

# AIRPHEN<sup>®</sup>

## The Multispectral camera from HIPHEN

AIRPHEN is a multispectral scientific camera developed by agronomists and photonics engineers to match plant measurements needs and constraints.

Its high flexibility, ease of use and radiometric quality give you a wide range of opportunities to develop your customized applications.



AIRPHEN embedded on UAV

### Main characteristics

- 6 Synchronized global shutter sensors
- Sensor resolution: 1280 x 960 pixels
- Data format: (tiff, 12 bit)
- SD card storage
- Metadata information: Exif and XMP
- Internal or external GPS
- Synchronization with different sensors (TIR, RGB, others)

### Key features

- Customized sensing configurations
- Easy integration
- Full control and configuration
- Powerful analysis with a specific *Agisoft* module



AIRPHEN + Thermal Camera FLIR Tau2



AIRPHEN embedded on Arvalis phenotyping robot



**hi-phen**

INTEGRATED PLANT PHENOTYPING SYSTEMS

### Contact us

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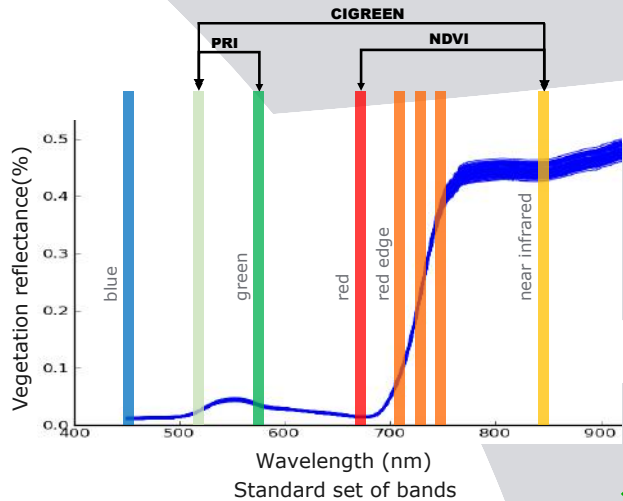
# CUSTOMIZED SENSING CONFIGURATIONS



With all the different options, Airphen camera can specialize in your plant monitoring application such as high throughput phenotyping or smart agriculture.

## Select your spectral bands

- 6 spectral bands among [450/530/570/675/710/730/750/850] (FWHM=10nm)
- Enables you to compute a wide range of Vegetation Indices and agronomic traits
- Other filters on request



Airphen + FLIR Tau 2

## Customize your focal lengths to solve the footprint vs spatial resolution dilemma

- 4,2mm ( 60°x 46° ): at 100m altitude: footprint of 11m x 80m for 9cm pixel resolution
- 8mm ( 33°x25° ): at 100m altitude: footprint of 60m x 40m for 4,7cm pixel resolution
- Combination of both focal lengths can optimize overlapping and resolution



4,2mm focal lens



8 mm focal lens



Configuration: 5 lens 8mm + 1 lens 4,2mm

## Combine thermal and RGB cameras to wider your range of applications

### -Thermal IR camera:FLIR Tau2

- Focal lens 19mm (32°x 26°), 640 x 512 pixels
  - Trigger synchronized with the 6 Airphen sensors
  - Configuration accessible through the Airphen interface
  - All metadata recorded for each IR image
  - 14 bits raw or thermal linear non compressed IR data acquisition on Airphen SD card
- Synchronization with a high resolution RGB camera through a simple jack cable



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# EASY INTEGRATION



*Airphen camera can be very easily integrated on any kind of UAV (multirotor or fixed wing). It can also be embedded on tractors, hand held devices, etc.*

## Easy to mount on any support



Fixed wings UAV



Multirotor UAV



Hand held device

## Standard connectors

- Energy (DC jack connector)
- GPS Antenna
- Trigger in/out + external GPS (jack connector)
- Optional ethernet interface for specific applications



Standard connectors



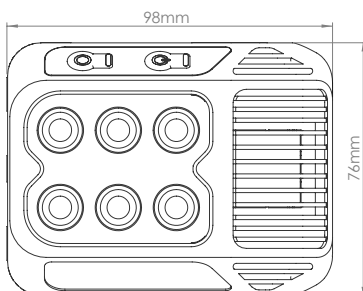
Optional ethernet interface

## Provided with

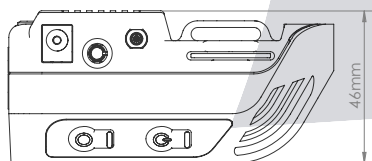
- Internal GPS antenna
- 2 batteries of 1000 mAh, 45min. of autonomy
- DC power supply
- Battery charging cables (X2)
- Camera fixing screws (M4) (X4)
- SD card 32GB
- Hard transport case
- Tools

