Ar Drone Controller
Version 1.6.0 and above

Getting started

Menu

1. Introduction

It is not that easy to fly the Ar Drone using a smartphone or a tablet, this is why I have wrote this little program, that allows to control the Ar Drone from a Windows computer using a joystick/joypad, and the keyboard.

<u>Important:</u> Use this application at you own risk, the author will not be responsible for damages caused to the drone or by the drone.

Do not fly over people, always respect the law of your country !

<u>Features of the program:</u>
- Compatible with Ar Drone 1 and Ar Drone 2.
- Video on pc from front and bottom camera in 360p or 720p (V2 only).
- Control the drone using the keyboard or a joystick/joypad.
- Easy joystick switch: Recognizes the joystick and loads the appropriate configuration.
- Assign joystick/joypad buttons to drone actions.
- Alarm for low battery or low wifi signal.
- Head Up Display that display direction, speed and altitude.
- Limitation of speed, acceleration and altitude.
- Record on pc or usb (v2 only) and take pictures.
- Return to Home with GPS. (v2 only)
- Return to Home without GPS (Experimental).
- Multiples languages are available : English, French and German.

2. Prerequisites

Ar Drone Controller is destinated to be used on Windows pc, in all recent versions, 32bits and 64 bits. The application is compiled as a 32 bit application, but runs on 64 bit Operating Systems, except WP 64 bits.

This program needs the « redistributables » from microsoft for visual studio 2010. Most of the time, they are already installed, but if you get a message that says «msvc100.dll » is missing, you will have to install them. You can find the setup on the following address : http://www.microsoft.com/en-us/download/details.aspx?id=5555

