

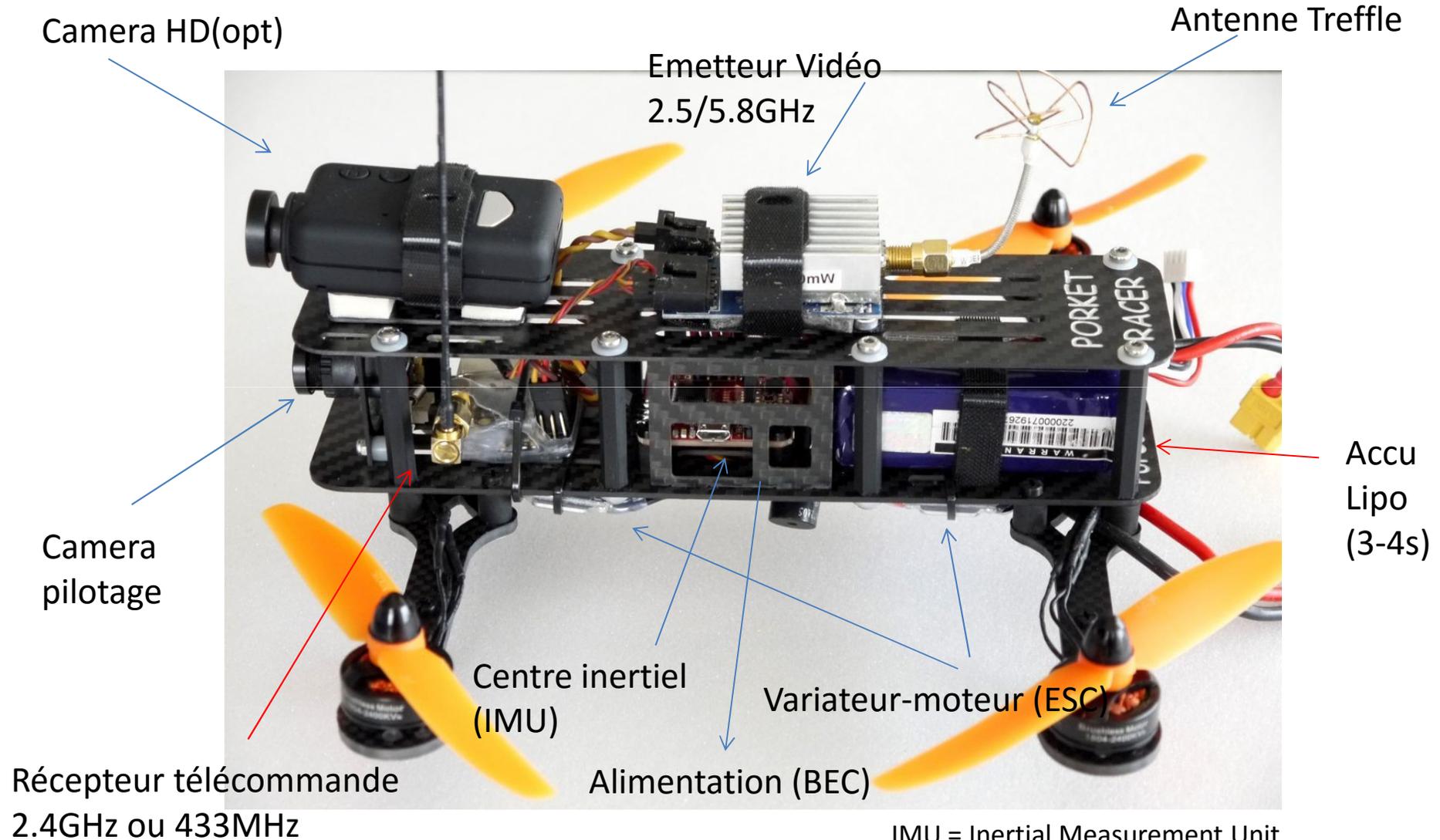
Agenda

1. Fonctions
2. Structure des solutions
3. Modularité
4. Compilation
5. Configuration
6. Extension
7. Exemple pratique
8. Q&R

Fonctions de base

- Télécommande (norme de transmission, fréq.)
- Mixage moteur, PID
- Equilibre (Gyro, accéléromètre)
- Vidéo (FPV, vol en immersion)
- Orientations (Magnétomètres)
- Etat et consommation ACCU

