



NEW PRODUCT

4K IP VIDEO CAMERA

~ with ~

INTEGRATED RECORDING & STORAGE



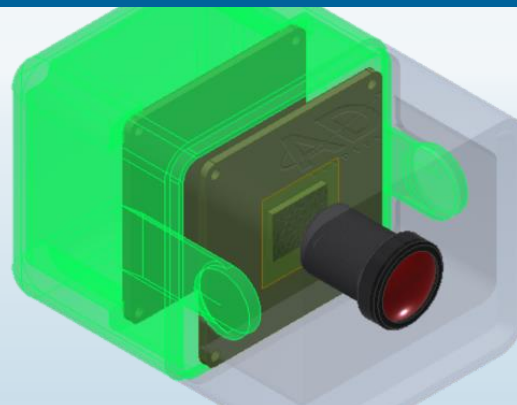
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USE CASES



AD
AEROSPACE
4K

enquiry@ad-aero.com
+44 1928 280300

INTRODUCTION



Aircraft are becoming **better connected** via **IP (Digital) backbones** in place of traditional analogue architectures.

There is a new focus on “open-source” **ONVIF** compatibility of avionics systems to allow for change and expansion.

Next generation aircraft video cameras must be adaptable to enable connectivity with third-party equipment and to allow for quick expansion in coverage and capability.

A new way to power systems has emerged – **Power over Ethernet (PoE)** – reducing wiring and weight.

Seamless integration with traditional EFB but also modern Flight Deck Displays, MFDs, and wider avionics is essential.

AD Aerospace’s new **4K** aerospace video camera will ensure there is a suitably advanced camera to support this new technological status quo.

In summary, the AD Aerospace 4K camera will be an airborne Ultra High Definition (UHD) IP CCTV internal/external camera.

The camera will feature high frame rate (60fps), 4K UHD resolution and low latency. It will be fully qualified to RTCA DO-160G. More detail on features can be found on page 3 and 4. Specifications are on page 6.

The camera will have multiple configurations suitable for different use cases, including both internal and external installations. More detail on use cases including examples can be found on page 7.

In addition, the new 4k camera will have a dedicated AI processor allowing for various possibilities including facial recognition, passenger counting, detection of suspicious activity, luggage size detection and many more...

FEATURES (1/2)



4K Resolution

In addition to improvement in picture quality and sharpness, 4K resolution enables more detail to be captured, viewed and recorded by the Pilot, First Officer and Crew.

4K resolution will also allow the camera to have a wider range of lens and therefore range of Field of View (FoV) options and low light performance.

The high-resolution camera also offers the potential for digital zoom without sacrificing the quality of the image.

Integrated Server (Recording / Storage)

Integrated server capability will:

- Allow recording and storage from the cameras themselves.
- Eliminate requirement for separate server installation.
- Allow for greater storage capacity - each camera can hold up to 1TB of data i.e., a 6-camera system can hold 6TB of data.
- Allow for remote data access/download via Wi-Fi - reduces time during maintenance checks as the units will not have to be accessed physically/manually.
- Reduce weight by a minimum of 2kg (based on weight and additional wiring of the AD Aerospace FV-0591 Video Server).

Power over Ethernet (PoE)

The 4K camera will have two options for power; standard 28VDC or Power over Ethernet (PoE).

PoE will enable the camera to only be connected via one wire which will provide both power input and ethernet connection.

The less wiring will reduce the weight of the system, reduce the potential points of failure and lower the installation and maintenance times.

ONVIF

The 4K camera will be Open Network Video Interface Forum (ONVIF) compliant.

It will therefore be part of the global open standard for the interface of IP avionics including any such Cabin Experience Network (CEN).

ONVIF compliance means the camera can be connected to third party ONVIF equipment / networks and will be adaptable and easily expandable i.e., cameras added to expand coverage.

FEATURES (2/2)



4K

EXAMPLES



Qualification

The 4K camera will be fully tested and qualified to D0160G, to enable it to be mounted internally but also external to an aircraft fuselage to provide industry leading external views.

AD Aerospace has significant history of successfully qualifying aerospace cameras for both internal and external applications on a range of aircraft programs.

Adaptability & Bespoke Housings

The design of the internal components of the 4k camera will be fixed in such a manner that will allow the product to have a range of configurations and bespoke housings. The camera will therefore be adaptable to many different use cases and installations.

