

FLUKE®



Fluke infrared tools

Built for the toughest industrial environments

TEMPERATURE MEASUREMENT SOLUTIONS

A grayscale background image of an industrial setting. In the foreground, a person wearing safety glasses and a hard hat is visible in profile, looking towards the right. The background shows various industrial structures, pipes, and equipment, creating a sense of a complex manufacturing or processing environment. The overall tone is professional and industrial.

Built for the toughest industrial environments

Get the infrared cameras that are built on 65+ years of industrial experience. Each camera is built without compromise to the Fluke standard of ruggedness, reliability and accuracy. Designed for everyday use, in any environment for thorough and accurate inspections.

Choose from the affordable and versatile Performance Series, the Professional Series that offers superior image quality, or the Expert Series that gives you HD images on a large touchscreen.



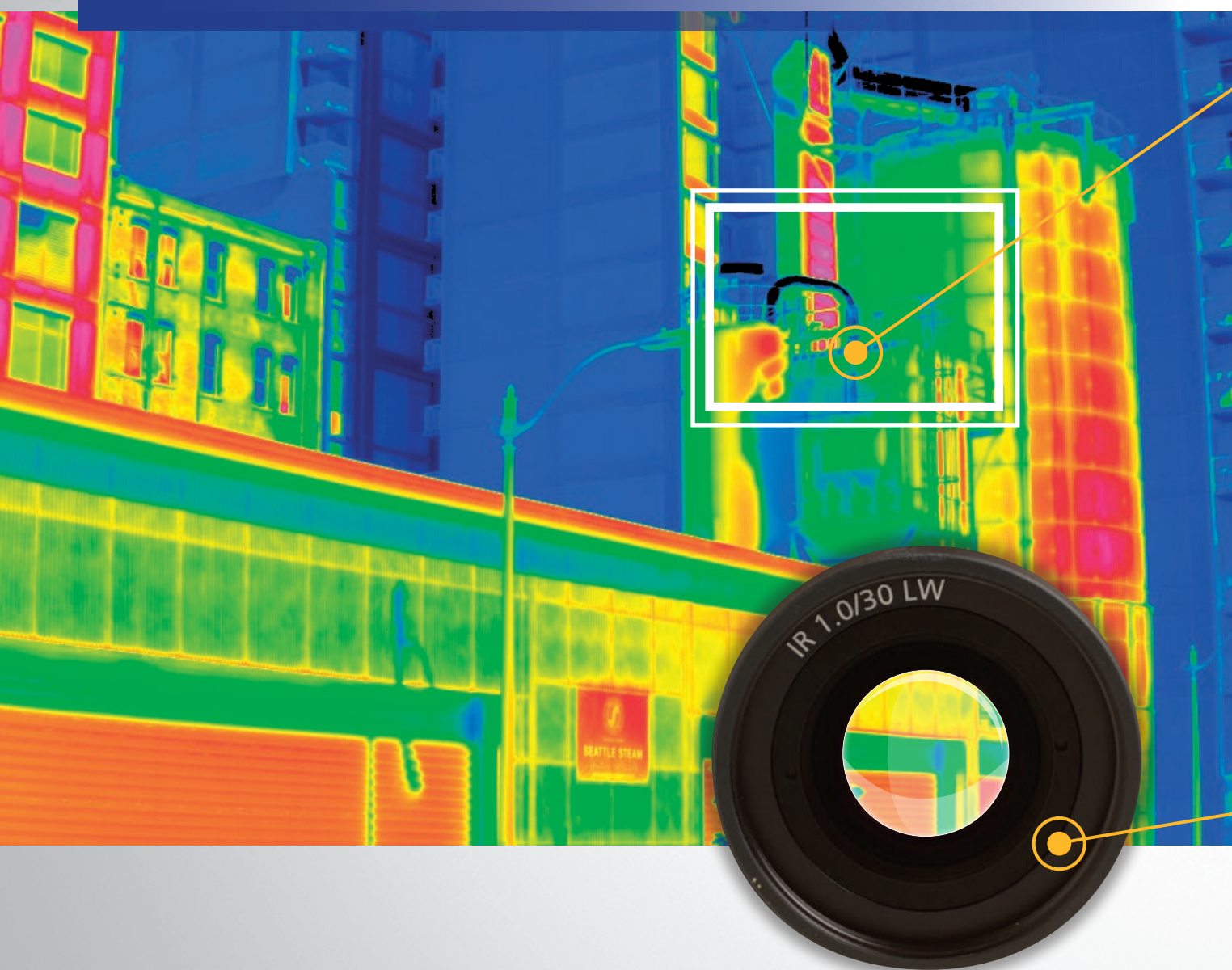
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Look beyond pixels. You'll SEE THE DIFFERENCE.

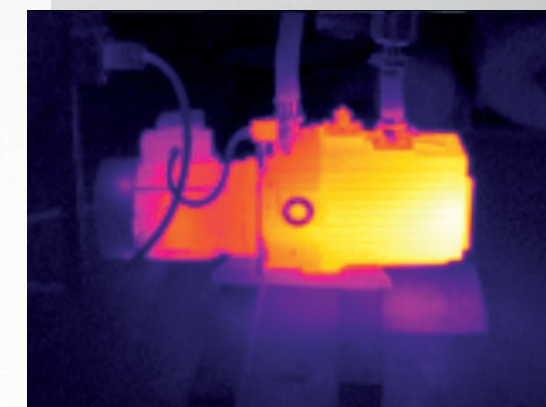
Pixels are only part of the equation that determines infrared image quality.

IMAGE QUALITY = focus + optics + FOV + pixels

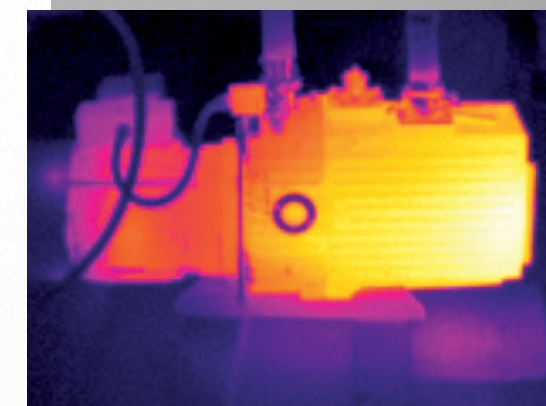


HOW FOV (FIELD OF VIEW) IMPACTS IMAGE QUALITY

We all know that detector resolution is imperative to image quality, but the level of detail that you can see in an image is also impacted by the field of view.



Resolution 160 x 120
FOV 31 ° x 22.5 °
D:S 295:1
Details in this image are a bit blurry due to the wider field of view that leads to a lower D:S.



Resolution 160 x 120
FOV 23 ° x 17 °
D:S 400:1
Same resolution, but the tighter field of view enables you to see more details in the target from the same distance.

Both images were taken with Fluke cameras at the same distance from the target.

Premier focus technologies.

Getting in-focus images can be painstaking with manual focus systems, and some autofocus systems may not focus on your desired target. Fluke Professional and Expert Series cameras include some of the most innovative focus technologies available.

- Capture a clear, accurate image focused throughout the field of view with MultiSharp™ Focus. Simply point and shoot—the camera automatically processes a stack of images focused near and far.
- Get an instant in-focus image of your designated target. LaserSharp® Auto Focus uses a built-in laser distance meter that calculates and displays the distance from your designated target with pinpoint accuracy—and immediately adjusts the focus.



Simply the best optics.

Fluke uses only 100% diamond-turned germanium lenses covered with a specialty coating. This is the most efficient available material to transmit energy to the detector to produce high quality infrared images.

The future of infrared is here in STUNNING HD resolution.

Your work as an expert thermographer is defined by the quality of the infrared images you take and your ability to analyze what's before you. The most pressing challenge lies not in analyzing what you see, but the fear of missing something you can't.



