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# D-0008 iLevil 3 AW Pilot's Guide

LEVIL AVIATION  
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### iLevil 3 AW Pilot's Guide

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### **AMENDMENT RECORD**

This procedure is reviewed to ensure its continuing relevance to the systems and process that it describes. A record of contextual additions or mission is given below:

<b>Revision No.</b>	<b>Date</b>	<b>Responsible Person</b>	<b>Description of Change</b>
1	12/22/2017		Initial release

### **Warranty**

Levil Aviation warrants this product to the original purchaser to be free from defects in material and workmanship for a period of one year from the date of the original purchase. The following are not covered: software, damage resulting from accident, neglect, misuse, fire, or flood, improper voltage supply or failure to follow operational guidelines supplied with this product. Extended warranty is available for purchase on our website.

Please register your product online at: <http://aviation.levil.com>

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### 1. Introduction

Every pilot should have a safety net when they go flying because no matter how much we hope for the best, it is always good to be prepared for the worst. The ILEVIL 3 AW provides an affordable solution to modernize the cockpit and give pilots the peace of mind they need to be able to safely overcome any instrument malfunction or related emergency.

The ILEVIL 3 AW is a fully independent, all in one avionics device. Avionics include WAAS GPS, ADSB-in, Air Data (Altitude, Airspeed), AHRS (Attitude, Directional Gyro, Turn Coordination, rate of turn, VSI) and the ability to connect to other external hardware such as EIS systems. Once it is installed, the ILEVIL 3 AW connect via Wi-Fi to a tablet inside the cockpit and data can be displayed on multiple Apps thanks to its open protocol.



**Figure 1. ILEVIL 3 AW layout and features**

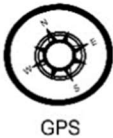


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### What makes the ILEVIL 3 AW special?

- Independent source of aviation-grade sensors, navigation and ADS-B information that fits in the palm of your hand.
- Most affordable and safe way to modernize your cockpit
- Wireless platform offering iOS/Android compatibility
- Multiple App compatibility. For a full list of compatible apps visit our website <http://aviation.levil.com/compatible-apps.html>



GPS



ADS-B IN



Wi - Fi



Air Data



AHRS



Data  
Recording

## 2. Operating Limitations

- The ILEVIL 3 AW is not a required system and may not be used as a substitution for the certificated aircraft system.
- No operational credit may be taken for installation of the ILEVIL 3 AW system.
- No operational credit may be taken for such items as reduced approach speed and shorter landing distances.
- The iLevil 3 AW can only report speeds of up to 210 kt.
- Although the ILEVIL 3 AW transmits AHRS Data is not to be used as a substitution for the certified AHRS instrumentation of the airplane. The AHRS supplied by the ILEVIL 3 AW is to be used only as supplemental information to the pilot.
- Levil Aviation does not provide or endorse any carry-on device that displays the information sent by the ILEVIL 3 AW.
- Ferrous Materials near the ILEVIL 3 AW may affect the compass reading.
- When transporting or temporarily storing in an airplane or vehicle, temperature range should be no less than 20 ° F (-12 ° C) and not more than 150 ° F (65 ° C)
- Storing our device at temperatures higher than 170 ° F for extended periods of time (more than 2 hrs.) may cause damage to battery and possible fire.
- DO NOT disassemble, remodel, drop or modify the ILEVIL 3 AW as this will invalidate the warranty of the unit as well as the FAA NORSEE certification.
- Do not use the ILEVIL 3 AW as an anti-collision system. Not all traffic is displayed using ADS-B in. Most aircraft are not currently ADS-B Out equipped and therefore not detectable by the ILEVIL 3 AW.
- Levil Aviation does not provide a display for this unit. Any display the pilot chooses to integrate Should comply with FAA certification requirements or qualify as a carry-on device. Under no circumstances should any display be placed in any way that it will



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obstruct the pilot's views of the aircraft flight instruments or the external view which may be detrimental to the ability of the pilot to fight the aircraft.

### 3. Specifications

#### 3.1 AHRS

- 360-degree pitch and bank operations
- GPS Independent Attitude
- 300°/sec max turn rates
- 4 G's max rating
- Output: Roll, pitch, magnetic heading, slip indicator, rate of turn, G meter, indicated air speed (max 210kts), vertical speed (ft/min), Pressure altitude.

