

 FLYABILITY



ELIOS 3

# **TECHNICAL SPECIFICATIONS**





## TECHNICAL SPECIFICATIONS

### AIRCRAFT

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## ■ AIRCRAFT

<b>Configuration</b>	Ducted fan quadcopter
<b>Data interface</b>	USB-C port using Inspector (requires drone to be powered by its battery!)
<b>Dimensions</b>	48cm wide; 18.9 in 38cm high; 13.8 in
<b>Flight control sensors</b>	IMU, magnetometer, barometer, lidar, 3 computer vision camera and ToF distance sensor
<b>Flight modes</b>	ASSIST - Stabilized mode ATTI - Attitude mode SPORT - Sport mode
<b>Flight Time E3 base</b>	>12min30s*

<b>Flight Time E3 base + lidar mapping payload</b>	>9 min**
<b>Ingress Protection</b>	Base platform + basic inspection payload: Splash and dust resistant design, equivalent to at least IP44 LIDAR Payload: IP68
<b>Mass E3 base</b>	1900 g +/-10g ; < 4,18 lbs Includes battery, payload & protection
<b>Mass E3 base + lidar mapping payload</b>	2350 g +/-15g; < 5,2 lbs Includes battery, payload & protection and lidar payload

<b>Materials</b>	Carbon fiber - kevlar composites, magnesium alloy, aeronautical grade aluminum, high-quality thermoplastics
<b>Max ascent / descent Speed</b>	2 m/s ; 6.6 ft/s (Assist / Atti modes)
<b>Max horizontal speeds in different flight modes and configurations</b>	2 m/s (Assist mode) ; 6,6 ft/s 5 m/s (Attitude mode) ; 16.4 ft/s 7 m/s (Sport mode) ; 23 ft/s
<b>Max Take-off mass</b>	2500 g (E3 base + 600g / E3 LIDAR + 150g)
<b>Max Wind Resistance</b>	5 m/s (Assist mode) ; 16.4 ft/s 7 m/s (Sport mode) ; 23 ft/s

<b>Motor life time</b>	50h (Test run to 120 hours, motors reached 100h with negligible degradation so specification is 50% of nominal life)**
<b>Motor type</b>	4 fast reversing electric brushless motors
<b>Noise Level</b>	83 dB(A) with lidar
<b>Onboard computer</b>	Nvidia Xavier NX onboard computer with custom linux OS
<b>Operating temp.</b>	0 °C to 50 °C* ; 32 °F to 122 °F Valid for batteries pre-condition between 10°C and 40°C

\*In ideal flight conditions, without a payload mounted on the payload bay, with a new battery.

\*\*In ideal flight conditions, with a new battery

## ■ AIRCRAFT

<b>Propeller life time</b>	10h
<b>Propellers</b>	4 propellers, 5 inches
<b>Standby time on full battery</b>	5000h or ~7 months

## ■ LIDAR PAYLOAD

<b>Lidar sensor</b>	Ouster OS0-32 beams sensor
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## ■ SMART BATTERY

<b>Battery change time</b>	< 10s by means of plug and play battery mechanism
<b>Battery life time</b>	50 flights
<b>Battery shelf time</b>	250 days when stored at ~20°C and at 50% SOC
<b>Battery Type</b>	<p>LiPo 6S HV Smart Battery:</p> <ul style="list-style-type: none"> <li>- LED, button and user interface for SOC monitoring, etc</li> <li>- Improved safety during charge cycle (protection for: overcharge, overcurrent, overvoltage, over/under-temperature)</li> <li>- Accurate state-of-health and state-of-charge estimation</li> <li>- Plug-and-play charging</li> <li>- Self-balancing</li> <li>- Storage self-discharge</li> <li>- Cycle counter</li> <li>- Battery ID</li> </ul>

