



WORKSWELL WIRIS 2ND GEN

Datasheet

Workswell WIRIS 2nd Generation

Introduction

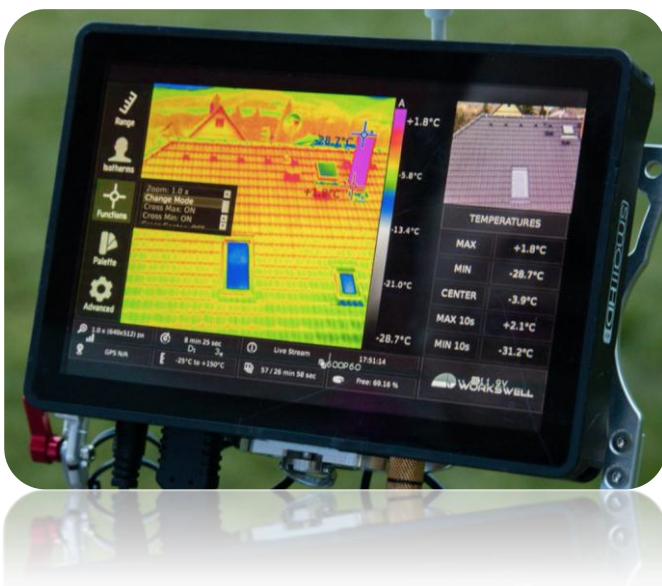
Workswell s.r.o. is pleased to introduce you a brand new thermal imaging system Workswell WIRIS 2nd Generation for unmanned air systems (UAV) or drones. We pushed the limits forward and created all-in-one system that weighs approximately 400 g. It can have a resolution up to **640 x 512 pixels** with temperature sensitivity up to 0.03°C and **temperature range up to 1 500 °C**. The main goal of the system is a simple transfer, storage and real-time analysis of radiometric (temperature) data directly from UAV (drone) and displays these data on an operator's controller in real time. The system can continuously record radiometric videos or images on internal 32 GB memory that allows you to save up to 80 000 images or 200 minutes of video. All data can be analyzed in software that is included in the Workswell WIRIS package. A pilot of the UAV is able to record video, take images and even control whole menu of WIRIS only with 2 digital inputs (PWM) or through SBus.



This functionality creates unlimited use of WIRIS in all applications, from industrial, agricultural to security. The system also offers a variety of modes, palettes, security alarms, Max and Min measurement analysis or up to 16x zooming. Have a clear visual and infrared view during the whole flight using an integrated real digital camera with high resolution 1 600 x 1 200 px.

Features

- Radiometric (temperature) data
- Calibrated temperature data
- Resolution up to 640 x 512 pixels
- Sensitivity up to < 30 mK (0.03 °C)
- Continuous 1- 16x digital zoom
- PWM, SBus and CAN bus connectivity
- Real-time temperature analysis
- Alarm (security) mode
- Image recording (radiometric)
- Video recording (radiometric)
- Free Workswell CorePlayer software
- Input voltage 6 – 36 V DC
- Low power consumption < 6 W
- Weight <400 g



WIRIS 2nd Generation technical specification

	Workswell WIRIS 2nd 640	Workswell WIRIS 2nd 336
Thermal Imaging Camera		
Resolution	640 x 512 pixels	336 x 256 pixels
FPA active sensor size	1.088 x 0.8705 cm	0.5712 x 0.4351 cm
Temperature ranges	-25 °C to +150 °C -40 °C to +550 °C, optional temperature range 400 °C to 1 500 °C (filter)	
Temperature sensitivity	0.05 °C (50 mK) 0.03 °C (30 mK) available on request	
Accuracy	±2 % or ±2 °C	
Spectral range	7.5 – 13.5 μm	
Calibration	Yes, the package includes the calibration certificate	
Detector type	Uncooled VOx microbolometer	
Lenses	Interchangeable and focusable, various field of view	
Available lenses	18°, 32°, 45°, 69°	17°, 25°, 35°, 45°
Focus	Manual (focused on infinity, Min focus distance depends on lens)	
Digital zoom	1 – 14x continuous	1 – 11x continuous
Digital Camera		
Resolution	1 600 x 1 200 pixels	
Focus	Fixed	
Digital zoom	1 – 16x continuous	
Screen real-time information		
Modes	IR mode and Digital Camera Mode	
Multimode view (PiP)	Yes, both modes on screen at the same time	
Max/Min/Center temp.	Automatic hot spot and cold spot detection, center point measurement	
Temperature range	Automatic or Manual adjustable via UAV controller during the flight	
Real time clock	Displayed on a screen and saved in every image	
Size of the memory	Real-time calculation of free memory on board	
Digital zoom	Up to 14x in thermal camera, up to 16x in digital camera	
Time to Non-uniformity correction (NUC)	Can be set time interval when the NUC will be done	
Information from GPS	Number of satellites, altitude, speed, GPS position	
Languages	English, French, Spanish, German and Czech	



