

## Quick Start

The ICflyAHRsII can be operated in Standalone-Mode using the provided **power button**.

### Power ON



Connect power button



Press button until  
'Active' blinks

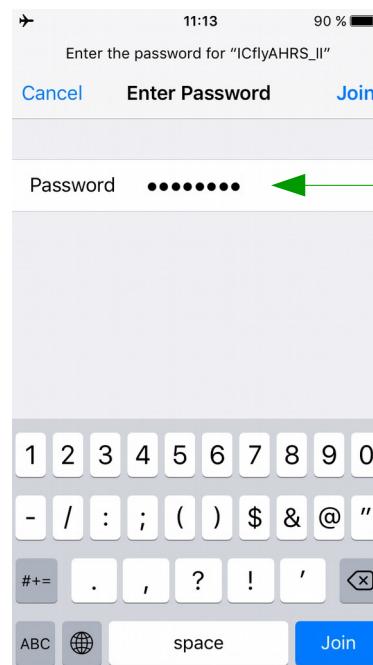


Release button

### Connect



Connect to WiFi-Network  
**ICflyAHRs\_II**



Password:  
**12345678**

(WiFi – Settings are configurable)

### App Setup

Protocol	IP-Address	Port
TCP	169.254.1.1	2000
UDP	169.254.1.1	46 400

### Power OFF



Connect power button



Press button until  
'Active' stops blinking



Release button

### External Power-Supply



The ICflyAHRsII can run from an **external power-supply**.

The ICflyAHRsII will **automatically turn ON** when an external power-supply is connected.

After disconnecting the external power-supply, the ICflyAHRsII will **automatically turn OFF** after 30 minutes. (configurable)

⊕ (8-24V) on Pin 11

— (GND) on Pin 2

# ICflyAHRsII

## Attitude Heading Reference System

The ICflyAHRsII is an Attitude Heading Reference System. It continuously monitors its orientation and transmits all orientation related data via Wi-Fi or Serial Port to your target device (e.g. mobile phone / tablet).

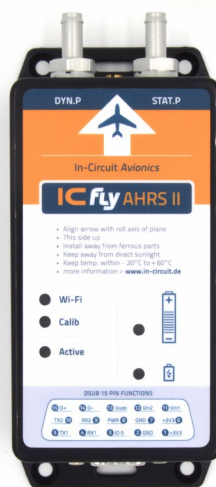
Furthermore the ICflyAHRsII can function as an interface between your target device and several avionics like an auto pilot or the ADS-B/FLARM® collision avoidance system.

The professionally calibrated 3-axis gyros, accelerometers and magnetometers lead to precise and reliable attitude and heading information.

The ICflyAHRsII standard version can be upgraded with pressure sensors for static and dynamic pressure, to provide precise altitude and speed information.

## Features

- **Roll:**  $\pm 180^\circ$ , Resolution  $0.1^\circ$ , 10Hz Refresh Rate
- **Pitch:**  $\pm 90^\circ$ ,  $0.1^\circ$ , 10Hz Refresh Rate
- **Magnetic heading**  $0^\circ$  to  $360^\circ$ ,  $0.1^\circ$ , 10Hz
- **Slip Angle** (Inclination)  $\pm 90^\circ$ ,  $0.1^\circ$ , 10Hz
- **Turn Rate** (turn coordinator)  $\pm 2000^\circ/\text{s}$  max.
- **G Meter:**  $\pm 16g$
- **Altimeter:** calculated from static pressure input, output in ft (only with optional pressure sensors mounted)
- **Climb rate:** calculated from static pressure input, output in ft/min (optional)
- **IAS:** calculated from dynamic pressure input (connect to Pitot-Static system of Aircraft), output in kts, Res. 1 kt (optional)
- Pressure fittings 1/8" 5mm hose fittings for pressure inputs (optional)
- Internal rechargeable battery:
  - more than 10 hours of operation time
  - charging cycle of less than 8 hours
  - charge from 8-24VDC or micro-USB-B with provided adapter



## CAUTION

- This product is NOT an FAA certified instrument
- **This product must NOT be used as primary or backup flight instrument**
- Keep temperature within  $-20^\circ\text{C}$  to  $+60^\circ\text{C}$
- Keep away from direct sunlight
- Li-Ion batteries are volatile. Failure to read and follow the **safety instructions** included in this package may result in fire, personal injury and damage to property if used improperly

**www.in-circuit.de**



## Data connections overview

The ICflyAHRsII can work as relay for Wi-Fi and RS232 data. Up to 2 RS232-receivers and 2 RS232-transmitters can be connected. The device is able to handle 3 Wi-Fi TCP connections in parallel. The connections to the RS232 devices can be configured comfortably on the built-in website.



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# 1. Installation

Follow these instructions for proper installation:

- **Charge** your ICflyAHRsII completely before first operation. (see chapter 4: Battery & Charging)
- **Align** the arrow/airplane symbol (located on the label) with the roll axis of your plane
- The label should face upwards
- **Mount** the module as close as possible to the center of your airplane
- Try to mount the ICflyAHRsII as far away from ferrous parts as possible (these will have an impact on magnetometer / heading precision)
- **Install** the device as leveled as possible drawn to flight position (see Chapter 11: Calibration for software-compensation of unlevelled mounting)

Connect to your ICflyAHRsII :

- Download & install your desired app on your mobile device (see chapter 6: App Setup Examples)
- **Switch on** the ICflyAHRsII (see chapter 2: Power Button)
- **Connect** to your ICflyAHRsII **via Wi-Fi** (see chapter 5: WiFi Interface)
- Your ICflyAHRsII is now ready to operate

ICflyAHRsII with pressure-sensors:

- **Dynamic pressure data (IAS, optional):** Connect the dynamic pressure line of aircraft's Pilot-Static-System to the corresponding dynamic pressure port of the ICflyAHRsII (marked as **DYN.P** on the label). Indicated airspeed will be available if the dynamic pressure line is connected!
- **Static pressure data (Altimeter, optional):** Connect the static pressure line of the aircraft to the static pressure port of the ICflyAHRsII (marked as **STAT.P** on the label).

