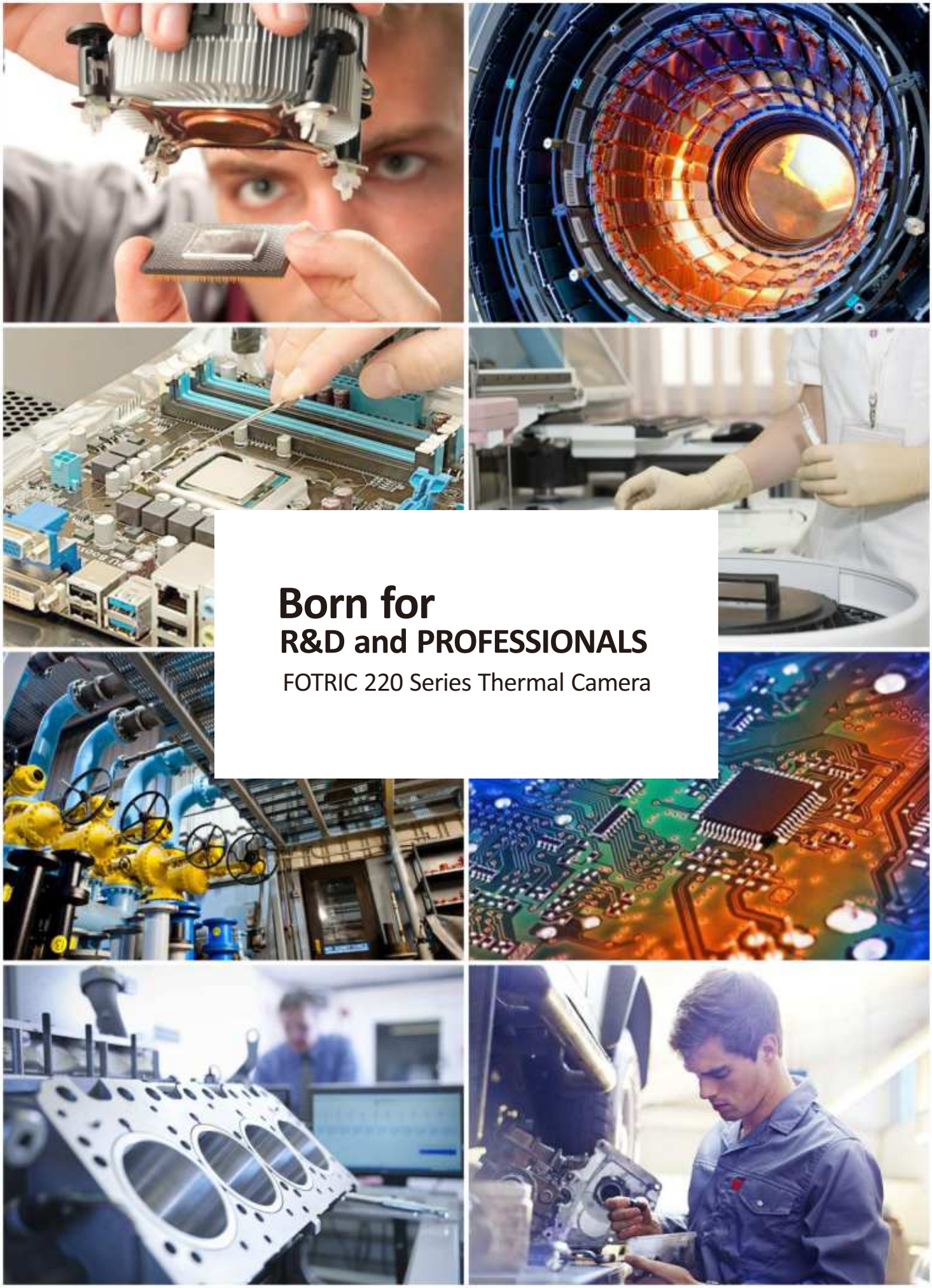
FOTRIC

Thermal Intelligence

Hand-Held More Convenient I Longer Time Online
More Professional Analysis I Faster Sharing

FOTRIC 220



Born for
R&D and PROFESSIONALS

FOTRIC 220 Series Thermal Camera

R&D user's measurement scene is complex and varied, including not only temporary detection tasks, but also lots of continuous sampling tests (such as trend analysis, reliability test, destructive testing, etc.), and continuous sampling tests may reveal more valuable data.

R&D users often face a dilemma when choosing a thermal camera: They may select a handheld thermal camera but cannot perform continuous sampling tests or they may select an online thermal camera, but lack flexibility.

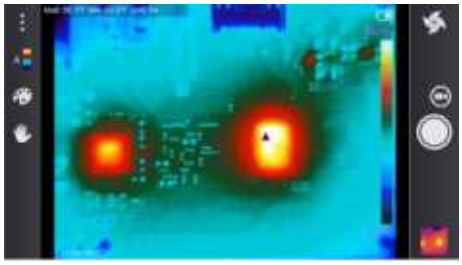
The FOTRIC 220 series thermal camera makes the selection no longer difficult. It's not just a hand-held thermal camera, but also an online thermal camera. It is more competent in long-term data sampling tests.

FOTRIC 220

Hand-Held Is More Convenient

Smartphone Full Touchscreen Operation

Easy-to-learn smartphone touchscreen APP user interface, ultra-simple operation, and ready to use.



Full Touchscreen APP User Interface

Fully-Radiometric Short Thermal VideoStream To Capture More Details

A smartphone connected with a FOTRIC thermal camera can record directly up to 1,000 frames of fully radiometric video and capture temperature change processes in real-time with a user-defined sampling rate (up to 5 frames per second). It can automatically collect data without a PC.