AN EXAMPLE OF WHERE TO USE THESE CAMERAS

Perfect for a substation technician, distribution technician or utilities engineer in the transmission and distribution segments of utilities, who is looking for the best accuracy and image resolution. With high temperature options (up to 2000 °C / 3632 °F), these infrared cameras are perfect for inspecting transmission lines, switchgears, transformers, and insulators. They are great for checking conductor and insulator conditions, coolant oil levels in transformers and pinpointing very small hot spots.



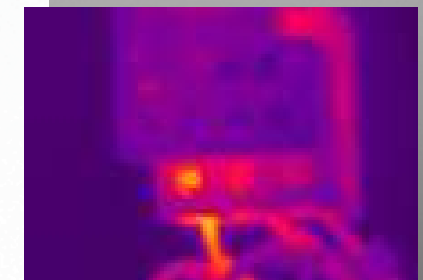
It's time to see what you're missing. Up to 3.1 million pixels with SuperResolution.

Instantly capture highly detailed images and start analyzing your images while still in the field. See incredible detail from a distance or extremely close up. On camera, you get up to 10x the pixels of a standard 320 x 240 camera (based on the TiX1000).

SuperResolution mode, available when viewed in software, lets you see HD resolution with up to 3.1 million pixels—4x the on-camera standard resolution.



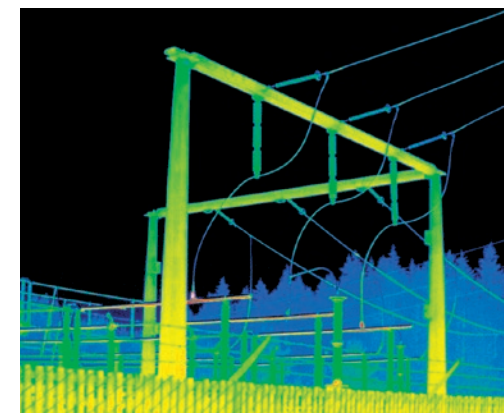
Full image, taken from 5 feet away with a TiX1000 infrared camera. The area shown in the white box is blown up below.



Regular resolution



Get 4x the pixels, and see incredible detail in your image with SuperResolution



The industry's most advanced focus options.

Precisely focus images by calculating the distance to your target with a laser distance meter, using LaserSharp® Auto Focus¹.

EverSharp multifocal recording gives you edge-to-edge clarity of targets both near and far in one image, which is created by capturing multiple images from varying focal distances.

TiX1000/620

- Capture tough shots with a large 5.6 inch rotating LCD display
- Optimized for outdoor inspections with viewfinder that reduces outdoor glare
- High temperature option up to 2000 °C¹
- Capture spectacular images close up or from a distance with your choice of seven optional lenses including 2x telephoto, 4x telephoto, wide angle, super wide angle and 3 macro lenses¹
- Identify rapid changes in temperature with the optional Subwindowing feature (up to 240 Hz)

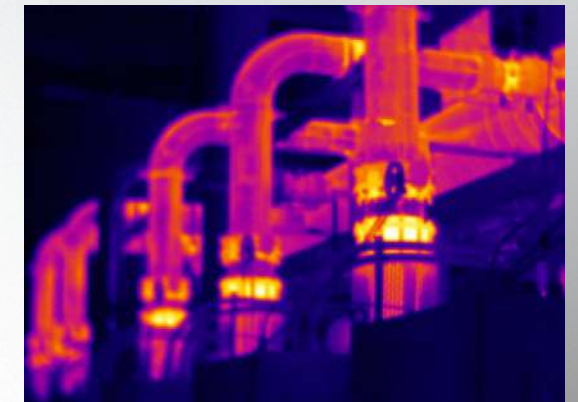
¹Features vary by model; see pages 28–30 for model specifications

TABLET-SIZED SCREEN. More details. Faster decisions.

You need maximum flexibility with an ergonomic design that allows you to easily navigate over, under and around hard-to-reach objects. With a lens that rotates a full 240 degrees and a tablet-sized 5.7 inch touchscreen LCD, you can aim and focus from a comfortable angle and easily capture the target that was once impossible to see.

100 % Focused—Every object. Near and far.

Capture a clear, accurate image focused throughout the field of view with MultiSharp™ Focus. Be sure your images will be focused and high-quality when you go back to the office to view them, even when working outdoors with the possibility of glare on your screen. Simply point and shoot—the camera automatically processes a stack of images focused near and far.



Manual focus



See around obstacles.

Easily maneuver over, under and around objects with the 240° rotating lens while viewing the screen at a comfortable angle.



MultiSharp™ Focus

MultiSharp™ Focus produces an image focused throughout the field of view

TiX580/560/520/500

- See small details in the image and discover anomalies faster with up to 640 x 480 resolution images and the 5.7 inch tablet-sized touchscreen
- Edit and analyze images on camera—edit emissivity, enable color alarms and markers, and adjust IR-Fusion® visual and infrared image blending
- Get 4x the pixel data with SuperResolution, to create up to 1280 x 960 images¹
- Find subtle temperature differences easily—instantly improve thermal sensitivity to as low as 30 mK¹
- Monitor processes with video recording, live video streaming, remote control¹, or auto capture
- Integrate temperature data, images and video into R&D analysis and reports with MATLAB® and LabVIEW® Tool Boxes¹
- Collaborate from the field in real time by wirelessly syncing images directly from your camera to the Fluke Connect® app on your smartphone, and optimize, analyze and generate reports with SmartView® desktop software²

¹Features vary by model; see pages 28–30 for model specifications

²Within your provider's wireless service area; Fluke Connect® is not available in all countries

AN EXAMPLE OF WHERE TO USE THESE CAMERAS

Built for heavy industrial environments, a plant technician in oil & gas or chemical processing can use this tool for a number of different inspections. With the rotating lens, these cameras are an ideal form factor for large asset inspections, such as transformers, tanks, turbines or furnaces. The ergonomic design of these tools make them great for a long inspection day of detecting solid levels of tanks or inspecting conditions of refractories.



Autofocus redefined. ON TARGET AND IN FOCUS. Every. Single. Time.

You're it when it comes to getting the right answers—there's no room for fuzzy, out-of-focus infrared images. Potential problems hide behind incorrect readings, which is why you need a camera with LaserSharp® Auto Focus for crisp, sharp images.



AN EXAMPLE OF WHERE TO USE THESE CAMERAS

In your process manufacturing facility, multiple maintenance technicians and plant engineers can use this tool. Electrical technicians can look for heat signatures on electrical panels, mechanical technicians can inspect motors and reliability engineers can execute scheduled maintenance inspections. These cameras are critical for preventive maintenance programs, ideal for quick image capture and equipped with auto focus options for time-sensitive, more complex inspections.

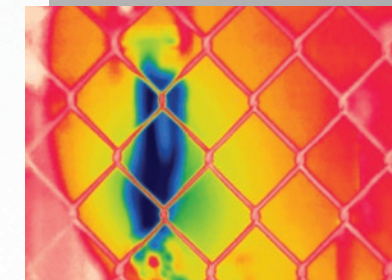


Precisely focused images.

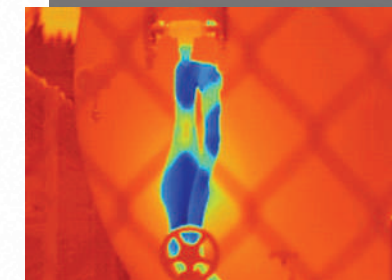
If your image is out of focus, temperature measurements could be off by up to 20 degrees or more. Getting crisp images in manual focus takes time and careful attention. Patented LaserSharp® Auto Focus with laser driven target detection gives you an in-focus image of your designated target with the push of a button. The built-in laser distance meter instantly calculates and displays the distance to your target, and the focus engine immediately adjusts the focus.



Many inspection sites are challenging for certain autofocus systems.



Passive autofocus systems may only capture the near-field subject (fence).



Using a laser pointer with LaserSharp Auto Focus captures your target.

LaserSharp® Auto Focus gives you in-focus images with the push of a button.



Navigate easier than ever.

