THERMAL PAYLOAD
PRODUCT CATALOGUE

WORKSWELL®
INFRARED CAMERAS AND SYSTEMS

About Workswell

COMPANY AND PRODUCT PORTFOLIO INTRODUCTION

Workswell thermal imaging product portfolio is divided into the several divisions:

- **systems for process control and automation**
- **UAV payloads & optical gas imaging camera**
- **early fire detection systems**
- **systems for detecting elevated body temperature**
- **calibration sources**

Workswell also provide OEM products like OEM cameras for drones, USB3 and GigE modules for thermal cores and OEM ThermoInspector. You can find many of our products as part of a third-party solution.

Workswell products are suitable for many applications in many fields such a:

- **process control**
- **industrial production**
- **technical diagnostics and inspection**
- **search and rescue**
- **research and development**
- **early fire detection systems**
- **non-destructive testing (NDT)**
- **precision agriculture**

Workswell is a Central European design and manufacturing company with headquarters located in Europe – Prague established in 2010. The company is focused on developing, producing and selling thermal imaging cameras, systems and solutions for Industrial, R&D, OEM and Medical applications.

Products and systems from Workswell enhance the manufacturing processes of numerous European car companies. If you drive a recent model produced by BMW, Škoda, Renault, Kia, it is likely that one of Workswell's thermal imaging systems played a part in the creation of your car's components or ArcelorMittal, and other companies of varying sizes.

Workswell operates in a highly developed and competitive market that challenges companies to innovate. **Workswell thrives in this high-pressure environment because of its unique approach and one-of-a-kind products.**

These include the GIS 320 – OGI (optical gas imaging) camera for use with UAV and drones and the WIRIS Pro, which is the most advanced drone thermal camera for industrial inspection. In addition, we are proud of ThermoInspector – a system that facilitates the rapid deployment of thermal imaging systems in industrial automation without the need for programming.

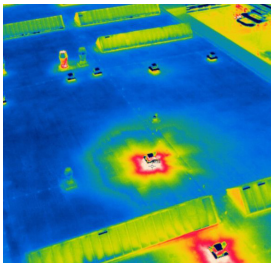
> Our mission is to provide complex products & solutions, as well as individual elements within thermal imaging, data evaluation and accurate measurement.

UAV APPLICATIONS OVERVIEW

PHOTOVOLTAIC PANELS INSPECTION

PIPELINES INSPECTION

HIGH VOLTAGE POWER LINES



CHECKING FLAT ROOF

BUILDING DIAGNOSTIC

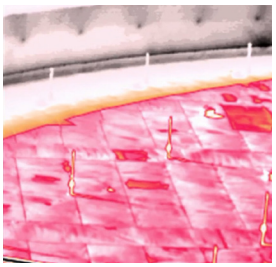
CULTIVATION AND PHENOTYPING FIELDS

DETECTION OF WATER STRESS

FAKEL BURNER INSPECTION

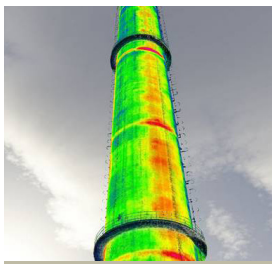
SECURITY APPLICATIONS

FIREFIGHTING AND DETECTION



GAS LEAKS VISUALIZATION

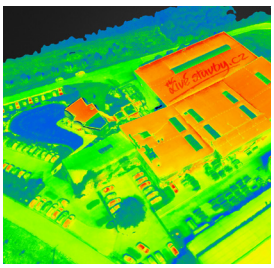
ROE DEER MORTALITY REDUCTION



DRONE BASED 3D THERMAL MODELING

MONITORING IN CLIMATE

IMPROVEMENT OF POTATOES



GREEN ROOF INSPECTION


16MPX
30X
OPTICAL
ZOOM
640PX
INFRARED
SENSOR
1500M
RANGEFINDER

WIRIS Enterprise

ADVANCED MULTI-SENSOR CAMERA FOR UAV & UGV

Workswell WIRIS® Enterprise has been designed first and foremost as an inspection camera. It's thermal camera is equipped with a LWIR microbolometric sensor with 640 × 512 px resolution (in the 7.5 – 13.5 µm range) and the Super resolution mode functionality providing an option to have the final thermogram in the **1 266 x 1 010 px resolution.**

The first RGB camera comes **with 16Mpx resolution,** which is designed primarily for high-resolution imagery and terrain mapping.
Second RGB camera comes with Full HD (1920 x 1080 px) resolution and, most importantly, it provides an absolutely unrivaled **optical ultrazoom 30x in real time**, which is suitable for security applications.

