



# WORKSWELL WIC INDUSTRIAL IP67 THERMAL CAMERA SENSOR

**Release date:** 3<sup>rd</sup> of March 2021

**Revision Number:** 210303

# WIC Industrial IP67 thermal camera sensor

## Introduction

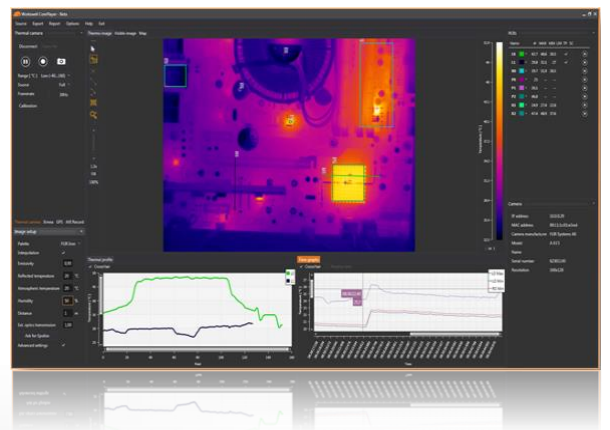
**Workswell WIC Industrial** is designed and manufactured for easy and user-friendly plug&play integration for all process control and quality control applications. All Workswell Infrared Cameras use the newest Long Wave Infrared Detector Technology. Customers can choose from two types of detector resolution: 640 x 512 and 336 x 256 pixel format, from several different lenses and **temperature range up to 1 500 °C**.

**WIC Industrial is powered via PoE and Ethernet** cable. Internal electronics is protected by high IP67 rating enclosure and can be **installed in harsh conditions from -50 °C to +200 °C**. WIC Industrial is fully compatible with Gigabit Ethernet protocol and therefore it can be easily integrated via SDK.

Except included SDK for Windows and Linux x86, WIC Industrial can be directly connected to Workswell CorePlayer desktop software that automatically detects a camera, configures an address and ensures a camera connection. **All WIC use 14 RAW data format or calculated calibrated temperature values**. Image can be shown in different colour pallets with interactive side bar and measurement tools. Users can manage camera parameters such as Gain, NUC, Factory Reset, etc. There is also tutorial application, Linux and Windows dll libraries and C# application code available.

## Key Features

- Fully radiometric and calibrated sensor
- Harsh conditions -50 °C to 200 °C (-58 °F to 392 °F)
- Linux x86 and Windows SDK in the package
- Desktop software CorePlayer
- Different lenses available
- Temperature range up to 1 500 °C (2 732 °F)
- Up to 60 Hz frame rate
- 30mK sensitivity in standard
- 1Gb/s Ethernet interface
- Sensor resolution 640 px and 336 px
- IP66/IP67 protection rating
- ThermoInspector and Hoof Inspector compatible
- **Additional accessories available**
  - Automatic cooling and heating
  - Pneumatic shutters and wind curtains
  - Mounting brackets and adapter plates