The Professional Series cameras have stunningly clear 3.5-inch, up to 640 x 480 high resolution responsive touch screens to easily spot problems, with intuitive controls to quickly navigate to the next image or switch modes. Plus, all camera features can be accessed one-handed—even with gloves—because of the large buttons.

Ti480/450/400/300

- Pistol grip form factor with up to 640 x 480 resolution for quick, point and shoot troubleshooting
- Capture clear, accurate images focused throughout the field of view with MultiSharp™ Focus¹
- Get 4x the pixel data with SuperResolution, which captures multiple images and combines them to create up to 1280 x 960 images¹
- Digitally document critical information with your infrared image using IR-PhotoNotes™, voice annotation, or text annotation
- Monitor processes with video recording, live video streaming, remote control¹, or auto capture
- Collaborate from the field in real time by wirelessly syncing images directly from your camera to the Fluke Connect® app on your smartphone, and optimize, analyze and generate reports with SmartView® desktop software²

¹Features vary by model; see pages 28-30 for model specifications

²Within your provider's wireless service area; Fluke Connect® is not available in all countries

Our bestselling cameras just got BETTER.

You deserve a leading-edge visual infrared experience. With our smartest, most intuitive user interface yet, the Ti480 PRO and Ti450 PRO offer increased thermal sensitivity to capture the smallest differences, the latest technology for on-screen clarity and lens compatibility to capture targets tiny-to-large.



AN EXAMPLE OF WHERE TO USE THESE CAMERAS

These cameras can be used for inspections by an entire maintenance staff. In your utilities generation facility, capture infrared images of boilers, compressors and refractories to inspect thermal variations. When accuracy, precision and image quality are critical, these cameras are the perfect addition to your tool belt.

Faster and easier to use than ever.

The Ti450 PRO and Ti480 PRO include an improved, user-tested, touch screen interface. The display integrates a contemporary design, featuring multiple rectangular markers in-camera. It helps your crew quickly identify min/max temperatures for an area of the equipment or equipment array.



Improved interface helps to quickly identify min/max temperatures.

Catch smaller temperature differences.

With the enhanced measurement accuracy and the wider dynamic temperature range of the Ti450 PRO and Ti480 PRO—up to 1500 °C with NETD as low as 25 mK— you can collect precise information for making informed decisions.



Screen comparison between Ti450 and Ti480 PRO. Diagnose problems faster with sharper onscreen infrared images with clearer color differentiation.

Ti450 PRO/Ti480 PRO

- Increased sensitivity to visualize temperature differences
- Easier to visualize and diagnose issues with sharper on-screen images, multiple rectangle markers and 9 color palettes
- More intuitive visual interface
- More flexibility to visualize targets—tiny to large with interchangeable smart lenses—no calibration required
- Capture a clear, accurate image focused throughout the field of view with MultiSharp™ Focus.
- Get an instant in-focus image of your designated target with LaserSharp® Auto Focus

Infrared for every day. SF6 gas detection when you need it.

Finally, a safe, easy and affordable way to catch SF6 leaks. Increase efficiency and save money with a top performing infrared camera that delivers pinpoint, state-of-the-art SF6 detection—conduct two critical functions with a single tool.



AN EXAMPLE OF WHERE TO USE THESE CAMERAS

In an outdoor electrical distribution station, this tool will perform efficient non-contact inspections of gas insulated switchgear to detect a potential SF6 gas leak, avoiding risk of electrocution. Perfect for use by a substation technician, journeyman electrician or lineman evaluating high voltage equipment that requires testing from a distance.



Designed for dependability.

Using the technology from Fluke's bestselling pistol grip camera, the Fluke Ti450 SF6 easily switches from infrared to gas mode with a turn of a dial, making it easy to change modes on the fly when you are in the field.



Safely investigate equipment using the included tripod mount and eyepiece

Two tools in one. At a one of a kind price.

Best of all, it's affordable enough to own, so you can conduct infrared and gas inspections whenever and wherever you want without having to pay heavy rental charges or hire expensive contractors.



Everything you need to detect an SF6 leak is included in the Ti450 SF6 case

Ti450 SF6

- Detects the location of an SF6 leak—without shutting down equipment
- 320 x 240 resolution for gas and infrared images; SuperResolution increases to 640 x 480, only in infrared mode
- Get in-focus images in both infrared and gas modes with a touch of a button with LaserSharp® Auto Focus
- Capture clear, accurate infrared images focused throughout the entire field of view with MultiSharp™ Focus
- Compatible with smart lenses that require no calibration when swapping them between cameras—2x telephoto lens included in kit
- Small and lightweight, fits easily into your tool box

Rugged. Accurate. BUILT TO PERFORM.

You need quick, accurate infrared imaging in a rugged body. Get up to 320 x 240 resolution, so you can easily identify small details that could indicate a big problem.



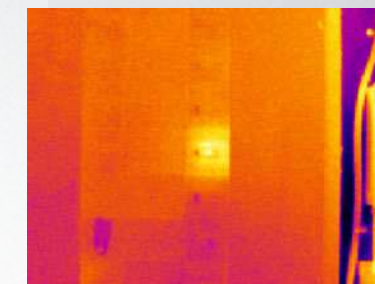
AN EXAMPLE OF WHERE TO USE THESE CAMERAS

For daily inspections where you need results immediately, these rugged cameras are great. HVAC/R contractors and facilities maintenance technicians looking for quick, frontline troubleshooting of hot spots will value this tool. They are ideal for users open to manual, auto, or fixed focus options, and for those who are concerned about larger ΔT s.



Precisely blended images offer more detail.

Image quality is everything when it comes to quickly analyzing infrared images. You need the right level of detail in your infrared image to pinpoint specific areas of concern. Fluke Performance Series IR cameras blend visible light and infrared images using patented IR Fusion® technology¹ to capture a clear 5MP real-world picture of your target. Blend at different preset levels and add picture-in-picture (PIP) to capture an incredibly revealing hybrid image.



Full infrared



50 % Blending , picture-in-picture mode



50 % Blending, cropped in to see detail

Easily read the breaker label with IR Fusion® technology—precisely blended visible and infrared images.



Designed for your environment.

See potential problems easily with the 3.5 inch LCD screen. The rugged, one-handed design (right or left handed) helps you work up a ladder or in virtually any environment, and leaves one hand free.

TiS75/S65/S60/S55/S50/S45/S40/S20/S10

- Get precisely focused images from as close as 15 cm (6 in) with manual focus, or choose fixed focus for faster images without the need to focus from 45 cm (1.5 ft) and beyond
- Monitor your battery charge and avoid an unexpected loss of power with the smart battery's LED charge indicator
- Get easy access to saved images with a removable SD card
- Digitally document critical information such as the location of the equipment or the motor nameplate with the infrared image using IR-PhotoNotes™ or voice annotation¹
- Collaborate from the field in real time by wirelessly syncing images directly from your camera to the Fluke Connect® app on your smartphone, and optimize, analyze and generate reports with SmartView® desktop software²

¹Features vary by model; see pages 28-30 for model specifications

²Within your provider's wireless service area; Fluke Connect® is not available in all countries

SOFTWARE for Fluke infrared cameras.

In the field or the office, Fluke Connect® makes it easy for you to analyze and organize thermal images in compelling reports. In addition to reports, images in Fluke Connect are available to the whole team on any mobile device, browser, or laptop so everyone can have access to the latest information.



Fluke Connect® mobile app.

Wirelessly sync images directly from your camera to Fluke Connect®. Email images to colleagues from the field to collaborate in real time. Edit and analyze images and generate reports on the go.

Download the free app by searching “Fluke Connect” in the Apple or Android app store

Fluke Connect® software for your desktop.

Powerful, new Fluke Connect® software for your Windows desktop computer makes it easy to edit images, perform advanced analytics, generate quick, customizable reports and export images to the format of your choice. Fluke Connect® is a comprehensive and connected software platform that represents the future of integrated equipment maintenance.

