

# Aratos RPAS solution description

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Aratos RPAS is a breakthrough product in terms of performance, reliability and cost efficiency. The aircraft fits under 55 lbs. regulation requirements, equipped with parachute recovery system and the state of art avionics, powerplant and software. It is capable of operating from unimproved terrain, day and night for over 20 hours.

The Aratos RPAS consists of:

- **Aratos Remotely Piloted Aircraft:** Over 20 hours endurance with the advanced fuel injected engine. Gyro-stabilized day/night payloads. Fully autonomous catapult take off, flight and parachute recovery.
- **Ground Data Terminal:** Up to 100 km range digital link for video and command/control. AES encrypted option available.
- **Ground Control Station:** Portable control station. User friendly software interface. Operational at extreme conditions.
- **Pneumatic Launcher:** Autonomous launching from an unimproved terrain. Man portable design. Launcher is capable of operating at 10,000 ft altitude.



# Aratos RPAS Payload

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The Aratos RPAS is available with EO/IR gyro stabilized gimbal payloads. The payload is automatically retracted into fuselage during take-off or landing.

## Payload



## Features

- Gyro stabilized OTUS U135 gimbal
- EO option Sony FCB
- IR option Flir Tau 640 LWIR
- Optional Target Tracker
- Optional Geo Tracker



# Aratos RPAS Specifications

## Aircraft Specifications

Wingspan	3.3 m/ 10.8 ft
MTOW	21.5 kg / 47.5 lbs.
Endurance	20 hours
Range	100 km/ 60 miles
Cruise speed	19-22 m/s / 37-43 knots
Max level speed	36 m/s / 70 knots
Ceiling	4500 m / 15 000 ft MSL
Takeoff	Pneumatic Catapult, fully autonomous
Maximum takeoff altitude	3000m /10 000 ft AMSL
Recovery	Parachute recovery, airbag
Operational temperature	-10° C to +40° C
Anti- icing measures	Heated Pitot- static tube. Flight in icing conditions is not approved.
Environmental protection	< 5 millimeters/hour rain

## Propulsion System

Engine type	28 cc EFI
Temperature control system	Automatically controlled via mechanical flap
Fuel type	95 Octane, oil mix
Generator system	80W onboard generator system

## Payload Specifications

Payload type	Day/night gyro stabilized
EO sensor	Sony FCB
IR sensor	FLIR Tau 640 LWIR Camera
Advanced features	Target tracking, Electronic Stabilization, Scene Steering, Real-time mosaicking, PathTrack software, Video on the map
Mounting	Motorized retract with anti-vibration damping

## Data Link Specifications

Datalink	2.4 GHz or 2.3 GHz
Link Rate	Up to 12 Mbps
Encryption	128 bit AES / 256 bit AES

## Flight Control System

Autopilot type	Piccolo, Cloud Cap Technology
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## Ground Control Station

Type	Portable, Dual touchscreen displays
Ground control software	Piccolo Command Center, Penguin Copilot
Ground Data Terminal	
Type	Tracking high gain directional antenna with magnetometer
Mounting type	Tripod

## Catapult System

Type	Portable pneumatic, 6000 J launch energy
Packed Size	1313 x 704 x 543 mm
Typical fill time	~ 15 min
Packed Weight	110 kg



# Other technical details of Aratos RPAS

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## **Competitive Edge:**

EFI Engine with silent muffler. State of art fuel injected gasoline engine for maximum reliability and performance. Silent muffler system is equipped as standard option for lowest acoustic signature.

## **Swappable propulsion modules:**

The propulsion module can be changed in minutes, allowing operation of the aircraft system while the maintenance is performed on a second module.

## **Smart Features**

The Aratos RPAS comes with numerous smart features to reduce operator's workload, reduce operator errors and improve the flight safety. Smart features include **Aratos RPAS Control software** with integrated checklists, emergency procedures, and critical alarms with operator recommendations.

The Aratos RPAS Control software has an integrated decision tree which analyses aircraft parameters and automatically executes sequences of safety decisions, reducing the probability of operator - induced accidents.

**Parachute system** allows recovery in the unprepared sites. The parachute is packed in the deployment bag and the replacement of the parachute in the field takes less than 5 minutes. The parachute will automatically disconnect from the aircraft once the aircraft touches the ground, preventing wind-dragging.