HIGH MEASUREMENT ACCURACY

We are aware that industrial applications can be very demanding when it comes to metrology and that is why it delivers an accuracy of up to ±2% or ±2 °C (±3.6 °F)

IP66 AND RUGGED CONSTRUCTION

Industrial inspections are often carried out in demanding environments. As a result, there is a high risk that inspection cameras will be damaged during the course of their normal use. That's why the WIRIS Enterprise comes with a with IP66 rating – complete protection from dust, oil, and other non-corrosive material also waterproof against rain, snow even from powerful jets of water.

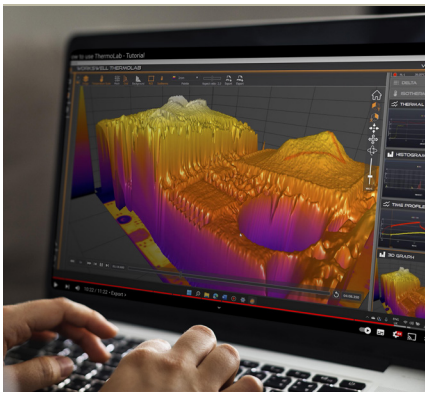
Ensconced in a rugged case of lightweight aluminum. What's more, the most sensitive component of the entire system, the thermal camera lens, is protected by a replaceable protective cap made of germanium.

INTERFACES

S.bus, CAN bus, Trigger, Digital output, MAVLink, USB-C, USB, Ethernet, Micro HDMI, PoE

- HIGH TEMPERATURE RANGE UP TO 1500°C
- PRECISE LABORATORY CALIBRATION ±2 % or ±2 °C
- RANGE FINDER UP TO 1500 M DETECTION
- THERMAL CAMERA IMAGE RESOLUTION 1266 x 1010 PX
- 30X OPTICAL RGB ZOOM WITH NIGHT VISION MODE
- VISUAL CAMERA RESOLUTION 16MPX

Find all information and videos on Enterprise website:



DETAILED ANALYSIS

Thermolab is a software for detailed analysis of thermograms from our thermal and infrared cameras, allowing the user to edit the data into different formats and create clear reports from the thermograms.

All standard data analysis functions are available in the program ,as well as extended functions such as GPS location of the image and the ability to display RGB digital images.

WIRIS OS

WIRIS OS has been in continuous development for over 4 years, and it has been tested succesfully on previous generations of Workswell WIRIS® cameras.

Today, WIRIS OS allows you to capture the full potential of the camera's sensor and computing hardware, and thus enjoy functionalities which similar products without an operating system cannot even come close to.

CUSTOMIZATION

We provide an SDK (Standard Development Kit) with every Workswell WIRIS® Pro to enable you to develop your own applications. These libraries give access to low-level functionalities and enable the application developer to maximize the potential of the camera's hardware. Workswell's SDK libraries provide developers with the tools and resources necessary to customize your thermal cameras for specific applications. Windustries and applications.

RADIOMETRIC DRONE THERMAL CAMERA

WIRIS Pro

The Workswell WIRIS Pro Thermal Camera is a cutting-edge tool designed for professional thermography applications. With its advanced features and high-resolution thermal imaging capabilities, the WIRIS Pro is an invaluable tool for a wide range of industries including building inspection, electrical maintenance, research and development, and more.

Workswell WIRIS® Pro has been designed first and foremost as an inspection camera. Its thermal camera is equipped with a LWIR microbolometric sensor with 640 × 512 px resolution (in the 7.5 – 13.5 µm range) and the Super resolution mode functionality providing an option to have the final thermogram in the **1 266 x 1 010 px resolution.**

The RGB camera comes with a Full HD (1920 x 1080 px) resolution and, most importantly, it provides an **optical ultrazoom 10x in real-time**. WIRIS Pro is capable to measure very high temperatures up to 1500 °C (2732 °F)

Each thermal camera is precisely and individually manufactured and calibrated in Prague, Czech Republic.

In summary, the Workswell WIRIS Pro offers high-resolution thermal imaging, advanced features, durability, wireless connectivity, ease of use, and a wide range of compatible lenses, making it a powerful tool for various industrial, professional, and research applications.

High-resolution thermal imaging

The WIRIS Pro features a high-resolution thermal sensor that captures images with high thermal sensitivity and accuracy. It allows for precise temperature measurement and thermal analysis, making it suitable for a wide range of industrial and professional applications.

