



NeuroFly V3.1

User's Guide Anti Collision

Anti collision with NeuroFly



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This document details the installation, configuration and use of the **NeuroFly application** for **anti-collision use** . For use in **tracking mode** , refer to the corresponding manual.

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1 Installing NeuroFly

NeuroFly is available for iOS (Ipad and iPhone) via the AppStore and for Android (Version > 9.0) on Play Store.



2 First start

See the **QuickStart guide** available in our [Help Center](#).

3 The main screen



3.1 The top banner: The main information

This banner summarizes the main information for the user. The order of priority is that of the presentation of the various information below, from least important to highest priority:

- **Waiting for the start of the flight:**



- In blue background with flashing "start" button.
- In this mode, no risk analysis is performed.

- **Normal operation, without any known danger:**



- In green background with the thumbs up, the flight is in progress the operational system and no risk is identified.

- **System Failure or Malfunction:**



- The yellow key is displayed on a black background, in the event of failure detection of a system element (loss of GPS signal, loss of connection, etc.). Click on it for more precise information (a sound alert is also performed when the fault is discovered).





- **Hazard identified:**








- The most important of the detected dangers is displayed with the color and the information depending on the height and the nature of the risk (yellow, orange, red or gray). See the "[Risks](#)" chapter." for more details.

3.2 The bottom banner: the status of connections and peripherals

The bottom banner displays the status of the main system elements:



- **Bluetooth pairing with a Neurone :**
 -  Grey: no Neurone connected, but no flight in progress: normal waiting situation.
 -  Red: No Neurone paired while a flight with Neurone is in progress. So there is a problem with the Bluetooth connection.
 -  Green: Neurone connected.
 -  Orange: Connection with a Neurone in progress.

- **GPS position :** this is the Neurone's GPS position. The Neurone on the outside can take on the order of a minute to position itself when it is started.
 -  Grey: no flight in progress, the GPS of the Neurone is not retrieved: normal waiting situation.
 -  Red: the connected Neurone has no GPS position
 -  Green: the Neurone has a precise GPS position.

- **Telephone network connection :** the exchange arrow indicates **NeuroFly 's connection** to the GSM network and therefore to our servers.
 -  Green: the connection with our server is established. You retrieve aircraft positions via the OGN network (FLARM, OGN trackers, SafeSky or PilotAware) and, during the flight, your position is exchanged in real time.
 -  Red: there is no connection with the server (no telephone network or WIFI connection). You do not receive any position from the OGN network nor exchange yours in real temps on NeuroSky. However, if you are in flight, your location history is stored on the smartphone and will be downloaded once the network is recovered. You will therefore have your entire journey afterwards on NeuroSky. Also note that the basemap is not updated if the connection is lost

Note : The lack of network in no way prevents **NeuroFly from working** with the Neurone (Neurone connection, detection, alerts).

NeuroFly constantly seeks to connect to the network and recovers it without action on your part as soon as possible. The temporary loss is usually due to a "white" area of the GSM network.


- **Battery** : This is the Neurone's charge level. Lightning flash  indicates power on.

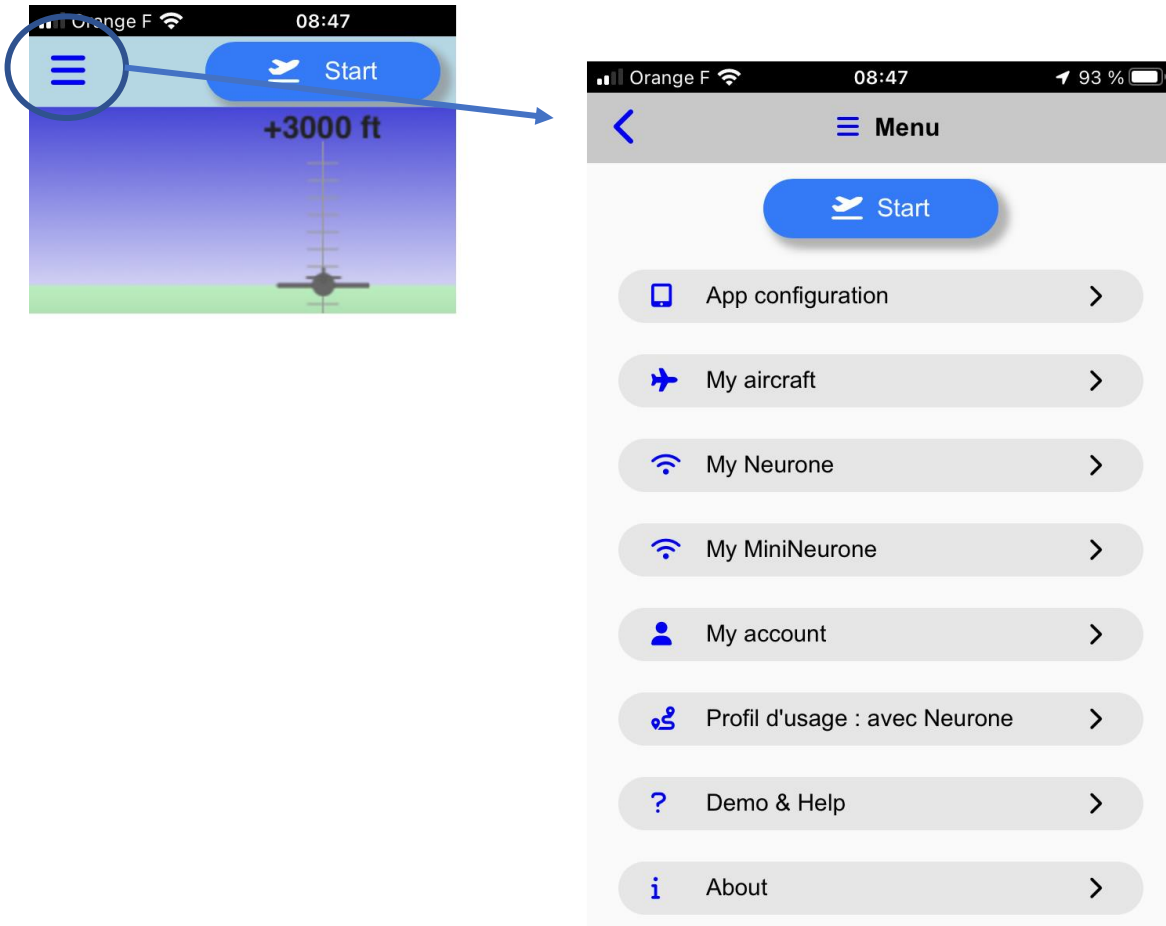
- **NeuroADSB** : indicator of reception of ADSB / Mode S / Mode C transponders via the **NeuroADSB device** .
 - **Neuro ADSB** In grey, transponder reception is not activated. If you wish, connect your **NeuroADSB** and configure your Neurone (see the chapter "[Configuring the Neurone](#)").
 - **Neuro ADSB** In green, transponder reception is operational via the **NeuroADSB** .
 - **Neuro ADSB** In red, the reception of transponders is activated in the Neurone configuration but does not work. Then check the connection of the **NeuroADSB** to the Neurone.


- **FLARM** : indicator of reception of FLARM positions via the **NeuroFLARM device** .
 - **Neuro FLARM** In grey, FLARM reception is not activated. If you wish, connect your **NeuroFLARM** and configure your Neurone (see the chapter "[Configuring the Neurone](#)").
 - **Neuro FLARM** In green, FLARM reception is operational via the **NeuroFLARM** .
 - **Neuro FLARM** In red, FLARM reception is activated in the Neurone configuration but does not work. Then check the connection of the **NeuroFLARM** to the Neurone.

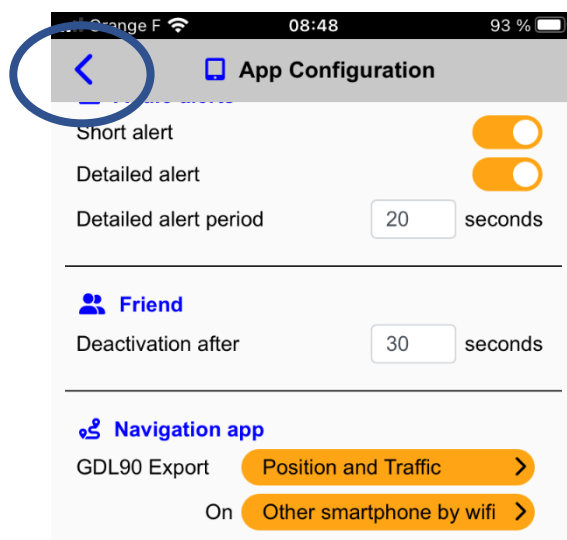
Note: If the connection to the server is established () the FLARMS are also retrieved via the OGN network.

3.3 The menu and dialogs

- o Access to the menu is via the button  top left of the screen.



- o The different dialogs accessible in this menu are described in the following chapters of this manual. Use the top left key  to go back.



3.4 The map

The map allows you to view your position and that of the aircrafts close to you within your surveillance zone (see the "[risks](#)" chapter below).

3.4.1 Content of the map:

The content of the map depends on your configuration choices.

- **Your aircraft:**
 - When your Neurone has a GPS position, it is displayed in gray (with the symbol corresponding to your type of aircraft) in the center of the circles (radar style centered on you).
- **Distance circles:**
 - They are centered on the connected Neurone and adapt to the zoom level. Their unit is defined in the "**App configuration**".
- **Map orientation:**
 - The direction of North is displayed at the bottom right of the map.

