Ar Drone Controller

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.

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

Features of the program:

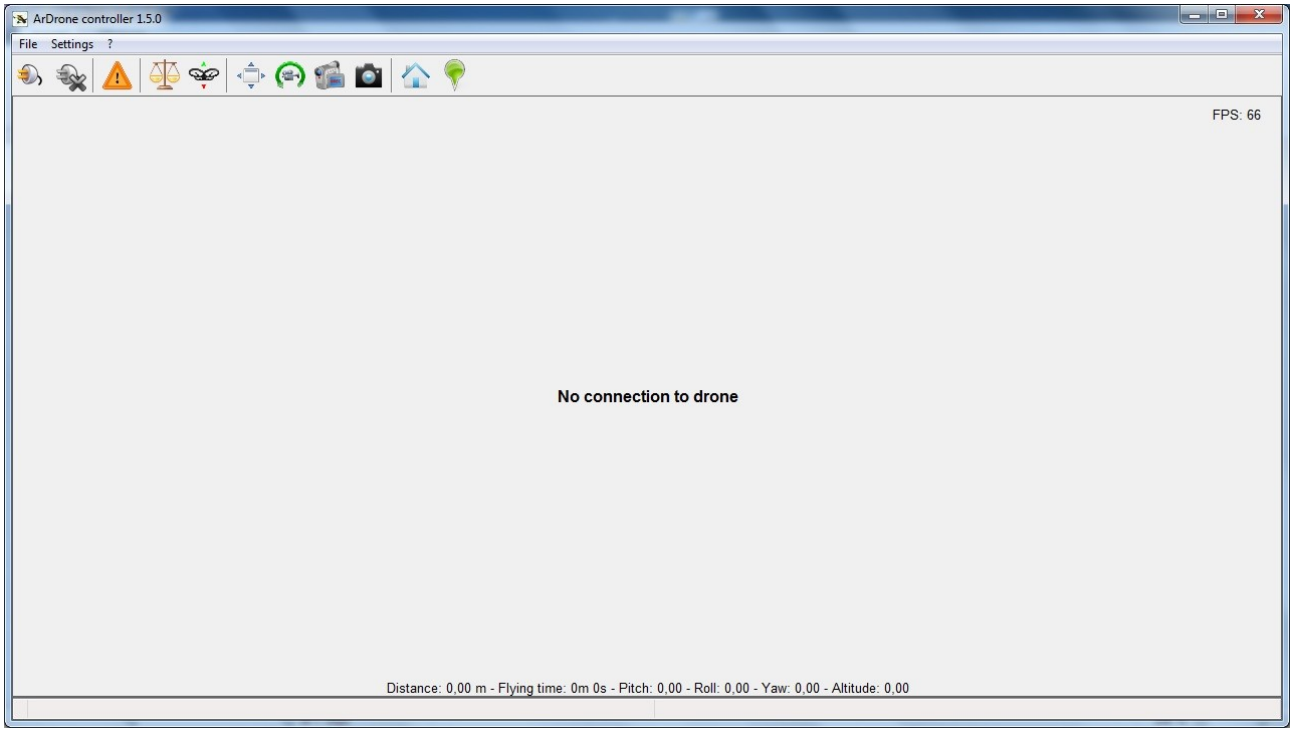
- Compatible with Ar Drone 1 and Ar Drone 2.
- Video on pc from front and bottom camera in 360p or 720p (V2 only).
- Control the drone using the keyboard or a joystick/joypad.
- Assign joystick/joypad buttons to drone actions.
- Alarm for low battery or low wifi signal.
- Head Up Display that display direction, speed and altitude.
- Limitation of speed, acceleration and altitude.
- Record on pc or usb (v2 only) and take pictures.
- Support of RC mod for video display (Experimental).
- Option Return to Home (Experimental).
- Multiples languages are available : English, French and German.

