



# FLIGHT DATA MONITORING



+



+



APPAREO  

---

  
AVIATION

FLIGHT DATA MONITORING | FLIGHT TRAINING | INCIDENT INVESTIGATION

# APPAREO'S TURN-KEY FLIGHT DATA MONITORING SUITE

**When it comes to flight safety, there's nothing more valuable than accurate statistics, actionable trending data, and true visual representations of every moment during a flight.**

The Vision 1000 is a stand-alone flight data recording solution that captures accurate flight data, plus cockpit audio and imagery. Supported by our Flight Data Monitoring (FDM) software, this information can be used to review and analyze your flight operations, allowing you to identify and mitigate risk. If the unthinkable were to occur, the recorded data is an invaluable investigation tool, giving you insights into exactly what, when, why and how it happened.

## **Increased Safety**

- Proactively identify and reduce risk.
- Get automated analysis and actionable reporting / trending tools.

## **Better Efficiency & Quality Assurance**

- Ensure SOP compliance on every flight.
- Set notifications to easily monitor your fleet.

## **Incident Investigation**

- Quickly answer your questions on what happened and why.
- Dramatically reduce the investigation time and expense.

## **Compliance & Accountability**

- Comply with FAA rule 135.607 for Helicopter Air Ambulance operators
- Easily show your level of operational safety with objective data.
- Demonstrate actionable safety initiatives for potential insurance savings.

## **Individualized Pilot Training**

- Use actual performance data to evaluate and educate pilots.
- Identify problematic trends, and correct them.
- Develop customized flight training for new pilots.

# HERE'S HOW IT WORKS



## Vision 1000

- Record flight data, audio, and cockpit imaging
- Small, light, and affordable
- Easy, one-day installation
- Playback utility included
- Records to removable SD card and internal hardened memory



## Visualization Software

- Synchronized imaging, audio, and 3D playback
- Flight training
- Incident investigation
- Maintenance troubleshooting



## FDM Software

- Automated event analysis
- Detailed reports
- Web-based accessibility
- Hosting to save and store flight data
- Easily manage your fleet from anywhere

RECORD



(Actual size)  
4" x 2.5" x 2"

## VISION 1000

### VISION 1000 CAPTURES:

- Attitude data (pitch, roll, yaw, etc.)
- WAAS GPS data (date/time, latitude, longitude, speeds, altitude, etc.)
- Cockpit imaging
- Crew and ATC communication
- Ambient audio

The Vision 1000 is a powerful tool that records an entire cache of flight data to help you better manage the safety and performance of your aircraft. Data is recorded to an internal crash-hardened memory as well as a removable SD card. The information is written on a continual loop so you always have the latest information available. Vision 1000 comes with playback software that works alone or with our extensive, yet easy-to-use, FDM software suite.

### Easy Installation

Unlike other flight recording solutions, Appareo's Vision 1000 is the only device you'll need to install in your aircraft. Its lightweight (0.55 lbs) and compact size (4" x 2.5" x 2") makes it ideal for any rotor or fixed-wing aircraft. With its own internal sensors, the Vision 1000 only requires aircraft power and ground; we also provide a small GPS antenna that is installed inside the aircraft. There is a free optional intercom system connection to record crew and ATC communications in addition to the ambient audio already being recorded. There are no special tools required for the installation, and it only takes about one day to complete.

# VISION 1000 SPECS



Audiovisual Specifications	
Image Resolution	2 MP @ 4 Hz
Image Frame Rate	4 Hz
Audio Frequency Range	50 Hz - 15 kHz

Vision 1000 General Specifications	
Input Supply Voltage	12.0 - 32.0 VDC
Input Supply Current	100 mA
Weight	8.8 oz
Dimensions	4.02" x 2.08" x 2.48"
Roll and Pitch Accuracy	< 1.5° RMS
Yaw Accuracy	< 2.0° RMS
GPS Accuracy	2.5 m CEP, 5.0 m SEP
Operating Temperature	-40°C to + 70°C

GPS Specifications	
GPS Receiver Type	L1 Frequency, C/A Code, 16 Channels
GPS Update Rate	4 Hz
GPS TTFF*	2 min
Signal Reacquisition	< 1 s
GPS Dynamics	≤ 4 g
Antenna Frequency	1575.42MHz ± 2MHz
Polarization	RHCP
Antenna Dimensions	1.9" X 2.3" X 0.6"

MEMS Rate Gyroscopes	
Sense Axis	X, Y, Z
Dynamic Range	300°/s
Sample Rate	64 Hz

MEMS Accelerometers	
Sense Axis	X, Y, Z Quad Redundant
Range	±10 g and ±1.7 g
Resolution	5 mg
Sample Rate	64 Hz