Fonctions de base

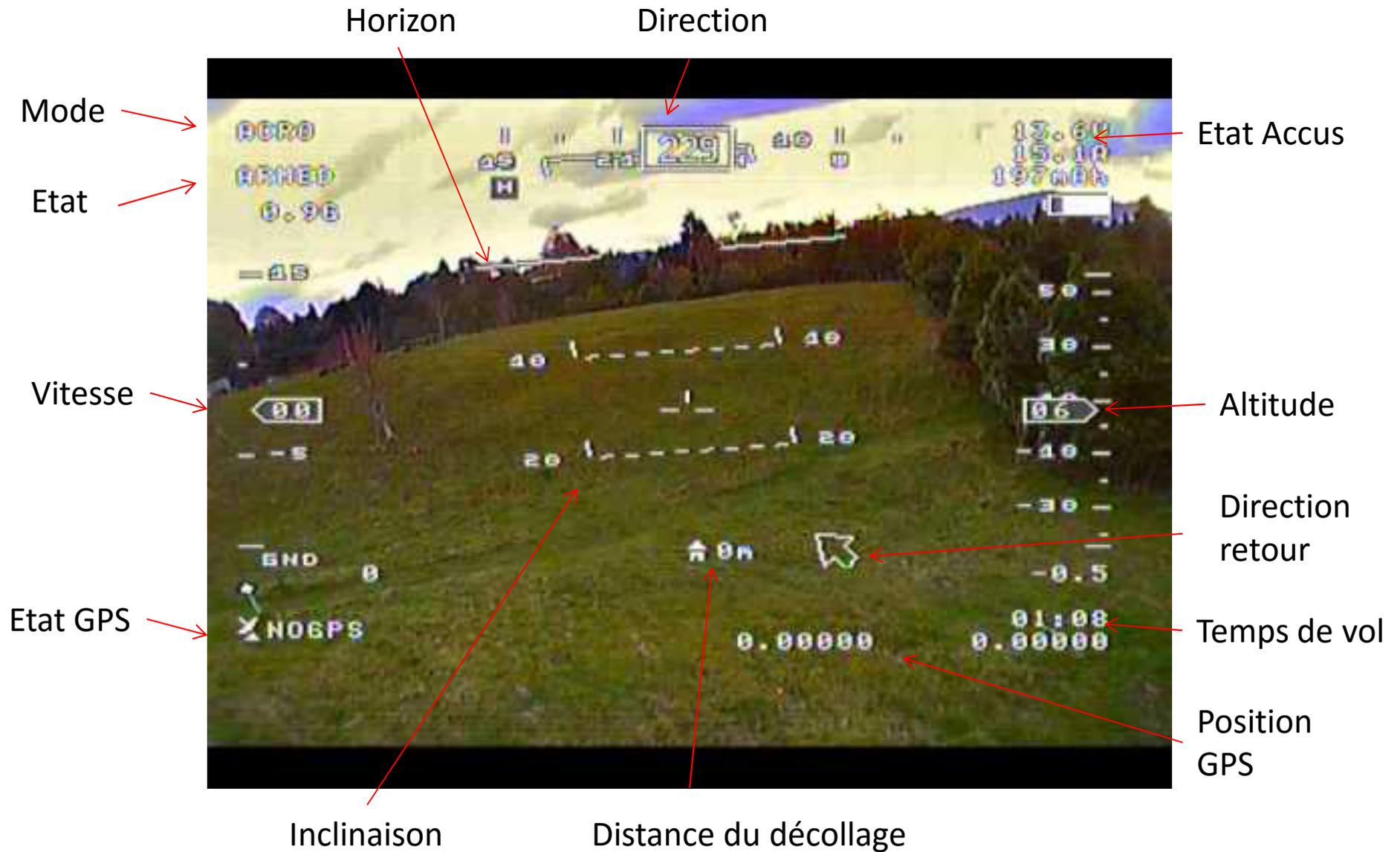


IMU = Inertial Measurement Unit
BEC = Battery Elimination Circuit
ESC = Electronic stability control

Fonctions optionnelles

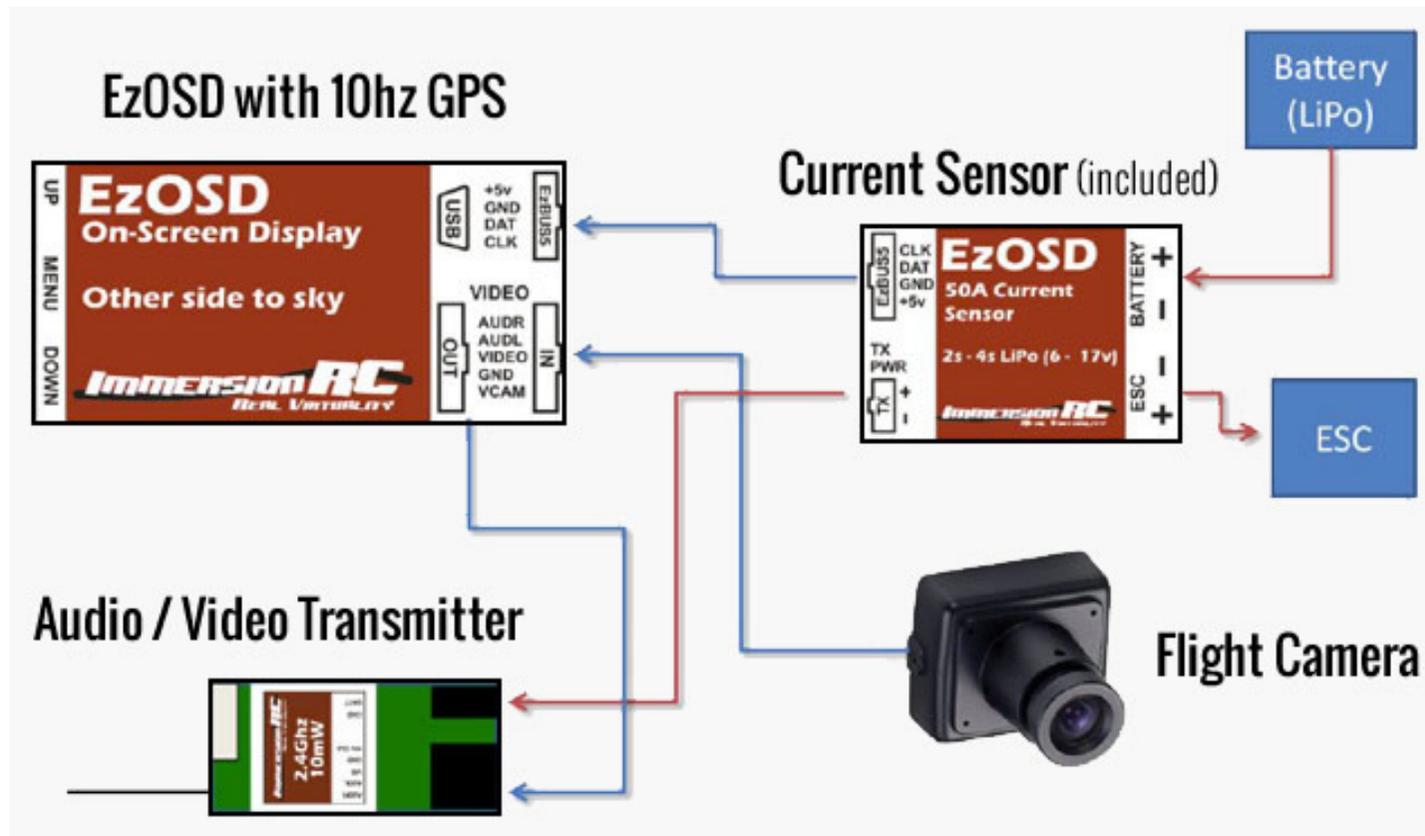
- OSD, insertion vidéo (page suivante)
- Camera vidéo HD
- Télémétrie (transmission de données de vol)
- GPS (localisation, retour automatique)
- Configuration de l'aéronef
- Affichage LED
- Enregistrement de données de vol