<b>Charger</b>	<p>Elios 3's plug and play Smart Battery Charger</p> <ul style="list-style-type: none"> <li>-&gt; 150VA Reactive power input</li> <li>-&gt; 100-240V AC voltage input</li> <li>-&gt; 1.5A AC max current input</li> </ul>
<b>Charging Temperature</b>	0°C - 45°C ; 32°F - 113°F
<b>Charging time</b>	1h
<b>Compliance</b>	Approved for carry-on luggage. Complies with IATA Dangerous Good Regulation.
<b>Energy</b>	99.2Wh
<b>Net Weight</b>	620 g ; 1.4 lbs

<b>Nominal Voltage</b>	22.8 V
<b>Operating Temperature</b>	10 - 40°C ; 50°F - 104°F
<b>Rated Capacity</b>	4350 mAh
<b>Safety alarm</b>	Audible warning when battery voltage is low

## ■ PAYLOAD CHASIS

<b>Camera Pod Downward tilt</b>	-90 degrees
<b>Camera Pod Upward tilt</b>	+90 degrees
<b>Payload head</b>	Damped for vibrations

## ■ MAIN CAMERA

<b>Control modes</b>	Auto mode with manual EV compensation
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<b>File Storage</b>	MicroSD card (onboard the aircraft) Max capacity: 128 GB Recommended model: Sandisk Extreme micro SDXC UHS-I V30
<b>Ground sample distance</b>	minimum 0.18mm/pix at 30cm
<b>Lens</b>	2.71 mm focal length Fixed focal
<b>Movie FOV</b>	114° horizontal, 131° diagonal
<b>Photo Formats</b>	JPG
<b>Photo FOV</b>	119° horizontal, 149° diagonal

<b>Photo Recording Resolution</b>	4000 x 3000, up to 40 pictures during flight
<b>Sensor</b>	1/2.3" CMOS Effective Pixels: 12.3 M Sensitivity: Optimized for low light performance
<b>Supported File System</b>	FAT32 for cards up to 32 GB, exFAT for cards bigger than 32 GB. Up to 128GB card size.
<b>Total vertical FOV</b>	approximately 244° including camera tilt including 180°C without obstruction
<b>Video Formats</b>	MOV
<b>Video Recording Resolutions</b>	4k Ultra HD: 3840 x 2160 at 30 fps FHD: 1920 x 1080 at 30 fps

<b>Video Streaming Resolution</b>	FHD: 1920 x 1080 at 30 fps
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## ■ THERMAL CAMERA

<b>Lens</b>	FOV 56° x 42°, Depth of field 15cm to infinity
<b>Sensitivity (NEdT)</b>	<50 mK
<b>Sensor</b>	Lepton 3.5 FLIR
<b>Video Recording Resolution</b>	160 x 120 at 9 fps
<b>Wavelength (LWIR)</b>	8-14 μm

## ■ LIGHTING SYSTEM

<b>Control</b>	From remote controller, adaptive light beam controlled by camera pitch
<b>Light Output, extreme</b>	Temporary Peak Power: - max 100W - 16000 Lumen
<b>Light Output, Nominal</b>	Normal mode - 20W default, 1x E2 max illumination. >> Working up to >50°C without thermal throttling - 40W boost, ~2x E2 max illumination >> Working up to 30°C without thermal throttling

<b>Light Output, Nominal</b>	Dust mode - default is equivalent to 1x E2 max illumination. - Throttling temperature >30°C”
<b>Modes</b>	Normal mode (4x panels used) Dustproof lighting (2x outer panels used only) Selective/oblique lighting (left or right side only)
<b>Type</b>	High-efficiency LEDs for even lighting in front, top and bottom, optimized for low impact of dust on picture quality.