If the aircraft does not have a pressurized cabin, the static port of the ICflyAHRsII can be left open (in this case cabin pressure is used to calculate the altitude).

**Advanced setup:**

- The ICflyAHRsII comes precalibrated for leveled mounting so you can start right away
- If you cannot mount the device leveled to ground, it is necessary to execute the "Calibrate Ground Pitch" procedure once while the airplane stands still.
- Once you are air-borne and in a leveled flight attitude set the Air Pitch Offset to compensate any offsets between flying and ground attitude (see Chapter 11: Calibration & Configuration menu)

## 2. Power Button

To activate the ICflyAHRsII you can either use the provided USB Adapter with integrated push button or you can connect a push button between pin 8 of the D-sub connector and GND.

The several functions of the power button are selected by press and hold the button for a defined time. The table below shows the holding-time of the power button and the assigned function.

	Hold for ... seconds	Released after ... seconds
< 2 seconds	'Active'-LED goes ON	(No state change)
2 – 5 seconds	'Active'-LED blinks	Power ON, If already ON: Restart sensors
5 – 20 seconds	'Active'-LED goes OFF	Power OFF
20-23 seconds	'Active'-LED blinks again	Wi-Fi reset of SSID and PASS

(See *chapter 9: Cockpit installation* if you want to install this power button into your cockpit)

The reset of Wi-Fi credentials can be used if you lost your current settings. These are reset to delivery values as given in Chapter 8. Calibration data is not influenced by this reset functionality.

## 3. Operation

While Vin or USB is connected the module is always on. Alternatively power on with a power button.

On Power Up, the Wi-Fi and Calib LED turn yellow until Wi-Fi is initialized.

Afterwards the Calib LED blinks while the module prepares the sensors for operation.

As soon as the Module is ready to operate, the Active LED starts blinking, and the module transmits data on the configured channels. (see Chapter 11: Calibration & Configuration menu)

LED	'Blinking'	'ON'
'Wi-Fi'	---	Yellow: WLANinitializing Green: WLAN running Red: Error on WLAN start
'Calib'	Start Up	Calibration running
'Active'	Module is operating	---

### LED signal on GPIO 0 pin:

A signal equivalent to the 'Active' LED state is output on the 'GPIO 0' pin.

You can mount a LED between one of the 3.3V output pins and 'GPIO 0' to relay the signal away from the mounting position of your ICflyAHRsII.

This makes it possible, in combination with a switch connected to the power button pin (Chapter 2), to mount the controls for your ICflyAHRsII next to other instruments within your plane. (see chapter 9: Cockpit installation)





### 4. Battery & Charging

The ICflyAHRsII contains a rechargeable Li-Ion battery. It can be charged over USB with the provided USB adapter (picture below) or an external power supply (8–24VDC) on pin 11 and GND. Power supply can also be ensured by connecting either Vin1 or Vin2 and GND. The ICflyAHRsII refuses to operate from battery if the charge state falls below 5%. Connect USB or an external supply to run the module and recharge the battery. A fully charged battery ensures a minimum operating time of 10 hours.



The upper battery LED indicates the power state:  
LED color oscillates: powered by USB or Vin  
LED static color: refer to table below

The lower battery LED indicates the charging state:  
LED ON: charging in process  
LED OFF: battery fully charged

LED	Charge state	Minimum operating time left
Green	>80%	10 hours
Orange	30% - 80%	3 hours
Red	10% - 30%	1 hour
Red (blinking)	<10%	<1 hour



Supply via USB



Supply via VIN



## 5. WiFi Interface

The ICflyAHRsII offers data readout via Wi-Fi and serial interfaces.

### Connecting via Wi-Fi:

After powering up, the ICflyAHRsII opens a WLAN-Network:

**Network ID:** ICfly\_AHRsII      **access key:** 12 345 678

After connecting to this network the data stream can be received by your connected device and displayed by your desired App.

Some Apps require additional setup to properly receive data from ICflyAHRsII. You may need to set the correct IP and TCP/UDP -settings as displayed below.

Protocol	IP-Address	Port
TCP	169.254.1.1	2000
UDP	169.254.1.1	46 400

The ICflyAHRsII can handle up to three parallel connections. Exceeding this limit can lead to erroneous data transmissions or in extreme cases to a reset of the modules Wi-Fi interface.

### Data included in the AHRs data stream:

- \$APPOWER: voltage, battery percent
- \$RPYL: roll Rate, pitch, heading, slip Angle, turn Rate, g Load
- \$APENV1: air Speed, altitude, vertical Speed

### Connecting via serial interface:

- See chapter 8: Serial Interfaces

### Apps known to work with the ICflyAHRsII:

- See chapter 6: App Setup Examples

## 6. App Setup Examples



### ICfly Instrument

- This is the **recommended App** to be used with ICflyAHRsII. It displays AHRs data received from ICflyAHRsII.
- Available on Apple AppStore for iPhone & iPad
- Installation is straight-forward:
  - Download & Install ICfly Instrument from Apple AppStore
- Setup:
  - No additional setup required
- Just connect to your ICflyAHRsII via Wi-Fi
- Press *CONNECT* to connect to your ICflyAHRsII



### Sky-Map

- This App displays GPS location and receives AHRs, GPS, ADS-B & FLARM-traffic from ICflyAHRsII.  
(requires GPS/traffic sensor connected to ICflyAHRsII.)
- Available on Apple AppStore for iPhone & iPad
- Installation is straight-forward:
  - Download & Install Sky-Map from Apple AppStore
- Setup:
  - Open *Menü* → *Setup*
  - Enable *FLARM/ADSB Verkehr anz.* to display FLARM/ADSB traffic
  - Enable *NMEA Daten für Autopilot senden* to send AutoPilot-data to ICflyAHRsII.
  - Select *Wireless Interface Setup*
  - → Activate *WLAN aktivieren* to activate Wi-Fi
  - → IP-Address: 169.254.1.1
  - → Port: 2000
  - Close *Setup* menu
- Now connect to ICflyAHRsII via Wi-Fi
- Sky-Map should now display any orientation, location & traffic data received from ICflyAHRsII