Multiple measurement modes

The WIRIS Pro offers different measurement modes, including spot measurement, line profile, area analysis, and isotherm analysis. These modes provide flexibility and versatility in capturing and analyzing thermal data according to specific requirements, making it a powerful tool for various industries such as building inspection, electrical maintenance, and mechanical troubleshooting.

Advanced features

The WIRIS Pro comes with advanced features such as radiometric video recording, time-lapse recording, and GPS data recording. These features enables you to record and analyze thermal data over time, track changes in temperature, and correlate thermal data with other environmental parameters, enhancing the camera's utility for research, monitoring, and documentation purposes.

Rugged and durable design

The WIRIS Pro is built to withstand challenging environments. It is water and dust resistant with an IP67 rating and can operate in a wide temperature range making it suitable for outdoor and industrial applications. Its durable design ensures reliable performance in harsh conditions, ensuring longevity and reliability.

Wireless connectivity and easy data sharing

The WIRIS Pro offers wireless connectivity options, allowing users to transfer data in real-time to a mobile device or a computer for immediate analysis and reporting. This enables efficient data sharing and collaboration among team members, making it an ideal choice for field work and remote monitoring.

User-friendly interface

The WIRIS Pro has a user-friendly interface with an intuitive menu and navigation system. The camera's ergonomic design and lightweight construction make it easy to handle and carry, ensuring user comfort during prolonged use.

Wide range of compatible lenses

The WIRIS Pro offers a variety of interchangeable lenses. This flexibility makes it suitable for a wide range of applications, from long-distance inspections to close-up detailed analysis.

Find more information, videos & detailed datasheet at drone-thermal-camera.com, or easy use this QR code.

FOR MOST DEMANDING APPLICATIONS

WIRIS Pro^{Sc}

Workswell WIRIS Pro^{Sc} is a state of the art thermal imaging camera used for the most challenging applications like geological, archeological and forestry research, ecological and enviromental studies, structural research of buildings (dams, chimneys, bridges) etc.

Workswell WIRIS Pro^{Sc} camera is designed for applications requiring the highest temperature sensitivity and accuracy, excellent service and software support. That's why the camera is offered in a research and **education kit with WIRIS Data SDK** for users application development and **WIRIS Ethernet SDK** for ethernet application development.

We want you... to measure accurately.

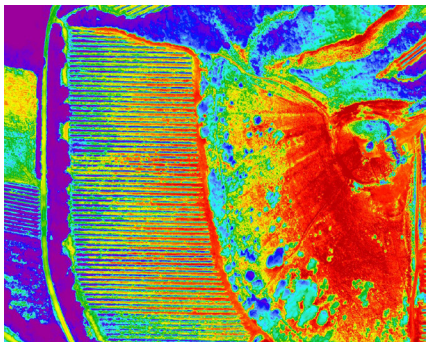
Each WIRIS Pro^{Sc} thermal camera is precisely calibrated in the climatic chamber. Not only is the accuracy of the thermal camera when measuring different temperatures, but also at different operating temperatures. We managed to achieve unmatched measurement accuracy in the field of aerial thermography, ie. **±2 °C or ±2 % (±3.6 °F).**

Many interfaces

(CAN, S.BUS, Ethernet, USB and more) make Workswell WIRIS^{Sc} a completely versatile system that can be placed on the DJI M300 drone and the most drones by other manufacturers such as Azup, Acecore, Drone Amplified, Clogworks, Copting, Freefly, InfraChen Technology Co., Ltd., Inspired Flight, Skyfront and Vision Aerial.

Workswell WIRIS Pro^{Sc} is the only UAV thermal imaging camera that can meet all the requirements of this extremely demanding application.

- highest thermal sensitivity **(<30 mK)**
- really low temperature drift even during long flight
- very high homogeneity in thermogram



WATER PLANT MANAGEMENT

Water plant management can greatly benefit from the use of thermal cameras. Thermal cameras can provide valuable insights into various aspects of water plant operations, including equipment maintenance, energy efficiency, and safety.

Water and plant management influence the local microclimate. By draining and removing greenery on large areas, we induce a desert climate, especially in cities or fields, that does not solve any technical equipment.

Thanks to this image, it is clear from which places in the landscape drought and loss of vegetation coming from. We can see that the naked hill on the right above the vineyard warms its surroundings and reaches through the vineyard.

We belive, that in terms of land management, Workswell WIRIS Pro^{Sc} is a useful tool. And with its help it is possible to localize, visualize and reverse local processes, the cause of which is currently considered global and the processes are considered as locally irreversible.