Exemple OSD



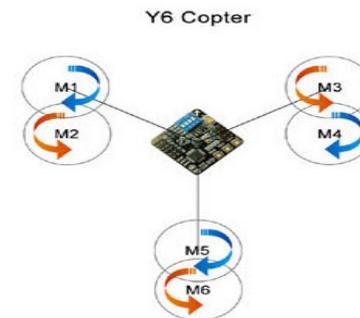
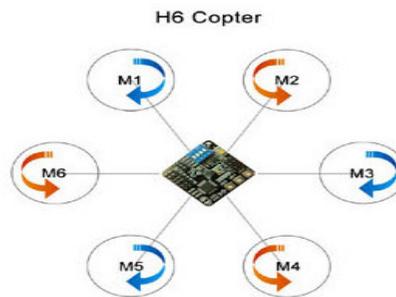
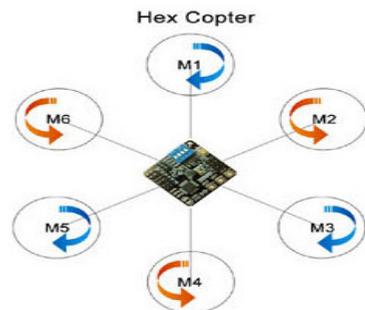
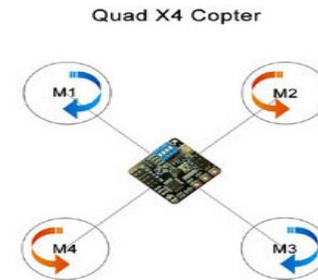
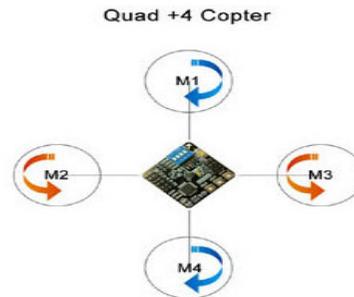
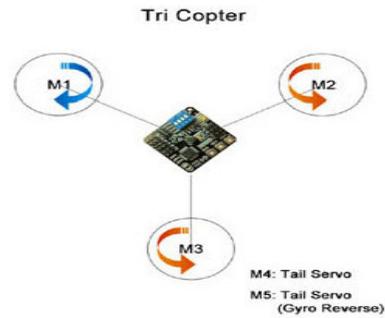
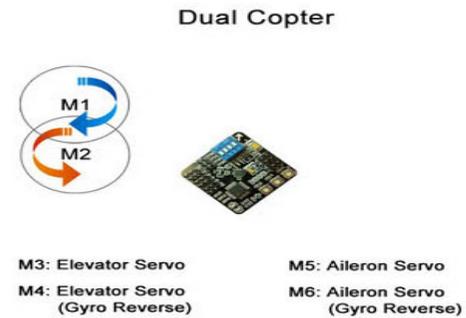
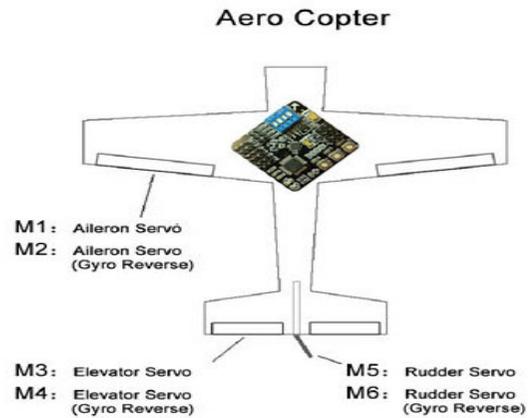
OSD (On screen Display)