#### 3.2 Internal Battery

- Operating Time after flight (if fully charged)  $\leq$  4 hrs.

#### 3.3 Wi-Fi

- Android and iOS compatible
- Support up to 5 devices connected simultaneously (UDP broadcast)
- Supports multiple protocols:
  - GDL90 (default)
  - iLevil Proprietary
  - NMEA

#### 3.4 GPS

- Support WAAS
- Cold start  $<$  60 sec. Typ. (open sky)
- 1 Hz output (5 Hz optional)

#### 3.5 ADS-B in (978/1090 MHz)

- Receives regional and continental NEXRAD reports broadcasted by ADS-B towers within range: (Regional every 2.5 min. /Continental every 15 min.)
- Receives "GROUND TO AIR" traffic. (re-broadcast of traffic by ADS-B towers nearby)
- Receives "AIR TO AIR" traffic reports from other aircraft operating 978/1090 MHz transmitters: (978 MHz UAT ADS-B out and Mode-ES transponders with extended squitter)

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### 3.6 LED Indicators

LED	Status	Description
Power/GPS	Slow Blink Green: Solid Green:	Power ON/ No GPS Fix Power ON/ GPS fix acquired Power Off
ADS-B	Slow Blink Green: Solid Green: Off:	Traffic Received Weather and traffic received No traffic or Weather received
Charging (with 5V USB power)	Solid Green: OFF (with power): OFF (no power):	Charging Battery 100% charged Not charging
Charging (with ship's power on Pin15)	No Charging Status available	

**NOTE:** iLevil3 has a charging temperature protection. If the battery is above 40°C (104°F) and the iLevil3 is connected to external power, the iLevil3 will continue to operate from external power but the charging process will be disabled. The charging LED status will be set to OFF.

### 3.7 DB15 PIN Description

**PIN 1:** 5V IN

**PIN 2:** RS-232 Data transmission (230400 bauds)

**PIN 3:** RS-232 Data reception (230400 bauds)

**PIN 4:** AUX Relay port 2 RX (receive)

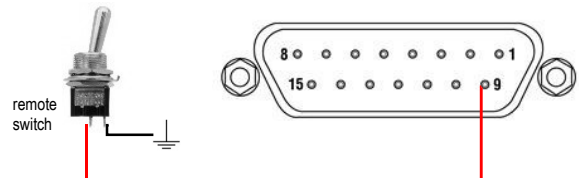
**PIN 5:** AUX Relay port 1 TX (transmit)

**PIN 6:** Time Mark High\*

**PIN 7:** Input/ Output 1(for future use)

**PIN 8:** GROUND

**PIN 9:** Battery ON. Connect this pin to GND using a remote switch to turn ON







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iLevil using internal battery, overriding the on-board power switch

**PIN 10:** AUX Relay port 0 RX (receive)

**PIN 11:** AUX Relay port 0 TX (transmit)

**PIN 12:** AUX Relay port 1 RX (receive)

**PIN 13:** AUX Relay port 2 TX (transmit)

**PIN 14:** Time Mark Low\*

**PIN 15:** Power (8-32V), use 1-amp Fuse for protection.

\*Only available with upgraded GPS option.

#### **4. User Interface**

The ILEVIL 3 AW is designed to be compatible with various Apps on both iOS and Android platforms by offering an open Broadcast of data using UDP communication. Third party developers can use the information broadcasted and display it on their App, but there are no restrictions on how or what data they can display. Refer to a table of compatible Apps on Levil Aviation's website to determine the capability of each App available.

##### **4.1 Connecting to your favorite app**

The ILEVIL 3 AW offers the most compatibility with Apps on both iOS and Android platforms.

- Turn ON the power of your aircraft or use the manual ON/OFF Switch to turn the ILEVIL 3 AW ON.
- Go to your tablet's "Wi-Fi Settings".
- Connect to a network called ILEVIL 3 AW-xxxx, when xxxx is the unique serial number for the device.
- Once your connection is established, a checkmark will appear next to the network name.
- Open your favorite App, the connection will be automatically.