Find more information, videos & detailed datasheet at drone-thermal-camera.com or easy use this QR code.

GAS LEAK DETECTION CAMERA
GIS 320

FULLSPECTRUM VISIBLE CAMERA

The Workswell GIS-320 contains a digital RGB camera.

Its resolution is 1920 x 1080 pixels and it has 10x optical zoom, which aids in the inspection of specific areas.

The camera is capable of **capturing images across the entire visible spectrum, ranging from UV (ultraviolet) to NIR (near-infrared) wavelengths.** This allows for comprehensive and detailed imaging of different types of objects and materials, including vegetation, water bodies, urban areas, and more.

IMAGES AND VIDEO RECORDING

The GIS-320 can also take non-radiometric images and video for later processing.
Its data is stored on a 256 GB internal SSD or flash drive.

The images captured by the **GIS-320 camera are high-resolution thermal images that display the gas leaks as hotspots.** Images can be saved and stored for later review and analysis. The camera also has a built-in video recording capability, allowing users to record real-time footage of gas leaks as they occur. **The video recordings can be saved in various formats** and can be used for analysing and reporting.

COOLED QUANTUM DETECTOR

The **cooled SWIR quantum detector's resolution is 320×240 pixels**, making it a powerful addition to this thermal camera.

The cooled detector operates at the very low temperature of -200°C, which increases its **temperature sensitivity to 10mK.**
The cooled quantum detector in the GIS-320 camera provides several advantages, including increased sensitivity, longer detection range, and reduced false alarms.

It enables users to accurately pinpoint gas leaks and visualize them **in real-time on the camera's display.**

The Workswell GIS 320 features a thermal imaging sensor that can detect gas leaks from a distance of up to 100 meters. **The camera also comes equipped with a high-performance lens that allows for clear and detailed imaging,** even in low-light conditions.

One of the key features of the Workswell GIS 320 is its **ability to detect and visualize over 200 types of gases at the same time.** This means that professionals can quickly and accurately identify the source of a gas leak, even when multiple gases are present.
The GIS-320 can detect a wide spectrum of gases which are invisible to the naked eye. Moreover, the GIS-320 has a high sensitivity, with a **detection range of between 3.2 – 3.4 µm. Itś absolutely perfect for gas leak detection.**

The Workswell GIS 320 is also highly customizable, with a on board operating system that allows professionals to tailor the camera to their specific needs.

This includes advanced features such as automatic alarm detection and notification, as well as customizable reporting tools that allow for easy data analysis.

Find more information, videos & detailed datasheet at drone-thermal-camera.com or easy use this QR code.

Overall, the Workswell GIS 320 is a highly advanced thermal imaging camera that is designed to meet the needs of professionals working in the gas industry.

With its advanced features and high level of customization, it is an essential tool for anyone involved in gas leak detection and prevention.

WIRIS Agro R

GET YOUR AGRICULTURE ON NEXT LEVEL

Workswell's WIRIS Agro R is the first device of its kind designed to map water stress across large areas in the field of precision agriculture. The aim of this method and device is to determine the value of water stress in the plant.

Crop drought - actual and real value. In the dry season what we are usually interested in is the actual effects of drought on crops. These impacts are not only dependent on the condition of the so-called climatic drought, but also on the groundwater drought, the size of the plant root system, etc. Measuring the water stress of plants with CWSI (Crop Water Stress Index) camera will help you to determine the actual and real effects of drought on the crop.

WIRIS Agro R offers four different colourmaps. From the point of view of data rocessing it is not important which colourmap you choose. In the application point of view a suit- a suitable palette choice can be very helpful.

INTERFACES

The Workswell WIRIS Agro R offers an interface enabling the widest range of connections to the drone, the control unit, an external GPS sensor, and other instruments. A Wi-Fi low latency live video streaming and command link is also available. The following HW interfaces are standard: S.BUS, CAN bus, Ethernet (RJ 45 with RTPS streaming and control signals transmission option), MavLink external GPS connection, External trigger

NDVI VERSUS CSWI

Dead or live X Situation in a real time

NDVI is used to detect live green plant canopies in multispectral remote sensing data. So you can only quantify the photosynthetic capacity of plant canopies in that time.

See the current situation! You can see how "it works" and how to "improve it" in real time. Intervention could be evaluated during a few hours.

