**SPECIFICATIONS

WEIGHT	460 g (16.2 oz.) Altum-PT + DLS2
DIMENSIONS	11.0 x 8.0 x 6.9 cm (4.3in x 3.1in x 2.7in)
RGB OUTPUT*	12.4 MP (global shutter, aligned with all bands)
SENSOR RESOLUTION	2064 x 1544 (3.2MP per MS band) 4112 x 3008 (12MP panchromatic band) 320 × 256 thermal infrared
GROUND SAMPLE DISTANCE	5.28 cm per pixel (per MS band), 2.49 cm per pixel (panchromatic band), and 33.5 cm per pixel (thermal)—at 120m (~400 ft) AGL
FIELD OF VIEW	50° HFOV x 38° VFOV (MS) 46° HFOV x 35° VFOV (PAN) 48° x 40° (thermal)
EXTERNAL POWER	7.0 V - 25.2 V
POWER INPUT	5.5/7.0/10W (standby, average, peak)
IP RATING	IP4X
CAPTURE RATE	2 captures per second raw DNG
STORAGE	CFexpress card
INTERFACES	3 configurable GPIO: select from trigger input, PPS input, PPS output, and top of frame signals. Host virtual button. USB 2.0 port for WiFi. Serial. 10/100/1000 Ethernet. CF Express for storage
SPECTRAL BANDS	Blue (475 nm center, 32 nm bandwidth), Green (560 nm center, 27 nm bandwidth), Red (668 nm center, 14 nm bandwidth), Red Edge (717 nm center, 12 nm bandwidth), Near-IR (842 nm center, 57 nm bandwidth)
THERMAL	FLIR LWIR thermal infrared 7.5-13.5um radiometrically calibrated

*With appropriate post-processing

**Note: Specifications are subject to change without notice

Altum-PT: An optimized 3-in-1 solution for advanced remote sensing and agricultural research.

Altum-PT enables season-long plant canopy analysis that is more comprehensive and more detailed than what current sensors are capable of offering. Its high-resolution outputs enable plant counting and the detection of small canopy features at early growth stages. The enhanced patented thermal calibration technology guarantees the most accurate thermal maps available - over two times better than the previous Altum, opening the door to advanced research applications.

Key Features

- Ultra-high-resolution panchromatic imager for data outputs at 2.49 cm GSD from 120m—more than 2 times the resolution of today's comparable multispectral cameras.
- Built-in 320 x 256 radiometric thermal imager, enabling over twice the ground resolution of the previous Altum—33cm/pixel vs. 81cm/pixel.
- Removable, professional-grade CFexpress storage with up to 2TB capacity allowing faster write speeds of up to two captures/second.

Visit us at micasense.com/rededge-p to learn more.
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MicaSense, Inc., An AgEagle company

ALTUM-PT™

Over twice the spatial resolution of the previous Altum

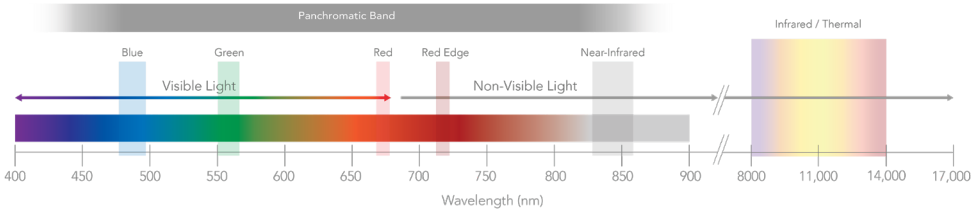
Altum-PT integrates an ultra-high-resolution panchromatic imager, a new thermal imager, and five discrete spectral bands, for outputs at over two times the resolution of the previous Altum. The higher spatial resolution capabilities mean that in most cases, Altum-PT can be used from early emergence all the way to the end of the season, allowing for subtle change detection and providing high-quality data throughout the year.

Applications include...

- Irrigation management
- Disease, pest, and nutrient deficiency detection
- Plant breeding
- Fruit yield estimations
- Water stress prediction
- Species classification for land management/conservation

Simultaneous capture of thermal, multispectral, and panchromatic imagery

The MicaSense Altum-PT is a solution that simultaneously captures calibrated pixel-aligned RGB, thermal, multispectral, and panchromatic outputs. The panchromatic sensor allows for pan-sharpening the multispectral imagery, ultimately increasing the spatial resolution of the multispectral data for results at resolutions that enable entirely new capabilities—1.2 cm (0.47in) pan-sharpened ground resolution when flying at 60m (200ft).