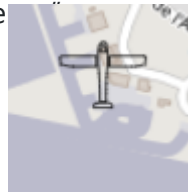


- **Basemap:**
 - Several possibilities are available in "**App configuration**".
 - Map: a plan is displayed
 - Satellite: a satellite view is displayed
 - Light: A light background is displayed, allowing better visibility in bright light.
 - Dark: A dark background is displayed, allowing better visibility in high/low light.








• **Other aircraft:**

- If the aircraft is fixed on the ground, it is displayed via an icon corresponding to the type of aircraft in "transparent" mode.



- If the aircraft is not fixed on the ground, its display depends on your configuration (see the "[App configuration](#)" chapter).







- The icon depends on the display configuration:
 - In TCAS Mode, aircraft are symbolized by an arrow and a frame depending on the level of risk:
 -  : no risk, distant aircraft
 -  : no risk, aircraft close
 -  : yellow risk
 -  : orange risk
 -  : red risk

- Outside of TCAS mode, corresponds to the type of aircraft, for example:



The color is random (fixed by the identifier of the aircraft) in order to easily differentiate the aircraft.

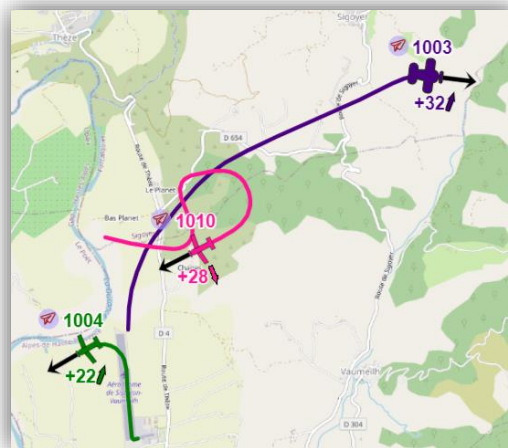
- a label is written above, if not deactivated in the configuration (see the chapter "[Configuration of the App](#)"). This label contains:

- An icon describing the source of the position:
 -  : Neurone received directly by your Neurone.
 -  : ADSB received live by your **NeuroADSB**
 -  : FLARM received live by your **NeuroFLARM**
 -  : Neurone, ADSB, FLARM, OGN tracker, SafeSky and PilotAware received via the telephone network.

- Aircraft identifier:
 - Aircraft name or registration if provided by the user. Otherwise, its ICAO number (preceded by h) or its address (FLARM, SafeSky) or its Neurone identifier (if the pilot has decided to remain private a temporary identifier with a question mark is displayed).
- The altitude of the aircraft or its altitude relative to your aircraft (positive if it is above you). The unit (meter or feet or flight level difference FL) is defined in the " **App configuration** ". If applicable, an arrow indicates the climb or descent of the aircraft.



- If requested in configuration, the direction of movement of the aircraft is indicated by an arrow.
- A track representing the last minute of aircraft positions (in aircraft color) is also optionally displayed.



- **Aircraft details:**

- By clicking on an aircraft, detailed information is displayed. Click on the information panel itself to make it disappear.




- **Danger :**


- In case of risk, a flashing cone in the color of the level of risk, starting from your aircraft towards the greatest danger identified in order to visualize the direction and the location of this one (see the chapter " [risks](#) ")

3.4.2 Map Movements:


Depending on the choice with the "Map movement" button, the interactive and automatic movements of the map are different:

- **Translation and Rotation:**
 -  **"On board" mode (default):**

If a Neurone is connected and has a GPS position:

 - the map is centered on the position of the Neurone.
 - the map is oriented in the direction of movement of the Neurone. If the Neurone is at low speed, the map is oriented in the direction of the phone
 - If no Neurone is connected or if it does not have a GPS position:
 - the map is centered on the Smartphone's position.
 - The map is oriented in the direction of the smartphone.
 -  **"North" mode:**


As for the onboard mode, the map is centered on the position of the Neurone.

 - The orientation of the map is fixed, however, and North is up, regardless of the orientation or movement of the Neurone.
 -  **Manual mode "":**

The map can be moved by dragging a finger or rotated by rotating 2 fingers on the map.

 - The map is by default oriented to the North when switching to manual mode.
 - It is possible to put the map back with North at the top by clicking on the "compass" at the bottom right of the screen.
- **Zoom :**
 - An automatic zoom mode exists (see the "[App configuration](#)" chapter); it adapts the zoom of the map according to the dangers (to make them clearly visible) and a default distance in the absence of danger. It is active only in "on board" or "north" mode.
 - In any case, it is possible to zoom by pinching the map with 2 fingers. If auto zoom is on, it will take over after a few seconds.


3.4.3 The SOS button:

This button  is used to initiate a distress call. Two actions are carried out jointly:

- A signal is sent by radio to the other Neurones and by network to the server: the other pilots and users are then informed in real time of your call by an SOS symbol displayed on your aircraft on the map.
- An SMS is sent by the server to the numbers pre-registered in your account in the "**My Account**" dialog. This sms provides them with your location in real time.

Of course, use this button sparingly and avoid making false distress calls.

3.4.4 The Friend button:

This button  is used to inform **NeuroFly** that the aircraft currently considered dangerous (on which the visual and sound alerts are triggered) is in fact a device with which you fly on patrol and/or which you control without risk: by pressing the button, **NeuroFly** will no longer consider the risks with this device and will no longer launch an audible or visual alert for a period of time (by default 30 seconds) predefined in " **App Configuration** " under the following label:



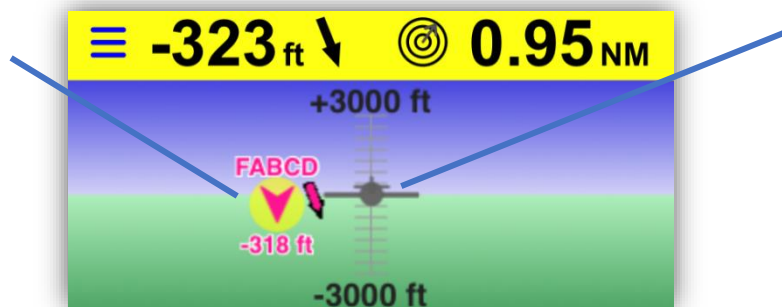
3.5 The artificial horizon

Aircraft at « yellow » risk :

On the left, behind (7 O'clock)

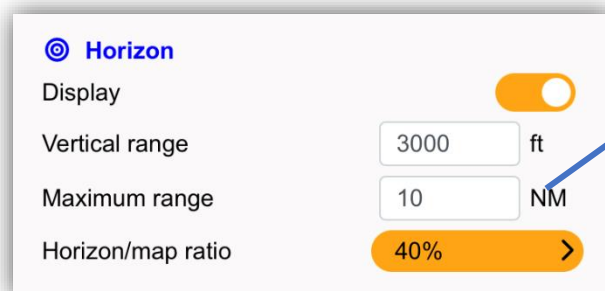
300 feet below

Moving down



Your aircraft

Its display is optional and its proportion on the screen can be configured via the horizon/map ratio in the " **App configuration** " dialog (see the " [App configuration](#) " chapter).



Only aircrafts closer than this distance are displayed.

It represents the view from the Neurone and allows you to visually realize the relative position of other aircraft.










Your aircraft is symbolized in the center, the blue area is above you and the gray area below.

3.5.1 Display of aircraft with known position (Neurone, ADSB, FLARM, SafeSky, ...)

Aircraft with position detected within the surveillance range and located within the altitude range and at a distance less than the maximum range from the horizon are displayed on the screen with a symbol:

- **Right or Left** : The symbol is positioned to the right or left depending on where it is located relative to your direction of movement (straight ahead).
 - o The extreme edge of the screen corresponds to 90° (3 o'clock to the right and 9 o'clock to the left).

- **Ahead or Behind** : The symbol points up if it is in front of you but it is reversed (points down) if the aircraft is behind you.

- **With a symbol** depending on the chosen configuration (TCAS display mode or not) and the risk:
 - o In TCAS Mode:
 - The aircraft are symbolized by an arrow and a frame according to the level of risk:
 -  : no risk, distant aircraft
 -  : no risk, aircraft close
 -  : yellow risk
 -  : orange risk
 -  : red risk
 - Their trend (vertical) is displayed by an arrow 
 - If the aircraft is the one identified as the most at risk, its identification and its altitude (relative, depending on the configuration) are also displayed.
 - If the aircraft is behind you, the arrow points downwards, for example: 
 - o Out of TCAS mode:
 - Aircraft are symbolized by an arrow of the color assigned to the aircraft by **NeuroFly** on the map, such as  .
 - Their trend (vertical) is displayed by an arrow 
 - If the aircraft is the one identified as the most at risk, it is underlined by a dot in the color of the risk. Its identification and altitude (relative, depending on configuration) are also displayed.

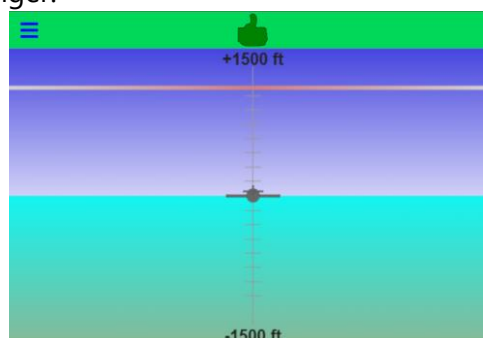
Thus on the screen below, the 2 planes are under your aircraft (300 feet below), the red plane is in front on the left at 10 o'clock, the blue plane is behind on the right at 5 o'clock. Both are on their way down. The red aircraft is identified with an orange risk of

collision: it is marked with an orange dot and its identification (number 304 here) and its altitude difference (302 feet here) are displayed.