Not the process but the result X Physiological process

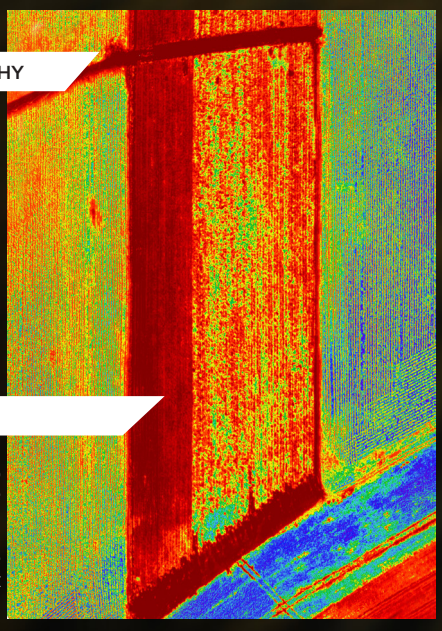
You observe the long-term effects of stress factors and environmental conditions on the state of vegetation but it is very difficult to identify the causes.

You observe the actual crop's physiological process under given conditions at a given time. This is great, for example, for controlling irrigation systems or locating vegetation infested by pests.

It's too late! X Before it's too late!

It is very difficult to make the right intervention as you cannot monitor the response quickly enough after applying the intervention. The NDVI shows the impact and result after a longer period of time.

You can take actions before the crops die, ie when the stress is already occurring but the process is still reversible. The effectiveness of the intervention can be evaluated immediately after applying it.

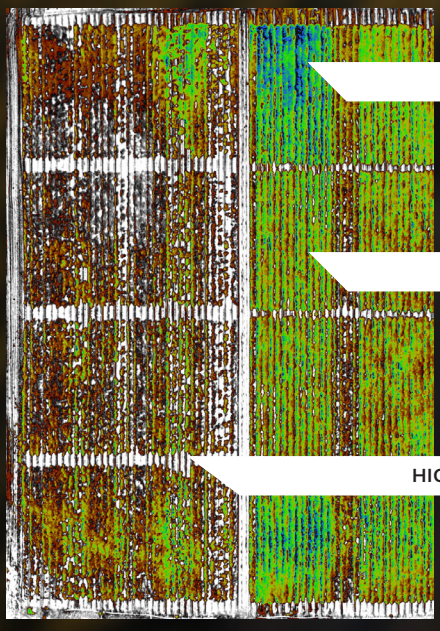


MODERATELY HEALTHY

Crops are feeling better or worse, but it's not clear from the NDVI map why and whether they are currently under stress. Any corrective action to improve their conditon will not be reflected quickly in the NDVI picture and will be difficult to evaluate.

DEAD CROP

Crop has already died and it is impossible to tell from the picture how this happened and what intervention would help. Corrective intervention does not exist.



WATER WASTING

CSWI is very low. Water could be better distributed over the land or saved. No drought effect.

CORRECT IRRIGATION

The water stress level corresponds to the current situation (sunny day, no precipitation). Irrigation helps prevent crop damage and works properly.

HIGH LEVEL OF STRESS

The irrigation system is not functioning properly and part of the crop is willing. High level of water stress.

- BIOMASS COVER INDEX ONLINE EVALUATION
- MONITORING OF ONGOING VEGETATION STRESS
- IRRIGATION SCHEDULING BASED ON WATER STATUS
- AERIAL INSPECTION OF IRRIGATION SYSTEMS
- NEW PLANT BREEDING EVALUATION
- AERIAL DETERMINATION OF CWSI

CROP DROUGHT IN REAL TIME

In the dry season, precision farmers want to measure the actual effect of drought on their crops. However, this can be difficult to identify. For example, crops may respond differently to drought if they have access to groundwater, and each plant has a different root system. These factors make it hard to tell how much a particular crop might be suffering during a given drought. That's where the WIRIS Agro comes in. This thermal camera makes real-time measurements of the actual effects of drought on a crop.

Find more information, videos & detailed datasheet at drone-thermal-camera.com or easy use this QR code.

Thermolab software

UNLOCK THE FULL POTENTIAL OF YOUR THERMAL SYSTEMS

Thermolab a software solution developed by Workswell, a company that specializes in thermal imaging technology. Thermolab software is designed to work in conjunction with Workswell's thermal imaging cameras, providing users with advanced tools for capturing, analyzing, and processing thermal images for various applications, such as industrial inspection, building diagnostics, and research.

3D GRAPHS

This feature takes thermographic analysis to the next level. With this feature, we can spatially represent significant temperature differences and determine the severity of a possible defect. 3D Graphs are designed to display, for example, surface homogeneity and to Analyse measured temperature data in a 3D representation with a number of advanced features that can be set by the user.