2. Prerequisites

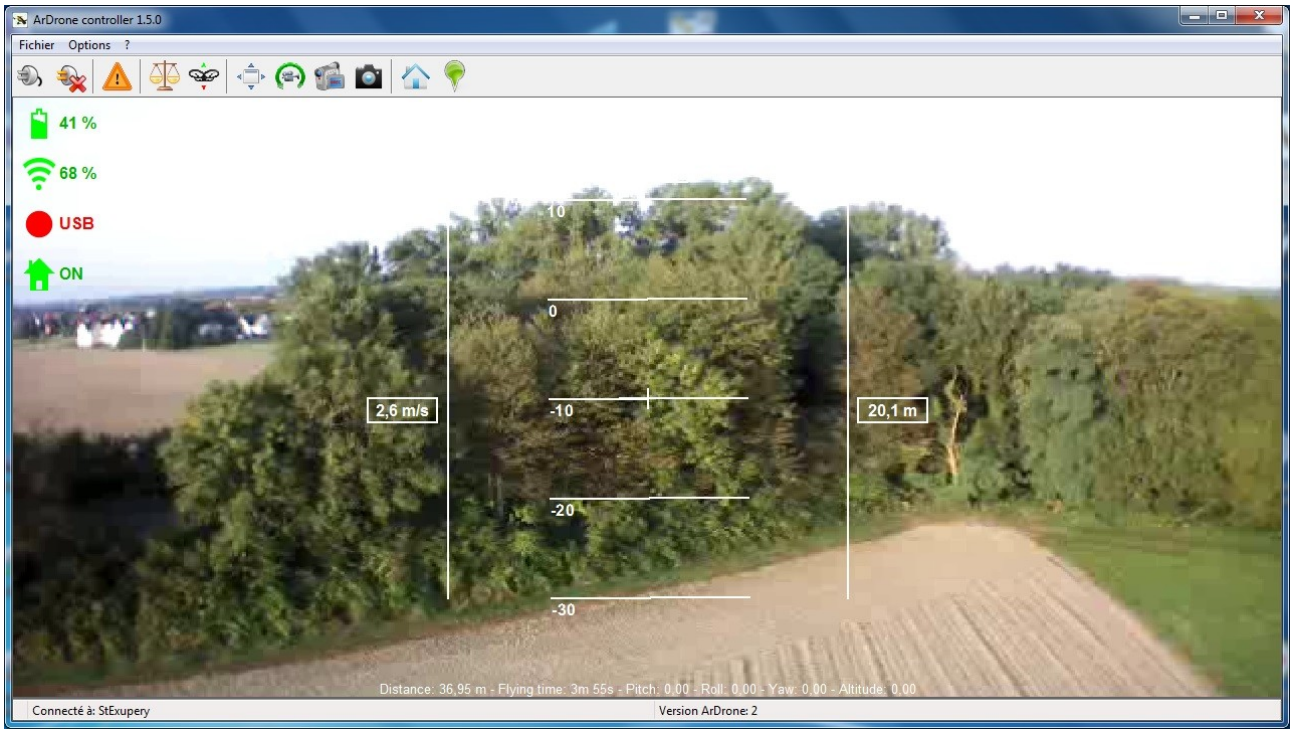
Ar Drone Controller is destinated to be used on Windows pc, in all recent versions, 32bits and 64 bits. The application is compiled as a 32 bit application, but runs on 64 bit Operating Systems, except WP 64 bits.

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: This option is available once the pc is connected to the wifi network of the drone, but the option is disabled as soon the program is connected to the drone, for performance reasons.
- **Quit:** Close the program

Settings

- **General:** Open the main options dialog.
- **Keyboard:** Open the Keybord configuration dialog.
- **Joystick:** Open the Joystick configuration dialog.

?

- **About:** Open an about dialog with version.