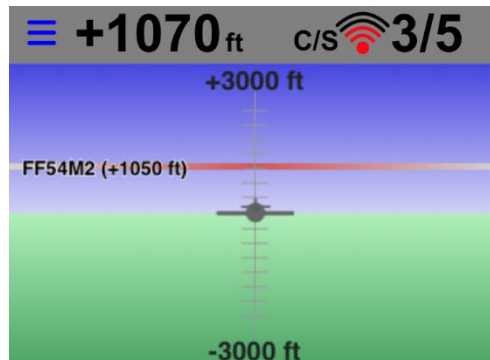
3.5.2 Display of S/C Modes

Aircraft equipped with Mode S and received by your **NeuroADSB** are displayed in the artificial horizon. The only information being their altitude and their signal strength, these aircraft are represented by a strip over the entire width of the horizon, placed at their altitude and of a gray color in case of no danger.



Mode S risk-free

The color of the headband is more or less red depending on the power level (out of 5). If the risk is high (greater than or equal to that defined in configuration – by default 2/5), the identification number and the altitude are written on the strip (see the "[Risks](#)" chapter).



Mode S in risk 3/5

It is possible to zoom on the horizon as on the map by pinching with two fingers. If the automatic zoom mode has been chosen, the horizon returns to its altitude range predefined in the "**App configuration**" after a few seconds.

4 Collision risks, visual and audible alerts


The objective of **NeuroFly** is to warn you of the risks of collision. Risks are classified into categories, involving different reactions from the pilot. The alert modes are visual and audible in order to best transmit the information to the pilot.

2 risk restitution modes are implemented depending on whether the detected aircraft provides its position (via a Neurone, FLARM, ADSB, SafeSky, PilotAware, etc. transmission) or not (via a Mode S or Mode C transponder transmission).

4.1 The nearby aircraft is an aircraft equipped with Neurone, ADS-B, FLARM, SafeSky or PilotAware and returns its position:

4.1.1 The Surveillance Zone:

In order not to pollute the display (for example with the presence of an airliner 30000 feet above you) and to focus on dangerous aircraft, you must define the surveillance zone around you on which the aircraft are located . This zone corresponds to a horizontal range (by default 30 km) and a vertical range (by default -1000m to +1000m in relation to you). It is defined in the "**App configuration**".

 **Watch area**

Max altitude difference ft

Max distance NM



Only aircraft in this area will be displayed and considered for the risk calculation. But presence in this area does not imply an alert! As long as there is no risk of collision, no alert is triggered.

The risk of collision is measured over a time range of 45 seconds.

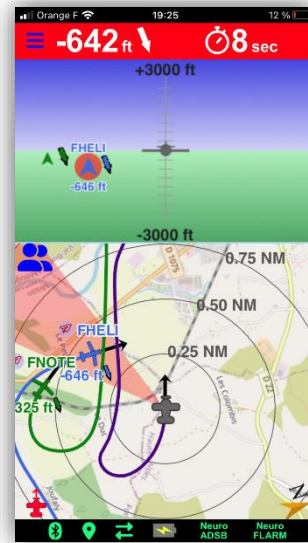
The level of risk is calculated every second on all the aircraft in the surveillance zone and is classified into 3 levels; the most dangerous will be returned to the pilot.

4.1.2 Risk levels :




- **“RED” level DANGER: it corresponds to a REAL and IMMIDENT risk.**
 - **MEANING:** high risk of collision if the trajectory is maintained. Mandatory maneuver.
 - **CAUSE :** The trajectories of the 2 aircraft converge within 45 seconds.
 - **ACTION :** It is therefore imperative that a maneuver be initiated by at least one of the aircraft.

- **DANGER of “ORANGE” level: it corresponds to a STRONG and IMMIDENT risk .**
 - **MEANING :** dangerous trajectory, recommended maneuver.
 - **CAUSE :** The trajectories of the 2 aircraft are not exactly convergent within 45 seconds but the margin between the 2 positions is very small!
 - **ACTION :** A maneuver must therefore be initiated by at least one of the aircraft to increase the safety margin.

- **“YELLOW” level DANGER: it corresponds to a POSSIBLE risk.**
 - **MEANING:** Be vigilant, aircraft may become dangerous.
 - **CAUSE :** The trajectories of the 2 aircraft do not converge within 45 seconds, however the 2 aircraft can collide within 45 seconds in the event of a strong change in trajectory, taking into account their respective current speeds.
 - **ACTION :** Watch the aircraft and if possible get out of this danger zone



4.1.3 Visual alerts:

- **The top band is the color of the risk.**
 - The information displayed is:
 - The height difference
 - The vertical direction of movement of the other aircraft
 - The distance (yellow risk) or the time before impact (orange, red risk)
- flashing yellow (or orange or red) **cone is displayed on the map.** It shows the direction of danger.
- **the zoom adapts** (in auto mode) to clearly see the dangerous aircraft
- **a yellow (or orange or red) circle is displayed under the dangerous aircraft** on the artificial horizon (where the aircraft is represented by ,  or  in TCAS mode).

4.1.4 Sound alerts:

- A **brief " yellow traffic "** (or orange or red) alert is repeated frequently (can be deactivated, see the "[Configuration of the App](#)" chapter).
- A **detailed alert** such as "**yellow traffic, light aircraft, 3 hours, 500 feet down, 2 nautical miles** " is announced when this danger appears and every 20 seconds (configurable, see the "[Configuring the App](#)").

Remarks :

- *the sound alert is triggered even if **NeuroFly** is in the background.*
- *In the event of multiple risks, only the most dangerous risk (in level, then in time of potential impact in the event that several aircraft have the same level of risk) is taken into account for the visual (cone) and sound alerts.*

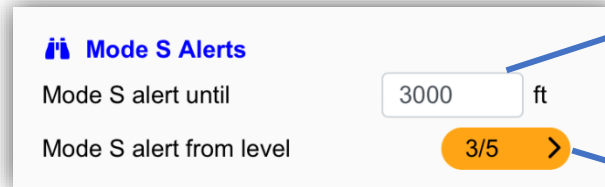
4.2 The nearby aircraft is an aircraft equipped with a Mode S or C transponder:

If you have a NeuroADSB, you receive signals from Mode S and C transponders. The positions of aircraft equipped with Mode S or C transponders are not known. Indeed they only provide their altitude. However, the Neurone also measures the power of the transmission received, which makes it possible to relatively evaluate the distance of the aircraft.

Thus a risk is calculated, based on the altitude difference and the power (0/5 to 5/5).

4.2.1 The Risk Zone for Mode S/C alerts:

In the " **NeuroFly configuration** " , you can define the risk zone to be considered:



Différence d'altitude maximale pour générer une alerte

Niveau de puissance minimale pour générer une alerte

- **Altitude difference limit** from which the aircraft is not considered at risk: with 1000 feet, for example, aircraft whose difference is 1300 feet (above or below) will not be considered at risk.
- **Minimum power limit** below which an aircraft is not considered at risk. For example, with 2/5 as the limit value, an aircraft received with a power of 1/5 will not be considered at risk.

If an aircraft is within altitude range and is received with power greater than or equal to your limit, then an alert is issued.



4.2.2 Visual alerts:

- **The top band has a gray background** and displays the altitude difference and the power level.
- In the artificial horizon, **the strip located at the altitude of the aircraft is displayed with a more or less red tone** depending on the power level.
- In the artificial horizon, **the identification and altitude differential (or altitude depending on your configuration) of the aircraft is written** .

4.2.3 Sound alerts:

- The detailed alert, such as “ **mode S traffic, 100 feet down, power 4/5** ” for example, is announced when this danger appears and every 20 seconds (configurable in configuration).

4.3 No aircraft are identified as dangerous

In the event that no aircraft is dangerous (aircraft with position or in S/C Mode), then **NeuroFly** is silent and informs you of this nominal situation with the thumbs up on the green band:



5 Course of the flight


Configure the display and the sound announcements to your liking before starting the flight (see the chapter " [Configuring the App](#) ").

Launch a flight by pressing the button



The previously selected aircraft will be used. The pairing to the last Neurone used is launched. In the case of a first use, you are asked to choose the aircraft and the Neurone (see the chapters " [Definition of your aircraft](#) " and " [Pairing the Neurone](#) ").

A voice announces the start of the flight: if no voice is heard, then check the volume of your phone, the connection to your headset or change your voice in the " **App Configuration** " .

During the flight, if no risk is identified and if the operation is correct, the thumbs up is displayed in the banner and **NeuroFly** remains silent. 

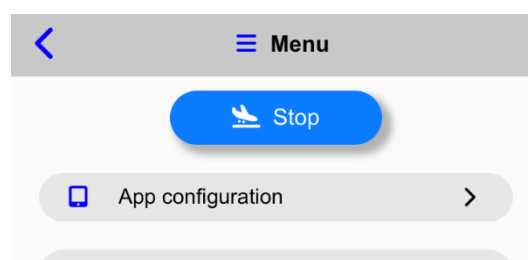
If a failure is detected, an audible message informs the driver and the strip switches to malfunction mode. 

If a risk is detected, a visual and audible alert is raised.



You can place the application in the background if you wish: it will continue to operate and warn you if necessary with a sound message.