## ■ OPERATIONAL SAFETY & CRASHWORTHINESS

<b>Battery latch safety alarm</b>	Sensor embedded in battery mechanism to alarm customer with visual warning on drone and in Cockpit if battery lever is not closed correctly.
<b>Fail safe</b>	Auto-landing on signal lost
<b>Max safe collision speed in different drone configurations and flight modes</b>	< 2m/s in frontal collisions - for at least 100 collisions without damages < 2.4m/s in all spherical directions - for at least 100 collisions without damages - to avoid too high accelerations on lidar payload -> Full speed collisions in ASSIST on flat walls are safe  < 3m/s to avoid structural damage to drone -> Fulls speed collisions in ATTI and SPORT mode will kill the drone

<b>Navigation lights</b>	One RGB navigation light on the rear of the drone
<b>Protection cage</b>	Carbon fiber cage with soft coating, modular subcomponents for maintenance ease, thermoplastic elastomer suspensions, bottom opening dimensioned for easy battery access, front opening dimensioned for easy payload access.



## ■ AIRCRAFT TRANSMISSION

<b>Designation of emissions</b>	Downlink: max 18Mbps -> Video: 1080p@30fps -> FMU data Uplink: max 3Mbps -> RC commands
<b>Frequency band Tx</b>	2.4GHz ISM band (2400MHz - 2483.5MHz)
<b>Maximum output power</b>	2.4 Ghz $\leq 20$ dBm





## TECHNICAL SPECIFICATIONS

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## ■ REMOTE CONTROLLER

<b>Battery</b>	6700 mAh 1S
<b>Battery Charger Voltage &amp; power input</b>	12 V / 24 W
<b>Battery Charging temperature range</b>	10°C to 35°C
<b>Battery Charging time</b>	<2h30min for 0-80% at room temperature <4h for 0-100% at room temperature
<b>Battery life time</b>	300 cycles
<b>Controls</b>	Aircraft control and payload settings

<b>Max Transmission Distance</b>	Up to 500m in direct visual line of sight
<b>Operating temp.</b>	-10 °C to 45 °C
<b>Operating time on full battery</b>	>5h at room temperature
<b>Options</b>	Optional remote controller (camera operator) with video stream reception on a secondary screen, and dual control of camera settings.
<b>Output port</b>	USB-c
<b>Weight</b>	1760g with tablet holder

## ■ REMOTE CONTROLLER TRANSMISSION

<b>Designation of emissions</b>	Downlink: max 18Mbps -> Video: 1080p@30fps -> FMU data Uplink: max 3Mbps -> RC commands
<b>Frequency band Tx</b>	2.4GHz ISM band (2400MHz - 2483.5MHz)
<b>Maximum output power</b>	2.4 Ghz ≤20 dBm
<b>Radio link Encryption</b>	128 bit aes-ctr as per the LTE spec

## ■ TABLET

<b>Battery Charger</b>	USB fast Charger 5V /15W
<b>Charging temp.</b>	0°C to 40 °C
<b>Charging Time</b>	3h (with fast charger provided with tablet) 5h (with normal charger provided by Flyability)
<b>Model</b>	Samsung Galaxy Tab S7 or S8
<b>Operating temp.</b>	-10 °C to 50 °C
<b>Weight</b>	500 g



# TECHNICAL SPECIFICATIONS

## ACCESSORIES & SOFTWARE

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■ **TRANSPORT CASE**

<b>Compliance</b>	NOT IATA compliant for checked-in luggage
<b>Dimensions</b>	65 x 45 x 55 cm
<b>Weight</b>	13 kg

■ **COCKPIT SOFTWARE**

<b>Features</b>	Real time video and UAV telemetry, status visualization (remaining battery, payload settings, warnings, etc. ), control payload settings and various configurations.
<b>Operating system</b>	Android 11/12 developed for Samsung Tab S7 / S8 tablet

■ **INSPECTOR SOFTWARE**

<b>Operating system</b>	Windows 10/11 (64 bits)
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## ABOUT FLYABILITY



Flyability is a Swiss company building solutions for the inspection and exploration of indoor, inaccessible, and confined spaces. By allowing drones to be used safely inside buildings, it enables industrial companies and inspection professionals to reduce downtime, inspection costs, and risks to workers. With hundreds of customers in over 50 countries in Power Generation, Oil & Gas, Chemicals, Maritime, Infrastructures & Utilities, and Public Safety, Flyability has pioneered and continues to lead the innovation in the commercial indoor drone space.

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