Kit Contents

- Altum-PT sensor
- DLS 2 with embedded GPS
- Calibrated Reflectance Panel (CRP 2)
- USB WiFi dongle
- Lens cover
- Necessary integration cables
- Assorted mounting hardware
- CFexpress card
- CFexpress card reader
- Hard Carrying Case
- Quick Start Guide

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THERMAL BY FLIR

Ultra-high resolutions, unlimited analytical capabilities

Altum-PT is designed to provide the most accurate radiometric results at resolutions that enable entirely new remote sensing workflows. Its thermal imager captures a pixel size of 17cm when flown at 60m, enabling more granular detection of thermal variability. Altum-PT provides better detail and image quality, supporting the most challenging irrigation management tasks.

ALTUM-PT™ Sensor Comparison Sheet

	Altum	Altum-PT	Altum-PT Advantages
Weight	406.5 g (14.34 oz.) Altum + DLS2	460 g (16.2 oz.) Altum-PT + DLS2	Pan-sharpening the data instead of using higher resolution sensors for each multispectral band results in a lighter overall camera, ensuring integration onto a variety of UAVs and minimizing flight time due to payload weight.
Dimensions	8.2 cm x 6.7 cm x 6.75 cm (3.2 in x 2.6 in x 2.7 in)	11.0 x 8.0 x 6.9 cm (4.3 in x 3.1 in x 2.7 in)	Altum-PT provides more than double the multispectral and thermal resolution of Altum, with only a slight increase in form factor.
External Power	4.9 V - 25.2 V	7.0 V - 25.2 V	
Power Input	5.5/7.0/10W (standby, average, peak)	5.5/7.0/10W (standby, average, peak)	
Spectral Bands	Blue 475(32), Green 560(27), Red 668(14), Red Edge 717(12), NIR 842(57)	Blue 475(32), Green 560(27), Red 668(14), Red Edge 717(12), NIR 842(57)	
RGB Output	High-resolution, global shutter, aligned with all bands	12.4 MP (global shutter, aligned with all bands)	The RGB composite from Altum was previously 9.6MP, now with the panchromatic sensor on Altum-PT the RGB composite is 12.4MP.
Thermal	FLIR LWIR thermal infrared 8-14um radiometrically calibrated	FLIR LWIR thermal infrared 7.5-13.5um radiometrically calibrated	
Sensor Resolution	2064 x 1544 (3.2 MP per EO band) 160 x 120 thermal infrared	2064 x 1544 (3.2MP per MS band) 4112 x 3008 (12MP per PAN band) 320 × 256 thermal infrared	The panchromatic sensor enables higher resolution without large lenses and imagers for each of the multispectral bands, optimizing camera weight and keeping down data volume. Altum-PT uses a FLIR Boson 320, compared to the FLIR Lepton previously used with Altum. The higher resolution thermal with the Altum-PT enables more detailed insights for assessing water stress at the plant level.
Multispec GSD (per multispec band)	5.28 cm per pixel at 120 m	5.28 cm per pixel at 120 m	For Altum-PT, this is the multispectral resolution before pan-sharpening.
Thermal GSD	81 cm per pixel (thermal) at 120 m	33.5 cm per pixel at 120 m	The higher resolution thermal with the Altum-PT enables more detailed insights for assessing water stress at the plant level.
Panchro & Pansharpened GSD		2.49 cm per pixel at 120 m	Pan-sharpened outputs from Altum-PT are the highest spatial resolution offered by MicaSense. Ground sample distance has a linear relationship with the flight altitude, so flying lower will enable even higher resolution. For instance, flying at 60m will result in a GSD of 1.2 cm per pixel.
Capture Rate	1 capture per second (all bands), 12-bit RAW*	2 capture per second raw DNG*	Due to the faster capture rate Altum-PT can keep up with faster flight speeds, enabling more efficient flight time.
Interfaces	Aircraft: Trigger input, top of frame out, 1 PPS out. 3.3V isolated IO 2x USB 3.0 SuperSpeed ports for WiFi or Ethernet and USB 3.0 Storage.	3 configurable GPIO: select from trigger input, PPS input, PPS output, and top of frame signals. Host virtual button. USB 2.0 port for WiFi. Serial. 10/100/1000 Ethernet. CFexpress for storage	
Field of View	50° x 38° (multispectral) 57° x 44° (thermal)	50° HFOV x 38° VFOV (multispectral) 46° HFOV x 35° VFOV (panchromatic) 48° x 39° (thermal)	Use of a panchromatic sensor means higher resolution, pan-sharpened multispectral outputs without sacrificing for a narrow field of view that will result in longer flight times.
Storage	USB 3.0 compatible storage devices	CFexpress Card	CFexpress cards are swappable in the field and have a much faster write speed than SD cards or USB storage devices. This enables efficient flight times, from small to large projects, and cuts down on card-to-computer transfer time when it comes to getting ready to process.

*RGB output with appropriate post-processing
*Specifications are subject to change without notice
*Capture rates vary based on write speed of USB storage device

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