**Download free at
www.fluke.com/flukeconnectti**



Fluke thermal imaging software features at a glance

- Download, view and wirelessly transfer thermal images
- Share images and measurements with remote team members
- Adjust level and span, IR Fusion® blending and color palettes
- Add and edit markers and color alarms
- Add text, audio and photo annotations
- Export radiometric .is2 images in BMP, JPG, PNG, GIF and TIFF format
- Create thermal imaging reports and export as PDFs
- Export temperature data in CSV or XLS format
- Search images by date, severity & title
- Free cloud storage for anywhere, anytime access (can be used offline)
- Customizable report templates
- Easy to use group editing feature

Fluke Connect® analysis and reporting software is available in all countries but Fluke Connect system is not. Please check availability with your authorized Fluke distributor.

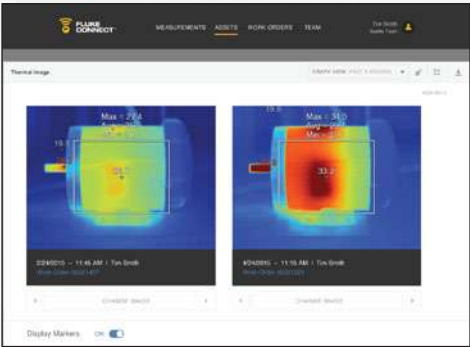
Quick, Confident Decisions with Fluke Connect® Assets

Fluke Connect Assets wirelessly transfers images from the camera to an asset record with no mistakes. This way, your whole team can see accurate temperature trends by asset and make confident decisions.

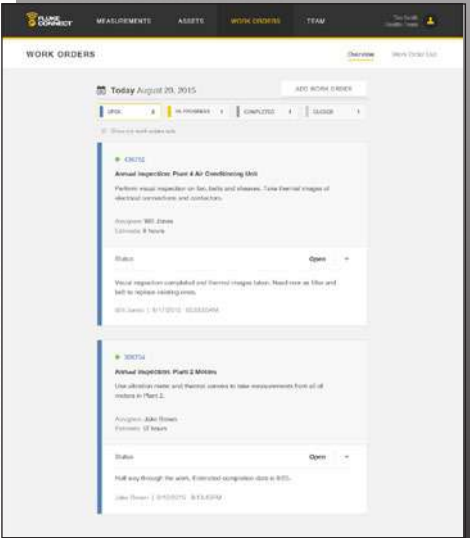


Receive instant alarms.

Set alarms based on equipment conditions you configure. Share live video and readings to troubleshoot problems from any location. And save yourself the time and effort of going to the plant floor or back to the office every time there is a question.



Asset Analysis dashboard: Easily compare complex data



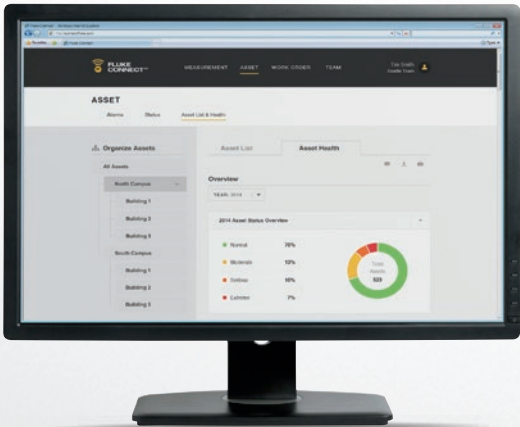
Fluke Connect® Assets

- Assign infrared images to an asset and view changes in your equipment over time
- Receive instant alarms based on asset conditions
- Generate work orders that include measurements and infrared images to provide more complete information to your maintenance teams
- Reduce your paperwork, increase your efficiency
- Minimal investment and setup time needed

Download the phone app at:



Fluke Connect® analysis and reporting software is available in all countries but Fluke Connect system is not. Please check availability with your authorized Fluke distributor.



SEE the impossible.

Telephoto lenses

The difference between finding and potentially diagnosing the problem, and not seeing any discrepancy at all. Get the detail you need, even from a distance, when you view your target magnified 2 or 4 times more than a standard lens.

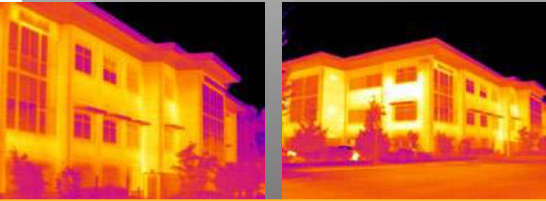


Standard (left), 2x telephoto (center) and 4x telephoto (right)—see the right level of critical infrared detail



Wide angle lenses

When working in a tight space, see a larger target from a close distance. Ideal for roof and building inspection or for looking through IR Windows.

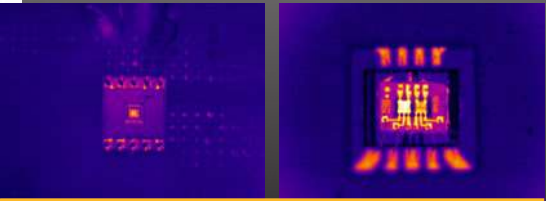


Standard lens (left) and wide lens (right)—see both sides of the building at once from the same distance



Macro lenses

Get an incredibly detailed image of very small objects—as small as 25 microns, smaller than the average human hair.



Standard (left) and 25 micron macro lens (right)—see detail in very small objects



Lens type	Use for	Applications
2x telephoto	Small to medium sized target, viewed from a distance	• Maintenance, electrical, and process technicians—when equipment is too high, difficult to reach or unsafe to approach • Building inspection—see fine detail from a distance
4x telephoto	Small target, viewed from a great distance	• Petrochemical—tall stacks • Power utilities generation and transmission—long distances • Metallurgy and metals refinement—too hot to approach; may have equipment near refinery that needs inspection
Wide angle	Large target, viewed from a relatively close distance	• Maintenance, electrical and process technicians—when working in a tight space or needing to view a large area • Building inspectors—for roofing and industrial building inspections, save time by seeing a much greater area at once
Macro	Tiny to microscopic target, viewed from extremely close	• Research and development • Electronics design and validation • Microscopic thermography

CHANGE THE WAY you see digital multimeters.

Combining a full-featured digital multimeter with integrated thermal imaging, the 279 FC thermal multimeter helps you find, repair, validate and report many electrical issues quickly so that you are confident problems are solved.



279 FC

- Locate the problem immediately with an 80 x 60 infrared image (non-radiometric) and center-point temperature measurement
- Full-featured digital multimeter has 15 measurement functions including: ac/dc voltage, resistance, continuity, capacitance, diode test, min/max, ac current (with iFlex®) and frequency
- Full-color 3.5 inch LCD screen provides clean, crisp readings
- Rechargeable lithium ion battery allows for a full work day (10+ hours) and auto power off saves battery power
- Transmit results wirelessly with the Fluke Connect® system¹
- iFlex® option expands your measurement capabilities so you can get into tight, hard to reach spaces for current measurement (up to 2500 A ac)

¹Within your provider's wireless service area; Fluke Connect® is not available in all countries.

Designed to SEE IT ALL.

Say good-bye to spot-by-spot readings. An infrared heat map superimposed over a visual image provides the context you need to clearly see temperature-related issues—priced to outfit the whole team.



VT04/VT04A

- Handy when you need it; easily fits in your tool bag or pocket
- Intuitive enough to use right out of the box
- Easily access saved images with the removable SD card
- Save in .bmp format when you only want the image, or choose .is2 format so you can optimize images and create reports in SmartView® software (available for download at www.fluke.com/vtsmartview)
- Protect your visual IR thermometer with the included hard case (VT04) or soft case (VT04A)
- Choose your preferred way of powering your visual IR thermometer: a rechargeable Li-ion battery (VT04) or 4 AA batteries (VT04A)

For FAST, EASY, DEPENDABLE readings, these are the go-to tools.

For a quick temperature reading, it doesn't get much easier than an IR Thermometer from Fluke. So rugged and fast you'll always want to keep it with you.

