iLevil 3 SW

Wireless Integrated Avionics Module

AHRS, GPS, ADS-B 978 / 1090 MHz Receiver, Data recorder

Instruction Manual

iLevil 3 SW


SOLAR PANELS
ADS-B ANTENNA
CHARGING LED
MINI USB PORT
SERIAL PORT
ON/OFF SWITCH
POWER/GPS LED
ADS-B LED
SD CARD PORT
iLevil 3 SW
ADS-B in (dual) • GPS • AHRS
CHG
AUX
ADS-B
GPS
OFF
ON

Package Contents

- Wireless iLevil3 SW
- USB to Mini USB cable
- ADS-B Antenna
- Rubber stoppers or rubber pad
- Protective bag
- User Manual
- SD Card

Charge before use

- Charge the iLevil3 SW fully using the USB cable
- The LED next to USB port indicates if the device is charging.
- When the LED goes off, the battery is charged. (Takes up to 4 hrs.)
- 100% charged battery supplies power for 5 hrs.
- The Solar Panel recharges the batteries when exposed to sunlight extending battery charge during flight for aprox. 1 hr.

Alignment

- Attach the supplied ADS-B antenna.
- Find a location that will allow your iLevil SW 3 to have a clear view of the sky, for satellite reception, and "line of sight" to ADS-B ground stations and other aircraft around you.

  - Align the airplane icon on the iLevil's top label with the roll axis of your aircraft.
  - ON/OFF switch should face the back of the aircraft.
  - Solar cells facing up.
- Install iLevil on a surface that is LEVEL with the horizon DURING un-accelerated, straight and level flight. It's ok if it isn't level on the ground (i.e. in tail draggers).
  NOTE: An optional RAM suction cup mount is available on the website with swivel base for ease of installation.
- You may use our free AHRS App available on the AppStore, or any other compatible App with a horizon display to assist you with leveling the instrument
- For optimal magnetic heading, install iLevil as far away from ferrous metals as possible. (i.e. magnetic compass, cell phones, steel airframe)
- Turn on by flipping the ON/OFF switch. GPS and ADS-B LED will light

NOTE: **DO NOT** rely on the iLevil for attitude & heading if it was not aligned as specified above.

Connecting to your favorite App

The iLevil series offers the most compatibility with Apps on both iOS and Android platforms.

- Turn ON your iLevil with the ON/OFF switch. (LEDs will light up)
- Tap Settings icon on your tablet.
- Tap WiFi and connect to the iLevil3 – xxxx network, where “xxxx” is the unique serial number.
- Once your connection is established, a checkmark will appear next to the network name.
- Run your Navigation App of choice.

The AHRS Utility App is a free application available for iPad/iPhone for iLevil troubleshooting, Alignment aid, Configuration etc.
Other advanced Apps may require subscriptions and offer more features than others. Some Apps may not support all the features of the iLevil. You may choose to use one Nav App or a combination of Apps on multiple devices depending on your flying needs.

NOTE

- For a complete list of compatible apps go to www.aviation.levil.com/compatible-apps.HTML
- To download a compatible App to your iPad/iPhone search using the AppStore on your tablet
- To download a compatible for your Android tablet search using the PlayStore on your tablet

LED Indicators

Label	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 external power)	Solid Green: Off (w/power): Off (no power):	Charging Battery 100% charged, not charging Not charging

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.

Magnetic Heading

There are two ways to obtain heading information from the iLevil, 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.

When using Magnetic Heading, it is important to know the following:

•Magnetic fields caused by other Magnetic Compass etc, may affect the AHRS heading.

• Verify your magnetic heading after following alignment and installation procedures:
(use 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 and it will use this new configuration on the next power cycle:
(AHRS Utility -> Device Config -> Enable Configuration -> Save Mag Data).

• If AHRS was unable to compensate for errors after turns, try using a different location.

• ERASE Magnetic data using AHRS Utility before attempting a different location or moving iLevil to a different aircraft or environment.