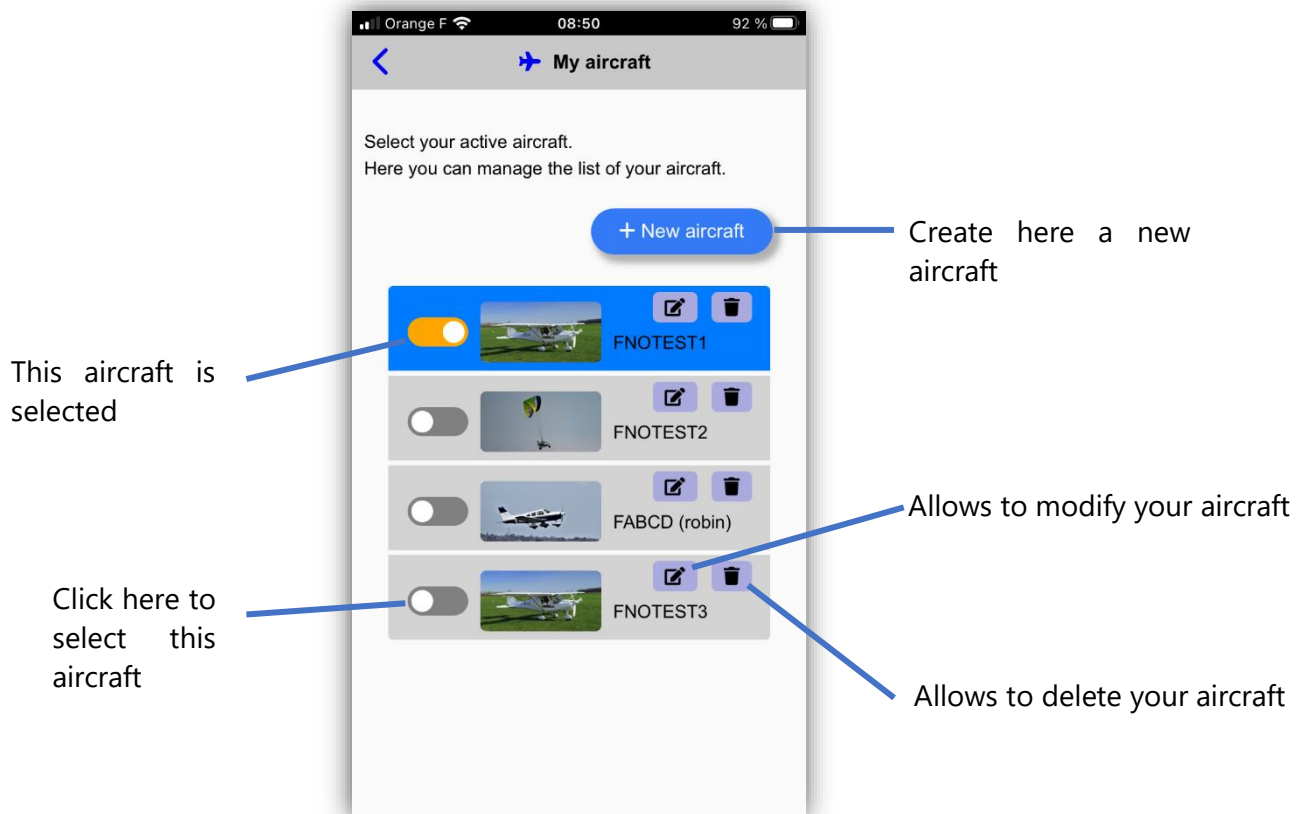
At the end of the flight, press the "Stop" button in the menu.



6 Definition of your aircraft

During a flight, you fly aboard a previously defined and selected aircraft. This manipulation is performed once or at each change of aircraft if you use your Neurone in several aircraft. The last selection is kept for the next flight.

My Aircraft dialog , a list is displayed and here you can create a new aircraft, edit or destroy an existing aircraft and select your current aircraft.



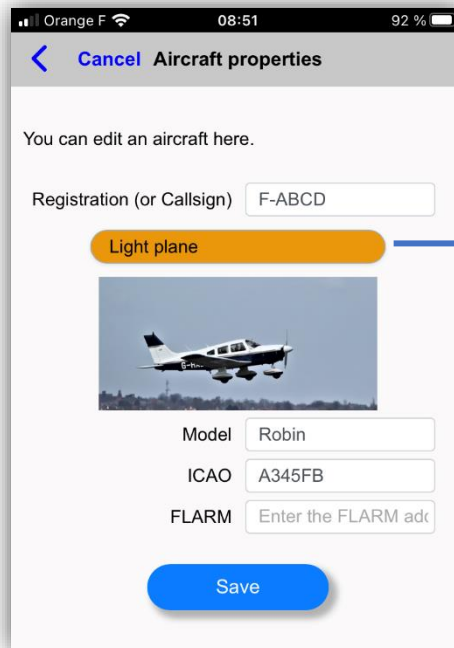
The properties of an aircraft are:

- **Its registration or name** : this will identify you to other pilots who will detect you.
- **Its type** : among all the types of aircraft offered, choose the one that best suits your situation.



The type is very important because it is used in collision risk calculations. Indeed, a pendular ULM does not have the same characteristics as a jet or a balloon.

- **Its model** (optional): this additional information is informative for you and the pilots who detect you.



The aircraft type is very important for estimating properly the collision risk.

- **Its ICAO address** : this is your hexadecimal address in the form A1B2C3 of your transponder if you have one. This allows you if you have a **NeuroADSB** (which receives the signal from your own transponder) to clearly understand that the signal is indeed that of your own device: otherwise an alert will be triggered because your transponder will be perceived as that of another very close ! Similarly, thanks to this information shared with others, pilots who receive your transponder signal and your signal from the Neurone will see 1 plane instead of 2 planes. Leave the box blank if you don't have a transponder.
- **Its FLARM address** : this is your FLARM address in the form A1B2C3 of your **NeuroFLARM** or your FLARM if you have one on board. This allows you to clearly understand that the FLARM signal received (by your **NeuroFLARM** or by the OGN network) is indeed that of your own device: otherwise an alert will be triggered because your FLARM will be perceived as that of another very close device! Similarly, thanks to this information shared with others, pilots who receive your FLARM signal and your Neurone signal will see 1 plane instead of 2 planes. Leave the box blank if you do not have a **NeuroFLARM** or FLARM transmitter.



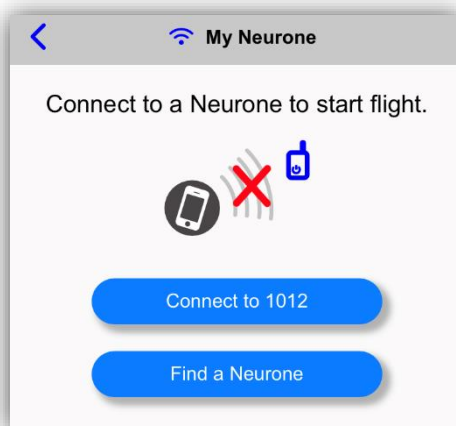
If you are off the telephone network, modifying an aircraft is not possible. However, you have the possibility of modifying the type of aircraft in order to have a good calculation of the risk of collision (as well as the other aircraft around).

7 Neurone Pairing

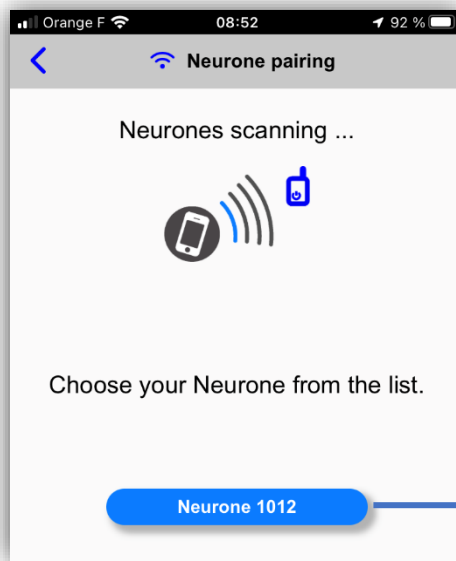
When the flight is started using the " **Start** " button, the Neurone with which you were previously paired will be used. A dialogue and the voice announcement informs you:




If you wish to change Neurone, then use the "My Neurone" dialog.




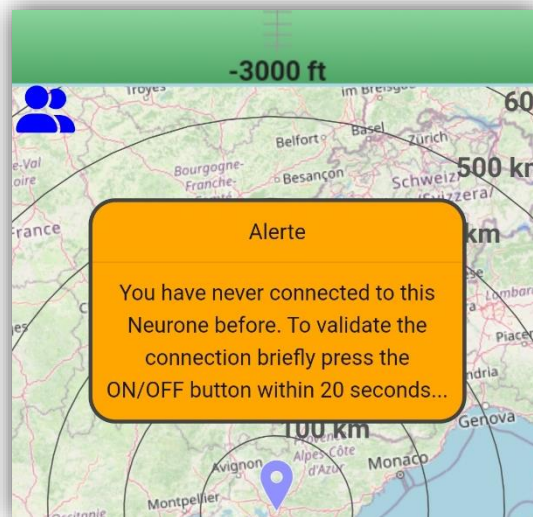
Then press "Find a Neurone": a scan is launched and the Neurones found (Neurones running around you and not connected to another smartphone) are listed.