### AirNavigation Pro

- This App displays GPS location and can receive AHRS, GPS, ADS-B & FLARM-traffic from ICflyAHRsII.  
(requires GPS/traffic sensor connected to ICflyAHRsII.)
- Available on Apple AppStore for iPhone & iPad
- Installation is straight-forward:
  - Download & Install AirNavigationPro from Apple AppStore
- Setup:
  - Open *Tools* → *Sensors*
  - Under *LOCATION SOURCES* select *Levil AHRS G Mini/iLevil 1+2*
  - Enable all switches (*Sensor, Use airspeed, Use pressure altitude, Use traffic*)
- Now connect to ICflyAHRsII via Wi-Fi
- AirNavigationPro should now display any orientation, location & traffic data received from ICflyAHRsII



### iHUD Remote

- This App displays AHRS data received from ICflyAHRsII.
- Used to be available on Apple AppStore for iPhone & iPad
- **You can only download & install this App if you already downloaded it once in the past. It's not available for purchase anymore.**
- Installation is straight-forward:
  - Download & Install iHUD Remote from Apple AppStore
- Setup:
  - Open *Settings* → *WiFi Settings & Signal / Compass Source*
  - Set *Connection* to *TCP*
  - → Port: 2000
  - → IP-Address: 169.254.1.1
- Now connect to ICflyAHRsII via Wi-Fi
- iHUD Remote should now display AHRS data received from ICflyAHRsII



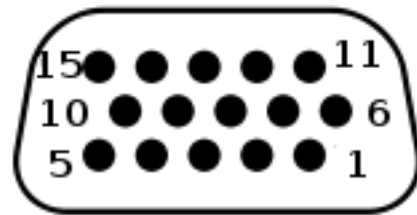
### AHRS Utility

- This App displays AHRS data received from ICflyAHRSII.
- Available on Apple AppStore for iPhone & iPad
- Installation is straight-forward:
  - Download & Install AHRS Utility from Apple AppStore
- Setup:
  - No additional setup required
- Now connect to ICflyAHRSII via Wi-Fi
- AHRS Utility should now display AHRS data received from ICflyAHRSII

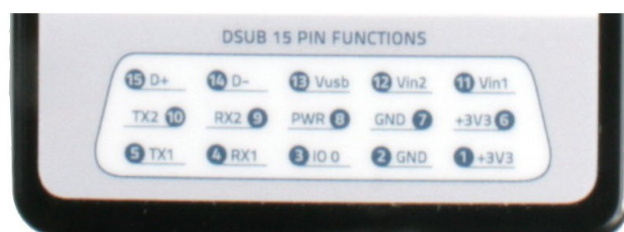


## 7. Connector

The ICflyAHRsII provides a male 15-pin D-sub connector. The pin assignment is listed in the table below.



Pin Number	Function	Description
1	+3V3	DC <b>output</b>
2	GND	Ground
3	GPIO 0	Output coupled to active LED (low active)
4	RX1	RS232 - input 1
5	TX1	RS232 - output 1
6	+3V3	DC <b>output</b>
7	GND	Ground
8	PWR/SW Button	Control button (low active)
9	RX2	RS232 - input 2
10	TX2	RS232 – output 2
11	Vin1	+ 8-24V DC input
12	Vin2	
13	Vusb	5V input voltage
14	D-	USB/GPIO
15	D+	USB/GPIO



## 8. Serial Interfaces

There are two RS232 ports available on the ICflyAHRsII.

This enables the ICflyAHRsII to be usable as very flexible dual-RS232-to-Wi-Fi bridge.

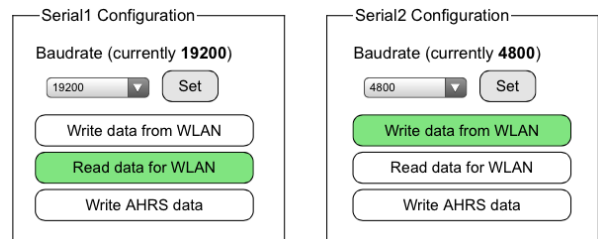
Both RS232 interfaces can be configured individually. The transmission format for both ports is **8,N,1** (8 Databits, No parity, 1 Stop-bit).

The ICflyAHRsII provides two serial interfaces to exchange data with other devices like an autopilot or an ADS-B/FLARM® collision avoidance system.

The serial interfaces can be configured using the configuration menu. (see Chapter 11: Calibration and Configuration menu)

The user can select whether to

- output data from Wi-Fi connections (e.g. autopilot data)
- read data and bridge it to Wi-Fi connections
- output AHRs data



The image shows two side-by-side screenshots of the serial configuration menu. The left screenshot is titled 'Serial1 Configuration' and shows a baudrate of 19200. The right screenshot is titled 'Serial2 Configuration' and shows a baudrate of 4800. Both screens have a 'Baudrate (currently ...)' label, a dropdown menu with the current value, a 'Set' button, and three main action buttons: 'Write data from WLAN', 'Read data for WLAN', and 'Write AHRs data'. In the Serial2 configuration, the 'Read data for WLAN' button is highlighted in green.

Serial1 Configuration	Serial2 Configuration
Baudrate (currently 19200)	Baudrate (currently 4800)
19200 ▼ Set	4800 ▼ Set
Write data from WLAN	Write data from WLAN
Read data for WLAN	Read data for WLAN
Write AHRs data	Write AHRs data

If enabled through the configuration menu, data from the serial interfaces is read in line based. A Wi-Fi packet is sent out when the new line character '\n' is received on the serial interface. To prevent interference with AHRs data, the line length is limited to 476 characters.