Incrustation de données dans l'image (Style HUD)



HUD = Head Up Display

Configuration de l'Aéronef



Fonctions intégrées dans l'IMU

- Fonctions Hardware

1. PWM Moteurs
2. PPM in/Radio
3. Battery mon.
4. Buzzer
5. FR-Telemetry
8. Bluetooth
9. Reset

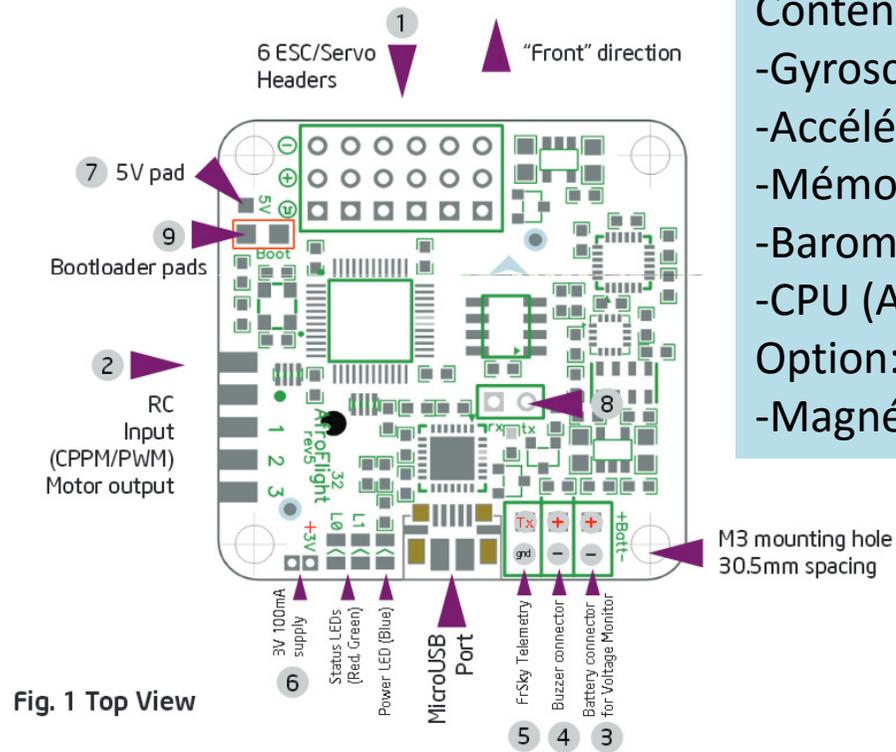
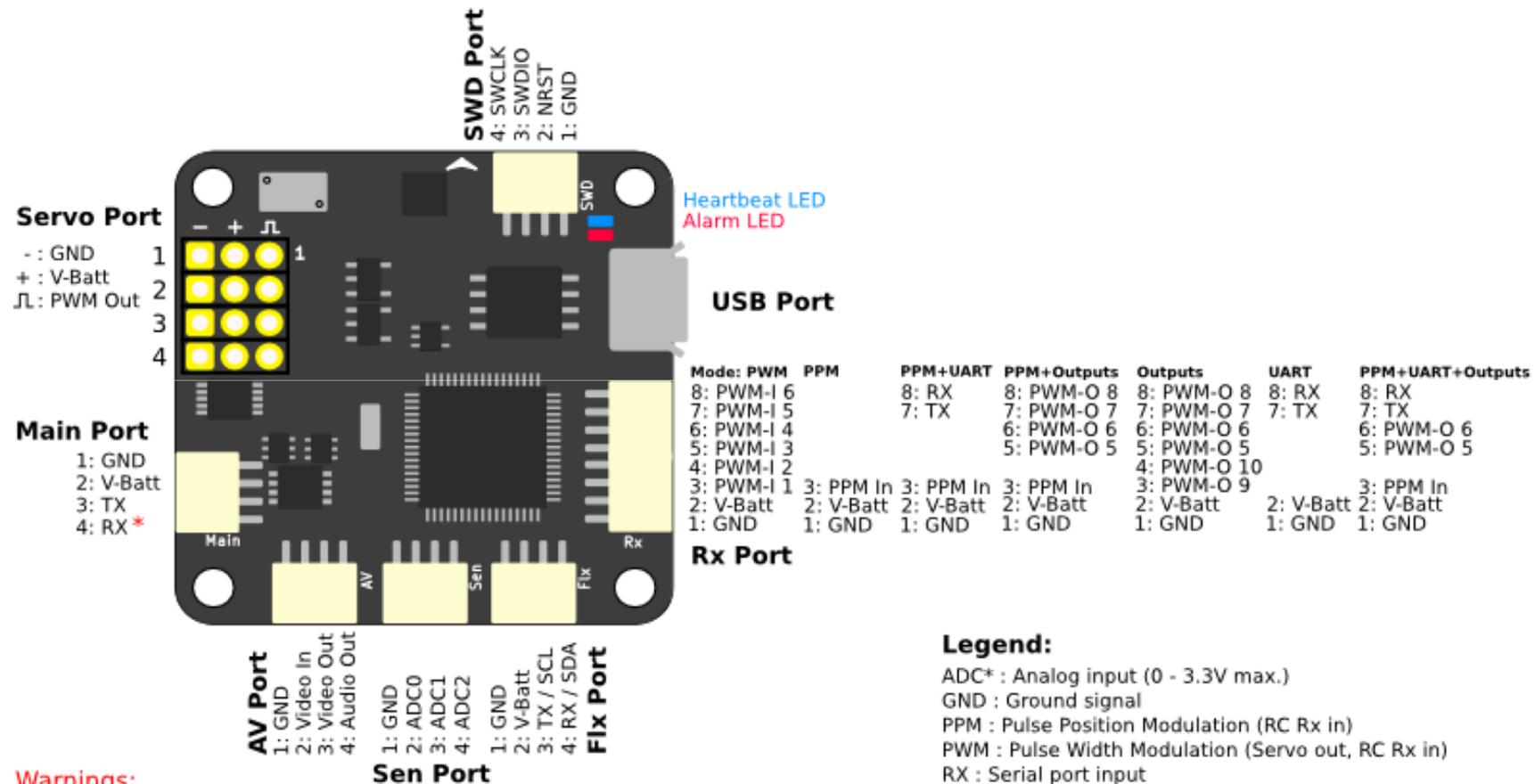