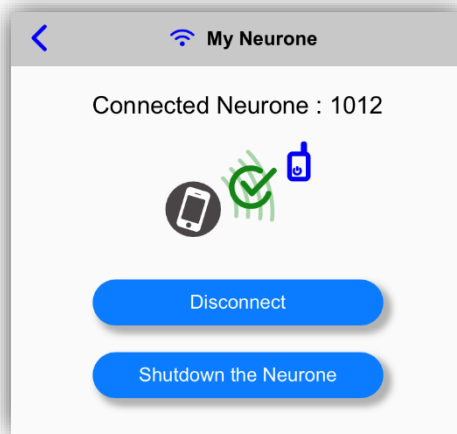
Neurone found when scanning.

Click on the Neurone in the list to pair with it. If you leave the dialog by without choosing  Neurone, the scan is stopped and no flight is launched.

Once the Neurone has been chosen, if this Neurone has already been paired with **NeuroFly** on this smartphone with your account, your flight will start immediately. Otherwise, a dialog appears asking you to confirm the pairing (to confirm that it is indeed your Neurone the first time): click on the Neurone button  as requested.



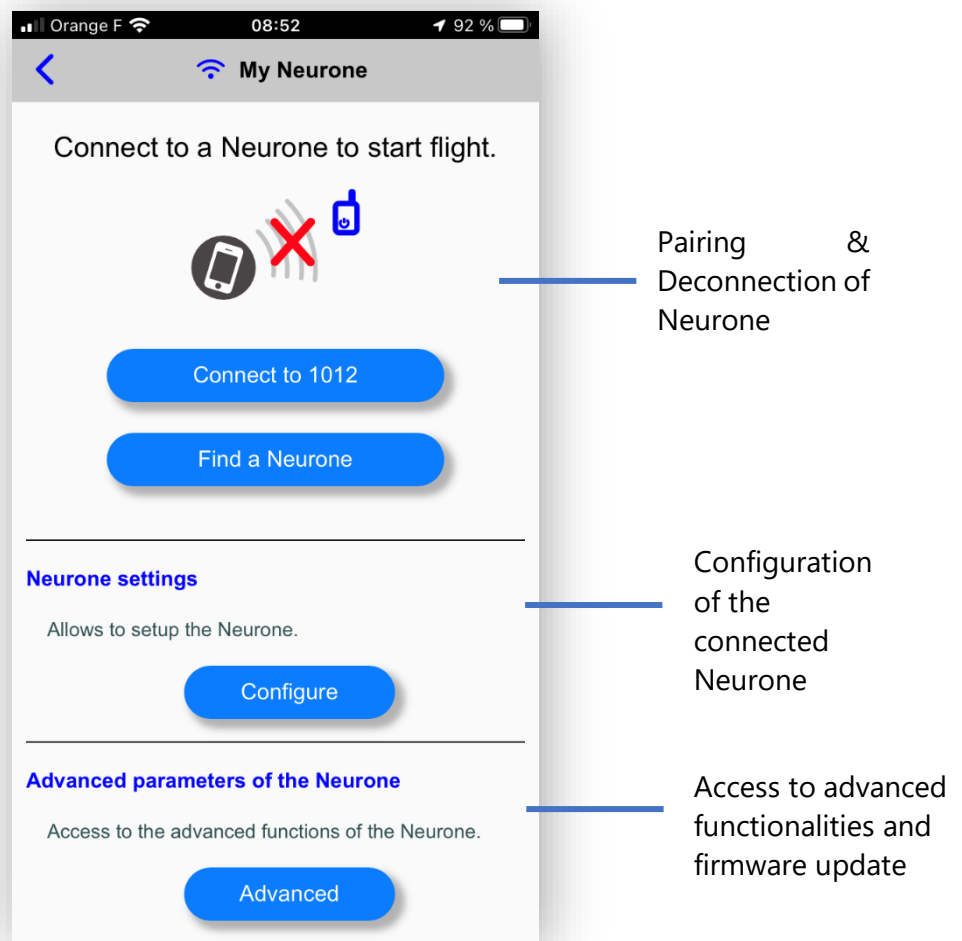
You can use the " **My Neurone**" dialog to end the current flight (by clicking on " **Stop connection** " or to stop the Neurone via the " **Complete stop Neurone** " button).



8 My Neurone

You have access to the pairing and disconnection of the Neurone in the "My Neurone" dialogue as seen previously in the chapter "Pairing the Neurone".

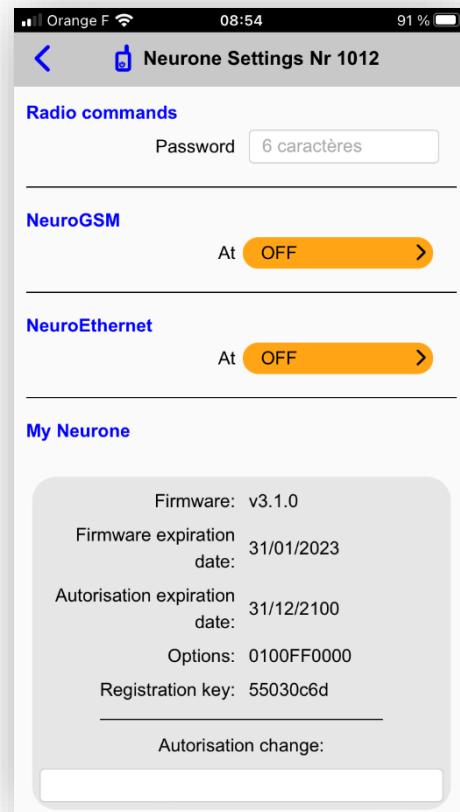
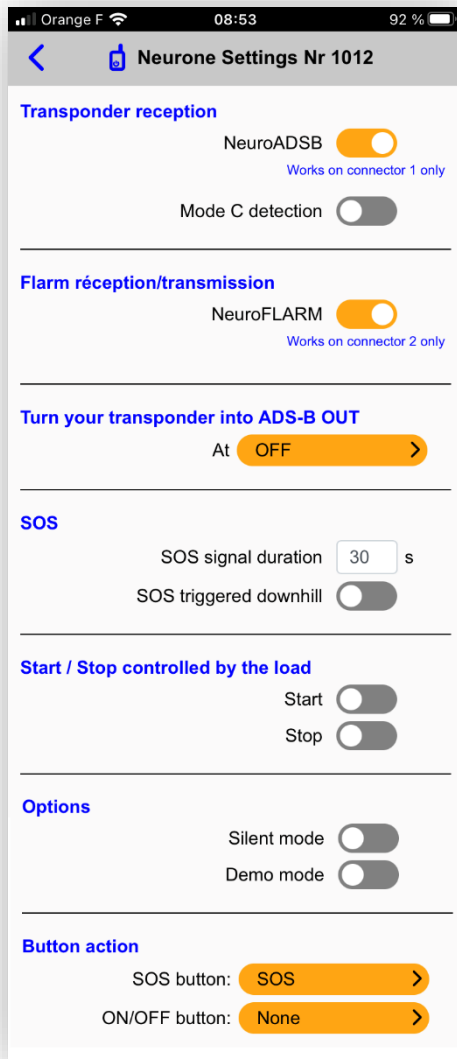
In this dialog, you also have access to the configuration of the Neurone (once connected) and to the advanced actions of the Neurone.



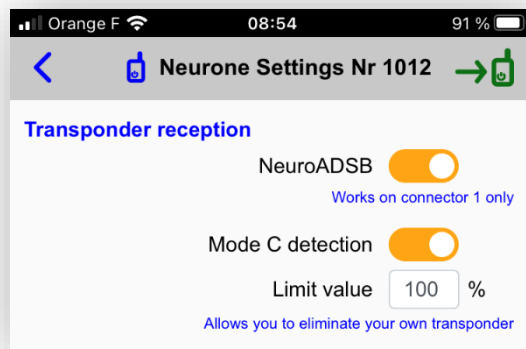
8.1 Neurone Settings

You can configure the Neurone connected to **NeuroFly** (so during a "flight"). This configuration accessible in the menu by "**Configuration of the Neurone**" allows to activate or not certain properties / peripherals of the Neurone.

- The following screen is displayed:

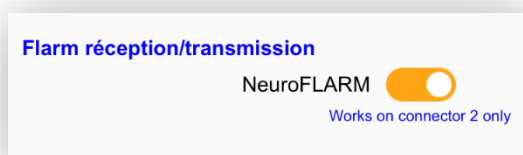


8.1.1 Reception of transponders



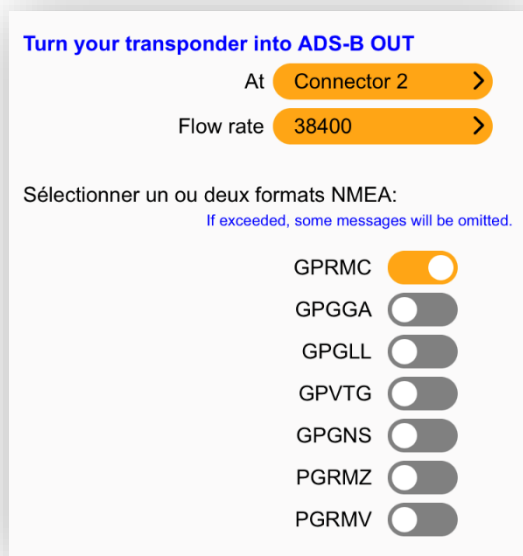
- If you have a **NeuroADSB** , check the **NeuroADSB toggle** .
- **Mode C detection** " toggle activates the detection of " **Charlie mode** " **transponders** . This activation is not recommended because many ADS-B OUT or TCAS also transmit in "Charlie mode" leading to information redundancy. However, if you activate this option, the " **Limit value** " allows you to avoid receiving your own transponder, based on the reception power. Adjust this value between 0 and 100% until you no longer receive it. A good value is 80%. If you still receive your transponder, lower this value.