Serial interface 1 is preconfigured with 19 200 baud, e.g. to read data from a TRX-1500 Traffic Sensor.

Serial interface 2 is preconfigured with 4800 baud, e.g. to print out data delivered over Wi-Fi connections (e.g. navigational data generated by a connected app for an autopilot)

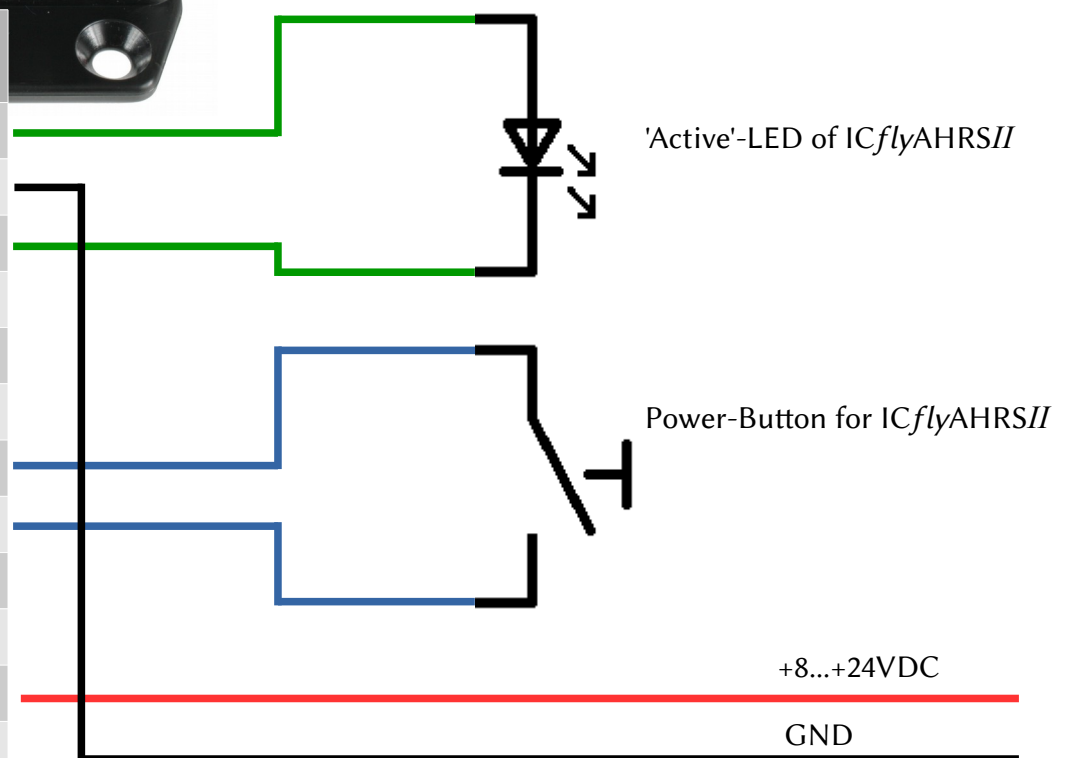
## 9. Cockpit installation

The ICflyAHRsII can be installed into your airplane, while the main control button and status-LED are available in your cockpit. The 15pin D-SUB provides all connections and signals required for a remote control of your ICflyAHRsII.

Please refer to the setup example shown below for further information.



Pin	Function ICflyII
1	+3V3
2	GND
3	GPIO 0
4	RX1
5	TX1
6	+3V3
7	GND
8	PWR/SW Button
9	RX2
10	TX2
11	Vin1
12	Vin2
13	Vusb
14	D-
15	D+



## 10. TRX-1500 Traffic Sensor

The picture on the right shows the required setup for the serial Interfaces of the ICflyAHRsII to properly transmit traffic data from a TRX-1500 Traffic Sensor.

(see chapter 11: Calibration & Configuration Menu)

Serial1 Configuration

Baudrate (currently 19200)

19200 Set

Write data from WLAN

Read data for WLAN

Write AHRs data

Serial2 Configuration

Baudrate (currently 4800)

4800 Set

Write data from WLAN

Read data for WLAN

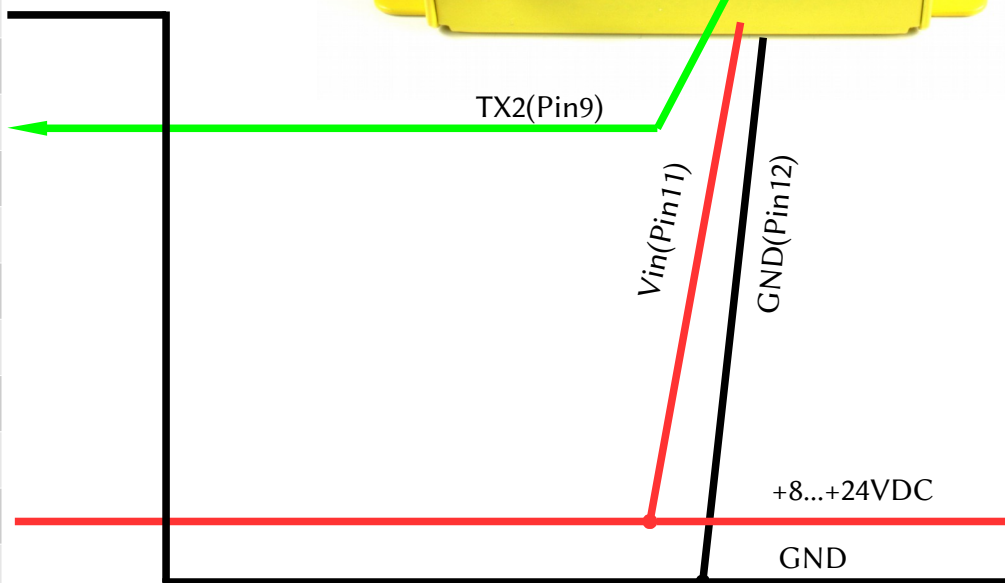
Write AHRs data

The drawing below shows how to connect a TRX-1500 Traffic Sensor to an ICflyAHRsII. The ICflyAHRsII receives the traffic data for ADSB and FLARM via RS232 and transmits these embedded in the AHRs data stream to connected Wi-Fi devices.