# WIC Industrial specification

Thermal and optical data	
Resolution	640 x 512 pixels or 336 x 256 pixels
Framerate	60Hz, 30 Hz or <9 Hz available
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 – 1 000 °C (122 °F to 1 832 °F) optional temperature range +400 – 1 500 °C (752 °F to 2 732 °F)
Accuracy	±2 % or ±2 °C (±3.6 °F) (in temperature range -10 °C to +150 °C (-13 °F to 302 °F) and 0 °C to +550°C (-40 °F to 1 022 °F))
Temperature sensitivity	≤0.03°C (30mK) @ 30°C
Spectral Range	7.5 – 13.5 μm
Dynamic range	14bit radiometric temperature data, 14bit RAW data
Calibration	Radiometric and calibrated
Detector Type	Uncooled VOx microbolometer
Available Lenses	6.8mm, 9mm, 13mm, 19mm (more information in <a href="#">FOV calculator</a> )
Focus	Manual continuous (Min. focus distance depends on lens)
Communication and Power Supply Interface	
Ethernet version	Gigabit Ethernet, RJ-45 connector
Input Supply Voltage	Power over Ethernet 48V type
Power Dissipation	< 1.3 W (max. 3 W during NUC calibration time)
Mechanical data	
Dimensions	96 x 96 x 226 mm (3.78 x 3.78 x 8.89 in)
Weight	1.9 kg (4.2 lb)
Mounting	Different mounting kits available
Accessories	Air nozzle, wind curtain, shutter, cooling / heating plate, sunroof and more
IP rating protection	IP66/IP67
Operating Environment	
Operating temperature	-50 °C to 200 °C (-58 °F to 392 °F) with cooling / heating accessories
Standard operating temperatures	-15 °C to 50 °C (5 °F to 122 °F)
Storage temperature	-30 °C to +60 °C (-22 °F to 140 °F)
Content of delivery	WIC Industrial with lens, Linux x86 and Windows SDK, desktop software, PoE adapter, My.Workswell download card, calibration certificate, transport box



# WIC Industrial specification

Thermal Camera Settings	
Source of image	As a source of image can be used <b>full image</b> (full sensor size) or only a part of the image specified by a rectangle <b>ROI</b> tool
Framerate	According to the camera you can change frame-rate from <b>1Hz to 60Hz</b>
Calibration	Using <b>Calibration</b> button you can activate <b>NUC</b> (non-uniformity compensation) to reach the best image quality and camera signal stabilization
Play/Pause	Using Play/Pause icon you can start and pause real time image streaming
Start recording/Snapshot	During radiometric thermal video acquisition (using <b>Start capture</b> button) you can save <b>snapshots</b> (Radiometric JPG) at the same time
AVI Record	User can save live video streaming directly as <b>AVI format</b> . It is possible to change framerate and bitrate and display into the video <b>Palette bar, Bottom bar and ROI</b>
Thermal Image Settings	
Palette	User can choose from <b>14 palettes</b> – BlackRed, BlueRed, BWRGB, Fire, FLIR Iron, Gradient, Gray, Iron1, Natural, Rainbow, Sepia, Steps, Temperature, WBRGB
Interpolation	To obtain a smooth image without pixelization, user can interpolate the image
Units	Temperature can be displayed and calculated in <b>°C or °F</b>
Acquisition Parameters	<b>Emissivity</b> (continuously in range 0.01 – 1.0 with step 0,01) and <b>Reflected temperature</b>
Advanced Parameters	In CorePlayer can be set/changed other parameters as <b>Atmospheric temperature, Humidity, Distance and Transmission of external optics</b>
Temperature Range	Interactive temperature range can be used in <b>manual</b> or <b>automatic</b> mode. Using it you can change the color distribution of temperatures to e.g. highlight details.
Isothermal Mode	User can set <b>Isothermal mode</b> of the image. CorePlayer offers four types of isotherms: <b>Below, Above, Between</b> and <b>Below and Above</b> .
Report generation	
Report Contents	There are automatically shown <b>thermal images</b> and <b>time graphs</b> and parameters of the image: <b>emissivity, reflected temperature, atmospheric temperature, humidity, distance and transmission of external optics</b>
Additional Information	User can insert into a report: protocol <b>name, date and time</b> of measurement, company <b>logo, user/company name</b> and additional information about measured <b>area</b>