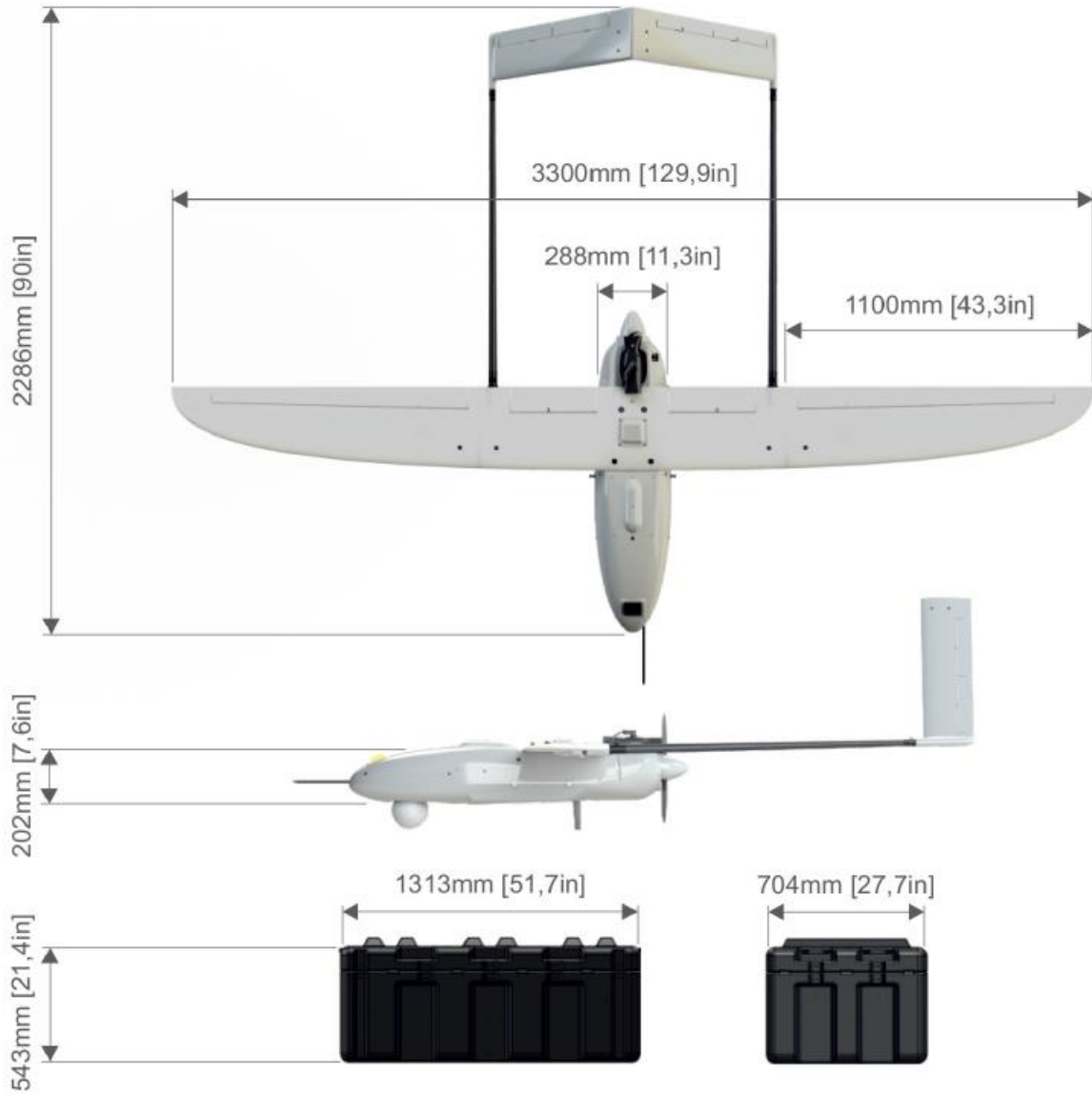
**Recovery Estimator** software has a proprietary algorithm that estimates the parachute landing point based on many parameters and allows a controlled recovery of the aircraft in the limited space.

## **Reduced Logistical Footprint**

The Aratos RPAS has lowest logistical footprint in class. The catapult is man-portable and the parachute system eliminates the need for the net recovery system. Aratos RPAS can be transported in a minivan, while being runway independent.



# Dimensions



# Aratos Control and Command Center

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Aratos Integrated Control and Action Operational Center is an integrated command and control center where all the information is being stored and more analytically processed in order to detect potential threats. It is also here where effective and intelligent decision making takes place and the available resources, where response strategies are initiated etc.

The Aratos Integrated Control and Action Operation Center receives data from the RPASs, integrates them taking into account the heterogeneity of the inputs and process them with regard to intelligent algorithms and image analytics for the detection of threatening patterns.

At that point alarms are being generated to be further forwarded within the responsible parties.

## Key Functionalities

- Handling of alarms
- Data Visualization
- Management Capabilities
- Data Integration and Interoperability
- Unified Emergency Responses

## Handling of alarms

First of all, the set of alarms being generated needs to be validated after true threat detection as opposed to false alarms. This is dealt via intelligent processing operations to enable self-learning capabilities in their system. The alarm system enables a validation/feedback option, before the activation alarm occurs including intervention of the operators' and cross reference of the detection with other devices.

## Data Visualization

Flexible graphical interfaces enabling visualization of processed images/video data, and also being mapped upon GIS platforms to present the dynamic location of events and detected entities, are used to allow operators to monitor and comprehend the inputs received, as if they were in fact in the place of the incident. These interfaces acquire and make full use of informative insights upon the data received to enable effective decision making and ultimately providing Control and Command upon the situations being monitored. The visualization system is manageable so as to enable:

- zoom in capabilities (according to different levels of information available),
- manual annotation of images,
- prioritized / selective visualization of received data/alerts according to the "criticality" of the alert, etc.



All the information gathered from the aforementioned methods will be amassed into the command and control center. There the decision makers will have the capabilities to operate the second response actions (security personnel's actions, closing relevant pipeline valves etc.).

The command and control center is designed so as to act in a multi-level environment and every level of decision making is aware of what is happening in the lower level.

# Aratos Command and Control Specs

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The command and control center will have the following specifications:

## Console Display

- Live viewing of up to 4 channels
- Multiple layout views offers tile view or full screen
- Configuring Intelligent Image Analytics

## Command Center

- Processor: Intel Core i5 2.5 GHz
- Memory: 4-8GB DD3 1333MHz
- HD: SATA 250-500GB
- Video Card: 1-2GB Dedicated Graphic Video Card
- OS: Windows 2007 Server