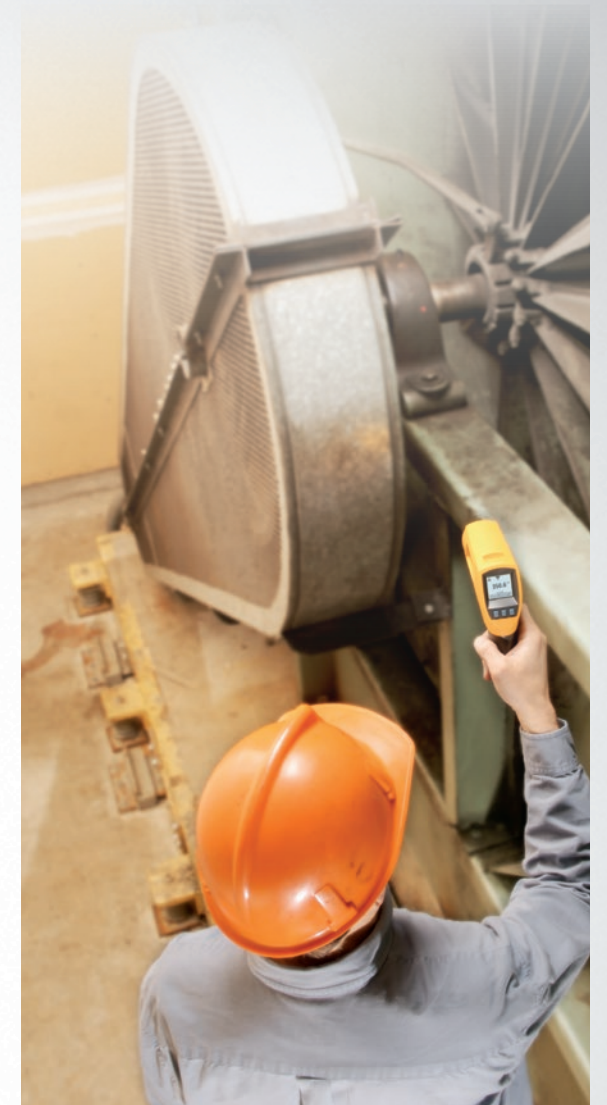


Quick and simple measurements.

With a start-up time of a mere second, you'll never have to wait on your tool. Simply pull the trigger and instantly get a spot measurement. Laser guides show where you're measuring, and dual lasers on some models indicate the area the measurement is based on.

Rugged, ready and reliable.

You have a tough job. Tough on you and your tools. That's why Fluke IR thermometers are ready for action even in harsh conditions—tested to withstand dust and water with an IP54 rating¹. Some can even survive a 3 meter drop¹. For rugged reliability, it's tough to beat Fluke.



572-2/568/62 MAX+/64 MAX

- Measure accurately from farther away with up to a 60:1 distance to spot ratio (572-2 60:1, 568 50:1, 62 MAX+ 12:1, 64 MAX 20:1)
- Measure temperatures up to 900 °C (1652 °F):
572-2 -30 °C to +900 °C (-22 °F to +1652 °F), 568 -30 °C to +800 °C (-22 °F to +1472 °F),
62 Max+ -30 °C to +650 °C (-22 °F to +1202 °F), 64 MAX -30 °C to 600 °C (-22 °F to 1112 °F)
- Save time with available onboard, downloadable data storage of temperature readings (572-2 and 568 models)
- Get contact measurement with 2-in-1 IR thermometers (572-2 and 568 models)
- Intrinsically safe model available for use in hazardous environments including oil and gas (568 Ex)².
- Identify the area you're measuring with dual-laser sighting on the 572-2 and the 62 Max+ or with single-laser sighting on the 568 and 64 MAX
- Get alerts when a temperature is outside the expected range with high and low alarms
- Flashlight (64 MAX) and large, easy-to-read backlit LCD display for easy viewing even in a dark environment
- Capture spot temperatures unattended (64 MAX)
- 99 data point logging (64 MAX)

¹Testing was done on the 62 Max and 62 Max+

²See 568 Ex product page on Fluke website for details

Increase the SAFETY and SPEED of your electrical infrared inspections.

A company’s greatest investment is not the equipment that’s behind the panel door. It’s the electricians, engineers and inspectors who risk their lives every day doing their jobs.



CV400/401/300/301/200/201

- Highest arc blast safety rating available—63 kA when properly installed
- Under 5 minute installation with 1 person; no need to remove panel door
- Available in 2 inch (50 mm), 3 inch (75 mm), and 4 inch (100 mm) sizes with convenient ¼ turn access or security key access options
- Clearly view equipment both visually and thermally with ClirVu® coating that protects the optic from the elements
- Corrosion and UV resistant for challenging outdoor environments—IP67 rugged

EXPAND the capabilities of your infrared camera.

Batteries and chargers

Expand your powering capabilities with an extra battery, charging base or car charger. All Fluke Professional and Performance series cameras feature interchangeable smart batteries. With the LED charge indicator, monitor your battery charge and avoid an unexpected loss of power with a push of a button.

Product	Description
SBP3	Rechargeable lithium-ion smart battery
SBP4	Rechargeable lithium-ion smart battery
SBC3B	Battery charging base
TI-CAR CHARGER	Car charger

Tripod mounts

Get sharp, steady images by attaching your camera to a tripod with a tripod mount (TRIPOD3). Set your camera to auto-capture to get multiple shots of the same target.

Sun visors

No need to squint when working outside. Get a sun visor (VISOR3) for your camera to reduce screen glare.



SBP3 rechargeable battery



SBP4 rechargeable battery



Battery charging base



Car charger



Tripod mount



Sun visor

Not all accessories are compatible with all cameras.

	Expert Series Thermal Imagers					
	TiX1000	TiX620	TiX580	TiX560	TiX520	TiX500
IFOV (spatial resolution)	0.6 mRad	0.85 mRad	0.93 mRad	1.31 mRad		
Detector resolution	1024 x 768 (786,432 pixels) SuperResolution mode: 2048 x 1536 (3,145,728 pixels)	640 x 480 (307,200 pixels) SuperResolution mode: 1280 x 960 (1,228,800 pixels)		320 x 240 (76,800 pixels) SuperResolution mode: 640 x 480 (307,200 pixels)		
Field of view	32.4 °H x 24.7 °V	32.7 °H x 24 °V	34 °H x 24 °V	24 °H x 17 °V		
Compatible lenses	2 wide angle, 2 telephoto, 3 macro and 1 standard	1 wide angle and 1 telephoto	Pre-calibrated smart lenses – TiX580: 2x telephoto and wide angle; TiX560, TiX520, TiX500: 2x and 4x telephoto, wide angle, 25 micron macro			
Wireless connectivity	—		Fluke Connect® app compatible. Wireless connectivity to PC, iPhone® and iPad® (iOS 4s and later), Android™ 4.3 and up, and WiFi to LAN¹			
IR-Fusion®	AutoBlend™ mode, continuous blending				AutoBlend™ mode	
Picture-In-Picture (PIP)	Picture-in-Picture					
Focus system	LaserSharp® Auto Focus, auto focus, manual focus, and EverSharp multifocal recording	Auto focus, manual focus, and EverSharp multifocal recording	MultiSharp™ Focus, LaserSharp® Auto Focus with built-in laser distance meter and advanced manual focus			
Display	Extra-large 5.6 inch color TFT display, 1280 x 800 pixel resolution, suitable for daylight operation		5.7 inch touchscreen LCD, 640 x 480 pixel resolution			
Design	Camcorder		Ergonomic design with a 240 degree rotating lens			
Thermal sensitivity*	≤ 0.05 °C at 30 °C target temp (50 mK)	≤ 0.04 °C at 30 °C target temp (40 mK)	≤ 0.05 °C at 30 °C target temp (50 mK)	≤ 0.03 °C at 30 °C target temp (30 mK)	≤ 0.04 °C at 30 °C target temp (40 mK)	≤ 0.05 °C at 30 °C target temp (50 mK)
Temperature measurement range	–40 °C to +1200 °C (–40 °F to +2192 °F) High temperature option—request at time of order: up to 2000 °C (3632 °F)	–40 °C to +600 °C (–40 °F to +1112 °F) High temperature option—request at time of order: up to 2000 °C (3632 °F)	–20 °C to +800 °C (–4 °F to +1472 °F)	–20 °C to +1200 °C (–4 °F to +2192 °F)	–20 °C to +850 °C (–4 °F to +1562 °F)	–20 °C to +650 °C (–4 °F to +1202 °F)
Frame rate	30 Hz or 9 Hz versions		60 Hz or 9 Hz versions			
Subwindowing modes available: (add-on at time of order—subwindowing options are not available on 9 Hz models)	Option 1: 640 × 480 (60 fps) Option 2: 384 × 288 (120 fps) Option 3: 1024 × 96 (240 fps)	384 × 288 (60 fps)	—			
Software	SmartView® desktop software		SmartView® desktop software and Fluke Connect mobile app¹			
Voice annotation	60 seconds maximum recording time per image, reviewable playback on camera; Bluetooth headset provided (where available)					
Text annotation	Yes					
Video recording	Standard and radiometric					
Streaming video (remote display)	Via HDMI; GigE Ethernet available in SmartView® software		Yes, see the live stream of the camera display on your PC, smartphone, or TV monitor. Via USB, WiFi hotspot, or WiFi network to Smartview® software on a PC; via WiFi hotspot to the Fluke Connect® app on a smartphone; or via HDMI to a TV monitor			
Remote control operation	Yes		Yes, through Smartview® desktop software or Fluke Connect mobile app¹			
Alarms	High temperature, low temperature, and isotherms (within range)					
Warranty	Two-years (standard), extended warranties are available					