Customize Sampling Rate

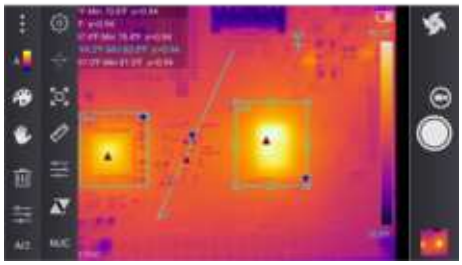
Analyze The Thermal Image And Video Conveniently On The Smartphone

The FOTRIC 220 series supports the instant analysis of the thermal image and thermal video on the smartphone, which is convenient after the thermal image or thermal video is recorded.

Instant Analysis Of Thermal Image On The Smartphone

Flexible Sub-regional Emissivity Setting And Professional Temperature Measurement Parameter Correction

The different emissivity of each sub-region can be set to achieve an accurate temperature measurement of different material. At the same time, transmissivity, test distance, etc. can be set to ensure the accuracy of the temperature.



ROI Emissivity And Parameter Setting On The Smartphone

Long Battery Life And No Worry Of Frequent Charging

The low-power design gives FOTRIC thermal camera more than 10 hours of battery life, to ensure a full day without interruption, allowing users to focus on work.

10 Hours Battery Life Of The Thermal Camera

Associate Thermal Image With Detected Object Automatically For Easy And Efficient Data Management

FOTRIC thermal camera can scan the equipment QR code and automatically tag thermal images, thus avoiding cumbersome, inefficient and erroneous manual entry.

Instantly Share Thermal Images/Videos Through Favorite Channels

Rapidly share field data with colleagues and solve field problems with remote diagnosis through your favorite channels such as Message, Facebook, LinkedIn, Twitter, etc.

Longer-Time Online

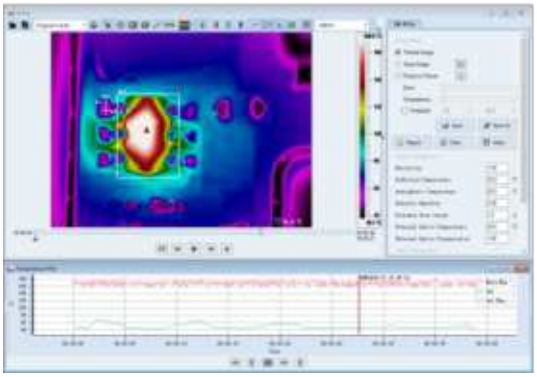
High-Quality Product With Longer Time Online

FOTRIC 220 series thermal cameras use expensive, high-end, and long-term work electronic components to ensure long-time normal operation and maintain long service life. With the bypass power supply design, FOTRIC thermal camera can work long-term without interruption under the external power mode.

Fully Radiometric Thermal Video Stream

FOTRIC 220 series thermal camera works with professional PC software, AnalyzIR, to record fully radiometric thermal video. Each frame of the video stream preserves the original temperature of each pixel.

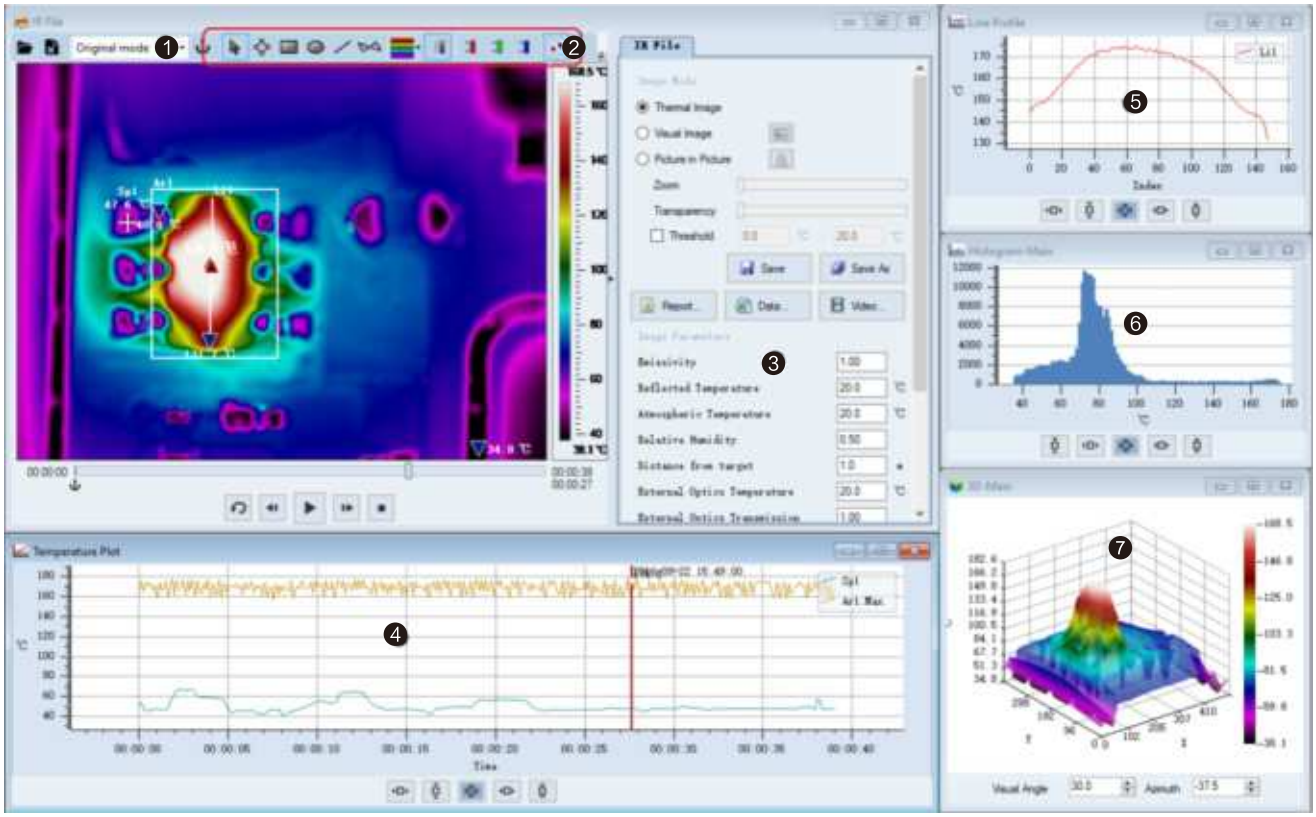
High-end Electronic Component + Professional R&d Test Platform For Longer-time Online