##### **4.2 AHRS Utility App**

Levil Aviation developed a free app that makes the use of the ILEVIL 3 AW easy and reliable for pilots. The AHRS Utility App is an application capable to display the ILEVIL 3 AW data graphically and numerically.



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This is a proprietary App developed by Levil Aviation that runs on iOS devices only (iPad /iPhone). This utility App is designed as a tool to help the pilot troubleshoot and calibrate the required systems, and as an aid for instrumentation display. Pilots can download the AHRS Utility directly to their iOS devices from the App Store. Installers are recommended to use this App when installing the ILEVIL 3 AW to set the tilt and calibrate the AoA. For a complete AHRS Utility User guide visit [aviation.levil.com](http://aviation.levil.com).

**NOTE:**

- Other apps may require subscriptions, and some offer more features than others.
- Some Apps may not support all the features of the ILEVIL 3 AW.
- You may choose to use one Navigation App or a combination of apps on multiple devices depending on your flying needs.
- For a complete list of compatible Apps go to [www.aviation.levil.com/compatible-apps](http://www.aviation.levil.com/compatible-apps)

**5. Magnetic Heading**

There are two ways to obtain heading information from the ILEVIL 3 AW, depending on the navigation App of choice, you may choose between the following:

- True Track: Heading information based on GPS track.
- Magnetic Heading: Heading information determined by a combination of 3-axis magnetometer and gyros that form part of the internal AHRS inside the ILEVIL 3 AW.

**5.1 When using Magnetic Heading, it is important to be aware of the following:**

- Magnetic fields caused by other things, such as Magnetic Compasses, may affect the AHRS heading.
- Verify your magnetic heading after following alignment and installation procedures: using the AHRS Utility App → options → Heading → Use magnetic
- In case of magnetic deviation, the internal AHRS will slowly learn your aircraft configuration during flight to compensate. This learning process requires the aircraft to turn both clockwise and counter clockwise for at least 40 seconds.
- After turning, or at the end of your flight, verify the magnetic heading again using the AHRS Utility App. If the AHRS was able to successfully compensate for errors, you may store this data inside the ILEVIL 3 AW and it will use this new configuration on



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- the next power cycle: Using the AHRS Utility → Device Config → Enable Configuration → Save Mag Data
- ERASE Magnetic data using AHRS Utility before moving the ILEVIL 3 AW to a different aircraft or environment.

### 6. Data Recording

The ILEVIL 3 AW will automatically begin recording once the unit is powered on and has acquired a GPS fix.

#### 6.1 Save files

- File name will be saved as follows ILEVIL 3 AWxxxx-yyyymmddThhmmss
- The ILEVIL 3 AW will have three file formats in which to choose from to record (.gpx, .csv, .fdr)
- .gpx will be the default format from the factory and can be changed before flying using the AHRS Utility App.

#### 6.2 How to change recording format

- Open AHRS Utility App
- Tap on the Device config tab
- Find Recording File Format
- Tap on Select, and choose desired format
- Press Apply

#### 6.3 How to change Callsign

- Open AHRS Utility App
- Tap on the Device config tab
- Scroll down to find Callsign
- Tap and type desired Callsign
- Press Apply

#### 6.4 How to use Triggers

Triggers are for use while in .csv format. These can be used to mark a specific event during flight for future references, while reviewing the spreadsheet.

#### NOTE



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- .gps – Google Earth, CloudAhoy, etc.
- .fdr – Xplane flight simulator.
- .csv Microsoft Excel (ASCII file)
- Data retrieval may be performed wirelessly using the AHRS Utility platform and is explained in detail in the AHRS Utility user guide available online.

### 7. Helpful Tips

- If you encounter Wi-Fi connection problems, try resetting the device's Wi-Fi (disable/enable)
- If using Apple devices, you may use our free AHRS Utility App to see battery percent, GPS signal power, ADS-B Diagnostic etc.
- In most locations, it is not possible to received ADS-B information from ground towers unless you are airborne (typically above 2000 feet) with line of sight to the tower
- The Internal AHRS has a max rate of turn of 300°/sec. Most likely you will exceed this limit (or “tumble” it) when playing with the ILEVIL 3 AW in your hands. If this is the case, and the AHRS did not recover, you might “tumble” it again, and set it on a level surface. It will recover within 4 secs.