## Characteristics

- Low weight (200g)
- Compact
- Low consumption (7w/h)
- 2 sides with 2 fixing points each



Airphen main dimensions



Airphen hard case



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# FULL CONTROL AND CONFIGURATION



Airphen camera has a Wifi access point for easy configuration and control.

## Define the setting mode

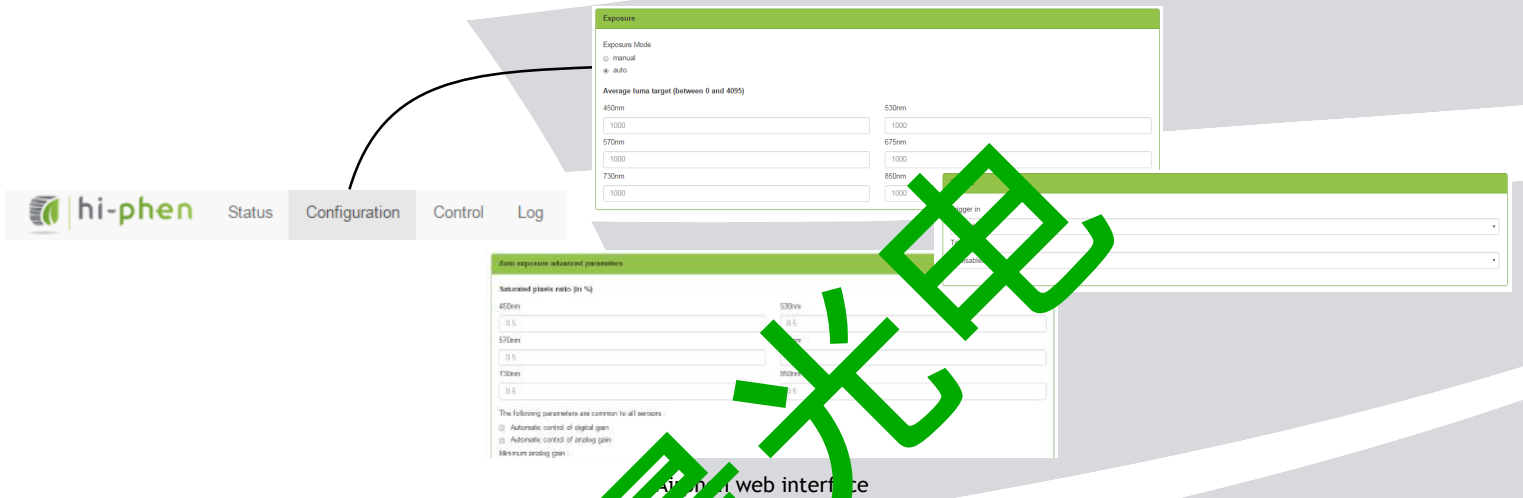
- Manual exposure time
- Automatic exposure (adjust mean value pixel)
- Auto control of saturation

## Define the triggering mode

- Automatic: Setting the frequency up to 1hz
- Triggered by UAV autopilot
- Others: Ethernet, etc

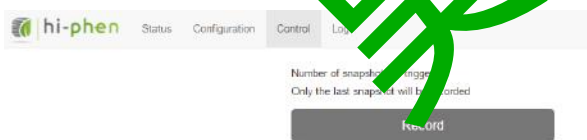


Camera status



## Start the acquisitions

- Manually by pressing a record button
- Through the web interface accessible from your smartphone, PC, tablet, etc



Remote control acquisition



Manually acquisition

## Monitor in real time the acquisition progress

## Download the data from the SD card



Airphen LEDs status



Smartphone connected to Airphen

# POWERFUL ANALYSIS WITH A SPECIFIC AGISOFT MODULE



We provide you a dedicated Agisoft Photoscan plugin to quickly and simply generate radiometrically calibrated and geometrically corrected orthoimages

