



DPM Elettronica

www.dronesbench.it

Certificato DronesBench

V.1.0

Protocol # 1 (02/03/2019)

This document is the technical report that analyzes, describes and certifies the tests and measurements carried out on the drone according to the CE standard and according to the best practice conducted by DPM Elettronica for tests that are not yet regulated.

The manual that accompanies the DronesBench certificate explains in detail the tools, methods and calculations used during the tests.



1. Introduction

The purpose of this document is to objectively describe the technical characteristics of the drone in multiple operating conditions in order to verify if it is suitable for marketing in the reference countries and to calculate with accuracy the class and operational area according to the most recent European regulations.

It also incorporates the use of existing legislation for electromagnetic compatibility and is proposed as a best practice with regard to the rules and standards not yet present.

The manual that accompanies the DronesBench certificate explains in detail the tools, methods and calculations used during the tests.

Always be careful to match the version of the manual to the same version of the certificate.



2. Customer ID

This technical report was commissioned by IIS G. Ferraris in Via Carlo Don Gnocchi n.2/A Settimo Torinese (TO) rappresentata da Alessandro Dionisio in the figure of Capo del team G. Ferraris.

3. Environment, operators and spectators

The tests began on **12/04/2019** at **17:06** with a temperature of **20 °C** , with a pressure of **1002 mbar** and with a humidity of **52 %** .

The test site is the **DPM Elettronica test laboratory**, in **via Sant'Alfonso de 'Liguori, 61 Foggia**.

They are present during the tests:

Nominativo	Codice fiscale	Ruolo	Firma
GIANMARCO D'URSO	DRSGMR91M24D643B	MISURISTA	

4. Drone features

The drone is named **Kit Drone Bagnino**

Diameter between rotor axes [mm]	380	Minimum battery voltage [V]	11.1 [3S]
Frame diameter [mm]	780	Battery capacity [mAh]	1800
Frame width [mm]	13	Propellers lead [in]	5.0
Propellers diameter [mm]	241	Drone battery C	35 C – 55 C
Alleged payload [g]	600	Battery weight [g]	155
Drone weight (with battery and maximum equipment) [g]	1196	Number of propellers	4

Components	Model e version
Frame	KIT CUSTOM
Imu	OPEN PILOT ATOM MINI CC3D
Esc	PLATINUM PRO 30 A BRUSHLESS
Motors	LHI 2212 920 KV
Propellers	1RANTOW RED 9.4x5.0
Receiver	FLYSKY IA6 2.4 GHz
Trasmitter	FLYSKY FS-I6 2.4 GHz
GPS	-
Radio control	FLYSKY FS-I6 2.4 GHz
Video trasmitter	-

Front and side photo

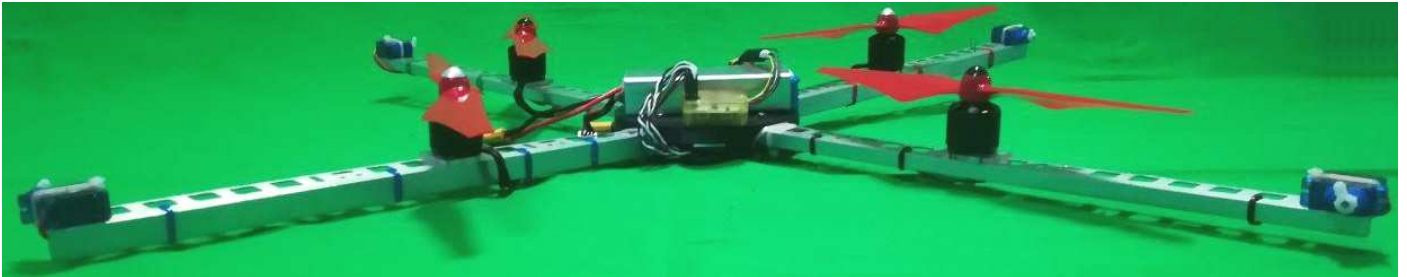
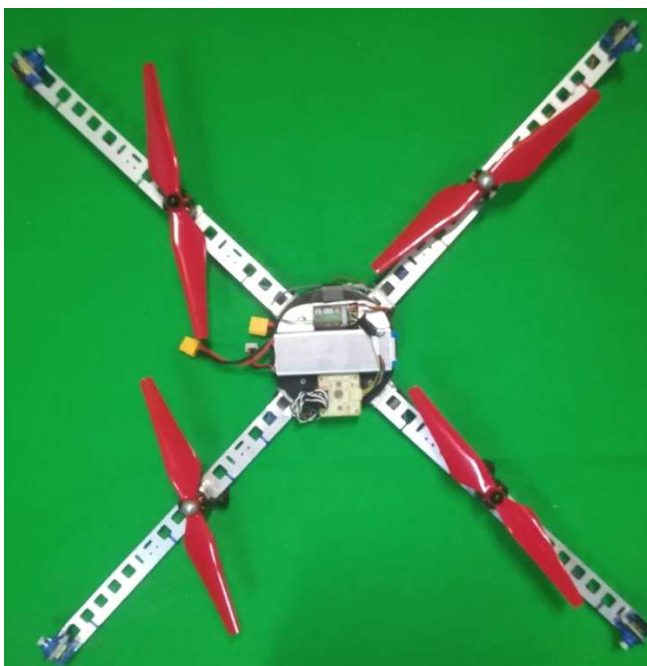