Remote Control	
Digital inputs	7x PWM digital inputs for complete control of WIRIS during the flight
SBus protocol	Supports up to 18 channels using only one single cable
PWM trigger	By servo connectors (PWM) via UAV controller
PWM power supply	Integrated power supply for RC transmitters (5 V)
External trigger (TTL Trigger)	Images: can be saved every 500 ms by trigger Video: start or stop recording by trigger
Digital outputs	Autopilot confirmation trigger and GPS synchronization
Full menu navigation	By only 2 digital inputs (Up/Down - Ok/Cancel via UAV controller)
Image recording	Saved by PWM, SBus or External (TTL) trigger
Video recording	Can be start/stop by PWM, SBus or External (TTL) trigger
Display mode switching	Can be changed by trigger through digital inputs
Palette control	All 19 palettes can be changed via UAV controller during the flight
Other controllable functions	Temperature range settings, Alarm mode (isotherms), Max/Min/Center point analysis, zoom, image capturing, video capturing, modes etc.
Memory and Data Recording	
Memory	Internal: 32 GB (up to 80 000 images or 200 minutes of video) External: recording directly on USB stick
Image recording	Radiometric image and digital JPEG image can saved by trigger Radiometric image format: JPEG or TIFF
Video recording	Radiometric video recording can be start/stop by trigger
Periodic image capturing	Yes, adjustable interval between 1 to 60 s (IR and digital saved on trigger)
GPS location info	GPS data is stored in EXIF when external GPS is connected
Remote control	Data are recorded by PWM, SBus or External (TTL) trigger
File management	Images and video from each flight are stored in separate folders
File transfer	Selected folders are transferred to USB flash disk
Measurement Functions	
Measurement functions	Center spot, Hot/Cold spot detection, Peak Max/Min spot detection
Alarm mode (isotherm)	Above, Below, Between, Above & Below
Hot/Cold spot detection	Auto hot and cold spot detection with temperature values
Peak Max/Min detection	Measurement interval 1 to 100 s
Temperature unit	Celsius, Fahrenheit, kelvin
Emissivity correction	Adjustable in WIRIS directly or in Software
Other corrections	Reflected ambient temperature, atmospheric temperature



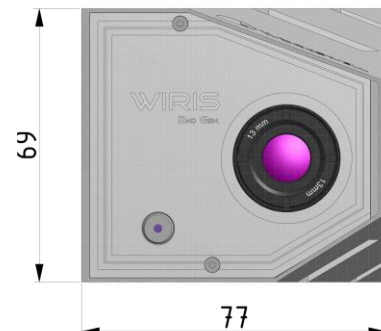
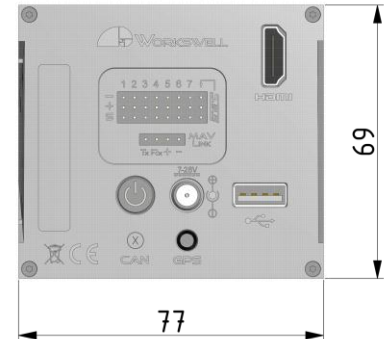
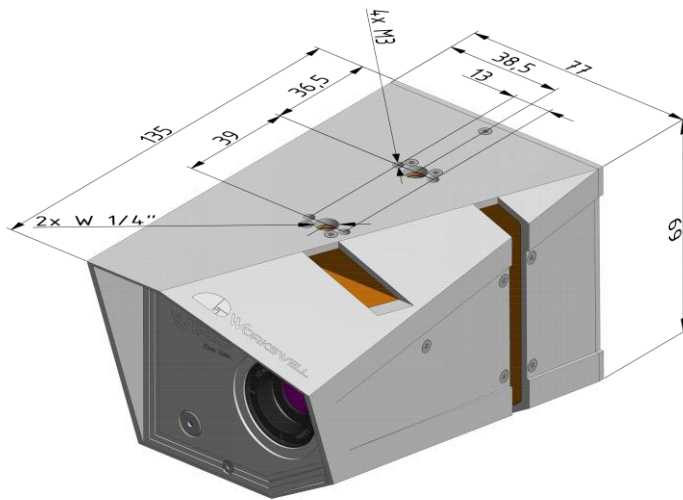
Software	
Workswell CorePlayer	Images and video analyzing software tool
Workswell ThermoFormat	Useful for massive processing of IR images
Video Output	
Interface	Standard HDMI (digital)
Resolution	1280 x 720, 1024 x 768, 1024 x 600, 800 x 600 px
Aspect Ratio	16:9
Other Connectivity	
USB 2.0	Transferring data and updating the system via USB stick
GPS (10 Hz)	NMEA protocol, TTL 5 V logic, JACK 3.5 mm
SBus	Supports up to 18 channels using only one single cable
CAN bus (on request)	Yes, compatible with DJI A2 and A3, GPS image geotagging
Mavlink	Yes, compatible with Pixhawk, GPS image geotagging
Ethernet (on request)	TCP/IP camera control and data downloading
Power Supply	
Input supply voltage	6 to 36 V DC
Power dissipation	< 6 W (max. 8 W during calibration event of approx. 0.5 seconds)
Power connector	Coaxial 2.1 x 5.5 mm, outer shell - GND
Dimensions/Weight	
Dimensions	135 x 77 x 69 mm
Weight	< 400 g
Mounting	4x 1/4-20 UNC thread (2x bottom side and 2x top side)
Operating Environment	
Operating temperature	-15°C to +50°C
Storage temperature	-30°C to +60°C
Humidity	5% to 95% non-condensing
List of contents	
	WIRIS head with chosen lens, Calibration certificate, USB Flash drive 32 GB, HDMI cable, Servo connectors (PWM), Power supply cable, Software license CorePlayer, Hard transport case