Any Temperature Spot Or Region Can Be Added And A Temperature Vs. Time Curve Can Be Plotted

AnalyzIR – Professional Analyses Software

FOTRIC AnalyzIR software is developed to meet the needs of R&D users, from the image, temperature and time of the three-dimensional perspective to analyze the test data. One thermal picture will have more details and process of changes than the conventional equipment maintenance class thermal imager to obtain more in-depth research, more reliable data, and more valuable paper.



Note:

1.Original / temperature difference mode

2.Spot, line, box, palette, isotherm and other tools

3.Pre- and post- sampling temperature correction; support sub-regional emissivity setting

4.ROI temperature vs. time curve; ROI+ROI temperature vs. time curve; Overlay comparison of different thermal video curve

5.Plot of temperature along the line

6.Histogram

7.3-D thermal image

1TB Oversized File, Recording Thermal Data Without Interruption

Thermal data collected under the long-term online mode is very large. FOTRIC 220 series companion software, AnalyzIR, supports up to 1TB single fully radiometric thermal video recording, which helps R&D users to record the complete data for the entire experimental process.

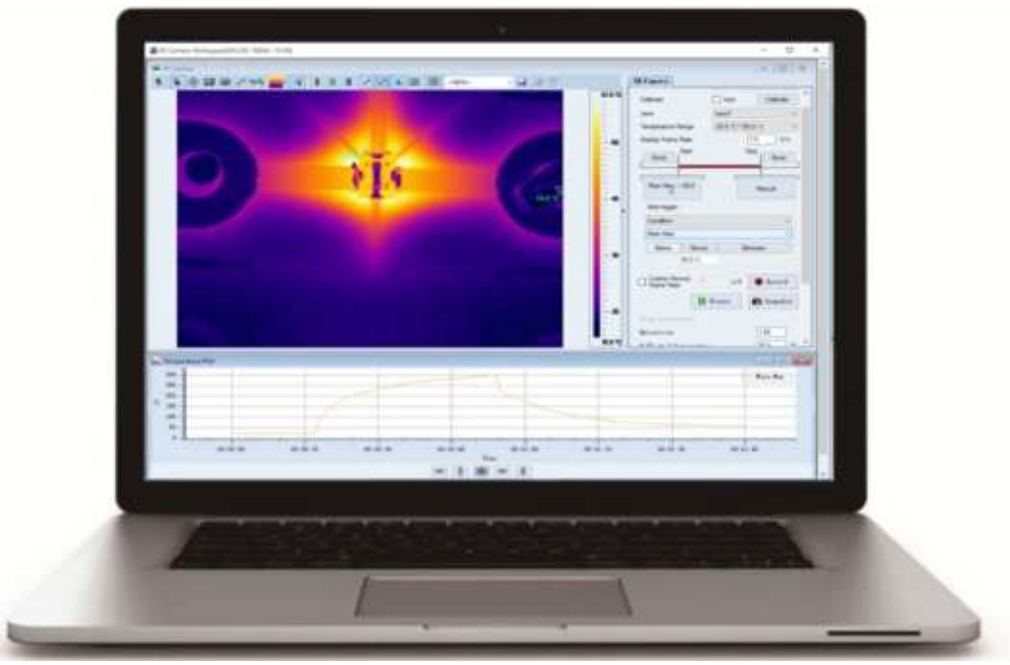
FOTRIC Model	Fotric 225 (*)	Fotric 226	Fotric 227 (*)	Fotric 228
1TB single file recording time (Calculate at 1HZ frame rate)		~25 days		~15 days

(*) Available on the upgraded model

Automatically Collect Data And Free Up Human Resources

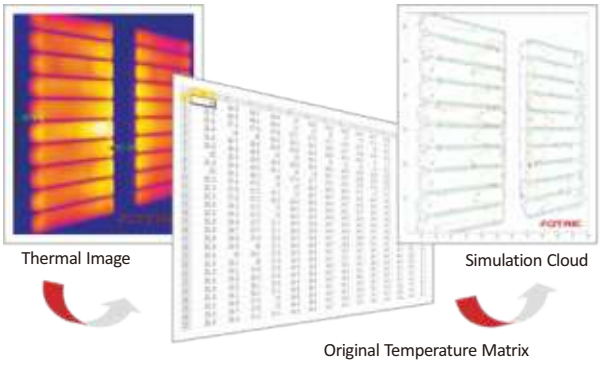
Three kinds of automatic data acquisition modes:

① Time trigger ② Temperature trigger ③ External I/O trigger



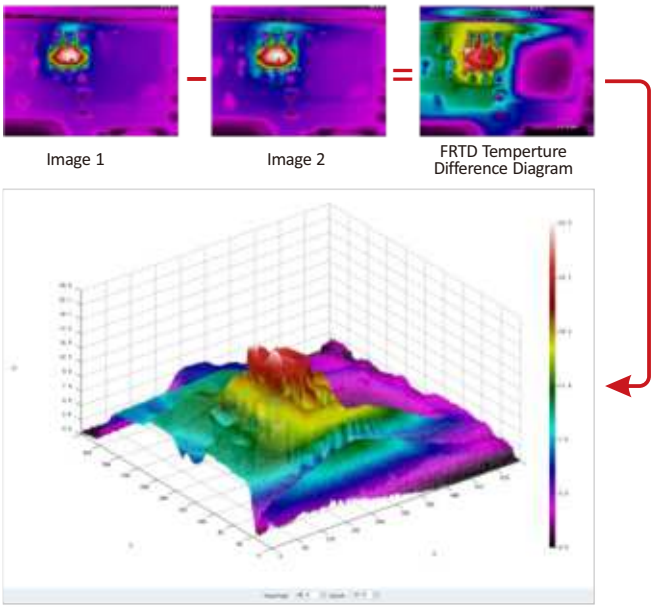
Raw Temperature Data Matrix

Users can pick up any frame of thermal image, save as a fully radiometric thermal image, and export to the .CSV file containing the original temperature of all pixels. These raw temperature data will help you optimize the algorithm, or use other software to generate a simulation contour map.