Fig. 1 Top View

Contenu minimal:
-Gyroscope
-Accéléromètre
-Mémoire
-Baromètre
-CPU (ARM)
Option:
-Magnétomètre

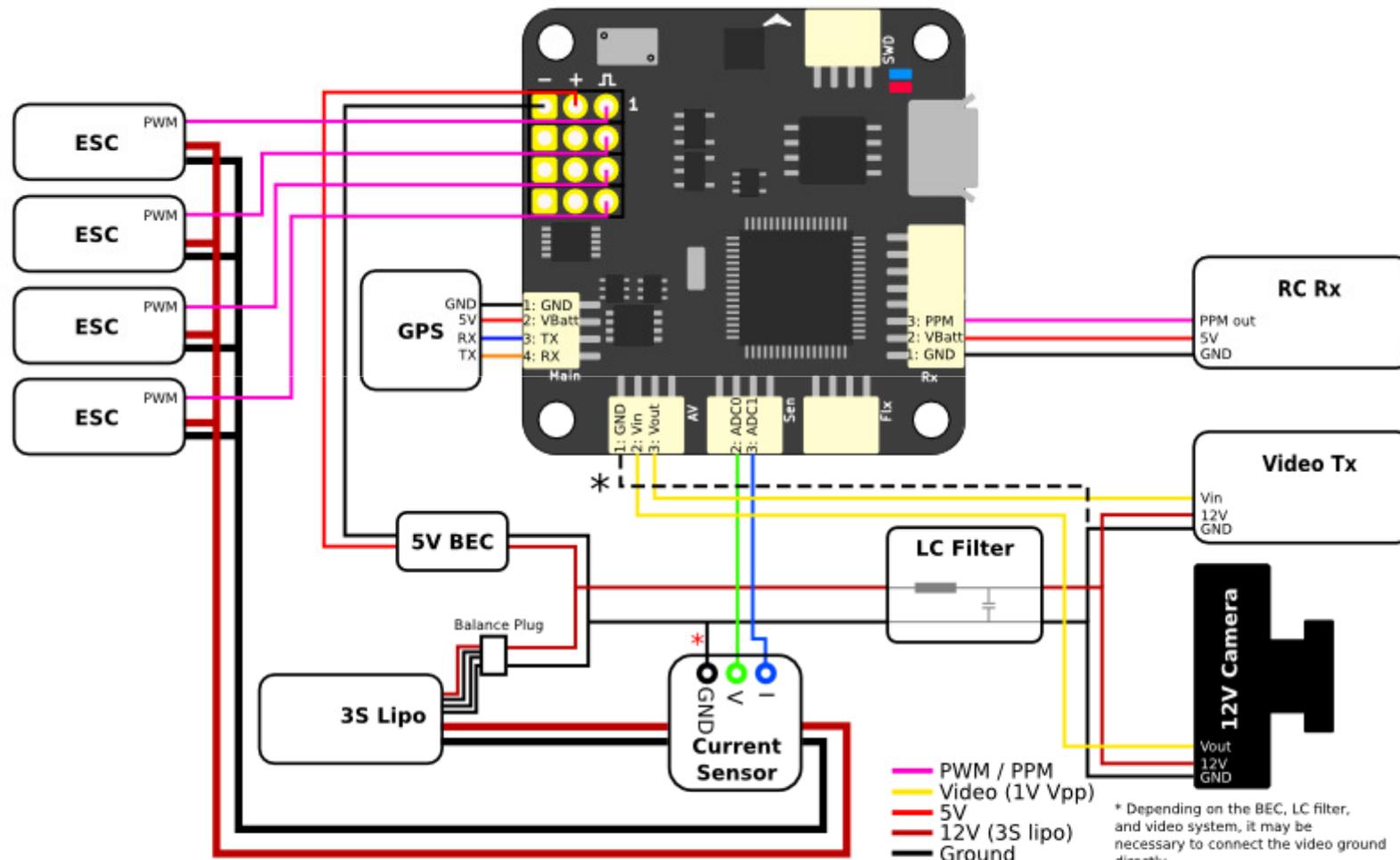
Flexibilité du HW



Warnings:

- All digital inputs are 5V tolerant, except Main Port RX (3.3V)
- ADC input max. voltage 3.3V, higher voltages will damage the board
- V-Batt max. voltage 6V, do not draw more than 1A combined on all ports

Câblage



* Note: When powering part of the system through the balance plug as shown here, connect the GND from the balance plug to the sensor. Failure to do so can result in the full lipo voltage being output on the V port of the sensor, which will possibly damage the Brain.