Photo from the top and from the maximum pitch angle





5. Methodology

5.1 Preliminary procedures

The DronesBron model DronesBench with the RMS tester suitable for the characteristics of the drone being tested is used for the following certificate.

The drone is analyzed in all its parts in order to recognize the components to compile this certificate and to search for any anomalies: uninsulated electrical parts, parts not secured to the structure, correct tightening of the propellers, structure integrity.

The calibration of the DronesBench measuring instrument is first verified: the weight measurement with a sample weight and the measurement of the voltage and current by imposing a known absorption.

DronesBench is reset to zero with the RMS tester on the head and then, with power off, the drone is placed on the bench's measuring head.

The position of the drone's center of gravity is centered on the base of the bench.

The feet of the drone are secured on the measuring head with the laces supplied, to then feed the drone through the RMS tester with:

- ✓ 3S 11.1 V battery capable of providing a maximum current of approximately 60 A,
- ✧ 13.4 V power supply capable of supplying a maximum current of 50 A .

5.2 Drone test for DronesBench certification

With the engines off, the weight of the drone is measured.

The drone is connected and powered with the supplied cables and the electrical parameters such as voltage, current and power are detected. The absorbed power is recorded as that consumed by electronics in its basic functions.

Once the stopwatch has been reset, the drone is armed, gradually bringing it to thrust the throttle to a thrust equal to the weight, for at least 30 hovering measurements recorded by the software.

The electrical and mechanical parameters are measured with the Dronescale in the moments in which the thrust equals the weight with a tolerance of 10 g.

It is also verified that the drone, during the thrust increase maneuver, remains always balanced.

The motors are then pushed to the maximum for a couple of seconds so that all the measurements are acquired at the moment of maximum current absorption.

The same procedure is repeated both with the life jacket and without the life jacket.

5.3 Electromagnetic compatibility tests

As regards the electromagnetic compatibility tests, refer to the directive 2004/108 / EC.

No electromagnetic compatibility tests have been performed.

6. Conclusion

The following data is provided for the license plate and the drone manual:

- ✓ Brand and model **Kit Drone Bagnino**
- ✓ Weight **1197 g --- 878 g**
- ✓ DBIs **69,6 mN/W --- 74,5 mN/W**
- ✓ Standard thrust / Weight **150 % --- 224 %**
- ✓ Max power **299,16 W --- 318,08 W**
- ✓ Battery features **3S 11,1V 1800 mAh 35 C - 55 C --- 3S 11,1V 1800 mAh 35 C - 55 C**
- ✓ Drone class **C2 --- C2**
- ✓ Operational area **A2 --- A2**
- ✓ Maximum transferable kinetic energy **9 J --- 9 J**
- ✓ Maximum speed **3,97 m/s --- 4,58 m/s**
- ✓ Standard and maximum noise **80,2 dBm 85,7 dBm --- 80,2 dBm 85,7 dBm**

The "CE!" symbol must be affixed as compatibility has not yet been verified.

The measurements have shown that the drone, characterized by the indicated measurements, is fully functional and ready to fly.

The technician

The supervisor