Removable Flash Memory	
Storage Capacity	16 GB* (optional 32GB**)
Storage Time	4 (8) hours image/audio, 200+ hours flight data
Card Type	SD HC

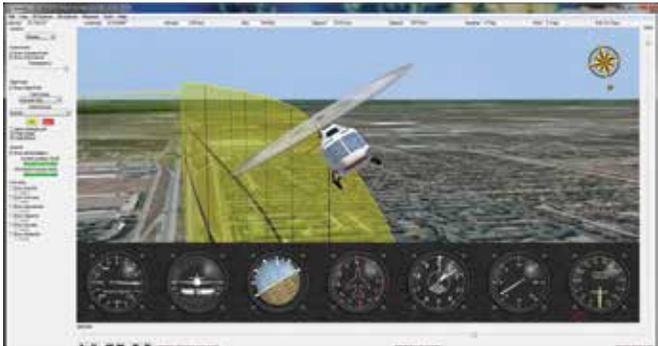
On Board Flash Memory	
Storage Capacity	8 GB
Storage Time	2 hours img/aud and 200 hrs flight data

\* The standard SD card for Vision 1000 is 16GB that records 4 hours image/audio.  
 \*\*An optional SD card for Vision 1000 is 32 GB that records 8 hours image/audio.

Vision 1000 Recorded Parameters				
Parameter	Unit	Rate	Resolution	Accuracy
Latitude	degrees	4 Hz	1x10 <sup>-7</sup> deg	2.5 m CEP 2σ
Longitude	degrees	4 Hz	1x10 <sup>-7</sup> deg	2.5 m CEP 2σ
Altitude (GPS)	meters	4 Hz	1 mm	5m SEP 2σ
Ground Speed*	knots	4 Hz	*	< 5 knots **
Vertical Speed*	feet/minute	4 Hz	*	< 50 ft/min **
Heading*	degrees	4 Hz	*	< 2 deg 1σ
Pitch Altitude*	degrees	4 Hz	*	< 1.5 deg 1σ
Roll Attitude*	degrees	4 Hz	*	< 1.5 deg 1σ
Pitch Rate	deg/second	4 Hz	0.01 deg/sec	.1 deg/sec/sqrt(Hz)
Roll Rate	deg/second	4 Hz	0.01 deg/sec	.1 deg/sec/sqrt(Hz)
Yaw Rate	deg/second	4 Hz	0.01 deg/sec	.1 deg/sec/sqrt(Hz)
Normal Acc.	g forces	4 Hz	0.9 ug	10 mg 2σ
Longitudinal Acc.	g forces	4Hz	0.9 ug	10 mg 2σ
Lateral Acc. (slip)	g forces	4Hz	0.9 ug	10 mg 2σ
Time	seconds	4 Hz	ms	<100 ns
Date	day	4 Hz		

\*These parameters are derived as part of a post processing algorithm – resolution is limited by the double precision floating point calculation

\*\*Approximate engineering estimates



# VISUALIZATION SOFTWARE

To complement and maximize the effectiveness of the Vision 1000, Appareo developed a turn-key FDM software solution.



## Vision 1000 Playback Utility

Included with your Vision 1000 is a playback utility, which allows you to replay the imaging, audio, and flight data recorded on a removable SD card.

## AS Flight Analysis Software

Replay the flight with our rich 3D visualization software that incorporates a topographical map overlaid with satellite imagery. Your flight path and accurate flight position show you exactly when, where, and how the aircraft was being operated. This software will also sync with the Vision 1000 Playback Utility, so you get a full picture of all recorded information.



Together, these software tools create a detailed, precise replay of your flights, which is ideal for incident investigations, flight training, and maintenance troubleshooting.

# FDM SOFTWARE

When you add Appareo EnVision to your FDM software package, it's like having a virtual flight analyst watching every minute of every flight. This web-based application allows you to access past and current flight data, generate detailed reports, and trend the safety improvements in your operations. It's available any time from any location with internet access.