Full Range Of Temperature Difference FRTD Analysis To Reveal Tiny Differences Clearly

Obtain the temperature difference of any two thermal pictures intuitively for faster and more accurate analysis, and generate a more understandable report.



3D Graph

Picture-In-Picture And Picture Fusion Function

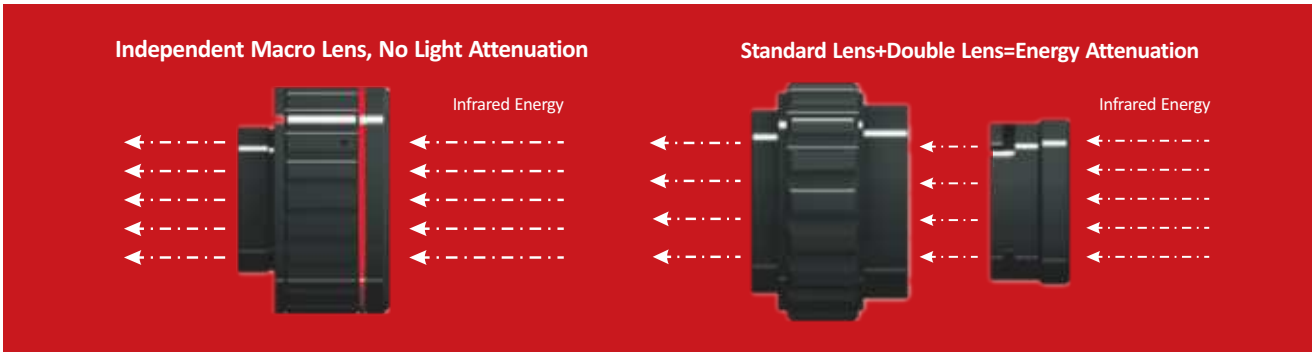
Support picture-in-picture (PIP) and picture fusion function; inspect the temperature of a specific area.

Support Picture-In-Picture And Picture Fusion Function

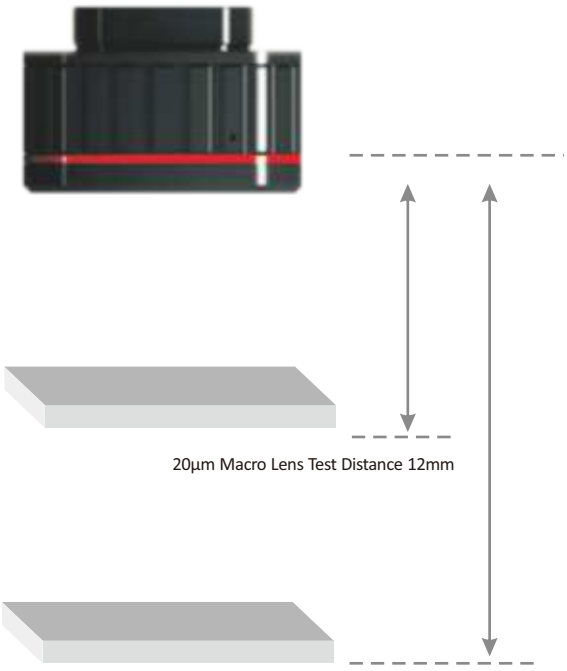
R&D Macro Lens = Independent Lens + Independent Calibration

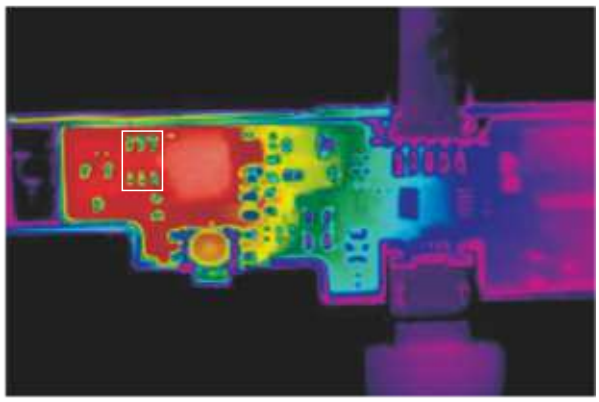
FOTRIC 220 Series Thermal Camera Is Capable of 20μm Micro Temperature Distribution Measurement.

- **Independent Macro Lens:** No energy attenuation to ensure thermal image quality; while standard lens plus magnification lens increase optical attenuation, reducing the image quality.
- **Independent Lens Calibration:** FOTRIC's original macro lens is temperature-calibrated in a one-on-one manner with the host thermal camera; temperature accuracy is guaranteed. 50μm Macro lens' test distance 43~55mm. The size of the chip in the white box is about 3mmx1.5mm.