Housing options will include internal and external housings as well as bespoke housings based on aircraft specifications. E.g., fuselage dimensions/curvature.

Materials

The optics of the camera are protected with a sapphire glass window which is scratch resistant, and the housing of the camera is manufactured from Titanium alloy.

For external applications, the unit is designed to be impervious to internal condensation “fogging” as well as external icing. This is due to the inclusion of an internally controlled heater localised to the optical surface, and also nitrogen purging.

AI

The 4K camera processor will have an integrated dedicated AI processor capable of at least 1 TOPS (Trillion Operations per second). This would allow the camera to perform AI processing at the edge directly on the camera processor, without the need to forward the stream to a dedicated server or cloud processing. This will speed up the AI operations and make the system self-contained.

Typical use cases might include facial recognition at the cockpit door, detection of unknown faces and alarms, passenger counting, face mask wearing, suspicious activity, luggage size detection and many more.

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PROVISIONAL SPECIFICATIONS



Maximum Weight	300g
Equipment Size	Application Dependent
Supply Voltage	Nominal PoE 28VDC 48VDC
Maximum Current Draw (at 28V)	250mA Heater* OFF 375mA Heater* ON
Maximum Power	<6W with Heater* OFF +10W with Heater* ON
LRU Connector	MIL-DTL-38999
Mating Connector	MIL-DTL-38999
Diagonal FoV	Wide Angle lens A variety of Fixed Lens option available - minimum FoV: HOV > 90°, VOV > 60°
Video Aspect Ratio	16:9
Resolution	Nominal 4K (3840 x 2160)
Low Light Performance	> 0.001 Lux
Day / Night	Automatic
Maximum Frame Rate	>= 60fps

Video Codec	HEVC (H.265) or H.264 / MPEG-4 AV
Data Loading	ARINC 615A
BITE System Health Control	ARINC-624
Stream Latency	< 100 ms
Start-up Time	<= 1min
Data Load / SW Update	<= 15min
Ethernet Speed	>= 1Gbps
MTBF	>= 25,000 hours
MTBUR	>= 25,000 hours

* External camera only

USE CASES / INSTALLATION



AEROSPACE

4K

Internal Surveillance

The 4K camera can be used for any internal camera requirement on-board any aircraft type. Such as:

- Flight Deck Entry / Cockpit Door Surveillance (FDEVSS/ CDSS), with MFD / Flight Deck Display integration.
- VIP Passenger Cabin Surveillance / Direct View – to comply with 14 CFR 25.785 so the seated cabin crew can view at least 50% of the passengers in a premium class cabin zone.
- Passenger cabin and galley video surveillance as a deterrent and solution to unruly passengers.
- Within the cockpit to monitor instruments and work in conjunction with Flight Recorders.

External (Fixed-Wing)

The 4K camera will have configurations designed specifically for installation external to the aircraft fuselage. Designed for use up to 50,000ft, the unit will be impervious to internal condensation “fogging” as well as external icing, due to an internally controlled heater localised to the optical surface, and nitrogen purging.

External use cases for fixed wing aircraft include:

- In-Flight Entertainment (IFE)
- Pilot Situational Awareness
- Ground Manoeuvring to mitigate against ground collisions.
- Aircraft Refuelling

Cargo / Freighter Surveillance

Cargo bay damage and baggage theft continue to prove costly for airlines and aircraft operators. With the new 4k camera system, as the server capability is integrated within the camera units, only cameras will need to be installed within the cargo bay(s) and using motion detection software the cameras can record as soon as movement is detected. Each camera can store detailed, ultra-high-definition video which can be accessed remotely if an incident is recorded.

External (Helicopter / eVTOL)

AD Aerospace currently sells its FV-0315 analogue external camera and FV-0361 HD-SDI external camera to several rotorcraft programs, the 4K camera will be the perfect replacement. Use cases include:

- Cargo Hook / Winch Monitoring
- Oil and Gas surveys
- Border Control / Police surveillance
- Firefighting
- Real time engine and gearbox monitoring

Advanced Air Mobility (AAM) has its own use cases for a 4K camera including IFE and Pilot Situational Awareness.

CONTACT US

Mark Isherwood (Sales Executive)
misherwood@ad-aero.com
<https://www.ad-aero.com/>
+44 (0)1928 280312

**ELECTRA HOUSE
PEPPER ROAD
HAZEL GROVE
STOCKPORT
SK7 5BW
UNITED KINGDOM**