3. Main screen
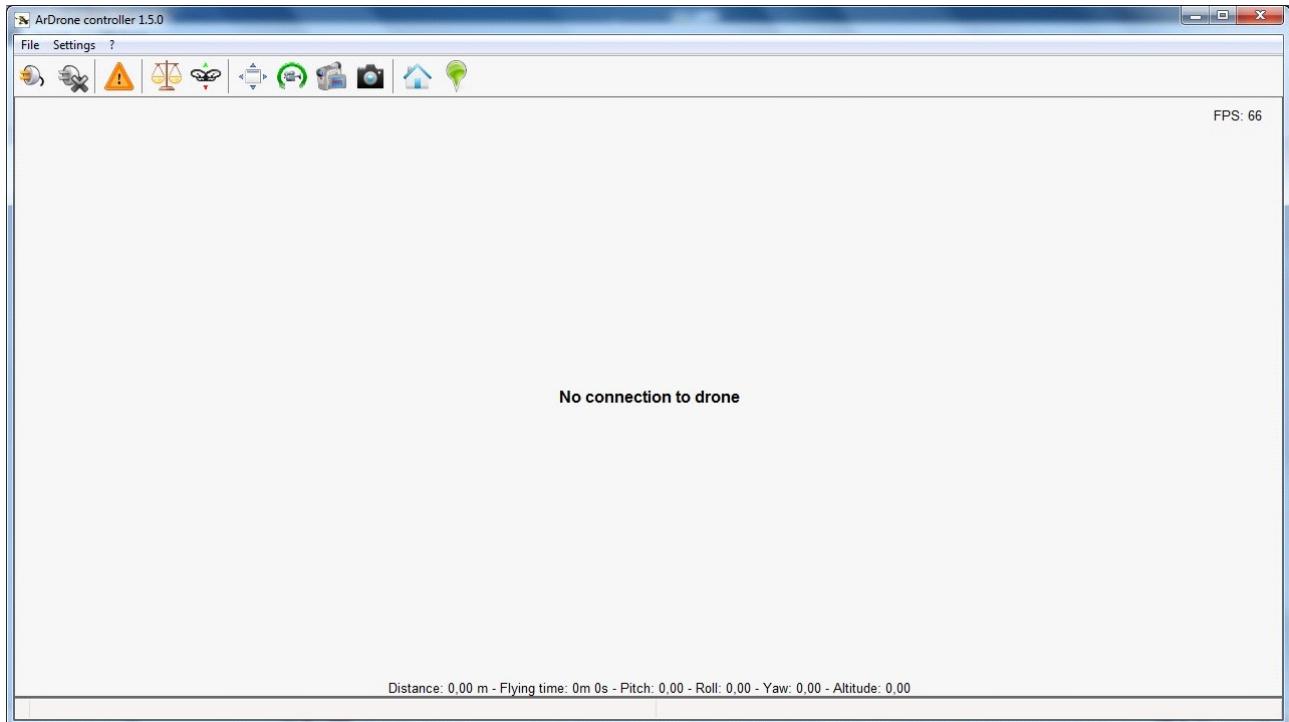
The connection to the drone is not automatic, but the different options can already been changed.
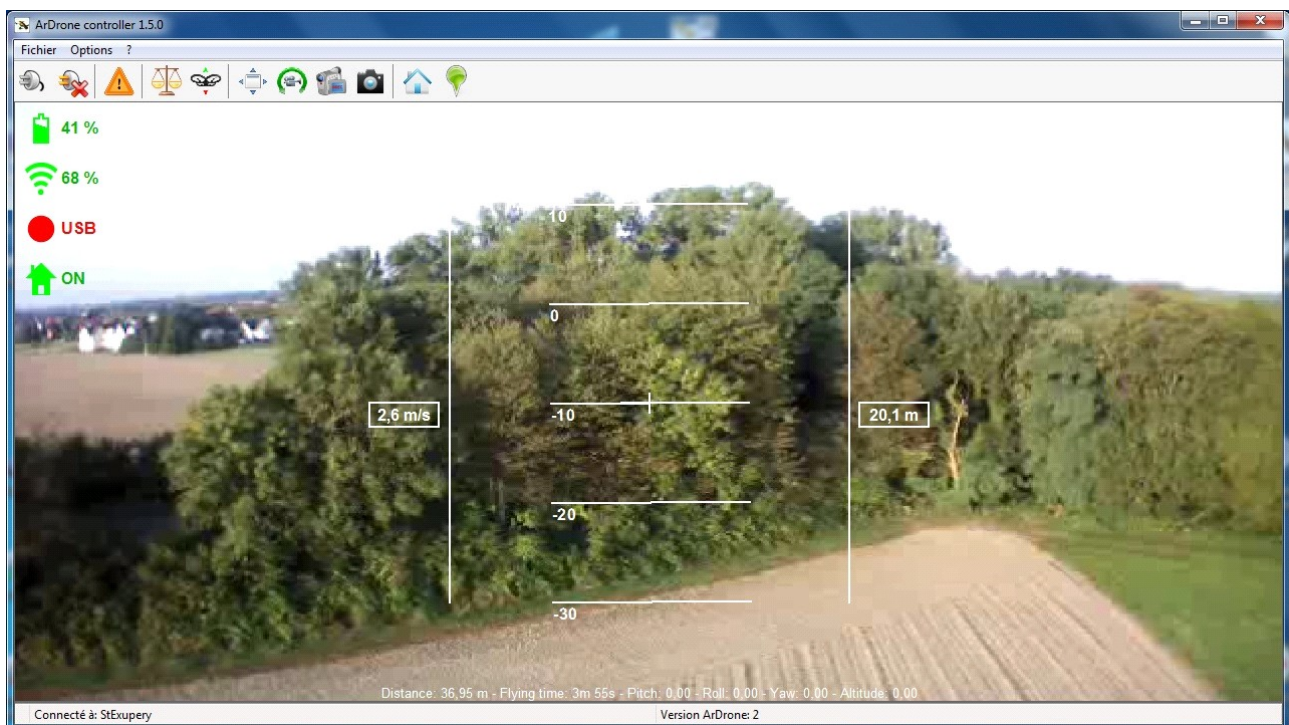
Once the connection is done, the video stream is displayed with a HUD (Head Up Display) wich brings information over altitude, speed and direction. The icons on the top left gives indication about battery level, wifi signal quality, recording status on usb or pc, and RTH activation status.
When battery level or wifi signal becames critical the text color changes and a sound will be played to alert the pilot. The quality of wifi signal may change slowly or quickly depending on the sensitivity of your wifi card, so you have to find your limit !