Pin ICflyII	Function ICflyII	Pin TRX1500	Function TRX1500
4	RX1	9	TX2
11	Vin1	11	Vin
2	GND	12	GND

Pin	Function ICflyII
1	+3V3
2	GND
3	GPIO 0
4	RX1
5	TX1
6	+3V3
7	GND
8	PWR/SW Button
9	RX2
10	TX2
11	Vin1
12	Vin2
13	Vusb
14	D-
15	D+

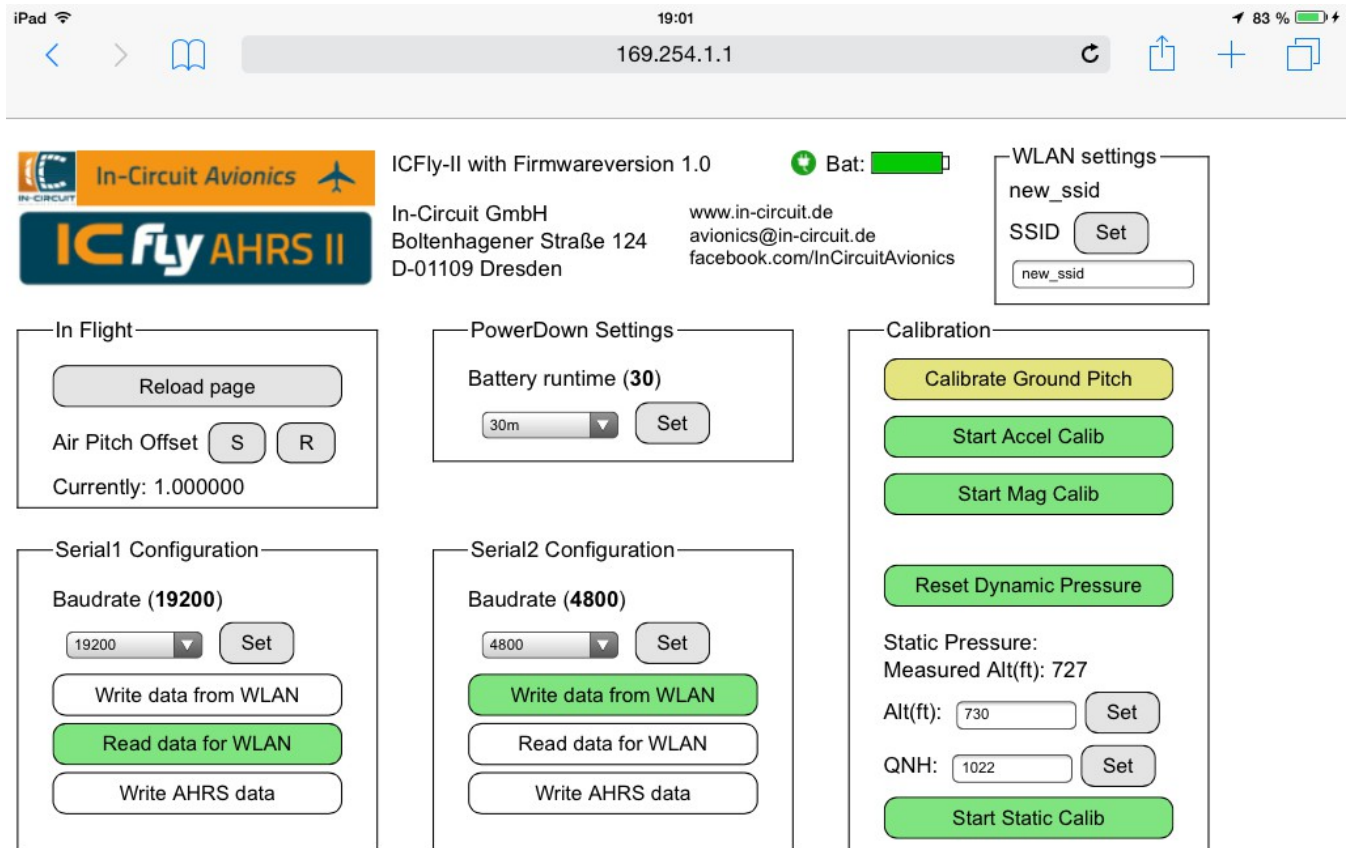


Note: TRX1500 Baudrate=19 200,8,N,1



## 11. Calibration & Configuration menu

The ICflyAHRsII provides a web browser based calibration and configuration menu. After powering up the module and connecting your target device to the Wi-Fi network (see chapter 5: WiFi Interface), start your web browser and enter the address: **169.254.1.1** in the address bar to access the calibration and configuration menu of the ICflyAHRsII. Some browsers may require you to type **http://169.254.1.1**. In the top right corner you can see the hardware and software version of your ICflyAHRsII. The menu, as you can see in the picture below, is divided into subsections.

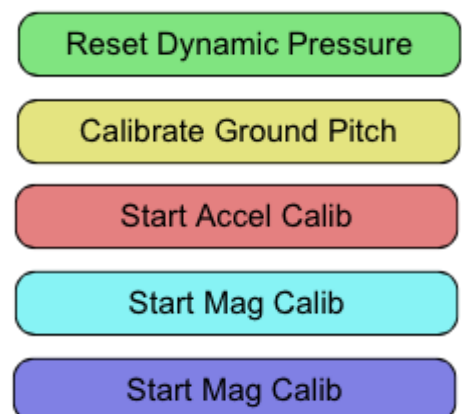


### General behavior:

In case of an internal communication error, a value may show “INV” instead of a valid one. Simply reload the page to reread the values.