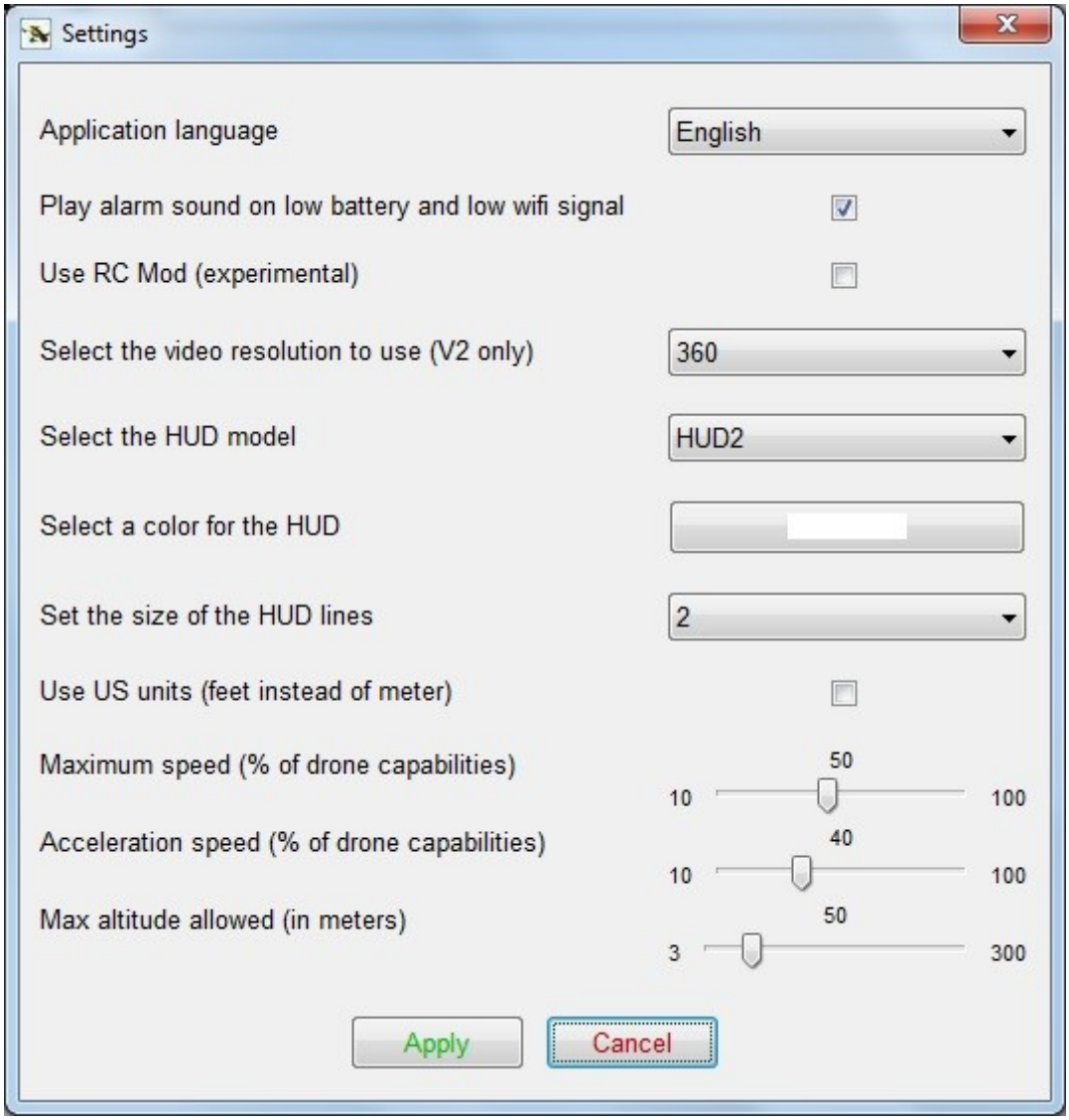
3.2 Toolbar

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

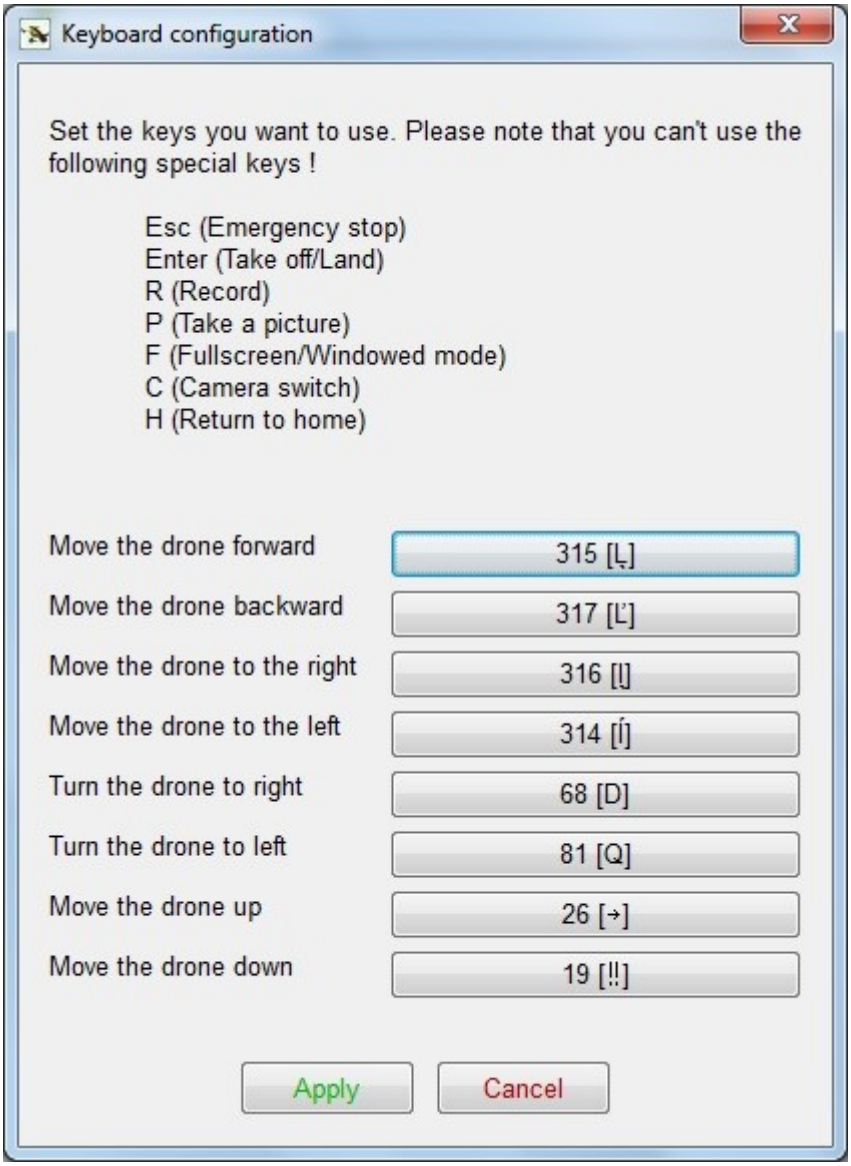
4. Settings



The options are easy to understand, but two points have to be explained. The first point is about the RC mod. Only the video is active, but this mod is experimental, so you will have to test it :)
The second point is about video quality. 720P 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: Recording on usb will force the resolution send to the drone to 360p, this is a limitation of the drone.