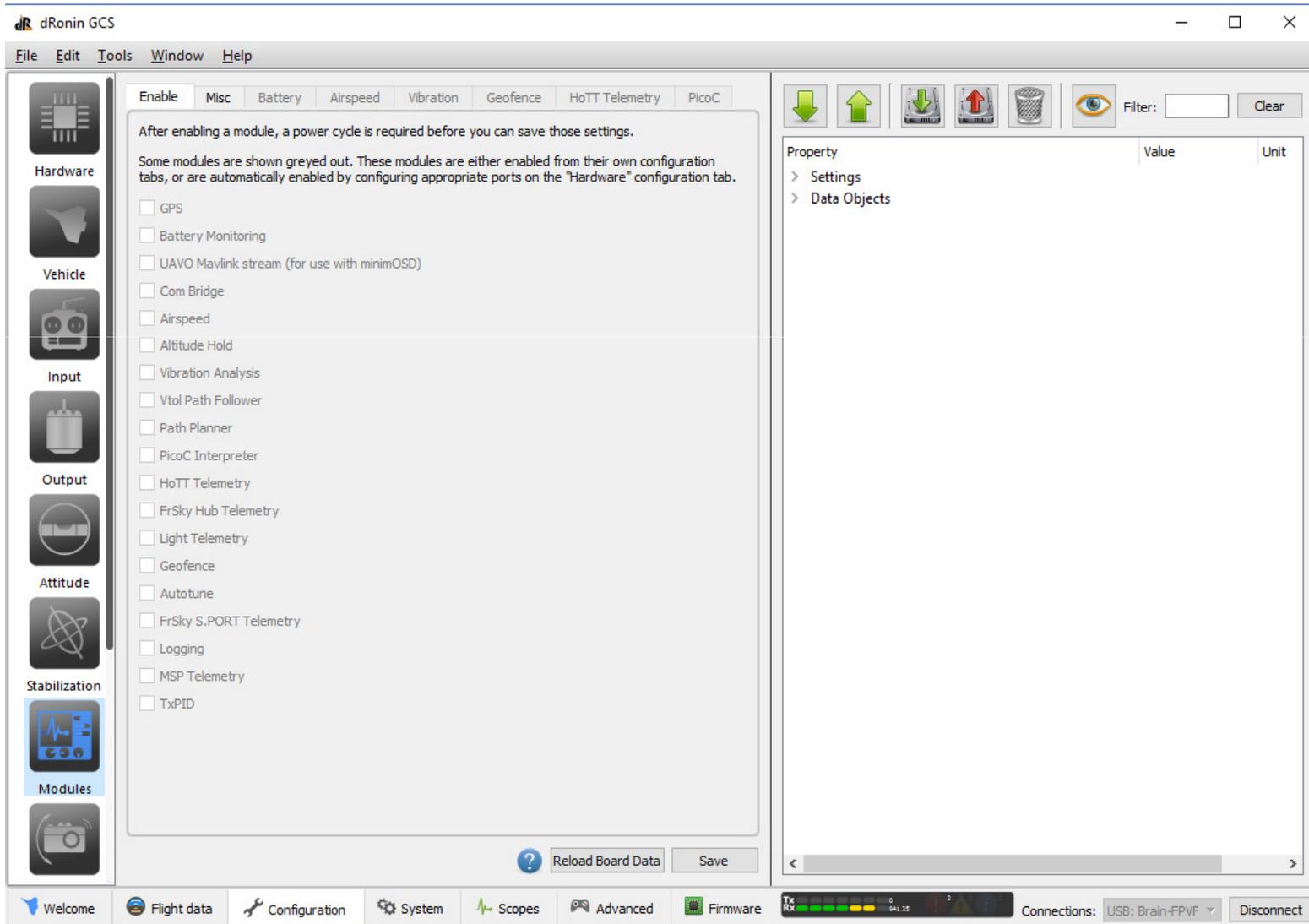
Fonctions Proiciel

- Configuration Aéronef (Mixage Fix->Flash)
- Stabilisation (Giro,.. Param. PID ->Flash)
- Configuration Moteur (format, vitesse,...)
- Télémétrie, envoi de données au sol (FrSky)
- Format GPS
- Fonctions des LED's (couleur, flash,...)
- Plan de vol

DEMO

Taulabs/dRonin

Paramètre du drone



Vérification des interfaces

mise à jour des données, suivi GPS, console

The screenshot displays the dRonin GCS (Ground Control Station) software interface. The window title is "dRonin GCS". The menu bar includes "File", "Edit", "Tools", "Window", and "Help".

