

ULTRACAM

EAGLE

➔ www.UltraCamEagle.com



Ultra-large

The Microsoft UltraCam Eagle represents a revolution in digital photogrammetric camera systems and sets new industry standards for digital aerial photography, enabling customers to soar to new heights with their mapping projects.



UltraCam Eagle builds on the award-winning UltraCam legacy and reputation, establishing Microsoft's UltraCam "third-generation" architecture.

With the UltraCam Eagle Microsoft introduces a modular housing concept, setting a new standard in component integration, which reduces sensor head size and balances weight. The updated sensor head offers an exchangeable lens system with three different focal lengths - a groundbreaking enhancement in digital photogrammetry - and is specifically designed for high-resolution digital aerial photography. UltraCam Eagle also features filters with curved

characteristics and silent-board camera electronics, further ushering in revolutionary aerial photogrammetric technology. Embedded in the integrated component package is UltraNav, a flight management and georeferencing system that includes state-of-the-art GNSS-Inertial technology, pilot displays, and flight-planning software.

The result is an ultra-reliable, ultra-efficient, ultra-large-footprint camera that screams through image acquisitions, captures the smallest details, and enables direct and swift flights that are not limited by technology.



Features

The most innovative and advanced UltraCam system to date, offering revolutionary product features that include:

- Largest PAN frame image footprint of ultra-large format cameras; more than 20,000 pixels across the flight strip.
- Custom electronics that deliver 3.7 gigabits per second of image collection, resulting in a frame rate of less than 1.80 seconds and forward overlapping of 80 percent at 284 kts for 10 cm GSD images.
- An integrated package that contains all components in the sensor head, including an embedded OEM UltraNav GPS/INS/FMS system, and modular solid-state storage, providing flexibility for onboard orientation of equipment.
- An in-flight exchangeable solid-state image storage system to store more than 3,900 images, resulting in minimal ground time.
- Exchangeable lens system configurations with three different focal lengths for greater flexibility, from lower-altitude engineering applications to high-altitude orthophotography projects.
- Pixel size of 5.2 μm , as well as enhanced PAN 7,600 gray values per pixel, offered by the latest CCD technology, new custom lenses and filters, and silent-board camera electronics.
- A user-focused interface with touchscreen technology to ease configuration and operation and allow in-flight control of each image.
- A compact unit weighing less than 75 kg (165 lbs) and reduced power consumption of 350 watts @ 24-28 VDC for increased flight efficiency.

UltraCam Eagle offers the ultimate in reliability and efficiency for digital aerial photography. With a PAN image footprint of more than 20,000 pixels across the flight strip, and an image capture rate of 1 image in 1.8 seconds, it soars beyond the traditional large-format cameras. The solid-state storage system stores 3,900 superior-quality images and can be exchanged in flight to meet any storage need.

Despite its expansive digital footprint, the UltraCam Eagle is a lightweight, integrated system that features a smaller physical footprint—taking up less aircraft space and providing the utmost in fuel economy. It also consumes less power than other cameras for even more cost savings. With UltraCam Eagle, customers can take to the skies, capture more data in less time, and complete mapping projects in fewer flight lines and with greater efficiency than ever before.

Key Parameters

Image Product Specification

- Image format analogous to an aerial film image at a format of 23 cm x 15 cm, scanned at 12 μm
- Image data formats: JPEG; TIFF with options for 8 and 16 bits, standard TIFF format
- Image storage format in level 2: full resolution panchromatic, separate color channels at color resolution

Camera Digital Sensor Subsystem

- Panchromatic image size: 20,010 x 13,080 pixels
- Panchromatic physical pixel size: 5.2 μm
- Input data quantity per image: 1050 MB, 260 megapixel
- Lens system 1: 80 mm PAN and 27 mm RGBNIR
- Lens system 2: 100 mm PAN and 33 mm RGBNIR, exchangeable by a trained end user, no recalibration required after lens exchange
- Lens system 3: 210 mm PAN and 70 mm RGBNIR, exchangeable by a trained end user, no recalibration required after lens exchange
- Maximum frame rate <1.8 seconds per frame
- CCD signal to noise ratio: 72 dB
- CCD image dynamic: 14 bit; workflow dynamic: 16 bit
- Physical dimensions with 80 or 100 mm (210 mm) PAN lenses, including computer and storage module: 43 cm x 43 cm x 73 cm (80 cm)
- Weight with 80 or 100 mm (210 mm) PAN lenses, including computer and storage module: approximately 65 kg (72 kg)
- Power consumption at full performance, including computer and storage module: 350 watts

Camera Computer and Data Storage Subsystem

- Solid-state disc pack, with RAID system for data protection
- Unlimited with use of multiple data units with approximately 4 TB (3,900 images) per unit

Camera Operational Specification

- Data recording time @ 10 cm GSD, 60 percent forward overlap, 140 kts @ 8 hours per data unit
- Maximum forward overlap @ 10 cm GSD (@ 5 cm GSD) with 140 kts @ 90 percent (80 percent)
- Maximum flight speed @ 10 cm GSD (@ 5 cm GSD) with 80 percent forward overlap @ 268 kts (134 kts)