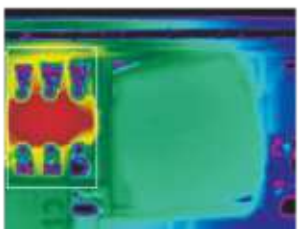


Macro Lens Illustration

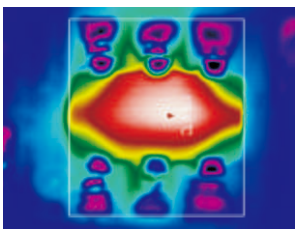




Standard Lens 15cm Test Distance(in White Area, The Chip Size 3mmx1.5mm)

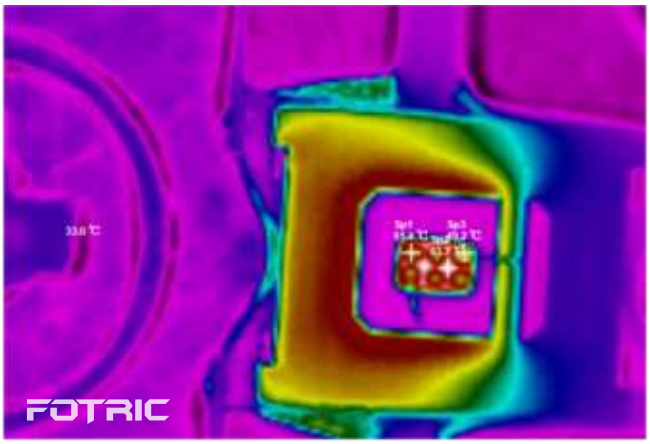


50μm Macro Lens



20μm Macro Lens

Typical Applications

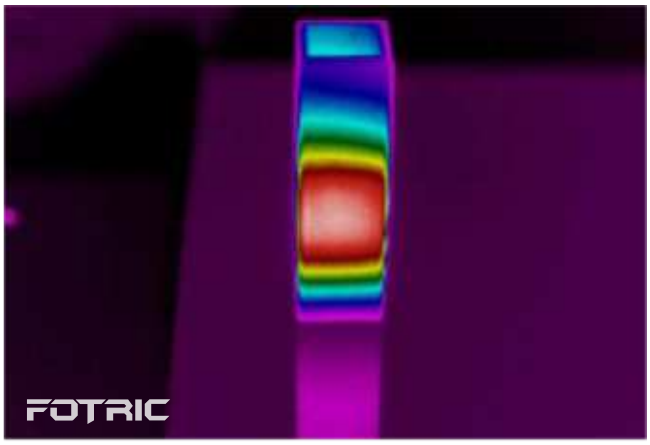


Electronics Industry

Unpacked Chip Internal Temperature Distribution Inspection

Test Difficulty: Single thermal image is not enough for most electronic thermal distribution analysis. It needs to capture the temperature change process and the entire experiment temperature changes, especially for devices as small as a chip.

Solution: For the test of small targets such as chips FOTRIC 226 thermal imager with 50μm macro lens can be used, or FOTRIC 227/228 thermal camera with 20μm macro lens. Through the FOTRIC 220 series software online model and AnalyzIR online analysis function, user can continuously detect the temperature changes and the recordings can also be analyzed later.

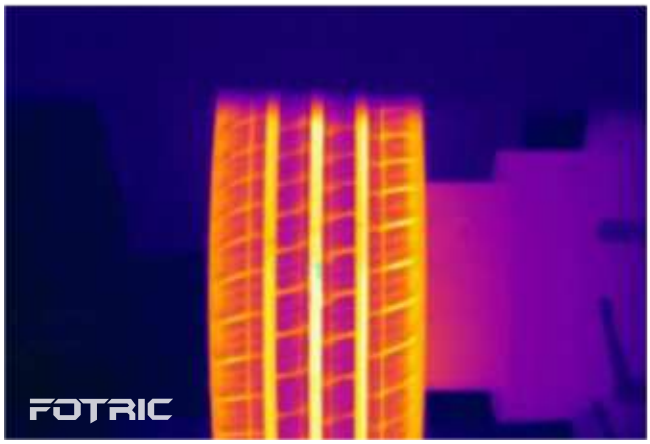


Biomedicine

Targeting Nanomaterials

Test Difficulty: Record the entire experimental process and compare the temperature changes of different test samples.

Solution: FOTRIC 226 thermal camera with B3s universal test bench can be used to observe the temperature changes horizontally in material testing and laterally in vivo experiment. Online analysis function can record the entire experimental process in real-time, and use the superposition of the time-temperature curves for direct comparison of temperature changes between different test samples.

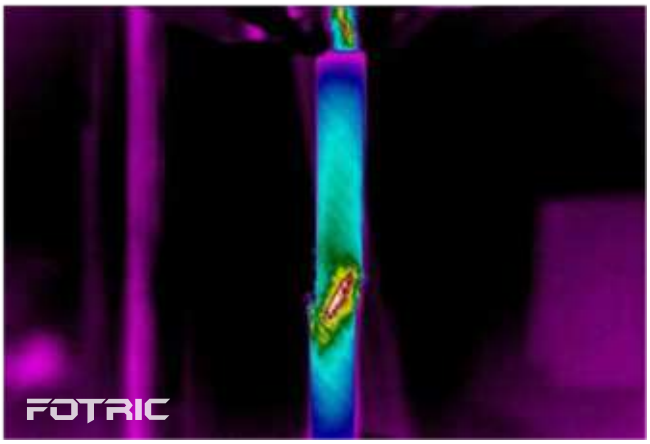


Automobile industry

Fatigue Life Test Of Tire

Test Difficulty: Tire durability test requires a long time monitoring, generally up to 7-10 days, and needs to record the entire process. Impact test requires a higher sampling frame rate.

Solution: FOTRIC 220 series thermal camera has bypass power supply design. It can use external power supply and won't lead to battery heating. The online analysis feature can be connected to PC software to record and analyze the data. User can customize the frame rate for impact test such as 30Hz high frame rate recording, and lower the frame rate in the durability test to reduce the amount of data. FOTRIC 220 series thermal imager supports 1TB single thermal video stream recording, suitable for the recording of long-term online test.