Lenses

Resolution 640 x 512 pixels	Field of view	Spatial resolution	Pixel size
Focal length 9 mm	FOV 69° x 56°	1.889 mrad from 1 meter	1.9 cm from 10 meters
Focal length 13 mm	FOV 45° x 37°	1.308 mrad from 1 meter	1.3 cm from 10 meters
Focal length 19 mm	FOV 32° x 26°	0.895 mrad from 1 meter	0.9 cm from 10 meters
Focal length 35 mm	FOV 18° x 14°	0.486 mrad from 1 meter	0.5 cm from 10 meters
Resolution 336 x 256 pixels	Field of view	Spatial resolution	Min focus distance
Focal length 6.8 mm	FOV 45° x 35°	2.5 mrad from 1 meter	2.5 cm from 10 meters
Focal length 9 mm	FOV 35° x 27°	1.889 mrad from 1 meter	1.9 cm from 10 meters
Focal length 13 mm	FOV 25° x 19°	1.308 mrad from 1 meter	1.3 cm from 10 meters
Focal length 19 mm	FOV 17° x 13°	0.895 mrad from 1 meter	0.9 cm from 10 meters

WIRIS Dimensions

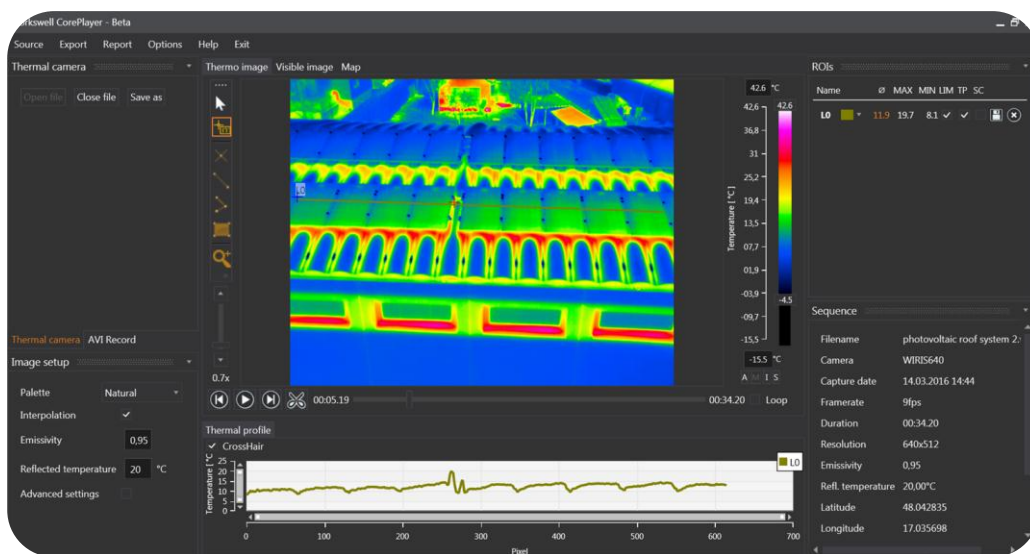


Software CorePlayer and ThermoFormat

Even if you spend many flight hours with the **Workswell WIRIS system**, a significant portion of your work will take place behind a computer in your office and during the data analysis. Your clients and your partners will require self-contained output from your measurements. This is to propose remedies, order reconstructions or decide on the level of investment.

Workswell CorePlayer

- Adjust parameters such as emissivity, reflective temperature, and more
- Edit radiometric images (IR images) to set level and span; change the palette or on/off alarm mode, zoom
- Add measurement tools – spots, line, polyline, rectangles, thermal profile function
- Display stored GPS information and even GPS trace on a real map. In the case of radiometric video for each each frame
- Create PDF report from your measurement
- Digital camera photos export (JPG, PNG)
- Export data to Microsoft Excel (CSV file) or simple PNG picture
- Create time plot from radiometric video (sequence)
- Export AVI video from radiometric video (sequence)



Workswell ThermoFormat

Workswell ThermoFormat is useful for massive processing of thermograms (thermal pictures). If you like to change palette, emissivity or temperature range on a large number of thermograms (thermal pictures), use Workswell ThermoFormat. Workswell ThermoFormat is also used for export pictures with GPS information in EXIF part of the file to creation a 3D model from the data set. For instance software Pix4D could be used.





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