UltraCam Eagle - Technical Specifications

| Image Product Specification | |
|---|--|
| Image format | Analogous to an aerial film image at a format of 23 cm x 15 cm, scanned at 12 µm |
| Image data formats | JPEG; TIFF with options for 8 and 16 bits, standard tiff format |
| Image storage format in level 2 | Full resolution panchromatic, separate color channels at color resolution |
| Color at level 3 | Full resolution R, G, B, Near-IR channels, planar or pixel-interleaved |
| Camera Digital Sensor Subsystem | |
| Panchromatic image size | 20,010 * 13,080 pixels |
| Panchromatic physical pixel size | 5.2 µm |
| Input data quantity per image | 1050 Mega Bytes |
| Physical format of the focal plane | 104.05 mm * 68.02 mm |
| Color (multi-spectral capability) | 4 channels – R, G, B & NIR |
| Color image size | 6,670 * 4,360 pixels |
| Color physical pixel size | 5.2 µm |
| PAN-sharpen ratio | 1:3 |
| <i>Lens system "f80"</i> | <i>Linor Vexcel Apo-Sironar digital HR</i> |
| Panchromatic lens focal distance | 80 mm |
| Total field of view, cross track (along track) | 66° (46°) |
| Lens aperture | f = 1/5.6 |
| Flying height for PAN Pixel size on the ground of 10 cm (GSD) | 1,540 m |
| Color lens system focal distance | 27 mm |
| Color lens aperture | f = 1/4.0 |
| <i>Lens system "f100"</i> | <i>Linor Vexcel Apo-Sironar digital HR</i> |
| Panchromatic lens focal distance | 100 mm |
| Total field of view, cross track (along track) | 55° (37°) |
| Lens aperture | f = 1/5.6 |
| Flying height for PAN Pixel size on the ground of 10 cm (GSD) | 2,019 m |
| Color lens system focal distance | 33 mm |
| Color lens aperture | f = 1/4.0 |
| <i>Lens system "f210"</i> | <i>Linor Vexcel Apo-Sironar digital HR</i> |
| Panchromatic lens focal distance | 210 mm |
| Lens aperture | f = 1/5.6 |
| Total field of view, cross track (along track) | 28° (20°) |
| Flying height for PAN Pixel size on the ground of 10 cm (GSD) | 4,040 m |
| Color lens system focal distance | 70 mm |
| Color lens aperture | f = 1/4.0 |
| Lens systems are exchangeable by a specifically trained end user expert or Vexcel Imaging GmbH without re-calibration | |
| Shutter system | Prontor magnetic 0 HS – Vexcel |
| Shutter speed options | 1/1000 to 1/64 |
| Forward-motion compensation (FMC) | TDI controlled |
| Maximum FMC-capability | 50 pixels |
| Frame rate per second (minimum inter-image interval) | 1 frame per 1.8 seconds |
| CCD signal to noise ratio | 72 dB |
| Radiometric resolution in each channel | >>12 bit |
| Analog-to-digital conversion at | 14 bits |
| Workflow dynamic | 16 bits |
| Physical dimensions of the camera with 80 or 100 mm (210 mm) PAN lenses; including computer and storage module | 43 cm x 43 cm x 73 cm (80 cm) |
| Weight of the camera with 80 or 100 mm (210 mm) PAN lenses; including computer and storage module | ~ 65 kg (~ 72 kg) |
| Power consumption at full performance; including computer and storage module | 350 W |
| Camera Computer And Data Storage Subsystem | |
| Concept | Modular stack, stacked onto sensor head or released with cabling to sensor head |
| In-flight storage system | Solid state disc pack, with RAID system for data protection |
| In-flight storage capacity | Unlimited with use of multiple data units; per data unit 4 TB, ~ 3,900 images |
| Weight of data unit | < 3 kg |
| Method of exchanging data units in-flight | In less than 2 minutes |
| Physical dimensions of module | Width 43 cm x Depth 43 cm x Height 35 cm |
| Weight of module | < 30 kg |
| Power consumption at full performance | 150 W |
| Camera Operational Specification | |
| Operating / storage temperature | 0 °C to 45 °C / -20 °C to 65 °C |
| Humidity | 5 % ... 95 % no condensation |
| Flight altitude non-pressurized (full accuracy, full temperature range) | ≤ 5000 m AGL |
| Flight altitude non-pressurized (reduced temperature range; 0 °C to 25 °C) | ≤ 7000 m AGL |
| Flight altitude pressurized aircraft | no limitation unless cabin pressure stays above 5000 m pressure |
| Data transfer from aircraft to office | Shipping of data unit, or transfer by high capacity storage medium |
| Post-processing of collected raw images | UltraMap, UM/AT extension, PC network or Laptop |
| Photogrammetric Production | TIFF-output compatible with Customer's photogrammetric production software |
| Extended Ortho Workflow | Full ortho workflow by UltraMap |
| Mounting of the camera | Using adapter ring for most current film camera mounts (UltraMount GSM 3000, PAV-80) |
| Integrated GPS/INS/FMS system | UltraNav (Applanix POSTrack OEM) full embedded into camera head |
| Flight planning support (external FMS) | Compatible with all major commercial systems (TrackAir, CCNS-4, ...) |
| Exterior orientation support (external GPS/INS system) | Compatible with all major DGPS/IMU systems (Applanix POS-AV, IGI Aero-Control, ...) |
| Image geometric accuracy | Better ±2 µm |