Specifications

AHRS

- 360 degree pitch and bank operation
- GPS Independent attitude.
- 300 deg/sec max turn rate
- 4Gs max rating.
- Output: Roll, pitch, magnetic heading, slip indicator, rate of turn, G meter, Indicated Airspeed (max 200 kts), Vertical Speed (ft/min) Pressure Altitude (at 29.92 inHg)

Internal Battery

- Operating time: <= 5 hrs. typical (no sunlight)
- Charging time: USB - aprox. 4 hrs.
- Charging time: Solar Power (only) aprox. 30hrs

WIFI

- Android and iOS compatible
- Supports up to 7 devices connected simultaneously (UDP broadcast)
- Supports multiple protocols:
  GDL90 (default)
  NMEA
  ForeFlight Sim

GPS

- Supports WAAS
- Cold Start < 60 sec. typ. (open sky)
- 1 Hz output (5Hz optional)

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)

Environmental Requirements

- Temperature range: -10° to 40 ° C (14 ° F to 104 ° F).
- Clear view to sky for best GPS reception.
- For best ADS-B reception line of sight view with ADS-B ground based towers and min 2000 ft.
- Windshields with integrated heating elements will severely attenuate GPS and ADS-B signals.
- Traffic received over the 1090 MHz freq. will not be displayed without a GPS signal
- GPS fix is necessary for SD recording functionality

Caution

- Ferrous materials inside aircraft affect the compass reading
- This product contains a Lithium-Ion battery. Li-Ion batteries are volatile.
- Failure to read and follow **Battery Safety Instructions** may result in fire, personal injury and property damage.
- The iLevil will get hot after it's been running in direct sun; don't leave the ilLevil ON or OFF parked on the ramp in the hot sun; **use caution!**
- 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. Do not use the iLevil as an anti-collision system.
- AHRS/GPS data provided is not FAA certified. Do not use it as a primary instrument for IFR

Serial Port

The iLevil3 features a serial port that can be used for data transfer or 5V external power input for automatic ON/OFF operations.
For more information check the iLevil Relay feature on our website
www.aviation.levil.com or email info@levil.com

Battery Safety Instructions

- Batteries only have a 30% charge when you receive your iLevil3-SW.
- **Never charge batteries unattended.** When charging Lithium-Ion Batteries, you should always constantly monitor the charging process to be able to respond to any problems that may occur.
- Always let batteries cool down to ambient temperature before charging.
- Charge batteries in a safe area away from flammable materials
- Do not expose your device to direct sunlight (heat) for extended periods while operational.
- 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 Lithium-Ion batteries at temperatures higher than 170 ° F for extended periods of time (more than 2 hrs.) may cause damage to battery and possible fire.
- **Short Circuits can cause fires!** If you accidentally short the battery, it must be placed in a safe observation area for aprox. 15 mins. Nevertheless, for safety, the unit is protected by a 2 amp fuse which will blow if any component is shorted or when overcharging the battery.
- DO NOT disassemble, remodel, drop, or let the iLevil3 get wet!

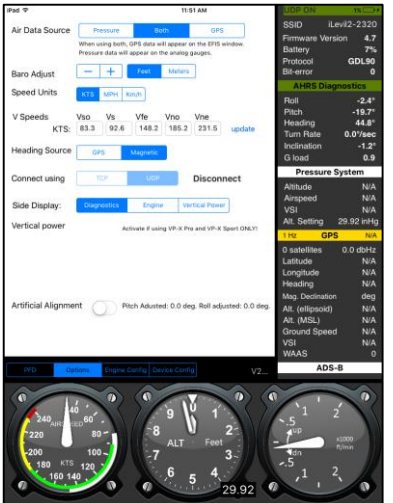
AHRS Utility APP

AHRS utility is a free application designed to display AHRS data graphically and numerically.

- User must be connected to the Wi-Fi network of the iLevil.
- The application will NOT display airplane attitude based on the internal gyros of your iPad/iPhone or GPS data.
- Air data is only available on the AW model. If you have an iLevil SW, Air data will be derived from the internal GPS on the iLevil.

A simple swipe to the right on the right side panel allows you to switch from gauges, diagnostics, and data recording.

AHRS Utility APP



- **Options:** The options menu is the main menu that allows user to very easily adjust various settings (air data source, baro, speed unit, heading source, side display, and allows you to artificially align the iLevil)
- **Engine Config**: User must have a compatible EIS connected to the iLevil to display this information. All gauges can be set up to display desired information.

