AIRPHEN ®

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

AIRPHEN + Thermal Camera FLIR Tau2

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 embedded on Arvalis phenotyping robot

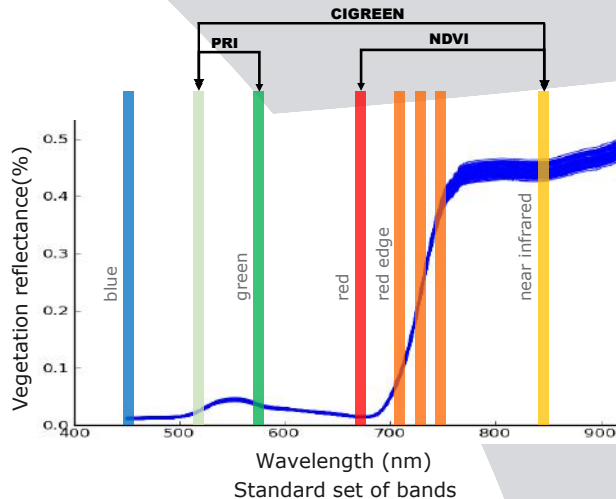# hi-phen

INTEGRATED **PLANT** PHENOTYPING SYSTEMS

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

Standard set of bands

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 114m x 86m 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 for optimize overlaping 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*

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)
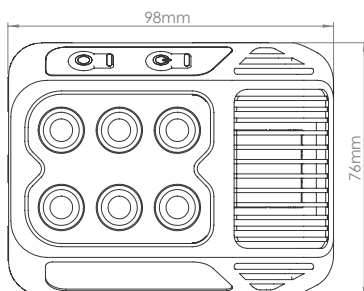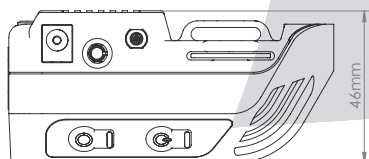- Optional ethernet interface for specific applications

Standard connectors

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

98mm
76mm
46mm
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

Airphen web interface

◖ Start the acquisitions
- Manually by pressing a record button
- Ttrough 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

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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
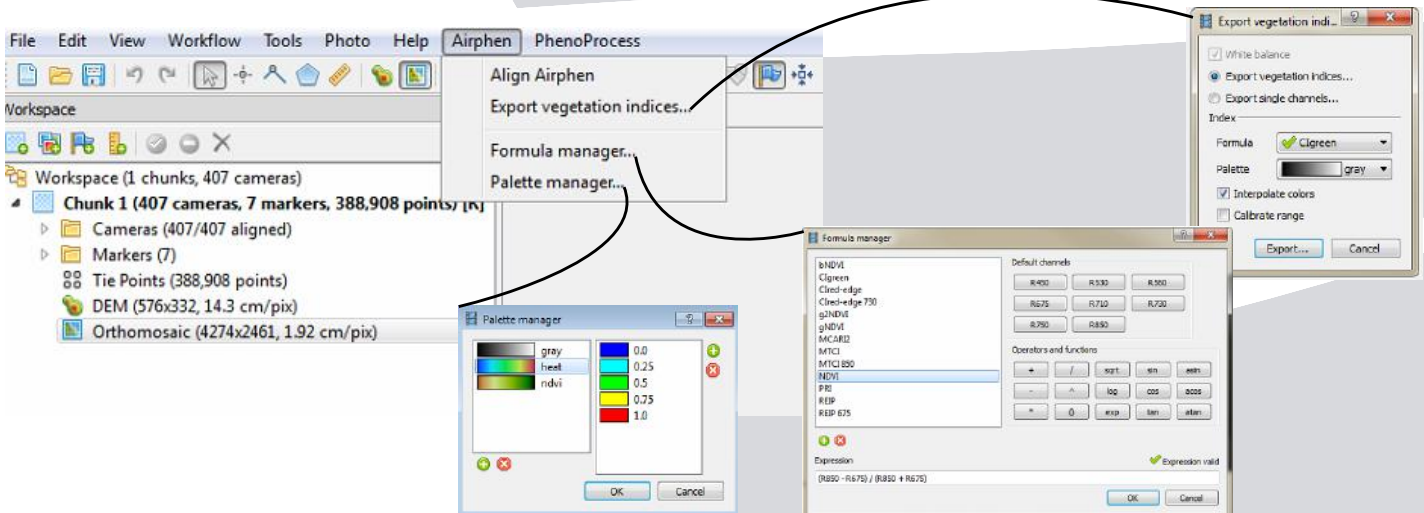
🍃 **Easy import of your Airphen dataset in Agisoft Photoscan**

PhotoScan

🍃 **Radiometric calibration tool**
- Automatic vignetting and integration time corrections
- Reflectance calculation from a reference panel

🍃 **Geometric corrections**
- Multiband coregistration
- Images alignment
- Orthorectification and georeferencement from internal GPS (metric precision) or RTK ground control points (centimetric absolute precision)
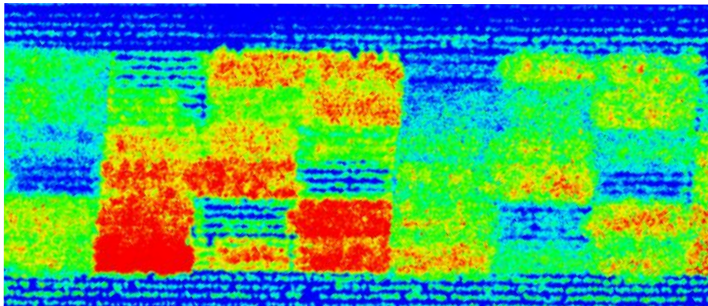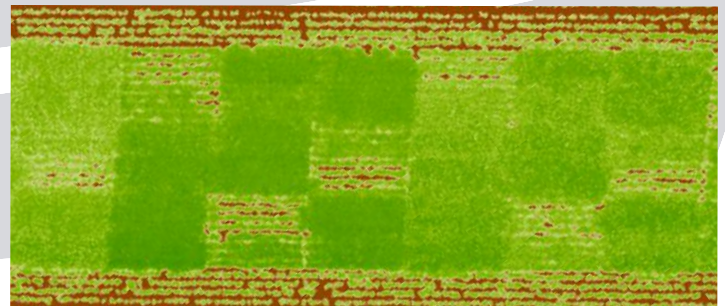
Airphen plugin in Agisoft

🍃 **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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