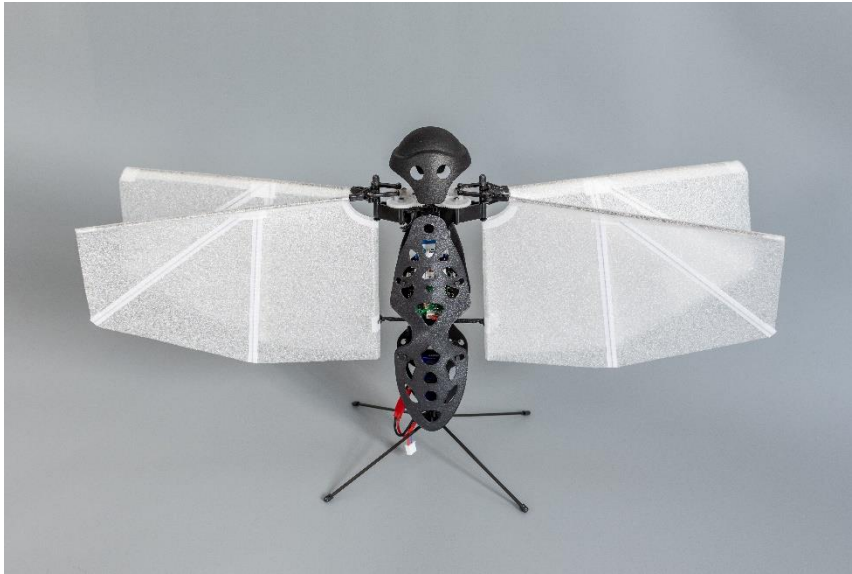


Flapper Nimble+ - Technical Data Sheet

Revision 2024-03 (Early Access)



Introduction

The **Flapper Nimble+** is the world's first commercially available tailless flapping wing robot. It is a development platform focused on universities, research labs, drone show operators as well as other users who are eager to explore the emerging field of bioinspired aerial robotics.

Features

- Ready to fly kit
 - Attach the wings and fly! No tools required...
 - Hover, fly forward or sideways, turn, climb & descent
- Bioinspired wing actuation
 - Brushless drive motors
 - Coreless digital servos with precision metal gears
 - 5-minute battery life when hovering with full payload
 - Up to 20% more in forward flight

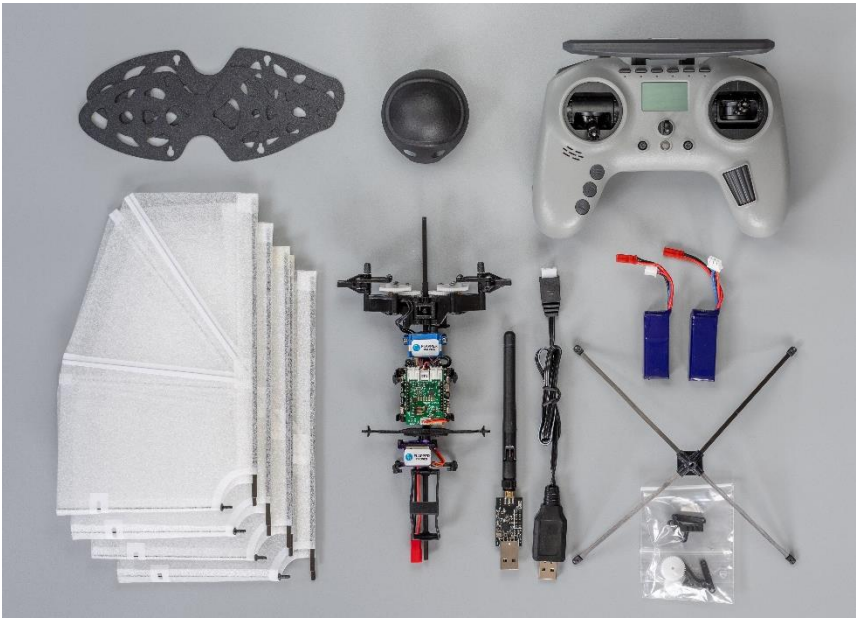
- Precise control for fun manual flight
 - Dedicated 2.4 GHz transmitter for precise control [OPTIONAL]
 - Smartphone App (Android/iOS) when packing light
- Crazyflie Bolt flight control board
 - Application microcontroller (STM32F405)
 - Radio & power management microcontroller (nRF51822)
 - 3 axis gyro & 3 axis accelerometer (BMI088)
 - High precision pressure sensor (BMP388)
- Compatible with the Crazyflie ecosystem
 - Open-source firmware
 - Open-source libraries for high-level control
 - Wireless firmware updates
 - Wireless telemetry
- Autonomous flight & addons
 - LPS/Lighthouse and other expansion decks for autonomous flight (sold separately)
 - Integrated onboard logging (uSD) & power measurement
 - Integrated interface for WS2812B RGB LEDs (max 1 A)
 - Integrated interface for external receiver (CPPM) [receiver delivered as an OPTION]
- Customizable appearance
 - Create your own body shells
 - Decorate the wings, or redesign their shape
 - Add light effects with RGB LEDs
- Designed for indoor operation
 - Safety assured by low weight & soft wings
 - Outdoor operation possible at low wind conditions
- Dedicated customer support
 - Online documentation
 - Development support for your specific application
 - All parts available as spares