### Button color coding:

- Green: On/Value up to date
- Yellow: Value valid but maybe not up to date (e.g. restored former calibration data at power up)
- Red: Value invalid (e.g. never before calibrated Accelerometer)
- Cyan: Action awaits confirmation
- Blue: Error in internal communication. Reload page to fix



**Starting actions requiring confirmation:**

Actions which alter the calibration tables possibly inflicting inaccurate calculations require a confirmation to actually be executed. The procedure is shown below.

After clicking the button once it will switch to cyan signaling the 'wait for confirmation' state. When clicking a cyan button the action will be executed.

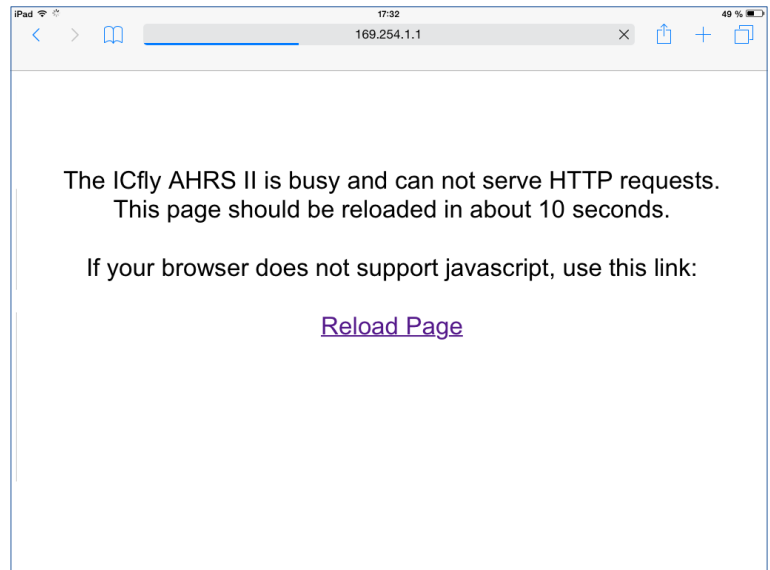


**Module busy page:**

While the ICflyAHRsII executes time consuming actions (e.g. calibrations) it can not correctly serve HTTP Requests. During this time the intermediate page shown on the right is displayed.

This page will reload itself every 10 seconds if your browser supports javascript.

You can force a reload by using the printed out link and need to do so if javascript is not available.

**Unavailable components:**

Controls for components not available on the current module are displayed with reduced opacity.

For example a module without pressure sensors will display the section as shown on the right.

**Battery and supply voltage:**

At the top of the page the current charge of the battery is displayed. Besides it the Vin icon is visible if an external supply voltage Vin/USB is connected.

External supply connected:



Running on battery with 73% charge:



### In-Flight section:

- **Reload page:** Reloads the configuration menu and refreshes all values. Pending confirmation is canceled.
- **Set (S) or Reset (R) Air Pitch Offset :** Sets/Resets the offset between flying attitude and ground attitude (This enables to calibrate the ICflyAHRSII in an unlevelled position and set this offset at a later time, see Chapter 12: Calibration Routines)  
This option is very useful for planes with tail wheel.  
The current pitch offset is shown in degrees.

In Flight

Reload page

Air Pitch Offset

Currently: 0.00°

Currently: 22.19°

### Battery run time:

- Sets how long the device will run on battery while no Vin is present. When this time span elapsed the module will power down.
- When the module is powered on using a power button it will stay on for at least 15 minutes and only afterwards respect this configuration.
- The current value is printed out in minutes if not stated else.

Possible settings:

**off:** The device will power down immediately after Vin is lost

**10s – 6h:** Stay on for the configured time span

**infinite:** power down only when battery exhausted

PowerDown Settings

Battery runtime (10s)

30m

off

10s

6h

infinite

### Serial configuration:

- **Baudrate:** Sets the baudrate of the serial interface (current baudrate shown in brackets)
- **Write data from WLAN:** Enables/disables data transfer from Wi-Fi connections to the serial interface
- **Read data for WLAN:** Enables/disables data transfer from the serial interface to Wi-Fi connections
- **Write AHRS Data:** Enables/disables output of AHRS data on the serial interface

The button color signals the current state of the function:

Green: Function enabled

White: Function disabled

Serial1 Configuration

Baudrate (19200)

19200

Write data from WLAN

Read data for WLAN

Write AHRS data

### Calibration:

- **Calibrate Ground Pitch:** Stores the modules current orientation as reference (If a high level of motion is detected during this procedure, the ICflyAHRsII will refuse to update the reference values).  
Colored yellow if current values were restored at power up  
Colored green if calibrated since last power up
- **Reset Dynamic Pressure:** Calibrates the dynamic pressure sensor to zero (optional)
- **Start Accel Calib:** Starts the calibration routine of the accelerometer (see Chapter 12: Calibration Routines)
- **Start Mag Calib:** Starts the calibration routine of the magnetometer (see Chapter 12: Calibration Routines)
- **Measured Alt(ft):** Displays the altitude calculated from measurements with the QNH given below
- **Alt(ft) and QNH:** Set current altitude in feet and QNH value for static pressure calibration (optional)
- **Start Static Calib:** Calibrates the static pressure sensor to the altitude and QNH values given above (optional)

Calibration

Calibrate Ground Pitch

Start Accel Calib

Start Mag Calib

Reset Dynamic Pressure

Static Pressure:

Measured Alt(ft): 727

Alt(ft): 730 Set

QNH: 1022 Set

Start Static Calib

### Changing Wi-Fi credentials:

Set a new SSID and pass phrase for the device.