3.1 Menu

The menu structure is the following:

File
    Read drone config: Saves the current internal configuration of the drone to the file Config.log, in folder Data\Log.
        Warning: If the option fail, connect to the drone and try again.
    Quit: Close the program

Settings
    General: Open the main options dialog.
    Keyboard: Open the Keybord configuration dialog.
    Joystick: Open the Joystick configuration dialog.
        Ip Address: Allows you to specify the ip address to use to open the connection to the drone.   Note: This option does not change the ip address of the drone.

?
    About: Open an about dialog with version.

3.2 Toolbar

Note: Some options of the toolbar are also available over keyboard shortcuts and can be assigned to joystick buttons.

The options of the toolbar, from left to right :
    Connect to drone
    Disconnect from drone
    Emergency stop (= Escape key)
    Trim when drone is on ground, calibration of the magnetos when drone is flying
    Take off and Land (= Enter key)
    Switch between full screen and windowed mode (= F key)
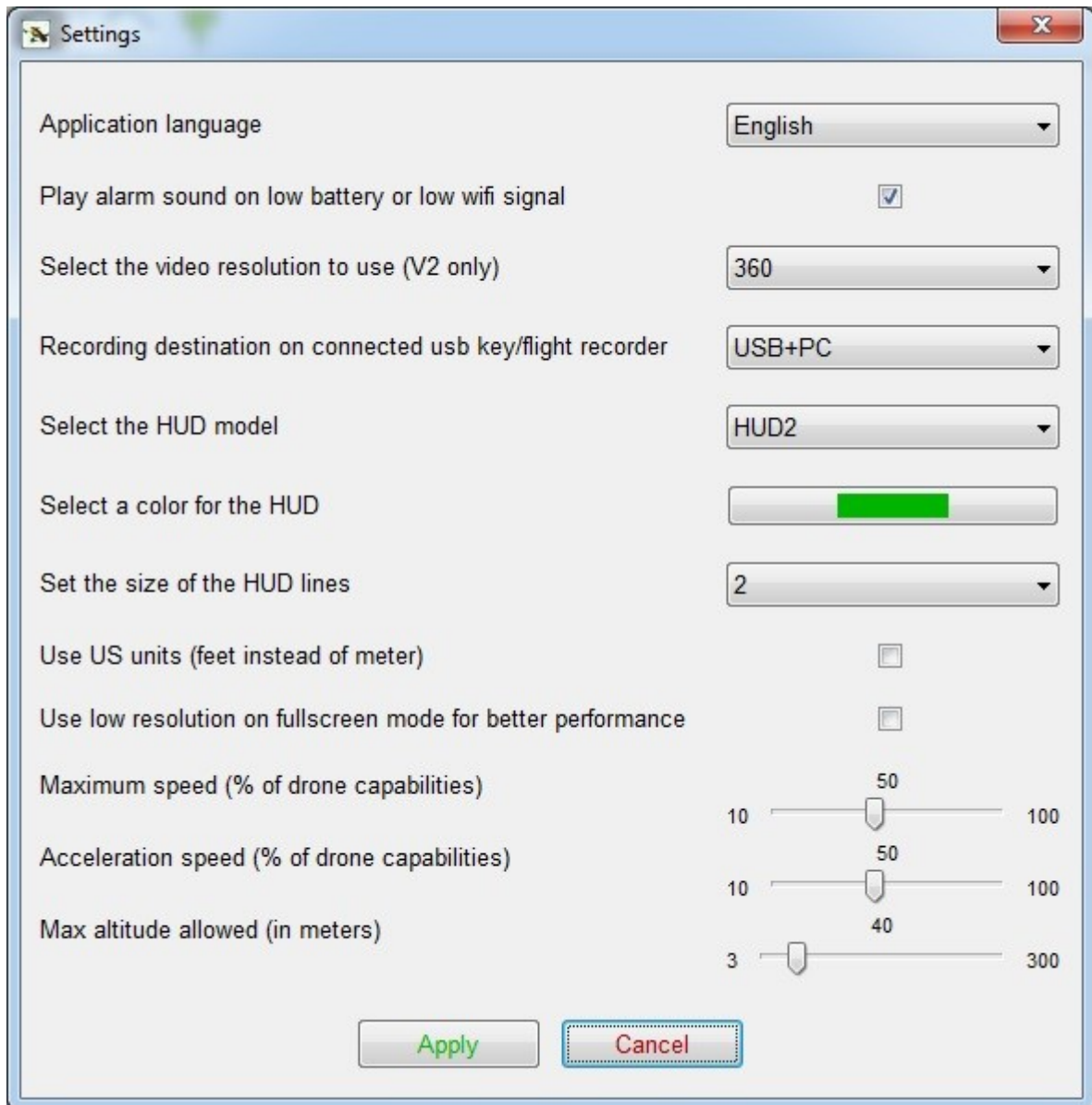   Switch between bottom and front camera (= C key)
    Start and stop recording on pc or usb (= R key)
    Take a photo (= P key)
    Return to starting position (= H key)
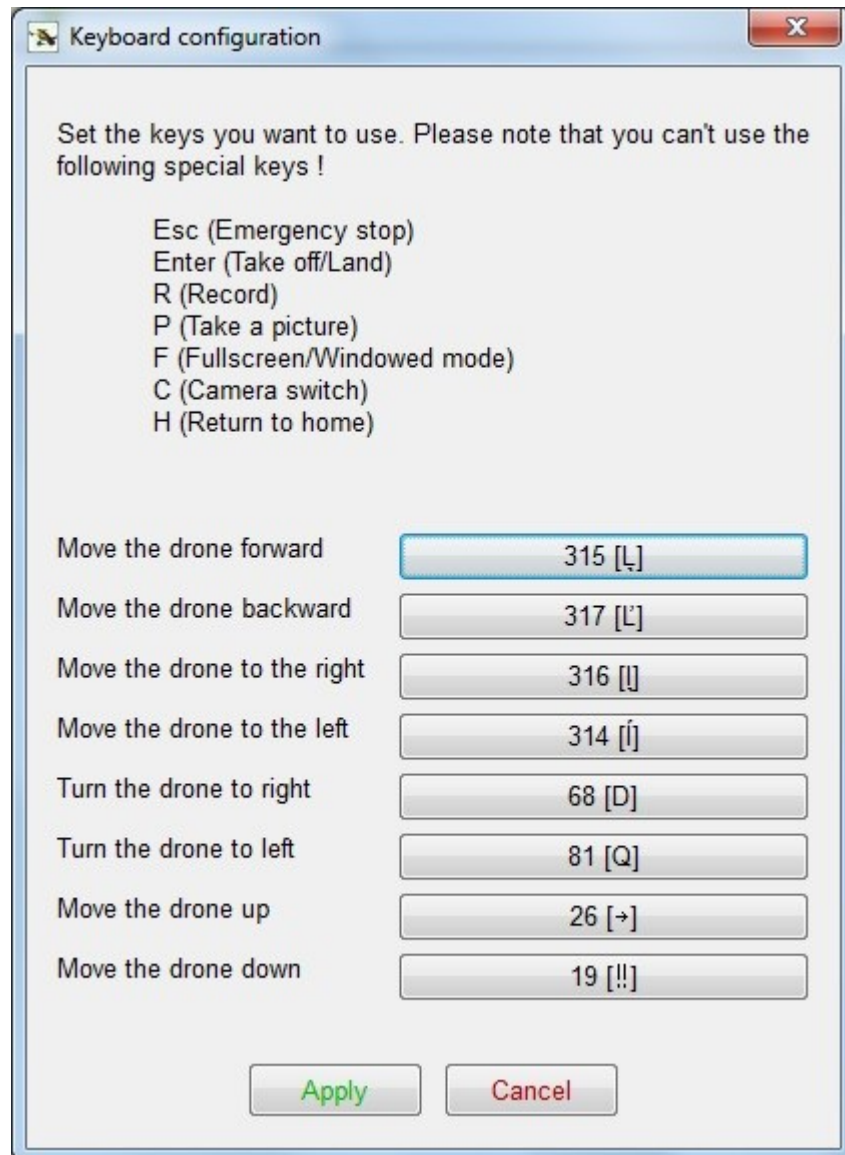   Set the current position of the drone as start position

4. Settings

The 720P video images (v2 only) are more beautiful but needs more network bandwidth, which means a good wifi signal quality. If the video is lagging, try the 360p resolution or stay closer to the pc.