	Professional Series Thermal Imagers						
	Ti480 PRO	Ti450 PRO	Ti450 SF6	Ti480	Ti450	Ti400	Ti300
IFOV (spatial resolution)	0.93 mRad	1.31 mRad		0.93 mRad	1.31 mRad		1.75 mRad
Detector resolution	640 x 480 (307,200) or 1280 x 960 with SuperResolution (1,228,800 pixels)	320 x 240 (76,800 pixels) or 640 x 480 with SuperResolution (307,200 pixels) 320 x 240 (76,800 pixels)		640 x 480 (307,200 pixels) SuperResolution mode: 1280 x 960 (1,228,800 pixels)	320 x 240 (76,800 pixels) SuperResolution mode: 640 x 480 (307,200 pixels)	320 x 240 (76,800 pixels)	240 x 180 (43,200 pixels)
Field of view	34° H x 24° V	24 °H x 17 °V		34 °H x 24 °V	24 °H x 17 °V		
Compatible lenses	Pre-calibrated smart lenses: wide angle, 2x and 4x telephoto, 25 micron macro		Pre-calibrated smart lenses: wide angle, 2x and 4x telephoto	Pre-calibrated smart lenses – Ti480: 2x telephoto, wide angle	Pre-calibrated smart lenses: 2x and 4x telephoto, wide angle		
Wireless connectivity	Fluke Connect® app compatible. Wireless connectivity to PC, iPhone® and iPad® (iOS 4s and later), Android™ 4.3 and up, and WiFi to LAN¹						
IR-Fusion®	Five modes of image blending (AutoBlend™ mode, Picture-in-Picture (PIP), IR/Visible alarm, Full IR, Full visible light) add the context of the visible details to your infrared image						
Focus system	MultiSharp™ Focus, LaserSharp® Auto Focus with built-in laser distance meter and advanced manual focus					LaserSharp® Auto Focus with built-in laser distance meter and advanced manual focus	
Display	3.5 inch touchscreen LCD, 640 x 480 pixel resolution						
Design	Rugged, ergonomic design for one-handed use						
Thermal sensitivity*	≤ 0.05 °C at 30 °C target temp (50 mK)	≤ 0.025 °C at 30 °C target temp (25 mK)		≤ 0.05 °C at 30 °C target temp (50 mK)	≤ 0.03 °C at 30 °C target temp (30 mK)	≤ 0.05 °C at 30 °C target temp (50 mK)	
Temperature measurement range	≤ -10 °C to +1000 °C (-14 °F to 1832 °F)	-10 °C to 1500 °C (14 °F to 2732 °F)	-20 °C to +1200 °C (-4 °F to +2192 °F)	-20 °C to +800 °C (-4 °F to 1472 °F)	-20 °C to +1200 °C (-4 °F to +2192 °F)		-20 °C to +650 °C (-4 °F to +1202 °F)
Frame rate	60 Hz or 9 Hz versions						
Subwindowing modes available: (add-on at time of order—subwindowing options are not available on 9 Hz models)	—						
Software	SmartView® desktop software and Fluke Connect mobile app¹						
Voice annotation	60 seconds maximum recording time per image; reviewable playback on camera; optional bluetooth headset available but not required						
Text annotation	Yes						
Video recording	Standard and radiometric						
Streaming video (remote display)	Yes, see the live stream of the camera display on your PC, smartphone, or TV monitor. Via USB, WiFi hotspot, or WiFi network to SmartView® software on a PC; via WiFi hotspot to the Fluke Connect® app on a smartphone; or via HDMI to a TV monitor						
Remote control operation	Yes, through Smartview® desktop software or Fluke Connect mobile app¹						
Alarms	High temperature, low temperature, and isotherms (within range)						
Warranty	Two-years (standard), extended warranties are available						

*Best possible.
¹Within your provider's wireless service area; Fluke Connect® is not available in all countries.

	Performance Series Thermal Imagers					
	TiS75	TiS65/60	TiS55/50	TiS45/40	TiS20	TiS10
IFOV (spatial resolution)	2.0 mRad	2.4 mRad	2.8 mRad	3.9 mRad	5.2 mRad	7.8 mRad
Detector resolution	320 x 240 (76,800 pixels)	260 x 195 (50,700 pixels)	220 x 165 (36,300 pixels)	160 x 120 (19,200 pixels)	120 x 90 (10,800 pixels)	80 x 60 (4,800 pixels)
Field of view	35.7 °H x 26.8 °V					
Compatible lenses	—					
Wireless connectivity	Fluke Connect® app compatible. Wireless connectivity to PC, iPhone® and iPad® (iOS 4s and later), Android™ 4.3 and up, and WiFi to LAN¹					
IR-Fusion®	Five modes of image blending (AutoBlend™ mode, Picture-in-Picture (PIP), IR/Visible alarm, Full IR, Full visible light) add the context of the visible details to your infrared image					—
Focus system	Manual focus	Manual focus (TiS65), Fixed focus (TiS60)	Manual focus (TiS55), Fixed focus (TiS50)	Manual focus (TiS45), Fixed focus (TiS40)	Fixed focus	
Display	3.5 inch (landscape) 320 x 240 LCD					
Design	Rugged, lightweight, ergonomic design for one-handed use					
Thermal sensitivity*	≤ 0.08 °C at 30 °C target temp (80 mK)			≤ 0.09 °C at 30 °C target temp (90 mK)	≤ 0.10 °C at 30 °C target temp (100 mK)	≤ 0.15 °C at 30 °C target temp (150 mK)
Temperature measurement range	-20 °C to +550 °C (-4 °F to +1022 °F)		-20 °C to +450 °C (-4 °F to +842 °F)	-20 °C to +350 °C (-4 °F to +662 °F)		-20 °C to +250 °C (-4 °F to +482 °F)
Frame rate	30 Hz or 9 Hz versions	30 Hz or 9 Hz versions (TiS65), 9 Hz (TiS60)	30 Hz or 9 Hz versions (TiS55), 9 Hz (TiS50)	30 Hz or 9 Hz versions (TiS45), 9 Hz (TiS40)	9 Hz	
Software	Fluke Connect mobile app and SmartView® desktop software¹					
Voice annotation	60 seconds maximum recording time per image, reviewable playback on camera; Bluetooth headset available separately (where available)				—	
Text annotation	—					
Video recording	Standard and radiometric		—			
Streaming video (remote display)	Yes, to Fluke Connect® Smartview® desktop software or mobile app		—			
Remote control operation	—					
Alarms	High temperature, low temperature, and isotherms (within range)			High temperature, low temperature	—	
Warranty	Two-years (standard), extended warranties are available					

*Best possible.
¹Within your provider's wireless service area; Fluke Connect® is not available in all countries.