8.1.2 Flarm reception



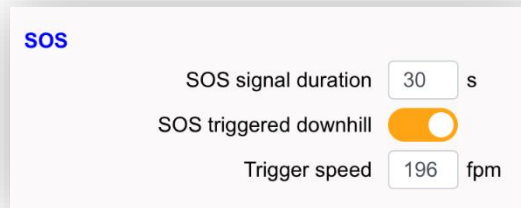
- If you have a **NeuroFLARM** , check the **NeuroFLARM toggle** .

8.1.3 Transformation transponder to ADS-B OUT



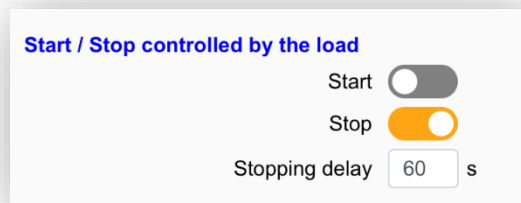
- If the Neurone is connected to your transponder via the **transponder cable** , select the connector used. Refer to the document " **FLNO_001 Conversion of a mode S transponder to ADS-B out** " to configure the rate and the NMEA formats to be selected.

8.1.4 S.O.S.



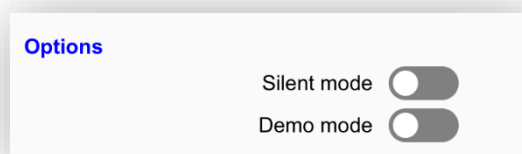
- When you send an SOS, either by pressing the button on the Neurone, or by pressing the SOS button on the application, a distress signal is sent by radio and also by SMS to all your predefined contacts in your account. The duration of the radio signal can be changed by specifying " **SOS Signal Duration** ".
- By checking the " **SOS triggered during descent** " toggle, it is possible to automatically send a distress signal if the descent speed exceeds the value specified in " **Trigger speed** ".

8.1.5 Start/Stop controlled by load



- Check the "On" toggle **so** that the **Neurone** starts automatically when a voltage is detected on the charging connector.
- Check the " **Shutdown** " toggle to have the **Neurone** shut down when voltage is removed after a " **Shutdown delay** ".

8.1.6 Options



- Check the " **Silent mode** " toggle to suppress all sounds emitted by the **Neurone** .
- Check the " **Demo mode** " toggle to simulate the presence of about forty aircraft around you. Remember to delete it before flying.

8.1.7 NeuroGSM

This option is currently not available. Keep the toggle on " **OFF** ".

8.1.8 NeuroEthernet

NeuroEthernet

At Connector 2 >

Flow rate 115200 >

Neurone IP Address Mode Fixed >

Neurone IP Address

Gateway

Mask

Server connection

Format Open FLNO 1 >

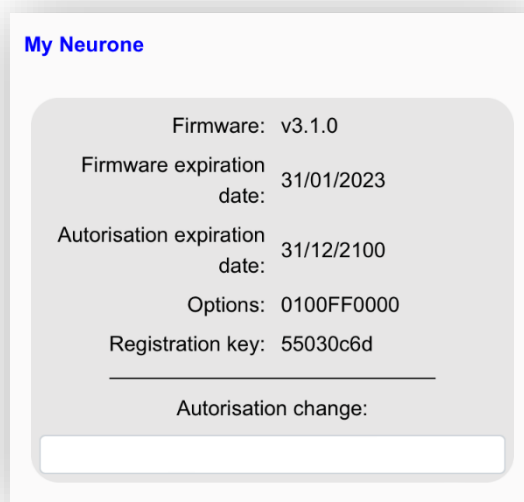
Server protocol UDP >

Server IP Address

Server Port

- If you have a **NeuroEthernet** , select the connector to which it is connected.
- Preferably choose the maximum rate accepted (921600 on connector 1 and 115200 on connector 2).
- You can opt for an automatic choice of IP parameters or specify them (**Address, Gateway and Mask**).
- The format of the frames is to be chosen between the " **Proprietary** " format of Flying Neurons and an open format " **Open FLNO 1** ". Contact Flying Neurons for the description of the open format.
- If you have opted for the open format, you can choose:
 - The **UDP** or **TCP protocol** .
 - **The IP address** or server **name** .
 - The **IP port** .

8.1.9 My Neurone



This last part of the screen informs you of the software version of the Neurone (**Firmware**) as well as its **expiry date** . New versions are regularly made available automatically. It is advisable to load them because they improve the system or correct detected malfunctions.

The " **permission change** " is reserved for future use.

8.2 Advanced Features

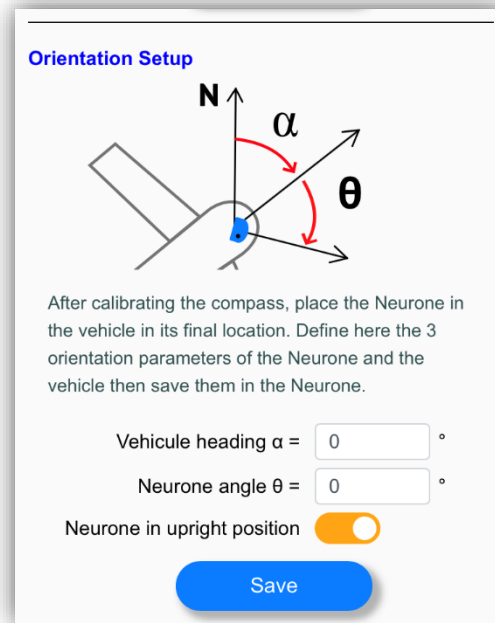
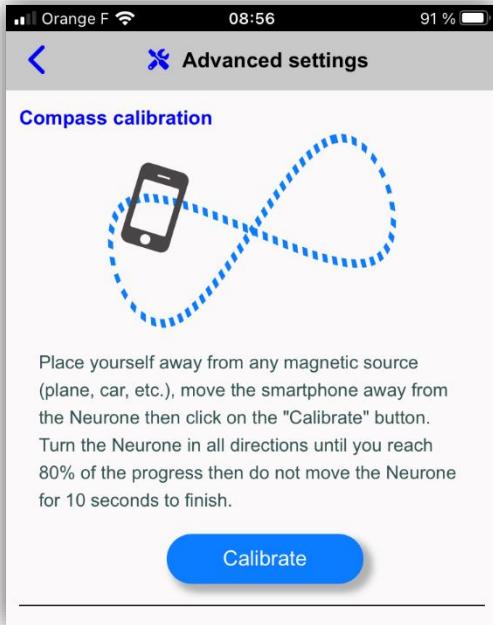
In the "Advanced" dialog you have access to some specific features of the Neurone:

8.2.1 Compass Calibration and Orientation Setup

These features are useful for orienting the heading of your aircraft in the map when it is a helicopter, a balloon, a rotary wing drone or in the case of a low speed plane.

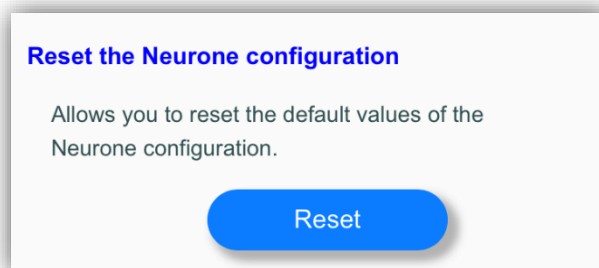
Note that as soon as the Neurone is in motion, for an airplane, ULM... the orientation used is that of the movement: this orientation is therefore not essential in these aircraft.

Follow **NeuroFly 's instructions** to perform these two operations.



8.2.2 Resetting the Neurone configuration

This function resets the Neurone configuration values to their default values. The Neurone must be connected to **NeuroFly** beforehand.



8.2.3 Firmware update



During the Neurone update, you are advised not to call or use other applications on the smartphone or tablet performing the update. Likewise, do not move the Smartphone or tablet away from the Neurone.

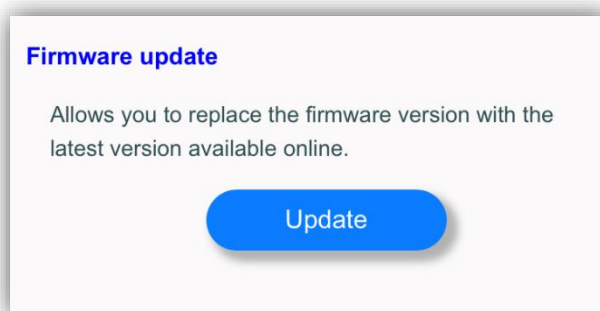
The update operation takes approximately 1 minute and 30 seconds.

8.2.3.1 Automatic update

Neurone updates are automatically offered to you when you connect to the **NeuroFly application** . We advise you to accept them because they bring new features and corrections.