Note: You should avoid to change the video settings while you are flying, as sometimes the switch fail and the program hangs. The best practice is to set the desired codec before you take off. Recording on usb will force the resolution of the drone to 360p, this is a limitation of the drone. Recording on pc is not affected.

The low resolution on fullscreen mode is only usefull for laptops with slow processors, and with big screen resolution. This option will force a low resolution on fullscreen mode, so you will have more frames per seconds.

5. Keyboard configuration

Keyboard configuration

Set the keys you want to use. Please note that you can't use the following special keys !

Esc (Emergency stop)
Enter (Take off/Land)
R (Record)
P (Take a picture)
F (Fullscreen/Windowed mode)
C (Camera switch)
H (Return to home)

Move the drone forward	315 [L]
Move the drone backward	317 [L]
Move the drone to the right	316 [I]
Move the drone to the left	314 [Í]
Turn the drone to right	68 [D]
Turn the drone to left	81 [Q]
Move the drone up	26 [→]
Move the drone down	19 [‼]

Apply   Cancel

Only direction keys can be modified. To do this, click on the button corresponding to the option you want to change, then press the key you want to assign. Don't assign one of the special key displayed at the top of the dialog (The program will not allow it).

The following key are assigned to special functions of the drone and can't be reassigned.
Escape - Emergency stop
Enter - Take off and Land
F - Full screen mode / windowed mode
C - Switch camera
R - Start and stop recording
P - Take a photo
H - Activate RTH (Return to Home)

The keys used to control the drone can be changed. The default language of the program is english, so the keys are configured for qwerty keybords:
Arrow up – Move forward
Arrow down – Move backward

Arrow left – Move to left
Arrow right – Move to right
A – Turn to left
D – Turn to right
W – Go up
S – Go down

When you switch the language to french, the last keys (A, D, W, S) are modified to azerty keyboard:
Q – Turn to left
D – Turn to right
Z – Go up
S – Go down

Note: As soon the configuration is edited and saved, a language change will not modify it again.

6. Joystick configuration

Important: The joystick must be plugged in on application start ! Only one joystick can be used at the same time !
The application recognize the connected joystick and loads the appropriate configuration file. If the joystick has not been configured, you will be invited to do it.
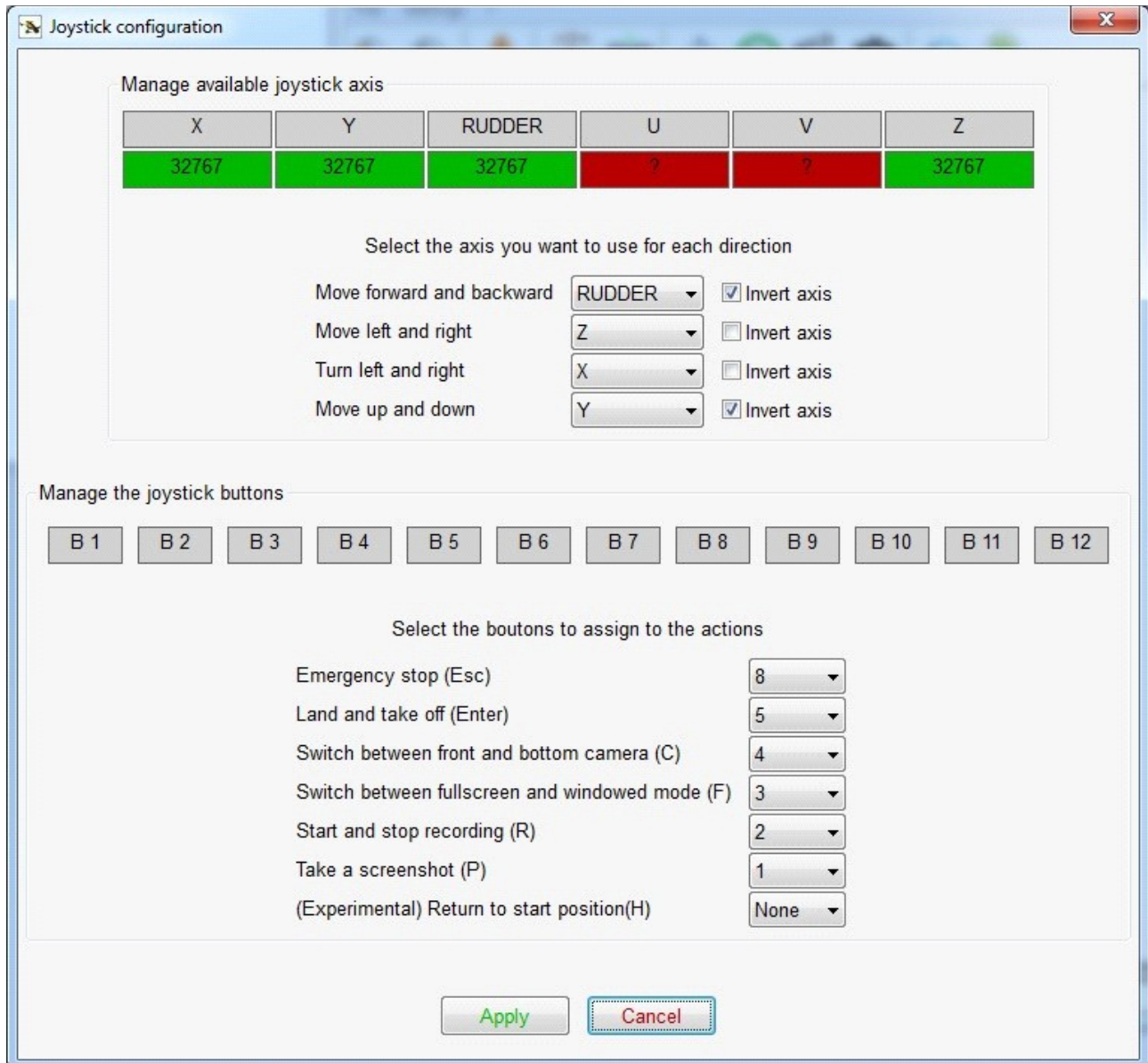
Available axis are displayed with raw values from the operating system, this should allow to identity the axis. You can assign an axis to a direction of the drone, and invert it if necessary. The buttons of the joystick can also be assigned to actions.