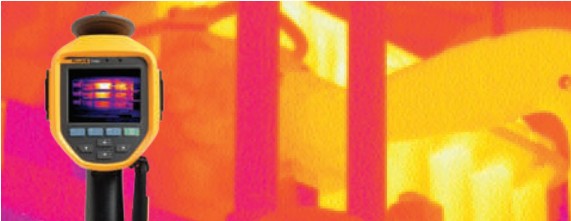
Fluke infrared tools are on the job because they do the job.

Questions?
Contact your local Fluke representative for more information, or go to our website and request your free product demonstration.

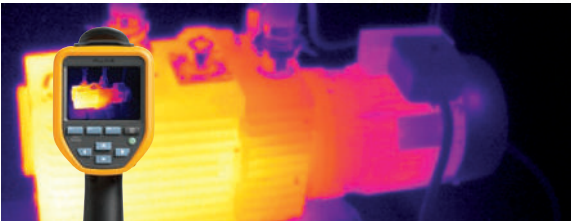
Fluke training
Between our online videos and seminars, and live classes with our training partner, The Snell Group, you can continue to grow as a thermographer and infrared technician.



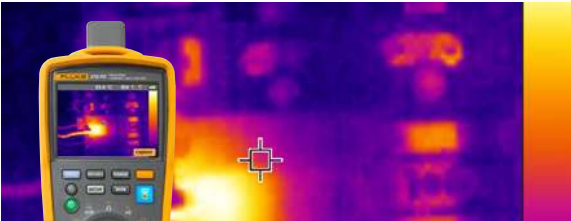
Expert Series
When you cannot be wrong, the Expert Series offers extremely detailed images. Plus, view images on a large, rotating, touchscreen display.



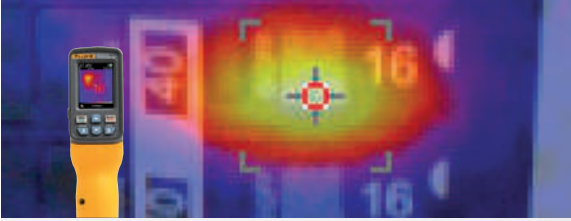
Professional Series
Focus with laser speed and accuracy on your designated target with LaserSharp® Auto Focus. Get highly detailed images and advanced features.



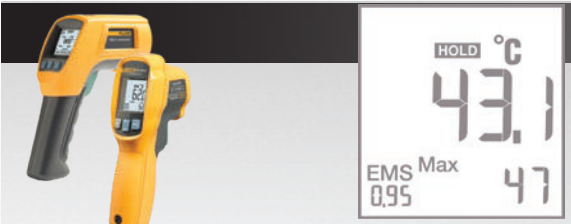
Performance Series
Get detailed images in an affordable infrared camera that's rugged and reliable. The perfect tool for a quick inspection.



Thermal Multimeter
A full-featured digital multimeter with integrated thermal imaging



Visual IR Thermometer
An infrared heat map with hot and cold markers reveals potential areas of concern. See issues in context by blending the heat map with a visual image.



IR Thermometer
Get a quick temperature reading, even from a distance, with up to a 60:1 distance to spot ratio and a start-up time of a mere second.

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Fluke Corporation

PO Box 9090, Everett, WA 98206 U.S.A.

Fluke Europe B.V.

PO Box 1186, 5602 BD

Eindhoven, The Netherlands

For more information call:

In the U.S.A. (800) 443-5853 or

Fax (425) 446-5116

In Europe/M-East/Africa +31 (0)40 267 5100

or Fax +31 (0)40 267 5222

In Canada (800)-36-FLUKE or

Fax (905) 890-6866

From other countries +1 (425) 446-5500

or Fax +1 (425) 446-5116

Web access: <http://www.fluke.com>

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What to look for in a professional grade pocket-sized thermal imager

Thermal imaging has become so broadly accepted for troubleshooting and maintenance that, in addition to a huge choice of features, there are several form factors to choose from, including one that fits in your pocket.



If you're wondering how much functionality and durability could fit into an imager that's about the size of a smartphone, you may be surprised. Electronics continue to shrink in size, which makes it possible to include an increasing amount of functionality into a smaller space. So now you can get a professional grade, thermal imager in a pocket size.

A thermal imager of this size is ideal for first line troubleshooting. Use it to quickly scan electrical equipment, pumps, motors, building systems, HVAC, and process control equipment for hot spots and cold spots that can indicate early signs of trouble. Pocket-sized infrared cameras easily fit in a shirt or pants pocket so it's easy to carry. And they're typically affordable enough to make it practical for each technician to have one.

You should select a pocket size thermal imager carefully because, just as with full sized imagers, there can be significant differences in resolution, durability, and capabilities. The following are some key criteria to use when evaluating pocket size thermal imagers.

1. Ruggedness

Just like your cell phone, a pocket-sized thermal imager needs to stand up to a lot of abuse. It needs to survive rugged use in harsh environments and even an accidental drop. Ruggedness in a pocket-sized thermal imager means more than just whether the unit works after being dropped on the floor. In an industrial environment tools need to stand up to dust, oil and water. The build quality is important, down to very small details. Does the battery door snap closed easily and stay closed? How well does the touchscreen display stand up to constant use and being stored in your pocket? Consider the manufacturer's reputation for quality construction with similar products. For example, Fluke has long been known for its rugged and reliable handheld test tools. It recently extended that rugged performance to the PTi120 Pocket Thermal Imager that includes many professional grade features.

2. Asset tagging and wireless image upload

The ability to quickly upload the images you collect and link those files to individual assets can save time and ensure the images are stored with the correct asset. The Fluke PTi120 also includes Fluke Connect® Asset Tagging that allows you to scan a asset's bar code or QR code and then wirelessly transmit images to the correct asset file on a computer or in the cloud. This provides one cohesive asset history that you can quickly and easily access, analyze, and use for comparison from anywhere to improve asset management workflow and save time.

3. Resolution

Infrared camera resolution determines the quality of the image and the accuracy of the temperature information you collect. Every pixel in an infrared image represents a temperature measurement. The higher the resolution, the easier it will be for you

to determine the criticality of problems you find during inspections. Detector resolution is specified in detector pixels—the higher the number the higher the resolution. Typically, the more detector pixels focused on the target, the more accurate your measurement. You need to look for a pocket-sized thermal imager with enough resolution to accurately identify hot and cold spots and give you a base level of diagnostic information that allows you to find early indications of mission critical problems.

4. IR Fusion®

Blended visible light and infrared images. Many of today's infrared cameras combine visible light and infrared images together in a single display. You should look for that same capability in a pocket-sized thermal imager. A blended image helps you find thermal anomalies because when you see a problem in the infrared image you can view that blended with the visible light image to quickly and precisely locate the area of concern on the actual piece of equipment. The PTi120 includes the same patented IR Fusion® technology available in other Fluke infrared cameras. IR Fusion automatically captures a digital visible light image simultaneously with an infrared image and lets you view the result with varying degrees of blending—from full infrared to full visible light.

5. Sharing images with remote team members

The ability to share thermal images from your camera with others on a smartphone or computer can help accelerate or escalate problem solving. You can instantly show potential issues to clients or co-workers in real time to expedite decisions on what to do next. Using the Fluke Connect mobile app you can share images from the Fluke Pocket Thermal Imager across the internet with remote team members. Once saved to the Fluke Cloud, thermal images are permanently accessible to you and other authorized users on your team. You can also create nearly instant, professional reports to present to managers or clients.