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Technical Specifications	
Wingspan	49 cm
Weight	102 g (min. take-off weight) 114 g (incl. body shells and landing gear)
Max. payload	25 g (body shells, landing gear, addon sensors, ...)
Battery	LiPo 2S 300 mAh (XT30)
Actuators	2 x Brushless DC motor 2 x Coreless rotary servo with precision metal gears
Flight time	> 5 minutes (hover with max payload)
Flight Control	Crazyflie Bolt 1.1 (Bitcraze SE) 2.4 GHz transmitter [delivered as OPTION] Mobile App (Android & iOS devices)
Wireless connectivity	nRF51822 (PC datalink via Crazyradio 2, Android & iOS App)
ESCs	Open-source design by fishpepper.de
Additional Features	Integrated microSD card slot for data logging Compatibility with Crazyflie expansion decks
Expansion Interfaces	Interface for WS2812b RGB LEDs (max 1000 mA) Interface for external receiver (CPPM, 2S) VCC (3.0V, max 100mA) VCOM (5V, max 300mA) I2C (400kHz), SPI, 2 x UART, 4 x GPIO/CS for SPI
Accessories Included (Base Kit)	1 x Wing set 1 x 300mAh 2S LiPo battery 1 x Landing gear 1 x Wear and tear spares set 1 x USB 2S LiPo battery charger 1 x Flight case (46 x 33 x 15 cm)
Optional accessories	2.4 GHz Transmitter with Open TX/Edge TX Dedicated receiver (FrSky) Set of body shells, Extra wing set, Extra battery
Not Included	USB power adaptor (battery & transmitter charging) microSD card (onboard data logging)



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Applications

- **Academic Research**
 - Flapping flight dynamics
 - Flight control of bioinspired robots
 - Swarming
- **Education**
 - Introduction to animal flight and bio-inspired robotics
 - High school and University courses
 - Science museums
- **Entertainment**
 - Drone shows
 - Flying characters in theaters & theme parks



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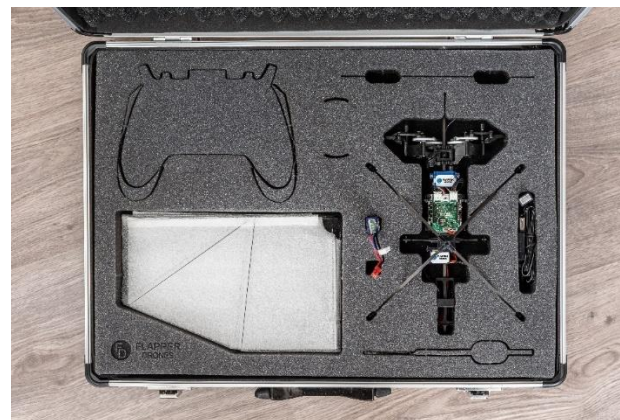


Buying options

Flapper Nimble+ (Base Kit)

Accessories included:

- Flapper Nimble+ drone
- 1 x Wing set
- 1 x Battery
- 1 x USB battery charger
- 1 x Landing gear
- 1 x Set of wear and tear spares



Flapper Nimble+ (Starter Kit)

Accessories included:

- Flapper Nimble+ drone
- 2.4 GHz Transmitter with Open TX/Edge TX
- Set of body shells
- Crazyradio 2 USB dongle for PC
- 2 x Wing set
- 2 x Battery
- 1 x USB battery charger
- 1 x Landing gear
- 1 x Set of wear and tear spares



Extra Accessories Sold Separately

- 2.4 GHz Transmitter with Open TX/Edge TX
- Dedicated receiver (FrSky)
- Set of body shells
- Extra battery
- Extra wing-set
- Crazyradio PA USB dongle for PC

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