The main interface is divided into several sections:

- Property Table:** A table with columns for "Property", "Value", and "Unit". The "Data Objects" section is expanded, listing various data points such as "AccelDesired (12 bytes)", "Accels (16 bytes)", "ActuatorDesired (24 bytes)", "AttitudeActual (28 bytes)", "GCSReceiver (16 bytes)", "GCSTelemetryStats (21 bytes)", "Gyros (16 bytes)", and "INSState (128 bytes)".
- Play/Pause Controls:** Includes "Play" and "Pause" buttons, a "Status: Idle" indicator, "Playback speed: 1.00", and "Jump to: 0.00s".
- Flight Status:** Displays "Coord: 0°0.000' S 0°0.000' W 0.00 m", "Speed: 0.00 m/s", "Heading: 0.00 deg", and "H / V / P DOP: 0.00 / 0.00 / 0.00". It also shows "Sats Used: 0" and "Fix Type: No GPS".
- Map:** A circular compass rose and a world map showing the drone's location.
- Console Log:** A scrollable area containing debug messages, including "usbmonitor detection cycle complete", "Bootloader disconnection detected", and "TelemetryMonitor: connected".
- Bottom Bar:** Contains navigation tabs for "Welcome", "Flight data", "Configuration", "System", "Scopes", "Advanced", and "Firmware". It also shows "Connections: USB: Brain-FPVF" and a "Disconnect" button.

Interface télémétrie dRonin

The screenshot displays the dRonin GCS (Ground Control Station) interface. At the top left, the title bar reads "dRonin GCS" with standard window controls. Below it is a menu bar with "File", "Edit", "Tools", "Window", and "Help".

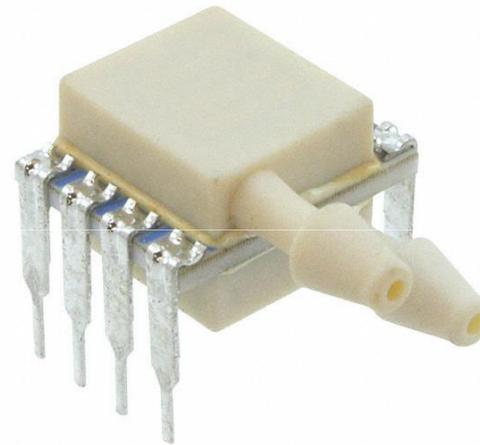
The main interface is divided into several sections:

- Top Left:** "FlightTime 1286" and "ARM" status (indicated by a red prohibition sign). A "Manual" button with a stick figure icon is also present.
- Top Right:** "Normal" mode, "Magic Waypoint" button, and a "Go To Place:" input field.
- Center Left:** A 3D attitude indicator showing roll, pitch, and yaw. It includes a heading scale at the top (0 to 340 degrees) and vertical scales for roll (0 to 10) and pitch (0 to 20). A small aircraft icon is shown at the bottom with "0/831" next to it.
- Center Right:** A large world map showing the drone's current location over the Atlantic Ocean. A compass rose is visible in the top left of the map area.
- Bottom Left:** A small 3D model of the drone.
- Bottom Center:** A system status panel with various indicators:
 - Power, Battery, 1:Telemetry, 2:GPS, 3:AUX
 - Sensors, I2C, Temp/Baro
 - 1 Servo, 2 Gimbal, 3 System config, 4 Path Planner
 - 5 Boot Fault, 6 Path follower, 7 Attitude
 - 8 CPU, 9 Stack, 10 Memory
 - Event System, Stabilization, Flight Time
 - PWR Sense, ADC In, USB, I2C, I2S, I2C
 - RC Input (1-8)
- Bottom Right:** A status bar with coordinates: "0.000000 lon: 0.000000 293.1deg 2. 0000000 0.000000 2792290 -152.9296 -5.2631e+06 -1.7024e+07 ---".
- Bottom Bar:** A navigation bar with tabs: "Welcome", "Flight data", "Configuration", "System", "Scopes", "Advanced", "Firmware". On the right, it shows "Connections: USB: Brain-FPVF" and a "Disconnect" button.

Projet: ajout d'un capteur Avantage OpenSource



MPXV7002 Tension proportionnelle
à la pression relative



MS4525 Alimentation
3.3v Interface I2C

dRonin, Open-Source (GIT)

The image displays a file explorer window for the dRonin project, showing the build process. The main window shows the project root with a list of folders and files. The 'ground' folder is selected, and its contents are shown in a sub-window. The 'shared' folder is also selected, and its contents are shown in another sub-window. The 'build' folder is selected, and its contents are shown in a third sub-window. A yellow lightning bolt icon is present next to the 'build' folder, indicating a build process. The text 'Make' is displayed in the center, with the commands '>make?', '>quanton', and '>make gcs' listed below it. The size of the project is indicated as 2.7GB, and the size of the build folder is indicated as 470k.