Test Of Material Characteristic

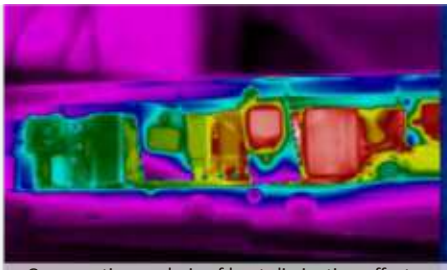
Carbon Fiber Fatigue Test

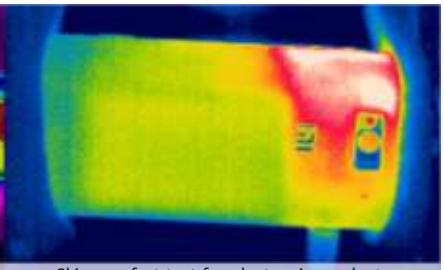
Test Difficulty: Capture the moment of fracture and record the temperature changes for post-test analysis.

Solution: Rupture moment is a sudden occurrence behavior which can be captured through the long-term online detection. FOTRIC 228 thermal imager with B3s universal test bench can free up the labor and achieve the online monitoring. Through the on-line analysis feature and recording function of AnalyzIR to record the entire temperature process, the trend analysis of temperature vs. time can intuitively show the temperature changes. And the temperature difference model is easy to analyze the temperature rise.

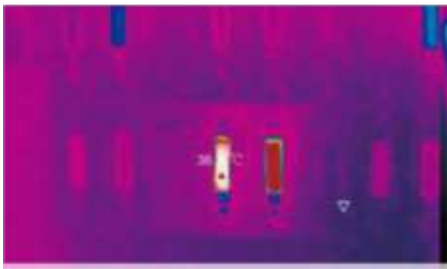
Other Applications

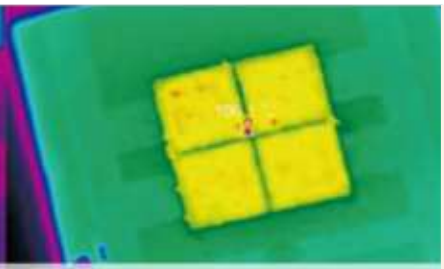
Heat Dissipation Study


Comparative analysis of heat dissipation effect of different copper/aluminum material