VIDEO ANALYSIS

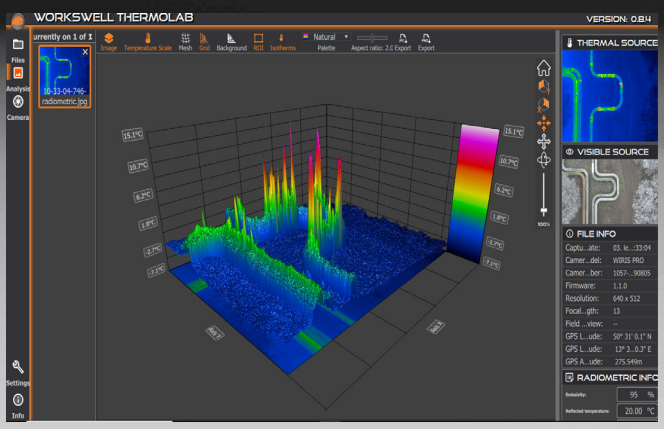
The advantage of calibrated radiometric video is the ability to monitor temperature changes over time. This allows the user to accurately

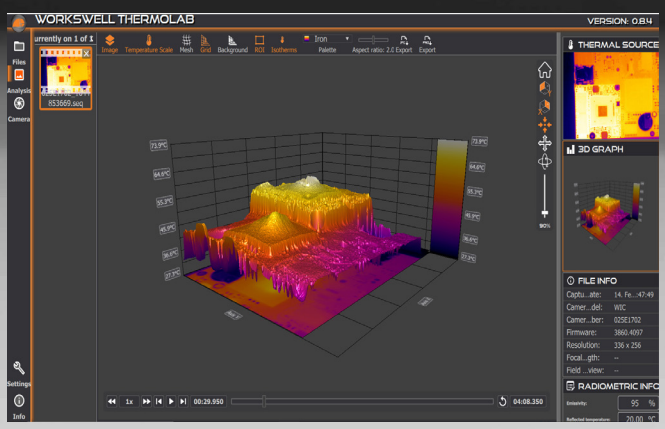
Analyse thermal dynamic processes that cannot be Analysed from a single image. Video analysis can also be used in the 3D Graph function showing spatial differences over time.

FAST EXPORTS

Thermolab's export function makes it easy to create a snapshot, video or numerical temperature matrix in commonly compatible formats such as: jpeg, tiff, pdf, png, mp4, csv, jpg.
Thermolab's export function provides flexibility in choosing different formats based on the user's requirements for snapshots, videos, and allows compatibility with commonly used file formats for ease of use and sharing.

- Setting measurement parameters) for both individual images and radiometric video.
- Inserting measurement functions: point temperature measurements, minimum and maximum in area, polygonal and triangular areas, temperature profile and other functions.
- Display of GPS coordinates on the map and in the case of radiometric video, display of the GPS position of individual frames and the entire trajectory.
- Editing radiometric images (thermograms), changing the palette, changing the temperature range.
- The camera section is used to process data from a camera connected via USB or Ethernet real time streaming
- The histogram shows the frequency of pixels with the same temperature and works for all ROIs.
- Continuous zoom – advanced zooming and display of thermographic image in detail
- RGB digital image display option





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GREMSY GIMBALS FOR THERMAL PAYLOADS

GREMSY PIXY WP

The Pixy WP is specifically **optimized for use with the WIRIS Pro and WIRIS Agro** thermal imaging camera, which is known for its high-resolution thermal imaging capabilities.

The gimbal provides precise control over the camera's pan and tilt movements, allowing for smooth and stable thermal imaging capture from the air. This makes it an ideal choice for a wide range of applications, including industrial inspections, search and rescue operations, and environmental monitoring.

GREMSY PIXY WE

PIXY WE is a particular version of Pixy series, specifically **designed to fit Wiris Enterprise** camera to provide for the most demanding metrological applications such as security, search and rescue.

Pixy WE is only 470g, what makes it one of the lightest gimbals among Gremsy gimbals. Built for a specific camera, prewired and prebalanced- simple one click integration. Pixy WE delivers excellent quality stabilization.

GREMSY T7

Boasting a robust design and powerful motor, Gremsy T7 is the next level of heavy lifting gimbal for industrial applications **ideal for our camera GIS 320**.

With a large camera cage and ability to carry up to 7 lbs, the T7 expands the range of compatible cameras and is capable of loading multiple specialized sensors at once.

Powerful. Capable. Industrial. Gremsy T7 is here to enhance the power of your system.