5. Keyboard configuration



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

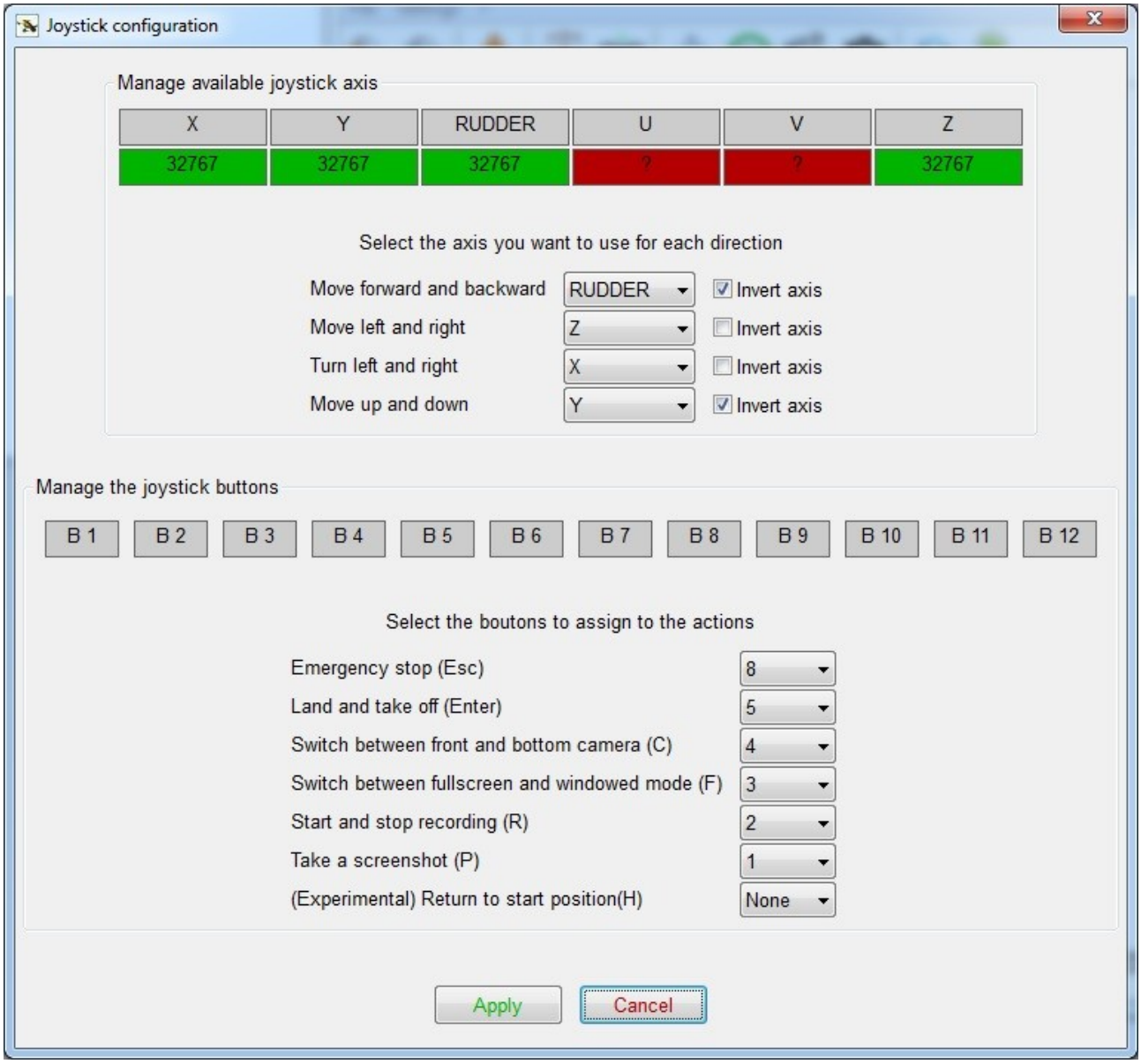
Arrow down – Move backward
Arrow left – Move to left
Arrow right – Move to right
A – Turn to left
D – Turn to right
W – Go up
S – Go down

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 !



Available axis are displayed with current values. 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

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

The RTH option allows the drone to return to his starting point, without GPS. To do this, the program calculate continously the position of the drone, using the onboard sensors. When the option 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, it should not be compared with a gps guided RTH !

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.

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

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.

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.