## Data Transfer

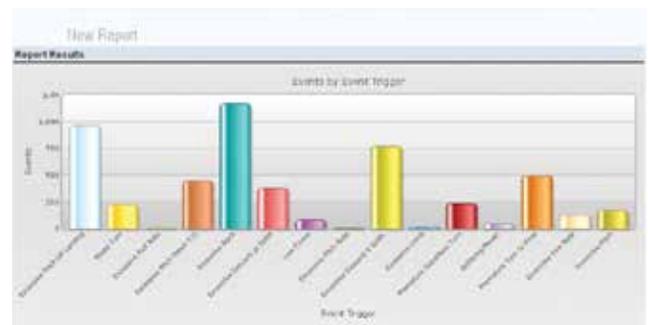
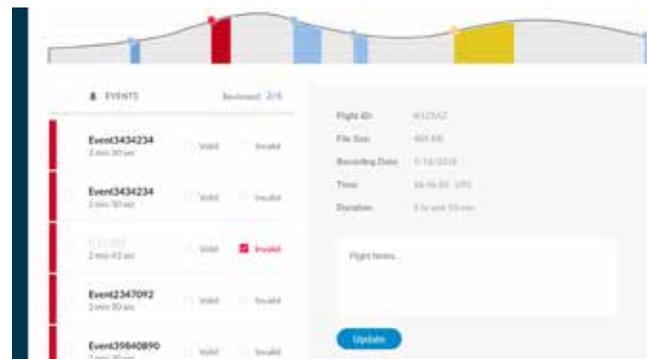
Automated analysis begins with the Appareo Transfer Utility (ATU), which uploads your inertial flight data to our servers for analysis. Comprehensive data for every flight is archived on the Appareo servers, giving you convenient online access to your data whenever you need it, while minimizing your IT costs.

## Automated Analysis

The Appareo EnVision software was designed for you to easily identify and address operational risk. Your flight data is automatically analyzed against customized Event Triggers which can be set for different aircraft or operations, based on the parameters defined in your organization's flight ops. Quickly see which flights had Events as well as the duration and severity of each. Detailed reports are easily generated from those Events, delivering the safety information you want to monitor and the ability to trend that information over time.

## Events Based on AGL Altitude

Our comprehensive terrain database allows you to create Event Triggers using above ground level (AGL) altitude without needing a radar altimeter. This allows you to get the most value out of the flight data by utilizing the AGL altitude limitations; a feature unique to Appareo's FDM suite.



# CERTIFICATIONS



The Vision 1000 is one of the easiest FDM devices to install because it is a small, lightweight, and self-contained system requiring only aircraft power, ground, and GPS antenna connections. We have a variety of U.S. and international certifications already in place, making it easier to obtain individual aircraft field approvals.

