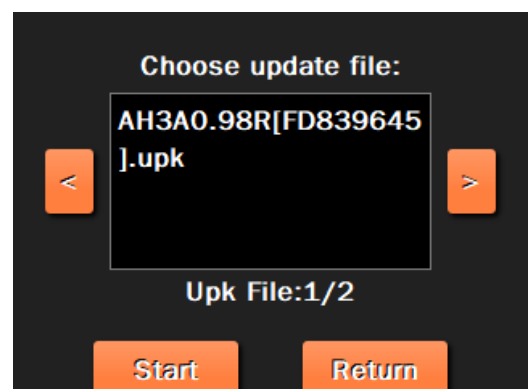


Figure 13

3.3 Performance Notes

3.3.1 GPS module

3.3.1.1 When GPS starts, it takes about 100 seconds to obtain a GPS fix (without shield and with good view of the sky), and less than 5 seconds to fix again after losing fix.

3.3.1.2 In the case where the heading is a GPS track heading, when there is no displacement or less than 0.3 m/s

moving speed, heading indication will either be off or not necessarily correct. When it enters a sheltered space (such as hangar and basement), though it may still show some satellite signal strength, the direction indicated is not necessarily correct.

3.3.2 Attitude Heading Module (AHRS)

3.3.2.1 Rotation rate limit

The AH3A will operate normally with rotational rates of up to 500 degree per second around any axis. If a rate of 500 degrees per second is exceeded, "ATTITUDE RECOVERING" will be displayed along the bottom of the display. The AH3A will continue to display attitude information, but it should be cross-checked against other instruments while in this recovery mode. After a few seconds of straight and level flight, the ATTITUDE RECOVERING message will automatically disappear when the AH3A is confident that it is showing the correct attitude.



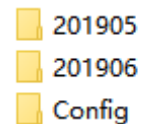
3.3.2.2 Aerobatics and non-standard maneuvers

The AH3A's attitude sensing algorithm is based on fixed wing aircraft flight dynamics. Using the AH3A during aerobatics or other maneuvers that are not encountered during normal fixed wing aircraft flight may cause the AH3A's attitude indicator to lag the actual horizon or be otherwise incorrect. This will especially be true if the maneuvers being performed exceed 150 degrees per second as described above. However, once straight and level flight is resumed for a short period, the AH3A will automatically recover and display the correct attitude. Additionally, no aerobatic flight maneuver will cause any permanent damage to the D3's attitude sensing ability.

3.4 Reading of Flight Data

3.4.1 Connect the computer

Prepare a microUSB cable to connect to the microUSB interface on the front of AH3A, insert the other end of the cable into the computer, and then turn on the power switch of AH3A. The computer will identify AH3A as a USB flash drive.



3.4.2 Data Fetch

Open the newly recognized U disk folder and see the directory similar to Figure 14.

Figure 14

The flight data is a folder every month. When the folder is opened, there will be a data file as shown in Figure 15. The number before ' .dat' represents the date.

01.dat	2019/6/1 12:40
02.dat	2019/6/2 18:28
03.dat	2019/6/3 19:19
04.dat	2019/6/4 19:03
05.dat	2019/6/5 1:31

Figure 15

3.4.3 Data Format

Open the data file with Notepad or Excel, as shown in Figure 16:

Time	ALT	AS	VS	PITCH	ROLL	SLIP	HEAD	GPSALT	GPSGS	GPSVS	LAT	LONG
10:43:45	11	6	0	-228	35721	254	18522	3	1	2	3128.59215	12016.33014
10:43:46	11	6	0	-227	35717	258	18522	3	0	1	3128.59211	12016.33012
10:43:47	11	6	0	-231	35714	254	18522	3	0	1	3128.59211	12016.33010
10:43:48	11	6	21	-232	35714	254	18522	3	0	0	3128.59211	12016.33010
10:43:49	11	7	17	-221	35720	256	18522	3	0	0	3128.59212	12016.33010
10:43:50	11	7	23	-227	35719	247	18522	3	0	-1	3128.59213	12016.33010
10:43:51	11	6	19	-240	35726	252	18522	3	0	-2	3128.59215	12016.33010
10:43:52	11	6	-23	-250	35726	254	18522	3	0	-2	3128.59216	12016.33010
10:43:53	11	5	0	-252	35727	252	18522	3	0	-3	3128.59217	12016.33009

Figure 16

Data Format:

Symbol	Name	Units
Time	Recording time	Hour: minute: second
ALT	Barometric altitude	m
AS	Airspeed	0.01m/s
VS	Vertical speed	0.01m/s
PITCH	Angle of pitch	0.01°
ROLL	Angle of roll	0.01°
SLIP	Angle of slip	0.01°
HEAD	Heading	0.01°
GPSALT	GPS altitude	m
GPSGS	GPS ground speed	km/h
GPSVS	GPS vertical speed	0.01m/s
LAT	Latitude	° , Positive numbers represent north latitude and negative numbers represent South latitude
LON	Longitude	° , Positive numbers represent the Eastern Meridian and negative numbers represent the Western Meridian

4. Troubleshooting

Problem Description	Possible Cause	Solution
The AH3A does not power on	On-board power supply failure, and standby battery are not connected or have been fully discharged.	Check the on-borne power supply and connection plug; verify that the standby battery has a power reserve and is connected to the back USB port.
The airspeed shown in AH3A does not read 0 when the actual airspeed is 0	The airspeed indicator needs zero calibration	Go to airspeed settings menu > zero calibration, see 3.2.2
Incorrect pitch, roll and slip angle	AH3A is not calibrated attitude or need to be recalibrated	After AH3A is installed, when the aircraft is in a horizontal state, go to Attitude settings menu, Pitch/Roll/Slip Adjust to align, see 3.2.4, 3.2.5. Adjust until the displayed attitude matches the aircraft attitude
The heading angle (track heading) does not agree with the magnetic compass value	This is expected behavior	That are GPS based and their indication is not entirely consistent with the other magnetic and the barometric-derived instrument that permanently-mounted in your aircraft.
Magnetic heading is not accurate	Interference sources are present in its vicinity or magnetic calibration is not performed	Eliminate interference sources and perform 3D or horizontal calibration with reference to 3.2.5

5. Screen Care

Use a dry, clean, soft cloth to clean the screen. Do not use soap, chemicals, or abrasives to avoid damaging the screen. You may also use commercially available wipes that are designed specifically for LCD screen cleaning. soft cloth. Never use water or solvents when attempting to clean the display.

Avoid excessive pressure to the display to prevent damage to the LCD (Liquid Crystal Display). Take care to prevent impacts to the screen to prevent cracking the display.