Specifications

WIRIS PRO

WIRIS Pro Key features description	
Super Resolution Mode	WIRIS Pro takes Super Resolution Mode 1.3Mpx IR images in one shot
Operating onboard system	WIRIS OS for full real-time data streaming and control during the flight • operating system ensures the full access to all camera functions • easy camera control via S.Bus, CAN bus, MavLink, RJ-45 or Trigger
10x Optical Antivibration zoom	Full HD 10x optical zoom camera with anti-vibration compensation
Thermal camera specification	
IR camera resolution	640 x 512 pixels
IR Super Resolution Mode	1 266 x 1 010 pixels (improvement of native resolution up to 1.3 Mpx)
FPA active sensor size	1.088 x 0.8705 cm
Temperature ranges	-25 °C to +150 °C (-13 °F to +302 °F) -40 °C to +550 °C (-40 °F to +1 022 °F) optional temperature range 50 °C to 1 000 °C (122 °F to 1 832 °F) optional temperature range 400 °C to 1 500 °C (752 °F to 2 732 °F)
Temperature sensitivity	Standard 0.05 °C (50 mK, 0.09 °F) or optional 0.03 °C (30 mK, 0.054 °F)
Accuracy	±2 % or ±2 °C (±3.6 °F) in temperature range 0 °C to +150 °C (32 °F to +302 °F), after camera stabilization • climate chamber and black body testing for all products
Frame rate	30 Hz or < 9 Hz
Spectral range / detector	7.5 – 13.5 µm / Uncooled VOx microbolometer
Calibration of each lens	Package includes a calibration certificate
Available lenses	18°, 32°, 45°, 69° (exchangeable lenses, all calibrated), visit FOV calculator
Protective filter on lens	Filter protects the lens against external damage during the flight
IR Digital zoom	1 – 14x continuous
Digital visual camera	
Resolution	1 920 x 1 080 pixels (Full HD), 1/3" sensor Auto white balance, Wide dynamic range, Backlight compensationExpo-sure and Gamma control
Optical zoom	10x optical zoom with vibration compensation
View angle	ultra zoom 6.9° - extra wide 58.2°, focal 33.0 mm - 3.3 mm
Noise reduction	Special 3D noise reduction function
Focus	Autofocus with Direct Focus Zoom synchronization
Memory and data recording	
Memory	Internal high-speed SSD 128 GB or 256 GB for image and video recording External slot for Micro SD card & USB 2.0 for USB stick for taking images
Image and video formats	Radiometric JPEG images and Digital camera Full HD JPEG images Radiometric TIFF images (Pix4D and Agisoft compatible for 3D modeling) Digital camera h.264 encode video HD recording Radiometric full-frame IR recording (raw data recording in 30 Hz or < 9 Hz)

WIRIS ENTERPRISE

WIRIS Enterprise Key feature specification	
Super Resolution on Mode	WIRIS Enterprise takes Super Resolution Mode 1.3Mpx IR images in one shot
Laser rangefinder	Distance measurement 10 to 1500 m (32 to 4920 ft), divergence: 1.4 x 0.4 mrad, EN 60825-1:2015-07 eye-safe 905nm
Operating onboard system	WIRIS OS for full real-time data streaming and control during the flight • operating system ensures the full access to all camera functions • easy camera control via S.Bus, CAN bus, MavLink, RJ-45 or Trigger
Thermal camera specification	
IR camera resolution	640 x 512 pixels
IR Super Resolution Mode	1 266 x 1 010 pixels (improvement of native resolution up to 1.3 Mpx)
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Temperature ranges	-25 °C to +150 °C (-13 °F to +302 °F) -40 °C to +550 °C (-40 °F to +1 022 °F) optional 50 °C to 1 000 °C (122 °F to 1 832 °F) optional 400 °C to 1 500 °C (752 °F to 2 732 °F)
Temperature sensitivity	Standard 0.05 °C (50 mK, 0.09 °F) or optional 0.03 °C (30 mK, 0.054 °F)
Frame rate	30 Hz or < 9 Hz
Accuracy	
Spectral range / detector	7.5 – 13.5 µm / Uncooled VOx microbolometer
Calibration of each lens	Package includes a calibration certificate
Available lenses	18°, 32°, 45°, 69° (exchangeable lenses, all calibrated), visit FOV calculator
Protective filter on lens	Filter protects the lens against external damage during the flight
Thermal image digital zoom	1 – 12x steps
Digital RGB cameras - WIRIS Enterprise is equipped with two RGB cameras	
Fixed visual camera	16Mpx resolution
High resolution fixed camera	30x optical zoom with vibration compensation and image stabilization
30x optical zoom camera	0.0008 lux (ICR on, Slow shutter 1/4s, High sensitivity on)
Optical zoom camera Image enhancement	Ultra zoom 2.3° - extra wide 63.7° / 129.0 mm – 4.3 mm
Optical focus camera – autofocus	Autofocus with automatic or manual exposure time control
Image enhancement	Auto-white balance, WDR, IR cut filtering, DEFOG, 3D Noise reduction
Memory and data recording	
Memory	Internal high-speed SSD 128GB or 256GB for image and video recording External slot for Micro SD card & USB 2.0 for USB stick for taking images