Project Root:

- .git
- .github
- androidgcs
- artwork
- branding
- build
- Doxygen
- flight
- ground
- make
- matlab
- package
- python
- shared
- tools
- .gitignore
- .gitmodules
- .mailmap
- CREDITS.txt
- gcs.sh
- Governance.md
- LICENSE.md
- LICENSE.rtf
- LICENSE.txt
- LicenseTemplate.txt
- Makefile
- README.md (2.7GB)

ground:

- docs
- gcs
- uavobjects
- uavobjgenerator
- ground.pro

shared > uavobjectdefinition:

- acceldesired.xml
- accels.xml
- accessorydesired.xml
- actuatorcommand.xml
- actuatordesired.xml
- actuatorsettings.xml
- airspeedactual.xml
- airspeedsettings.xml
- altitudeholddesired.xml
- altitudeholdsettings.xml
- altitudeholdstate.xml

mydRonin > build:

- bl_aq32
- bl_brain
- bl_cc3d
- bl_discoveryf4
- bl_flyingf3
- bl_lux
- bl_pipxtreme
- bl_quanton
- bl_revolution
- bl_sparky
- bl_sparky2
- bu_aq32
- bu_brain
- bu_cc3d
- bu_discoveryf4
- bu_flyingf3
- bu_lux
- bu_pipxtreme
- bu_quanton
- bu_revolution
- bu_sparky
- bu_sparky2
- ef_aq32
- ef_brain
- ef_cc3d
- ef_discoveryf4
- ef_flyingf3
- ef_lux

Make

```
>make ?  
>quanton  
>make gcs
```

470k

Ajout d'un capteur Pression

- Copier le code du GIT dans un dossier local
- Installer les outils (MingW32, Python, QT, ARM-SDK, OpenSSL)
- Définition des paramètres communs (uavdefs..)
- Prévoir un Switch pour l'activer (pios_config.h)
- Ajouter le code qui permet de sélectionner le capteur dans l'interface graphique si nécessaire (ground)
- Modifier le code 'airspeed.c' qui contient l'activation dans le drone
- Ajouter le code dans la bibliothèque des modules 'MS4525.c'
- Ajouter le code dans la liste des objets à compiler 'make.mk'

Démo Cleanflight

CLEANFLIGHT
CONFIGURATOR 1.2.2

Port: /dev/rfcomm0 Manual Selection
115200
Auto-Connect Connect

2016-05-21 @ 00:24:27 -- Running - OS: Windows, Chrome: 50.0.2661.102, Configurator: 1.2.2 Show Log

CF Welcome

Documentation & Support
Firmware Flasher

Welcome to
CLEANFLIGHT

Welcome to **Cleanflight - Configurator**, a utility designed to simplify updating, configuring and tuning of your flight controller.

Hardware
The application supports all hardware that can run cleanflight (SPRacingF3, Vortex, Sparky, DoDo, CC3D/EVO, Air Hero 32, Flip32+/Deluxe, DragonFly32, CJMCU Microquad, Chebuz F3, STM32F3Discovery, Hermit, Naze32 Tricopter Frame, Skyline32, Naze/32/Mini/Pro/Blackbox etc)

The firmware source code can be downloaded from [here](#)
The newest binary firmware image is available [here](#),
development builds available [here](#)

Latest **CP210x Drivers** can be downloaded from [here](#)
Latest **STM USB VCP Drivers** can be downloaded from [here](#)
Latest **Zadlg** for Windows DFU flashing can be downloaded from [here](#)

Contributing
If you would like to help make Cleanflight even better you can help in many ways, including:

- Answering other users questions on the forums and IRC.
- Contributing code to the firmware and configurator - new features, fixes, improvements
- Testing **new features/fixes** and providing feedback.
- Helping out with **issues and commenting on feature requests**.
- Donating, buying a T-Shirt or buying an SPRacingF3 board

Open Source / Donation Notice
This utility is fully **open source** and is available free of charge to all **cleanflight** users.
If you found the cleanflight or cleanflight configurator useful, please consider **supporting** its development by donating.

[Donate](#)

SPONSORS

MassiveRC Armattan Quads Bungeecow Multirotors Immersion RC RadioC
MultiWiiCopter OverSkyRC Multi Rotor Mania Scorpion Power Systems MultiGP MakeltBuildt

Port utilization: D: 0% U: 0% Packet error: 0 I2C error: 0 Cycle Time: 0 1.2.2

Questions & Réponses

Matériel nécessaire

Avion, drone, racer

+ Contrôleur (Naze, Sparky,...)

+ Logiciel (cleanflight, taulabs)

+ Accus

+ Radiocommande (Graupner, FrSky,...)

- Achat d'un ensemble complet (immersionrc.com)

- Montage de sa propre configuration (Hobbyking)



Matériel

- Cartes disponibles dans les shops spécialisés
- En ligne Hobbyking, Banggood
 - Naze32*
 - Sparky32
 - Quanton*
 - Revo
 - Brainfpv *
 - CC3D



Cartes disponibles sur internet ou dans des magasins spécialisés

Logiciel Opensource

- Cleanflight -> courses, relativement simple
- Taulabs -> Pilotage automatique (waypoints)
- Openpilot -> Freepilot (solution commerciale)

- Migrations,
 - Cleanflight + Baseflight (Fork GIT)
 - Taulabs devient dRonin (GPS, plan de vol,,)
 - Openpilot devient FREE Pilote

r1 ! Les solutions open-software sont toutes disponibles sur GIT, on peut donc voir des solutions qui migrent (fork) vers de nouveaux produits dès qu'ils sont trop difficile à réintégrer (merge).

Slide 24

r1

Certaines solutions ont disparu depuis 1 année, le marché du Matériel étant pris d'assaut par les sociétés de distribution chinoise, le suivi de chaque produit est très délicat.

rolf; 14.05.2016

Coupe du monde FPV

[Championnat du monde 2016](#)

[Demo course de drones FPV](#)

[Dubai champion chip 2016](#)