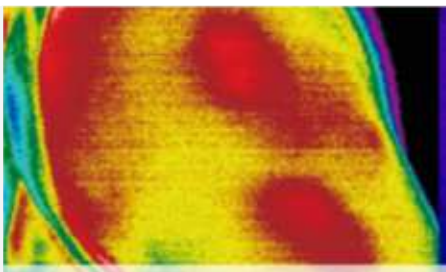

Skin comfort test for electronic product network license

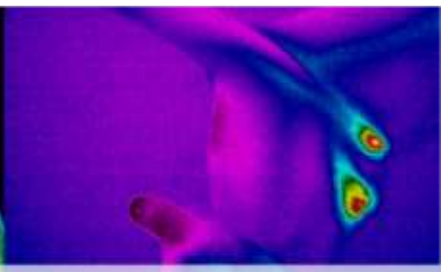
New Energy And Energy Saving


New energy battery

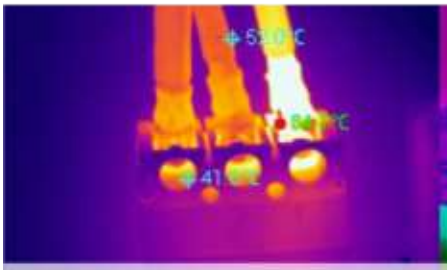

LED chip local hot spot

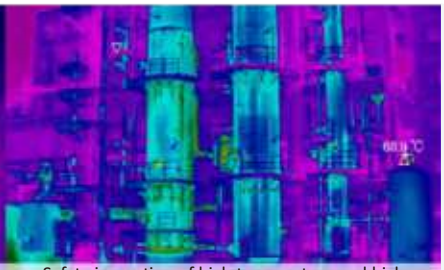
Biological Test


Inspection of muscle fatigue chronic stiff

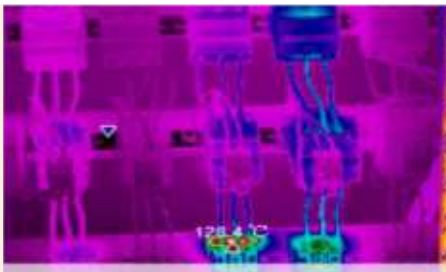

Help Yangtze River finless porpoise protection

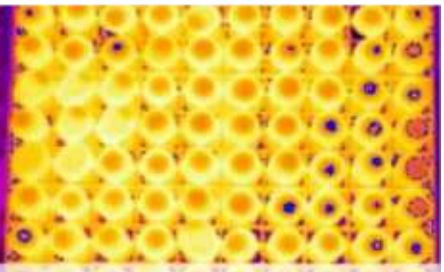
Maintenance Repair Operation


Distribution Cabinet Detection


Safety inspection of high temperature and high pressure equipment

Other Studies


Distribution cabinet detection


Egg hatching status monitoring

FOTRIC
Thermal Intelligence

Specifications

	FOTRIC 228	FOTRIC 227	FOTRIC 226	FOTRIC 225
Infrared Imaging				
IR Resolution	640 × 480 pixels (307,200 pixels) or 1280 x 960 w/ Super-Resolution	512 × 384 pixels (196,608 pixels) or 1024 x 768 w/ Super-Resolution	384 × 288 pixels	320 × 240 pixels
Field of View (FOV)	28.7°H × 21.6°V	23°H × 17°V	28°H × 21°V	24°H × 18°V
Temperature Range	-20°C ~ +650°C (-4°F ~ +1202°F)			
Minimum Focus Length	0.1m (Standard Lens)		0.15m (Standard Lens)	
Spatial Resolution (IFOV)	0.78mRad, D:S 1282:1 (Std. Lens)		1.27mRad, D:S 787:1 (Std. Lens)	
Thermal Sensitivity (NETD)	≤0.05℃@30℃		≤0.06℃@30℃	
Measurement Accuracy	± 2℃ or ±2% whichever is greater @ Environment Temperature 10℃~35℃			
Focus	Manual			
Spectral Range	8~14μm			
Detector Type	Focal Plane Array (FPA) uncooled microbolometer			
Zoom	10X continuous digital zoom		8X continuous digital zoom	
Image Processing				
Palettes	15 palette options (Gray White, Gray Red, Iron Red, Rainbow, etc.)			
Palette Switching	Tap palette icon			
Noise Calibration	Automatic noise calibration FFC / Manual noise calibration FFC			
Measurement And Analysis				
Correction Settings	Emissivity, reflected background temperature, relative humidity, ambient temperature, measuring distance, transmission			
Emissivity Adjustment	0.1~1.0			
Regional Emissivity Adjustment	Support, on smartphone and in software			
Automatic Capture of High, Low and Average Temperature	Support, on smartphone and in software			
Isotherm	Above / Below threshold			
ROI Measurement Modes	12 moveable spots 12 moveable area boxes (min/max) 3 lines (min/max) Emissivity set for each ROI		8 moveable spots 8 moveable area boxes (min/max) 1 line (min/max) Emissivity set for each ROI	
Temperature Alarm	User-defined temperature threshold, audible and visual alarm of above/below temperature threshold			
Image Format	Standard JPEG, including raw temperature data, radiometric			
Long-Time Online Measurement				
USB	Transfer fully-radiometric thermal video stream with all original temperature data of each pixel to PC, connect with mobile devices supporting OTG (On-The-Go host)			
Continuous Online Monitoring	1TB in software; 1,000 frames on smartphone	1,000 frames on smartphone	1TB in software; 1,000 frames on smartphone	1,000 frames on smartphone

FOTRIC
Thermal Intelligence

	FOTRIC 228	FOTRIC 227	FOTRIC 226	FOTRIC 225
Professional Function				
Display Mode	Full screen thermal image, customer size/transparency/moveable dual vision fusion picture-in-picture (PIP)			
Image Saving Modes	Single thermal image / Thermal & digital mix image			
Take fully-radiometric Thermal Video Stream on Smartphone	Support, user-defined frame rate (up to 5 fps) or frame interval, up to 1,000 frames per video stream on smartphone			
Take fully-radiometric Thermal Video Stream on PC	Support 1TB in software	N/A	Support 1TB in software	N/A
Thermal Image Analysis on Smartphone	Support on site analysis			
Thermal Video Analysis on Smartphone	Support on site analysis			
Image Tagging / Labeling	Thermal image can be automatically labelled by scanning QR code or barcode			
Image Annotation	Voice / Text Memos			
Power Supply				
Battery Type	Rechargeable Lithium-ion			
Battery Operating Time	10+ hours			
Charging System	AC Power Adapter			
Charging Voltage	12V DC Charger			
Environment				
Operating Temperature	−20°C ~+50°C (-4°F~ + 122°F)			
Storage Temperature	-20°C ~+50°C (-4°F~ + 122°F)			
Humidity	< 90%RH			
Physical Parameters				
Enclosure Rating	IP40			
FCC Certification	CFR 47 Part 15.107 CFR 47 Part 15.109			
Tripod Mounting	UNC1/4''-20			
Weight	~615g			
Dimensions (LxHxW)	118×145×93.5mm			
Warranty	2 years			
Software And App				
· FOTRIC AnalyzIR, professional computer analysis software	· FOTRIC LinkIR, smartphone App			
Standard Configuration				
· Thermal imaging camera (built-in battery) · Standard infrared lens · Lens protective case · Power adapter · USB to micro USB OTG cable (left angle / right angle)	· USB to Micro USB OTG cable · USB to Micro USB-C OTG cable · USB to USB cable · Hand wrist strap · Getting started manual (with warranty card) · Calibration certificate			
Optional Test Bench				
· FOTRIC B3s Universal test bench	· FOTRIC Rc2 Rigid carry case for Fotric 220 series	· FOTRIC Bg1 Pouch shoulder bag		

Optional Thermal Lens

Equipment Type	Optional Lens
Fotric 225 (with standard lens and up to 2 optional lens)	L13-225 telephoto lens, FOV 13°×9° L40-225 wide-angle lens, FOV 40°×30° L76-225 wide-angle lens, FOV 76°×57°
Fotric 226 (with standard lens and up to 2 optional lens)	M30-226 macro lens, resolution 30μm (Calibrated range -20~150℃) M50-226 macro lens, resolution 50μm (Calibrated range -20~150℃) M100-226 macro lens, resolution 100μm (Calibrated range -20~150℃) L07-226 telephoto lens, FOV 7°×5° L15-226 telephoto lens, FOV 15°×11° L47-226 wide-angle lens, FOV 47°×35° L91-226 super wide-angle lens, FOV 91°×71°
Fotric 227 (with standard lens and up to 2 optional lens)	L06-227 telephoto lens， FOV 6°×4.5° L14-227 telephoto lens， FOV 14°×10° L35-227 wide-angle lens， FOV 35°×26° L72-227 super wide-angle lens， FOV 72°×54°
Fotric 228 (with standard lens and up to 2 optional lens)	M50-228 macro lens, resolution 50μm (Calibrated range -20~150℃) M20-228 macro lens, resolution 20μm (Calibrated range -20~150℃, accuracy ±5℃ or ±5%) L08-228 telephoto lens, FOV 8°×6° L17-228 telephoto lens, FOV 17.6°×13.3° L45-228 wide-angle lens, FOV 45°×33.8° L92-228 super wide-angle lens, FOV 92°×76°

FOTRIC B3s Universal R&D Test Bench

R&D Test Bench
FOTRIC B3s (360 degree orientation)
Compatible FOTRIC Thermal Cameras
Fotric 225, Fotric 226, Fotric 227, Fotric 228

FOTRIC
Thermal Intelligence

FOTRIC 220 series thermal camera used in research papers published on the world's most authoritative magazines, such as Nature and others