Be sure that the values pitch, roll, yaw and altitude at the bottom of the main screen are set to 0 when the joystick is centered, otherwise you will have to calibrate it !
Some joysticks have an option «analog» that must be activated, otherwise some axis may not be recognized, or recognized as simple buttons !

7. RTH – Return to home

7.1 With GPS

Once the flight recorder has detect enough satellites, you will be able to take off. The home point is set to the starting point, but can be set using the corresponding toolbar option.
Activate the RTH option, and the drone will fly to the home point automatically.

7.2 Without GPS

Attention: This option is experimental, use it with caution !

The program calculate continously the position of the drone, using the onboard sensors. When the RTH is activated, the program calculate the way to home.
The position of the drone is not very accurate as it depends on the calibration of the drone and weather condition, use it with caution !

8. Wifi range

With a smartphone or a table, the range is often limited to less then 330ft (100m). The advantage of the pc, is that it is possible to add a more sensitive external usb wifi card, with an antenna to extend the range, without loss of video.

9. Issues and solutions

Unable to connect to the drone

Verify that the pairing option is not active, and that the pc is connected to the wifi network of the drone.

Verify the ip address of the drone. The default address is 192.168.1.1, if your drone has another ip address, you should set it as destination address using the option « Ip Address » of the « Options » menu.

The drone is drifting

Verify that the values of the bottom of the main screen are set to 0 when the joystick is centered, otherwise you should calibrate the joystick using the operating system tool (Execute > joy.cpl)

On an plane and monochrome surface, or dark environment, it may happen that the bottom camera is unable to detect drifting.

The video disappear and the screen becomes grey for several seconds

The video signal has been lost, the video thread must be restarted. Try to fly closer and avoid flying zones with many wifi access points.

Recording on usb doesn't work

The usb key has not been recognized, or is incompatible. Try to connect the usb key before the battery is plugged.

Use Parrot's Ar Freeflight and make sure the option « record on usb » is active.

The saved configuration of a joystick does not work / All joystick axis are not recognized

Verify if the joystick is in « analog » mode, otherwise use the calibration option of Windows to check the joystick.

More informations about problems can be found in the Error.log file, that is saved in Data/Log.