## Easy import of your Airphen dataset in Agisoft Photoscan

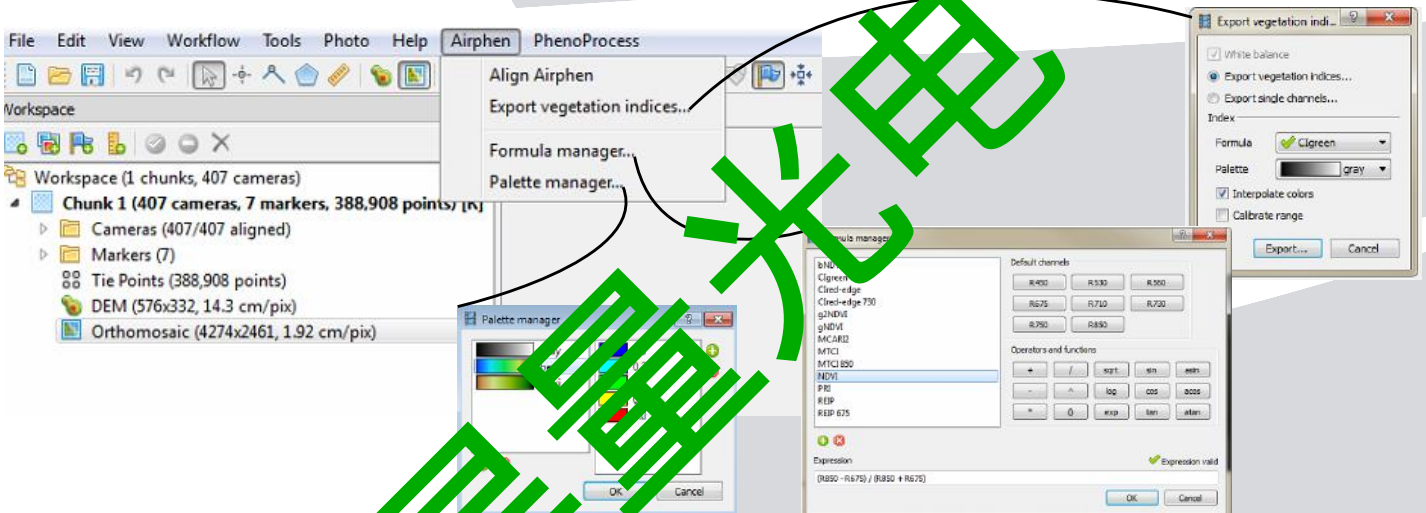


## Radiometric calibration tool

- Automatic vignetting and integration time corrections
- Reflectance calculation from a reference panel

## Geometric corrections

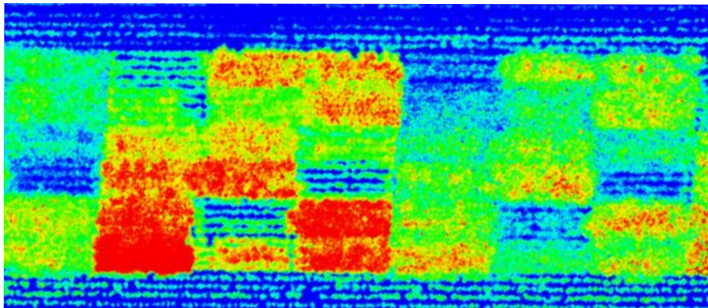
- Multiband coregistration
- Images alignment
- Orthorectification and georeferencing from internal GPS (metric precision) or RTK ground control points (centimetric absolute precision)



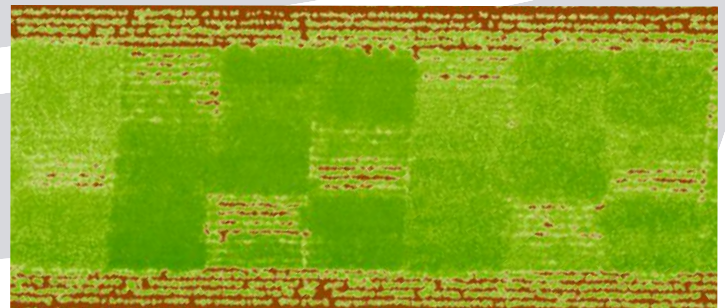
## Calculation of high value products

- Spectral indices (NDVI, MTCI, Cigreen, PRI, or user defined)
- Digital elevation model
- Dense cloud

## Export in a large range of format for integration in your GIS



Cigreen Orthoimage



NDVI Orthoimage



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