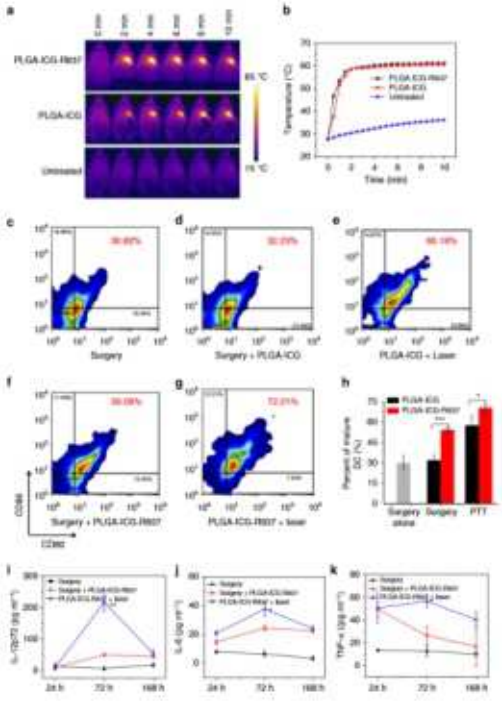
nature COMMUNICATIONS

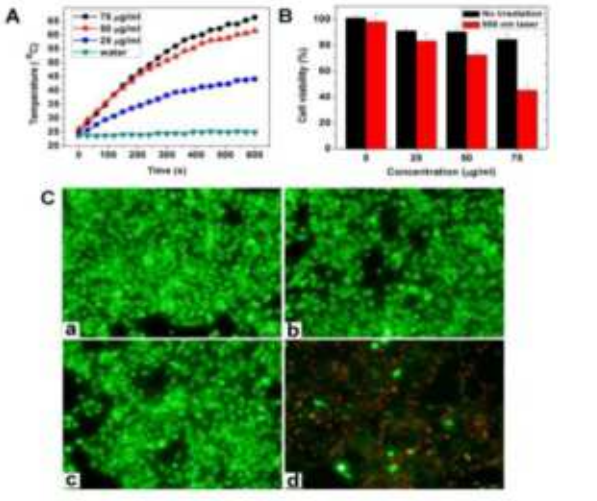
ARTICLE

Photothermal therapy with immune-adjuvant nanoparticles together with checkpoint blockade for effective cancer immunotherapy

ACS Publications
Most Trusted. Most Cited. Most Read.

PEGylated Au@Pt Nanodendrites as Novel Theranostic Agents for Computed Tomography Imaging and Photothermal/Radiation Synergistic Therapy





About FOTRIC

Infrared Thermal Imaging Technology is the conversion of invisible infrared energy emitted from objects to visible thermal images through infrared detectors and optical imaging lenses. The different colors on the thermograph represent the different temperatures of the measured objects, so that the high/low temperature points and the temperature distribution can be judged intuitively and quickly. And FOTRIC, as a brand that focuses on Infrared Thermal Imaging Technology, comes from the following: FO is the abbreviation of the English word PHOTON that represents light, and TRIC is the abbreviation of the English word ELECTRIC.

FOTRIC is dedicated to the research and innovation of Infrared Thermal Imaging Technology. It integrates Internet-based thermal big data platform to optimize the user experience and improve the work efficiency. FOTRIC owns the ZXF laboratory in Dallas, Texas, USA, and established the“Infrared Photoelectric Technology Application Laboratory”in cooperation with the Wuxi Research Center of Shanghai Technical Physics Institute of the Chinese Academy of Sciences, as well as launched the “Academician's Expert Workstation”by the academician of the Chinese Academy of Science and Technology in the field of infrared and remote sensing. It has dozens of core invention patents and software copyrights in the mobile Internet and intellectualization of infrared thermal imaging system, along with the ISO:9001 quality system certification, it is a High-Tech Enterprise.

- In 2012, FOTRIC launched a large-scale network monitoring thermal imaging system, and developed its first thermal image monitoring APP, which leads to the integration of thermal imaging technology and the internet;
- In 2013, FOTRIC developed its advanced professional thermal imager based on Android smartphone;
- In 2014, FOTRIC launched an intelligent fire-detect thermal camera, which can independently complete the analysis of fire alarm and link them to the fire system. It won the innovation fund of the State Ministry of Science and Technology;
- In 2016, the 2ndgeneration smartphone based thermal imager FOTRIC 220 series was greatly praised by users, winning the first of the thermography image competition in the electric category of the American IR/INFO 2018.
- In 2017, based on internet cloud thermal camera, the Fotric 123 was released at CES in the USA. This innovated device provided the simplest user operations as the Internet cloud-based thermal camera.
- In 2018, FOTRIC launched the new Cloud-Based Thermal Imager, named“FOTRIC X Series." This series is based on the PdmIR thermal image data management system, with built-in industry standard and expert expertise, not only can it displays the temperature rising trend in real time, but also can generate the report by one-click. This strategic series will greatly reduce the user's data processing timing cost and studying cost; it has created a very innovative portable intelligent thermal imager category.

FOTRIC has its headquarters in Shanghai, China and Dallas, US, along with Beijing, Wuxi, Ji'nan and Xi'an for branches. FOTRIC have developed distributors in more than 10 countries and regions, such as Britain, Germany, Canada, South Korea, Singapore, and Australia, for a sound sales channel and technical support network to serve global customers. In January 2015, the company was officially listed on the new third board (stock code: 831598) and became a public company with a standardized operation.

The Mission: Improve efficiency and ensure safety
The Vision: Open up the thermal world for 123,456,789 people
The Values: Innovation, extraordinary, and integrity

On the 2018 New Year’s Concert, FOTRIC conducted in-depth strategic cooperation with the Hunan satellite TV by applying the thermal imaging technology in a live show watched by more than 100 million people, continuously promoting the Infrared Thermal Imaging Technology to the public.

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