8.2.3.2 Manual update

You can cause an update of the **Neurone** connected to **NeuroFly** in the " **Advanced** " dialog by clicking on "**Update**" in the "**Firmware update**" section,



8.2.3.3 Neurone blocked following an update

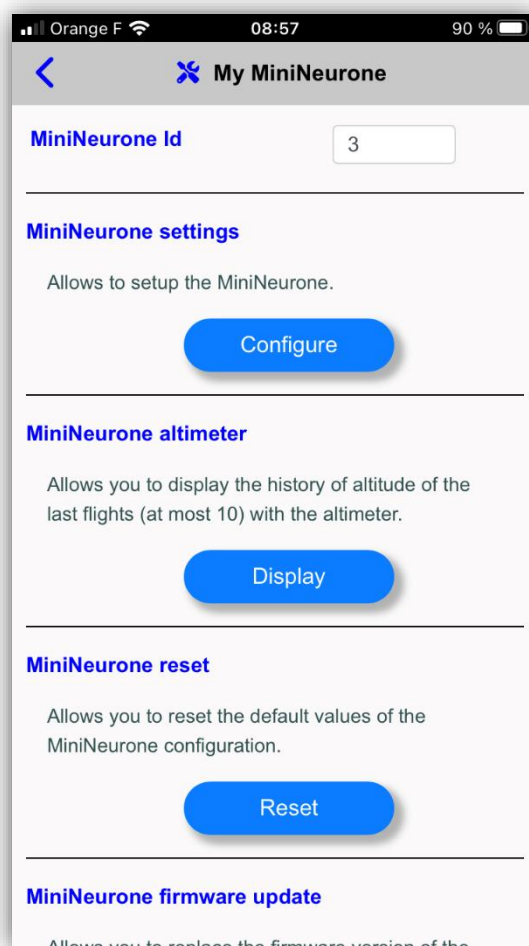
If the update has not been completed (application shutdown, disconnection, etc.), it is possible to restart it:

- Go to the "**Advanced**" menu, "**Firmware Update**" section .
- Click on "**Update**".
- Answer "**No**" to the question "**Can you connect?**" " .
- Enter the **Neurone number** .
- Click "**OK**"

If the update does not work, contact Flying Neurons.

9 My MiniNeurone

If you have a MiniNeurone, you can configure it and update it using the functions in this menu.

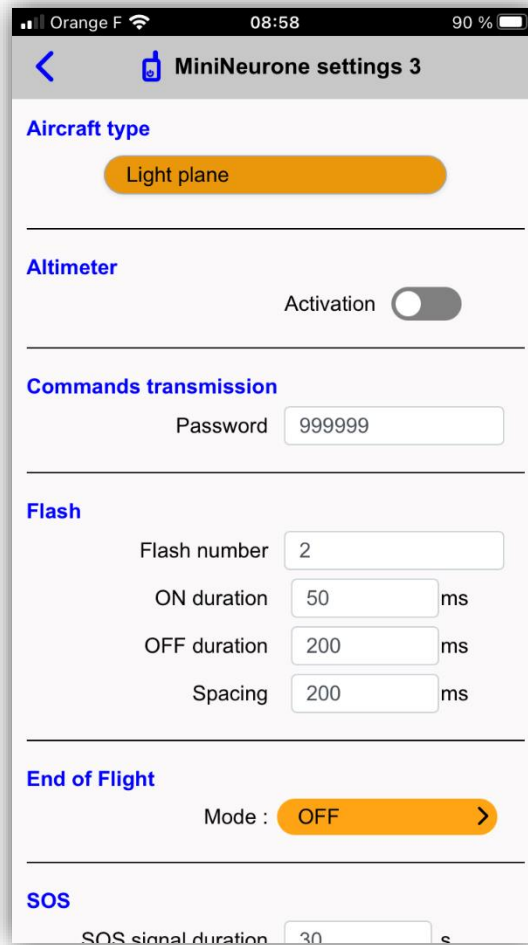


To use these features, your MiniNeurone must be running near you, and you must be in bluetooth connection with a Neurone.

Then enter the **number of the MiniNeurone** you wish to use at the top of the menu.

9.1 Configuring the MiniNeurone

Click the **Configure button** . The following dialog is displayed allowing you to configure the MiniNeurone.



The **aircraft type** of the MiniNeurone (similar to the aircraft type of your Neurone) is the important characteristic for anti-collision.

See the MiniNeurone manual for information on configuring the MiniNeurone.

9.2 Resetting the MiniNeurone

Click on the **Reset button** to reconfigure your MiniNeurone with factory settings.

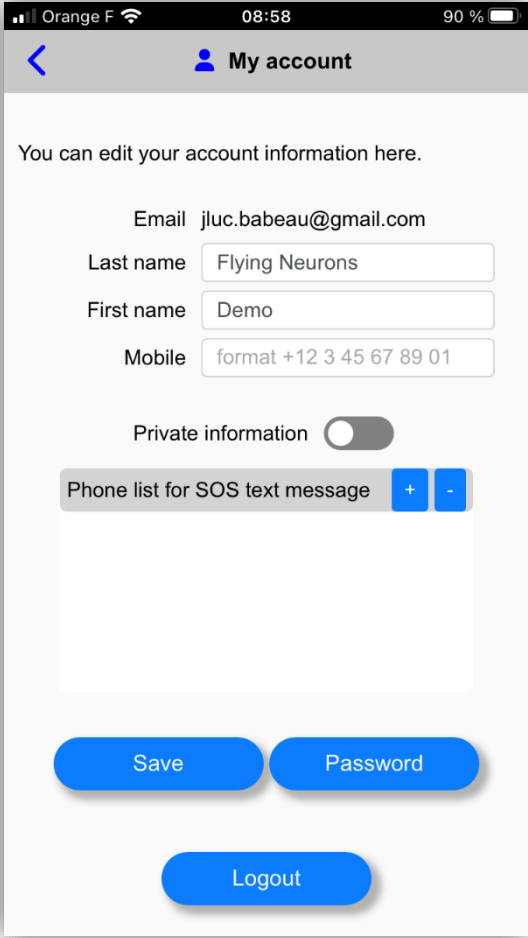
9.3 MiniNeurone firmware update

Click **Update to** replace the firmware version. The operation takes about 3 minutes. Avoid any other use of the smartphone during this operation.

10 Account definition

Accessible in the "My Account" dialog, the information relating to your account is:

- **The identifier** of the account (email) not editable.
- Your **surname, first name, telephone number** : this information is optional.
- The choice to keep your information private or not: if you publish it, the pilots receiving the signal from your Neurone will have access to your information (Name, First name, Telephone) entered in this dialog.
- The list of phone numbers that will receive an emergency text message when you press the SOS button.



You can also change your password via the "**Password**" button .

Your account is kept in the application even after it is stopped. So you don't have to reconnect each **time NeuroFly is launched** . Do not log out of your account to end your session. Use "**Sign out**" only to change user account on the smartphone/tablet.



By using "Sign out", all information and configurations will be erased. In addition, you must have a network to reconnect when you launch NeuroFly. Don't use it to end your session: just close NeuroFly or put the app in the background.

11 App Configuration

This very important dialog allows you to configure the whole of **NeuroFly** :

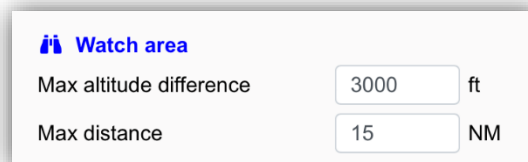
11.1 How to use :



Here you choose the mode in which you use NeuroFly:

- **Anti Collision** : to be used on board an aircraft to detect and be alerted to the risk of collision with the aircraft around you. This is the mode of use corresponding to this user manual.
- **Tracking** : to be used - generally on the ground - to follow a Neurone or MiniNeurone of your choice, your Neurone being used as a mobile station. See the corresponding manual.

11.2 Monitoring area:



Only aircraft detected in this area will be displayed on the map and considered for collision risk.

Max Altitude Difference : Aircraft with a greater altitude difference to you (up and down) will not be displayed. So airliners below you are not displayed unless you use a very large value of around 40,000 feet.

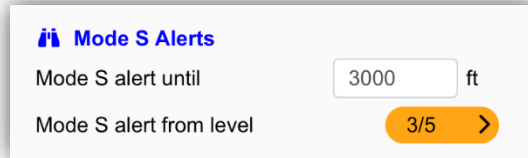
Max Distance : Aircraft that are more than this distance from your position will not be displayed. A distance of 30km is generally sufficient for the risk of collision. By using a large value, you have a view of the traffic in the distance, via the telephone network.

Even if you use a large area (in altitude or distance), all detected aircraft will be displayed but not necessarily considered at risk! Our risk calculation algorithms will apply to everyone and will filter out the dangers.

We advise you not to use excessive values so as not to overload the application in case of heavy traffic.



11.3 Mode S alerts:



🛩️ **Mode S Alerts**
 Mode S alert until ft
 Mode S alert from level >

In the case of Modes S (and Modes C), the position not being known, the alerts are a function of the difference in altitude and the power of the signal (which corresponds to a relative distance).

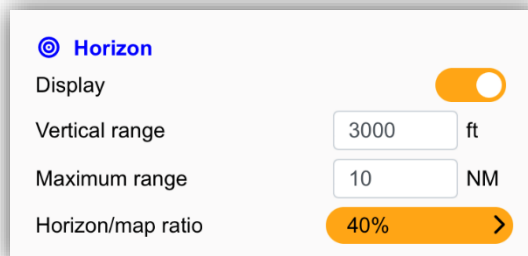
The alert will be announced only if:

- The altitude difference between you and the aircraft is less than the value entered in "Mode S alert up to". So a higher or lower aircraft will be displayed in the artificial horizon but will not raise an alert.
- The signal reception power is greater than or equal to the value entered in "Mode S alert from level".