## **Type Certificates (TCs)**

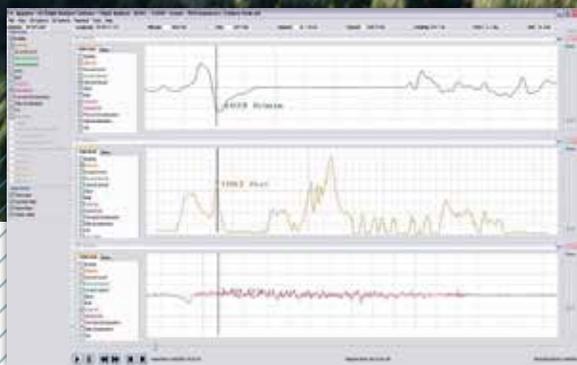
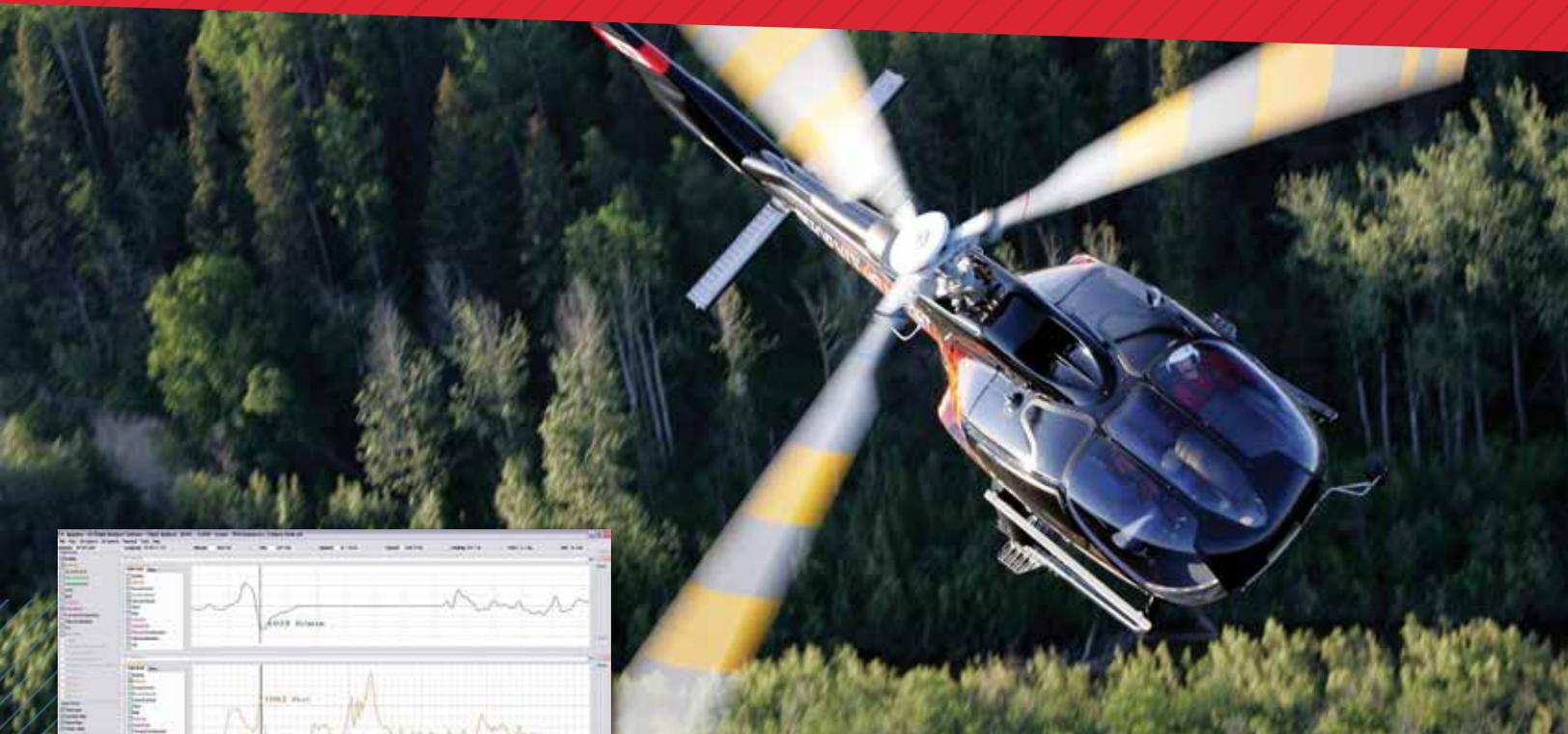
- AS350: H125 (standard)
- EC135: H135 (standard)
- EC145: H145 (standard)
- Airbus Helicopters EC175 (standard)
- Leonardo Helicopters AW139 (option)
- Leonardo Helicopters AW189 (option)
- Piper Archer (option)
- Piper Seminole (option)
- Piper Seneca (option)

## **FAA Supplemental Type Certificates (STCs)**

- Bell 206 (206B, 206L1, 206L3, 206L4)
- AS350: H125 (AS350B1, AS350B2, AS350B3, AS350BA)
- Leonardo Helicopters A109 (A109A, A109II, A109C, A109E, A109K2, A109S)
- Leonardo Helicopters A119 MKII
- Diamond DA-40 F
- Cessna 172 (variants)
- Cessna 208B (Grand Caravan)

If you do not see your aircraft listed here, please contact us at [sales@appareo.com](mailto:sales@appareo.com), or +1 701-356-2200.

# TURN-KEY FDM SOLUTION



The comprehensive data recorded by the Vision 1000, coupled with our high-impact FDM software, makes this an unparalleled solution. It is applicable and affordable for any size operation from small, private companies to corporate fleets with multiple locations.

## **With the RECORD + REPLAY + REVIEW components of our FDM suite, you'll be able to:**

- Easily review a flight with data, imaging, and audio.
- Utilize automated flight data analyses.
- Easily manage data from all your aircraft.
- Generate powerful reports and trend safety information.



# APPAREO'S FLIGHT DATA MONITORING SUITE

**We'll quickly become an important  
member of your flight crew.**

- Quick, simple installation
- Affordable
- Easy to use
- Convenient access to data



**RECORD**

Vision 1000  
Hardware

+

**REPLAY**

Visualization  
Software

+

**REVIEW**

FDM  
Software

To learn more about how our FDM suite can help improve the safety and performance of your flight crew, contact Appareo Aviation today.

+1 701-356-2200  
sales@appareo.com  
appareoaviation.com

# EASIEST FLIGHT DATA MONITORING SOLUTION

+1 701-356-2200  
sales@appareo.com  
appareoaviation.com

**APPAREO**  
  
AVIATION

FLIGHT DATA MONITORING | FLIGHT TRAINING | INCIDENT INVESTIGATION