WIRIS AGRO R

WIRIS Agro R Camera key features description	
CWSI onboard processing	Evaluation of Crop Water Stress Index (CWSI) onboard in real-time as well as temperature value
Operating onboard system	WIRIS OS for full real-time data streaming and evalution during the flight • operating system ensures the full access to all camera functions • easy camera control via S.Bus, CAN bus, MavLink, RJ-45 or Trigger
Biomass cover index in %	Real-time percentage calculation of the mass of the vegetation in RGB
WIRIS Agro R specification	
Sensor resolution	640 x 512 pixels
Real-time CWSI evaluation	Workswell patented WIRIS Agro R camera technology based on crop water stress index (normalized to value from 0 to 1) brings information about the crop stress and crop water management on large areas. The information can then be used to determine yield maps, manage irrigation or implement water management related remedies.
FPA active sensor size	1.088 x 0.8705 cm (LWIR band sensor)
Radiometry	Yes, temperature value in each pixel
CWSI evaluation range	0 – 100 % (100 % means very stressed)
Temperature sensitivity	0.03 °C (30 mK, 0.054 °F)
Field of view of the lens	45°
Color maps	4 color maps for CWSI and Water management evaluation
CWSI Range settings	Automatic or manual
CWSI digital zoom	1 – 14x continuous
Software ThermoLab	Yes, included in the package 2 licenses
3D mapping SW compat-ibility	Agrisoft and Pix4D
10x optical zoom RGB camera	
Resolution	1 920 x 1 080 pixels (Full HD), 1/3" sensor, Auto white balance, Wide dynamic range, Backlight compensation, Exposure and Gamma control
Optical zoom	10x optical zoom with vibration compensation
View angle	ultra zoom 6.9° - extra wide 58.2°, focal 33.0 mm – 3.3 mm
Biomass cover index	Calculation of the index in real-time with Threshold function
Focus	Autofocus with Direct Focus Zoom synchronization
Memory and data recording	
Memory	Internal high-speed SSD 128 GB for image and video recording External slot for Micro SD card & USB 2.0 for USB stick for taking images

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Infrared Cooled Camera (MWIR)	
Resolution	320 x 240 pixels
Temperature ranges	Optional temperature ranges -20 °C...+350 °C (-4 °F...+662 °F)
Temperature sensitivity	0.015 °C (15 mK, 0.027 °F)
Frequency	30 Hz
Spectral range	3.2 – 3.4 µm, Cooled InSb FPA detector (MWIR)
Lens	24° x 18° or 14,5° x 10,8°
Focus	Automatic Motorized focusing, minimum focus distance 0.5 m
Zoom	Digital zoom 1 – 4x in infrared image
Special GAS detection mode	Yes
Temperature level adjust-ments	Yes, automatic, manual or moving span
Digital Visual Camera	
Resolution	1 920 x 1 080 pixels (Full HD)
Focus	Autofocus
Zoom	10x optical zoom with vibration compensation
Remote control & Video output	
Digital interfaces	S.BUS CAN bus (for DJI control and GPS coordinates) USB 2.0 (data transfer, video recording, FW update) MavLink
Video output	Digital HDMI 720p (1 280 x 720 px)
Memory and data recording	
Image and video formats	Radiometric JPEG images and Digital camera JPEG Full HD Radiometric TIFF (Pix4D and Agisoft compatible for 3D modeling) Digital camera h.264 encode video HD recording Radiometric full-frame IR recording (raw data recording in 30 Hz)
GPS tagging	MavLink External GPS A2 or A3 DJI compatible via CAN bus interface
Memory	Internal high-speed SSD 256 GB for image and video recording External slot for Micro SD card & USB 2.0 for USB stick for taking images
Temperature Measurement functions	
Measurement functions	Max temperature, Min temperature, Centre temperature
File format	Saved in radiometric (raw) format in JPEG, TIFF and video WSEQ

Contact

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