Thus, for example, for respective values of 3000 feet and 2/5:

- An aircraft 4000 feet above you and received with a power of 4/5 will not trigger an alert (it is certainly close enough but high enough to ignore it)
- An aircraft 100 feet below you and received with 1/5 power will not trigger an alert (it is at the same altitude as you but far enough away to ignore it)

11.4 Horizon




📍 **Horizon**
 Display
 Vertical range ft
 Maximum range NM
 Horizon/map ratio >

This section concerns the actual display of the artificial horizon:

By unchecking " **Display** ", the artificial horizon is not displayed and only the map is on the screen. Note that the S Modes will therefore not be "viewable" but the alerts concerning them are always activated.

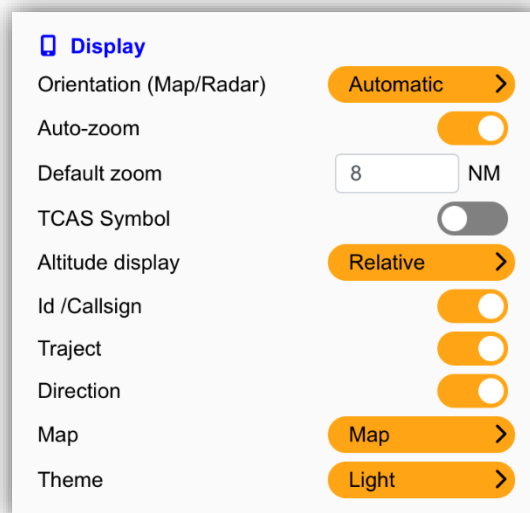
The " **vertical range** " corresponding to the min and max altitude difference displayed by default. You can zoom in and out manually by pinching with two fingers in the artificial horizon. If the " **Auto zoom** " mode is activated (see below) then the artificial horizon gradually returns to the default range defined here after a few seconds.

The " **maximum range** " allows you to filter and not display aircraft far from you in the horizon. A large value will pollute the display: it is interesting to limit it to, for example, 30 km so as not to have too many aircraft on the horizon. Note that far planes are displayed with a discrete symbol: 

" **Horizon/map** " ratio allows you to change the part of the screen used by the artificial horizon.






11.5 Display

This section is used to configure the display of the map and the artificial horizon:



- **Orientation (Map/Radar)** : Allows you to control the orientation of the display on your smartphone:
 - o **Automatic (default)** : the map and menus will adapt to the position of your phone.
 - o **Portrait** : the application will be displayed in portrait mode, even if the smartphone is oriented in landscape mode.
 - o **Landscape** : the application will be displayed in landscape mode, even if the smartphone is oriented in portrait mode.
- **Auto zoom** : If the option is checked, the zoom of the map automatically adapts according to the nearest danger. Thus a zoom is carried out in order to keep this risk at about half a screen width to make it clearly visible.

Similarly, if you (un)zoom the map by pinching with 2 fingers, the zoom returns to its default value or to that imposed by the danger after a few seconds.

- **Default zoom** : this is the initial zoom which is also the zoom value in the " **Auto zoom mode** " when there is no danger.
- " **Display TCAS symbols** " : by activating the option, the symbols of the aircraft in the map and the artificial horizon are the TCAS symbols ( ,  ,  ,  ,  , see the chapter " [The main screen / The map](#) " for their meaning) . Otherwise the symbols are representations of the aircraft type such as:

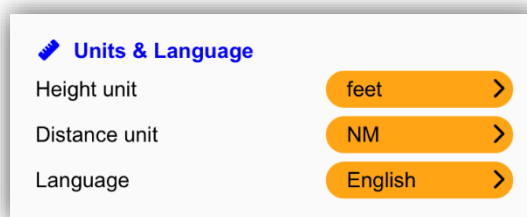


- **Altitude display** : three modes are available for displaying the altitude under the aircraft symbol:
 - o " **Absolute** " altitude: the altitude displayed is the GPS altitude of the aircraft relative to sea level. The unit is that defined in the " [Units](#) " section. » below.
 - o " **Relative** " altitude: the altitude displayed is the difference in altitude between you and the aircraft. The value is negative if it is below you. The unit is that defined in the " [Units](#) " section below.
 - o " **FL difference** " : the altitude displayed is the flight level difference (TCAS style) expressed in hundreds of feet: thus +47 means that the aircraft is 4700 feet above you.



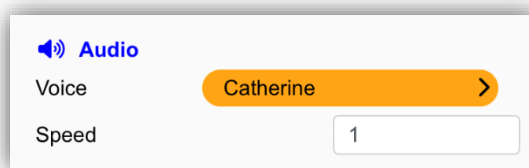
11.6 Units and Language

Set the units and language used in the display and sound announcements here.



Note that the altitude display choice " **FL difference** " has priority in the map (in hundred feet), but the sound announcement uses the height unit defined here.

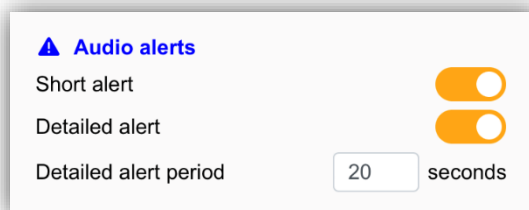
11.7 Audio



This section allows you to choose the voice used in the sound announcements and the speaking speed of the voice.

If no voices are heard when starting the flight or when choosing from the list of voices offered, change voices, the voices may not be downloaded to your smartphone. You can update the voices of your smartphone in the smartphone settings (under Accessibility > Spoken content > Voice > French (English) on iOS and under Accessibility > Text-to-speech on Android).

11.8 Audio alerts

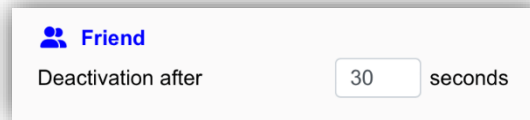



NeuroFly sound alerts . There are 2 types of alert:

- **The brief alert** (for example "Orange Traffic") is frequently announced every 5 or 7 seconds depending on the alert level. It can be disabled here.
- longer **detailed alert specifying type, course, height and distance (e.g. "Red tariff, helicopter, at 2 o'clock, 200 feet down, 400 meters") or power height for S modes ("Traffic S, 300 feet up, 3/5" power)**. It can be disabled here and you can set the time interval between these messages. Note that the detailed alert is relaunched before the end of the period if the danger levels up or changes aircraft.

For example, you can disable the brief alert and set the interval to 40 seconds to have a less intrusive application.

11.9 Friend



Here you can define the duration during which your press on  will be considered: during this time, the targeted aircraft (the one that generated the visual and sound alerts at the time of the press) will no longer trigger an alert. Once this time has elapsed, this aircraft will again be considered at risk.

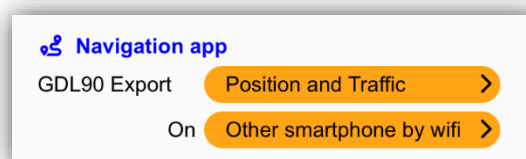
For example, if you often fly on patrol, you can set this duration to for example 180 seconds: NeuroFly will not trigger an alert with this aircraft for the next 3 minutes.

11.10 Navigation software

If you want to export your position and/or that of the aircraft detected by Neurone and NeuroFly in the navigation software you are using at the same time, configure the export here (in standard GDL90 format):

Define:

- what you want to export (your location and/or detected traffic)
- if the navigation software runs on the same device (smartphone/tablet) as your NeuroFly or if it runs on another device connected by WIFI.

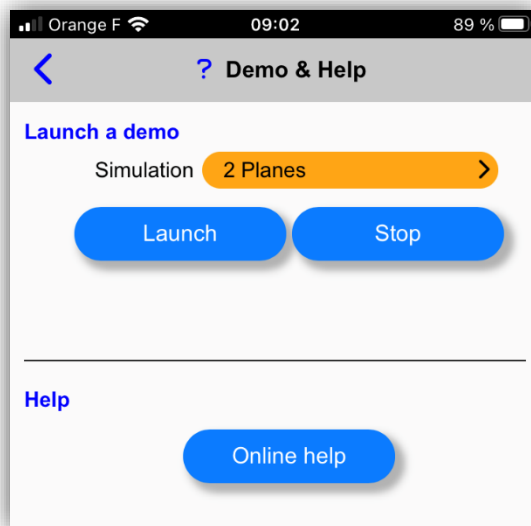


The export of this information takes place during a "flight" with NeuroFly.

Note that NeuroFly is "split view" compatible. If this is the case of the navigation software, then you can have the displays of the 2 applications on the same screen as for example here on an iPad:



12 Demo / Help



Use this dialog to launch demos:

- The "2 Aircraft" demo simulates the flight of a light aircraft with convergence with another light aircraft. It helps to understand the visual and audible alarms (which you can configure in your own way in the "App configuration" dialog).
- The "3 Aircraft" demo simulates the flight of a light aircraft with the presence of 2 other aircraft.
- The "Airplane and Mode S" demo simulates the flight of a light aircraft (equipped with a Neurone with NeuroADS-B) with the presence of another aircraft equipped with Mode S.

Any flight in progress will be stopped and the demo flight will start as soon as " **Launch** " is pressed.

Online help " button allows you to access our help center on our website www.flyingneurons.com : there you will find our [manuals](#) and our list of [questions and answers \(FAQ\)](#) .

Also check out our tutorials on our [YouTube channel](#) .