NOTE: Device Config option should only be used with the advice of Levil Aviation Tech Support. Any settings changed incorrectly in this tab can lead to iLevil malfunctioning!

Data Recording (SD CARD)

- The iLevil will automatically begin recording if the unit is powered on with an SD card already inserted.
- If the iLevil is powered on with NO SD card inserted, recording will begin by simply inserting SD card.

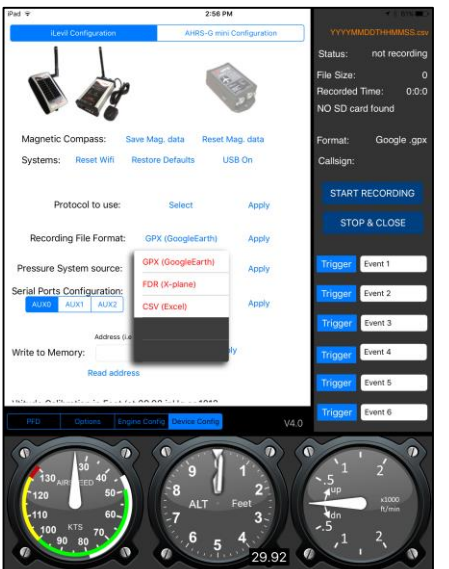
NOTE: iLevil will ONLY record once a GPS fix is obtained.
NO recording if no GPS fix.

File name will be saved as follows
iLevilxxxx-yyyymmddThhmmss

- With the iLevil, you will have three file formats in which to choose from, to record in (.gpx,.csv, .fdr.)
- .gpx will be the default format from the factory and can be changed before flying, on the AHRS Utility App.

How to change format

- Open AHRS Utility
- Tap on the **Device Config** tab.
- Find **Recording File Format.**
- Tap on **Select**, and choose desired format.
- Press **Apply**
- Reset iLevil (turn OFF, wait 10 seconds, turn back ON)



Data Recording (SD CARD)

How to change Callsign:

- Open AHRS Utility
- Tap on the **Device Config** tab.
- Scroll down to find **Callsign.**
- Tap and type desired Callsign
- Press **Apply**

How to use Triggers:

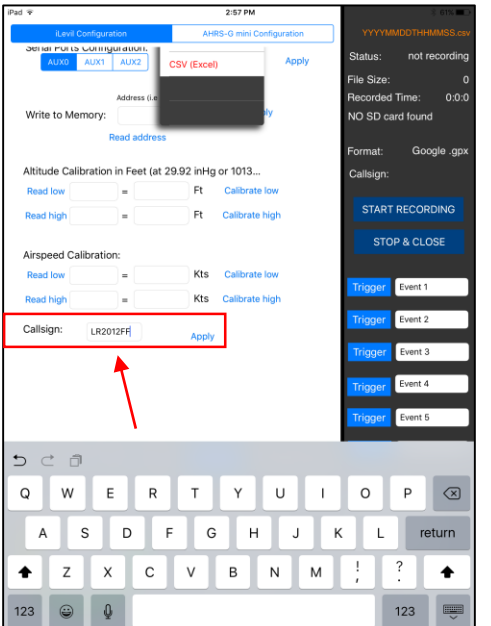
Triggers are for use while recording in .csv format. These can be used to mark a specific event during flight for future reference, while reviewing in spreadsheet.

NOTE:

.gps – Google Earth, Cloud Ahoy, Ect.

.fdr – X Plane Flight Simulator

.csv – Microsoft Excel (ASCII file)



Helpful Tips

- If you encounter WiFi connection problems, try resetting the tablet's WiFi (disable/enable)
- If using Apple devices, you may use our free AHRS Utility App to see battery percent, GPS signal power, ADS-B diagnostics etc.
- Do Not switch the iLevil ON/OFF button swiftly when resetting power to the iLevil.
- When turning OFF the iLevil3, wait for it to complete the shut down sequence.
- Make sure the LEDs go OFF before turning iLevil ON again.
- In most locations, it is not possible to receive 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 deg/sec.

Most likely you will exceed this limit (or "tumble" it) when playing with the iLevil in your hands.
If this is the case, and the AHRS did not recover, you may "tumble" it again, and set it on a level surface.
It will recover within 4 sec.

Warranty

Levil 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, 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: www.aviation.levil.com