1. Set the desired SSID  
- 4 to 30 chars

2. Set the new pass phrase  
- 8 to 30 chars

3. Confirm the pass phrase

WLAN settings

new\_ssid

SSID Set

myPreferredSSID

WLAN settings

myPreferredSSID

PASS1 Set

.....

WLAN settings

myPreferredSSID

PASS2 Set

.....

If an error occurs the module will print out an error message as shown below.



ICflyAHRs II

ICFly-II with Firmwareversion 0.5

**Password min 8 chars**

In-Circuit GmbH  
Boltenhagener Straße 124  
D-01109 Dresden

www.in-circuit.de  
avionics@in-circuit.de  
facebook.com/InCircuitAvionics

Bat: 

WLAN settings

myPreferredSSID

PASS2 Set

When the procedure successfully completes, the wireless interface will restart with the new credentials immediately and you have to reconnect to the network.



## 12. Calibration routines

### Installation calibration routine:

This procedure has to be done after the installation of the ICflyAHRsII in a new orientation.

- Start Ground Pitch Calibration. (see Chapter 11: Calibration & Configuration menu) This will store the devices current orientation as reference
- Once you are air-borne and in a level flight attitude set the Air Pitch Offset to compensate any orientation differences between flying attitude and ground attitude.

### Accelerometer calibration routine:

This procedure will calibrate the ICflyAHRsII's accelerometer.

The goal of this procedure is to have normalized gravity acting in every axis on the accelerometer. This is done by measuring the gravity while the module is lying on its faces.

The ICflyAHRsII must not be attached for this procedure.

- Start the calibration routine of the accelerometer (see Chapter 11: Calibration & Configuration)
- Place the ICflyAHRsII on a flat, level surface
- Press the power button for a short time (see chapter 2: Power Button)
- Turn the module over to the side
- Press the button again
- Repeat for all six faces of the module (order not important)  
(To calibrate the accelerometer on the two sides with attachment appliances, press the module against an upright surface)

### Magnetometer calibration routine:

This procedure will calibrate the ICflyAHRsII's magnetometer.

The goal of this procedure is to have the maximum of the magnetic field detected in every direction on the magnetometer. This is done by revolving the module in all directions.

The ICflyAHRsII must not be attached for this procedure.

- Before starting the calibration hold the ICflyAHRsII in your hand and as far away as possible from any ferromagnetic material
- Start the calibration routine of the magnetometer (see Chapter 11: Calibration & Configuration)
- While the routine is running (~10sec) revolve the ICflyAHRsII in all directions around its axes as shown in the picture below. Try to reach every possible orientation for the device.



## 13. Firmwareupdate via SD-card

### Quick Guide

Please check online at **www.in-circuit.de** for the latest firmwareupdate available for your ICflyAHRsII.

- Download & extract the **firmwareupdate.zip** onto a SD-Card so that there's a folder **update** with subfolders **fwv\_005\_** etc. on the SD-Card
- **Turn Off** ICflyAHRsII and disconnect any external power supply
- Insert SD-Card into ICflyAHRsII and power on ICflyAHRsII using external supply
- Wait 5-10 min.
- When 'WiFi', 'Calib', 'Battery'-LEDs blink altogether **turn off** ICflyAHRsII

(Note: On minor updates the ICflyAHRsII will directly boot into normal operation and skip this blink state.)

Remove SD-Card from ICflyAHRsII. The ICflyAHRsII is now ready to operate.

After each firmware update verify the firmware version using the ICflyAHRsII's internal webpage.

### Extended Guide

#### When to update your firmware:

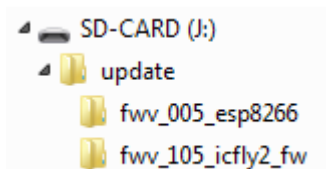
Please check online at **www.in-circuit.de** for the latest firmwareupdate available for your ICflyAHRsII.

- Refer to *Chapter 11: Calibration & Configuration menu* to obtain your current firmware-version from the ICflyAHRsII's internal webpage
- If there's a newer firmware available at **www.in-circuit.de**, you can proceed to update this firmware onto your ICflyAHRsII following the steps listed below

#### Prepare a µSD-card with the latest firmwareupdate:

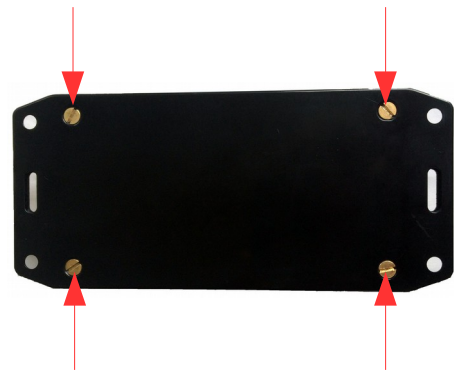
A µSD-Card is required to update the firmware of your ICflyAHRsII.

- Max. µSD-Card-Size: 32GB
- Format your µSD-Card with FAT or FAT32 file system  
→ Windows: Open Explorer → Right-Click on SD-Card → Format
- Download the latest firmwareupdate from **www.in-circuit.de**
- Unzip the firmwareupdate-file after downloading
- The firmwareupdate contains a folder named **update**
- Copy the folder **update** onto the µSD-card. The image on the right shows a valid folder structure example after extracting the firmware-update to a µSD-card.