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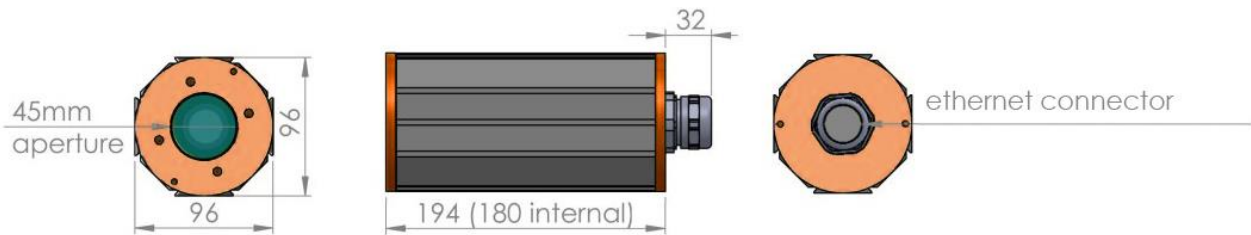
Measurement features	
ROI analysis	User can insert into the image variety of measurement tools/ROI: <b>Point, Line, Polyline</b> and <b>Rectangle</b> . User can insert more ROIs into one image, change its color, replace it or delete ROIs that a user can see in the top-right subwindow
Zoom	User can <b>zoom</b> real-time streamed data, the acquired image or sequence – continuously, each mouse scroll zooms 0,5x
Measured Values	In each ROI can be measured and visualized <b>Min, Max, and Average</b> temperature. User can save temperature values from the ROI as <b>CSV file</b>
Graphs	
Thermal Scanner	Temperature values for Line ROI could be visualized in <b>Thermal Scanner</b> . User can select number of lines and temperature range (manual or automatic)
Thermal Profile	All measured data can be displayed in real time <b>Thermal Profile</b> (for Line ROI). User can adjust range of <b>graph axis</b> and see the measurement <b>Target Cross</b> for fast and easy visualization of measured graph values
Time Graph	Temperature values from all ROI tools (for real time visualization or captured sequence measurement) can be showed into the <b>Time Graph</b> . User can adjust range of <b>graph axis</b> and see the measurement <b>Target Cross</b> for fast and easy visualization of graph values. For saved sequence can be set upper and lower <b>limit</b> for the temperatures in each ROI and x-axis in <b>relative or real time</b>
Radiometric Sequence	
Playback	Radiometric video can be played <b>Backwards, Forwards</b> , show <b>Next frame</b> or <b>Previous frame</b> or play the sequence continuously in the <b>loop</b>
Processing	User can <b>cut</b> the video and save it into new file as radiometric sequence.
Additional functions	
Export	User can export images into different file formats - save <b>*.seq</b> file as <b>Radiometric JPEG, PNG</b> or <b>CSV</b> file. Radiometric sequence can be exported to <b>AVI</b> file
Presentation Mode	For presentation purposes the live stream or acquired image can be displayed in <b>full screen mode</b> with image related controls.
User Interface	Intuitive and well-arranged <b>user interface</b> . User can change layout of sub-windows or restore layout to defaults
Image Information	The information about saved image in sub-window: <b>filename, camera type, captured date, resolution, emissivity and reflected temperature</b>
Camera Information	CorePlayer shows information about connected camera: <b>IP and MAC address, Camera manufacturer, Camera model, Name, Serial number</b> and <b>Resolution</b>
GPS Support	CorePlayer supports integration of <b>GPS data</b> from standard GPS receiver and display the position in Google Maps



## WIC Industrial lenses

Resolution 640 x 512 pixels	Field of view	Spatial resolution IFOV	Min focus distance
Focal length 9 mm	FOV 69° x 56°	1.889 mrad from 1 meter	7 cm
Focal length 13 mm	FOV 45° x 37°	1.308 mrad from 1 meter	15 cm
Focal length 19 mm	FOV 32° x 26°	0.895 mrad from 1 meter	20 cm
Resolution 336 x 256 pixels	Field of view	Spatial resolution	Min focus distance
Focal length 6.8 mm	FOV 45.6° x 35.5°	2.5 mrad from 1 meter	5 cm
Focal length 9 mm	FOV 35° x 27°	1.889 mrad from 1 meter	7 cm
Focal length 13 mm	FOV 25° x 19°	1.308 mrad from 1 meter	15 cm
Focal length 19 mm	FOV 17° x 13°	0.895 mrad from 1 meter	20 cm

## WIC Industrial drawings



## Example of WIC Industrial accessories

**Air nozzle**



**Wind curtain**



**Shutter**



# Contact information

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