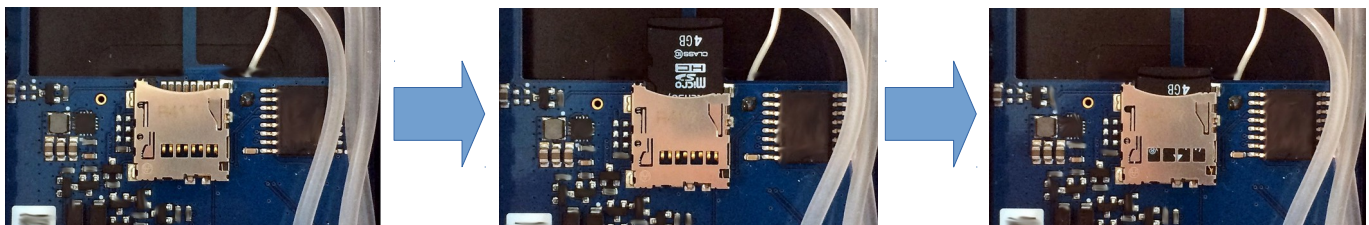


### Perform the update procedure:

- **Turn your ICflyAHRsII off**
- Remove the 4 screws on the bottom of the ICflyAHRsII and open the device carefully



- Insert the  $\mu$ SD-card which contains the firmwareupdate



- Connect **VIN- or Power-Button & USB-supply** to start the firmwareupdate on your ICflyAHRsII



Supply via USB

or



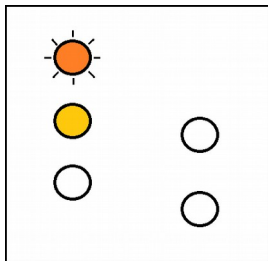
Supply via VIN

- The ICflyAHRsII now begins to update its firmware.
- The **LEDs** of your ICflyAHRsII will **signalize the firmwareupdate progress** and required actions depending on the current update-state
- Perform the required actions listed **on the following page** according to the **LED signaling** of your ICflyAHRsII
- After a successful firmwareupdate, make sure that the  $\mu$ SD-card is removed from your ICflyAHRsII
- Close your ICflyAHRsII using the 4 screws that were removed at the beginning
- ICflyAHRsII is now ready for normal operation

## Firmware-update signalization

ICflyAHRsII displays its current state while updating a firmware from SD-Card.

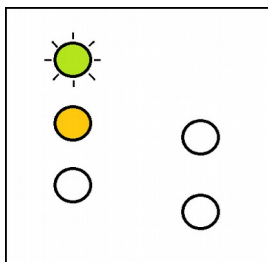
The signalizations and required user interactions are listed below.



### Verifying Firmware-Files:

ICflyAHRsII analyzes the firmware-files on the  $\mu$ SD-Card.

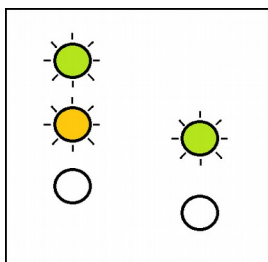
No user interaction required.



### Installing new firmware:

ICflyAHRsII installs a new firmware from the  $\mu$ SD-Card.

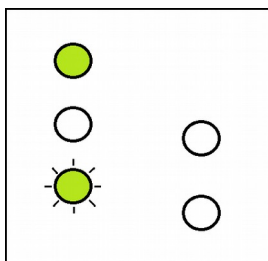
No user interaction required.



### Update complete:

ICflyAHRsII successfully updated its firmware.

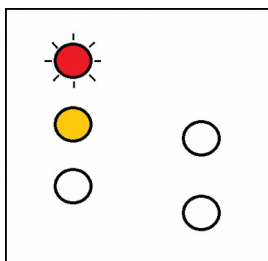
Please **power off** ICflyAHRsII and **remove the  $\mu$ SD-Card**.



### Normal operation:

ICflyAHRsII successfully updated its firmware and automatically restarted.

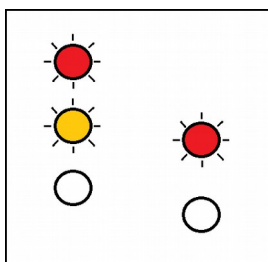
Please **power off** ICflyAHRsII and **remove the  $\mu$ SD-Card**.



### No firmware available:

There's no valid firmware installed on ICflyAHRsII. There's also no valid firmware-update available on the  $\mu$ SD-Card.

Turn off ICflyAHRsII. Insert a  $\mu$ SD-Card that contains a valid firmware-update and start with the firmware update procedure from the beginning.



### Update Error:

A critical error occurred while updating the firmware.

Turn off ICflyAHRsII. Start with the firmware update procedure from the beginning.

This error can happen if the  $\mu$ SD-Card is removed while updating.



## Accessories

### Integrated accessories

Micro USB adapter with  
integrated power button  
Order# 901.375

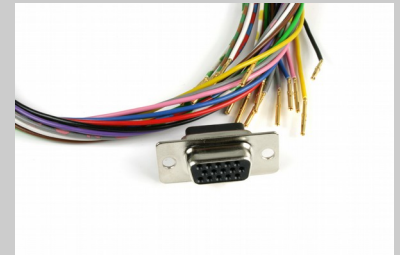


LiPo battery pack usable as stand-alone  
or backup power-source.  
3.7V, 1950mAh, over-current protection  
Order# 303.239



### Optional accessories

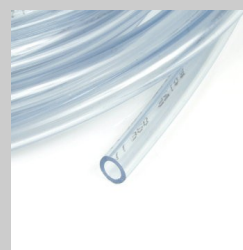
D-SUB HD15 connector with  
15x crimped cables  
Order# 303.325



Micro USB 2.0 cable  
length 0.5m  
Order# 306.044



Flexible hose 5mm x 1.5mm  
(only relevant for version with pressure sensors)  
Order# 303.242



T-piece 5mm hose size  
(only relevant for version with pressure sensor)  
Order# 303.241



## Certifications



### European R&TTE Directive Statements

The ICflyAHRsII module has been tested and found to comply with Annex IV of the R&TTE Directive 1999/5/EC and is subject of a notified body opinion.



### RoHS / WEEE compliant

WEEE-Reg.-Nr. DE 17225017



### Revision history:

Version	Date	Changes	Editor
A	2016/02/01	Initial Version	Klaus, Träger, Blocher
	2016/07/18	Quick-Start Guide, Cockpit Installation, Firmwareupdate, App Setup Examples	Kormann