6. Battery life

The amount of time that you can use a pocket-sized thermal imager between charges varies by the level of features and the power management system of your device. You should expect at least two hours of use between charges. Rechargeable lithium ion batteries (similar to those used in mobile phones) provide high energy density and are slow to self-discharge. In addition, this lithium technology typically delivers a five-year operating life, and often can be recycled. To maximize the life of the lithium-ion battery it's



a good rule of thumb to use them to full discharge and then fully recharge them the first 5-10 times.

7. Robust memory

As anyone with a regular digital camera knows, images can use up memory in a hurry. That is even more true for infrared images. So when considering a pocket-sized imager look for enough onboard memory for your needs. A good starting point is about 4 gigabytes, which would allow you to store approximately 500 images. Saving images in the .is2 format allows you to perform further image processing and analysis, and export the images into many commonly used file formats. Having enough memory will allow you to maintain a database of thermal images right in your pocket that can be used for comparisons at any time.

8. Ergonomics

The small size and light weight would seem to automatically make a pocket-size thermal imager easier to handle but don't forget to consider details. Does it fit comfortably in your hand? How accessible is the power button and the controls? Does the device have a strap to make it easier to carry and hang on to?

The Fluke PTi120 pocket imager at a glance

This professional-grade thermal imager can help you quickly and easily find, assess and solve mission-critical problems.

Key features

- 120 x 90 resolution
- Asset Tagging through bar code or QR scanning
- IR Fusion IR and visible light image blending
- Rugged to withstand 1-meter drop
- IP54-rated

Industries

- Process manufacturing
- Discrete manufacturing

Applications

- Electrical pumps
- Motors process
- Control building systems
- HVAC



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In the U.S.A. (800) 443-5853 or
Fax (425) 446-5116
In Europe/M-East/Africa +31 (0) 40 2675 200 or
Fax +31 (0) 40 2675 222
In Canada (800)-36-FLUKE or
Fax (905) 890-6866
From other countries +1 (425) 446-5500 or
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Web access: <http://www.fluke.com>

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APPLICATION NOTE

LED Chip Heat Dissipation Mapping

The LED chip is the core component of LED lighting. If the chip temperature is too high, the LED life and luminous quality could be severely affected.



What is a heat sink and why is it important?

A heat sink is a common component in many electronic devices. It transfers the heat created by a device, acting to reduce the device's temperature to prevent overheating. Heat sinks are an important part of LED lighting, more specifically LED chips. The heat sink aids in heat dissipation of the chip, ensuring that the temperature of these chips stays within the appropriate range. Testing heat sinks in the production process of LED chips is critical to ensuring quality.

Infrared cameras can be used in the R&D process to check LED heat sinks. The readings from a camera can help manufacturers find potential problems with materials and designs, to better analyze and improve heat sink quality.

Relationship between the LED chip temperature and the heat sink

To continue operating properly, LED chip temperature should not exceed 120 °C. As chip temperature increases, the unfortunate reality is that service life decreases. So, if the chip temperature is very high, or even worse, exceeds 120 °C, service life of the chip will be shortened.

Therefore it is important to stay below 120 °C to maintain chip performance and service capability. This emphasizes the

importance of the heat sink—the heat sink is what cools the LED chip. If the heat sink is unavailable, poorly designed, or made of improper material, the heat dissipation effect will be seriously affected, thus shortening the LED service life or resulting in a change of LED color.

CASE:

We worked with the R&D department for a large LED manufacturer to understand how LED chips are tested. The manufacturer stated the importance of the heat dissipation effect and heat sink size when designing a heat dissipation scheme for the chip. Six types of heat sinks were designed for research.

As shown in Figure 1, the heat sink area increases as you move from bottom left to top right. These figures have the same chip under the same input voltage, current and the same lighting time.

In Figure 2, the temperature at the upper middle position is 48.1 °C, inconsistent with the temperature trend of heat sink size. Normally the estimated value should be in the range of 43 °C to 44 °C. Since we see in the figure that the temperature falls outside of this range, it is likely that the design or material selection of the heat sink here is flawed. The image can also be used to calculate the heat dissipation per unit area by focusing on the area size and

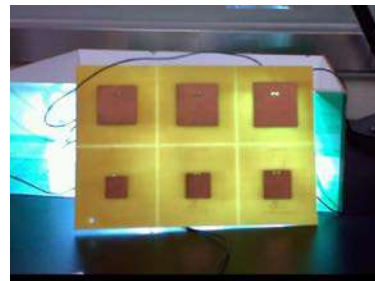


Figure 1

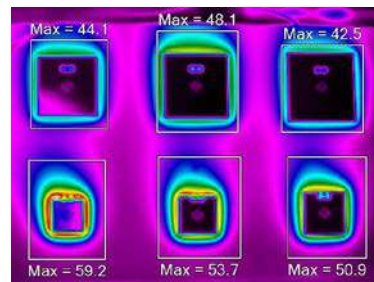


Figure 2

temperature. In this example, it is clear that the design at the upper right corner has the worst heat dissipation effect, and the lower left corner shows the best heat dissipation effect.

Before an infrared camera, what was used to measure the temperature during heat dissipation R&D of an LED chip?

Before the introduction of infrared cameras, a thermocouple was the most popular way to measure temperature during heat dissipation.

In Figure 3A the LED chip (circular part) uses a strip-like heat sink, and Fluke SmartView® desktop reporting and analysis software is used to perform linear analysis for the temperature distribution at different distances as seen in Figure 3B.

In Figure 4A there are metal bands (purple color on the heat

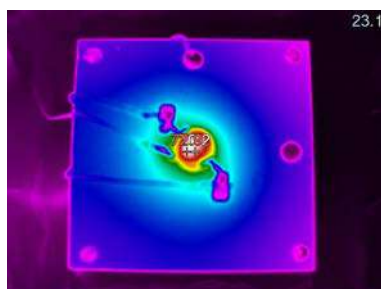


Figure 3A

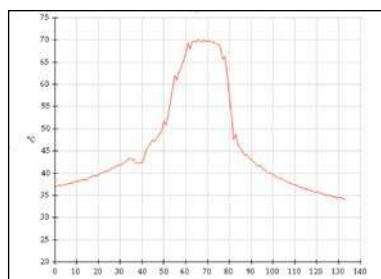


Figure 3B

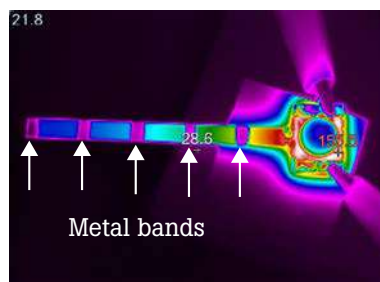


Figure 4A

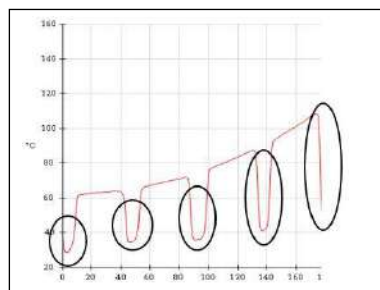


Figure 4B

sink) segmented on the strip-like heat sink. This is causing the temperature of these segments to be low due to the low emissivity. This is seen on the graph (Figure 4B) where the temperature drops down, highlighted by the black circles.

What are the disadvantages of using the thermocouple for testing?

The thermocouple has a few limitations. The first disadvantage of using a thermocouple is that it must make contact with the surface to take a measurement. To be able to make contact there must be a surface placed over the heat sink using glue which can alter the temperature reading. In addition when using a thermocouple you can only take a point measurement. This means that only a singular point of the heat sink is tested which does not provide an accurate reading for the whole heat sink.

What are the advantages of the infrared camera?

The infrared camera can quickly test the performance of the radiation fin. The online monitoring and real-time shooting thermal map features can be used to conduct specific temperature analysis of the fin on a PC. An infrared camera is a non-contact form of temperature measurement which decreases the time it takes to measure the apparent temperature and is more accurate. The temperature profile of the heat sink with other related analysis functions is of major importance to help optimize the heat sink design thus prolonging the LED chip life.

When you are performing tests make sure to keep accuracy as a priority. Here are three things to keep in mind for better LED inspections.

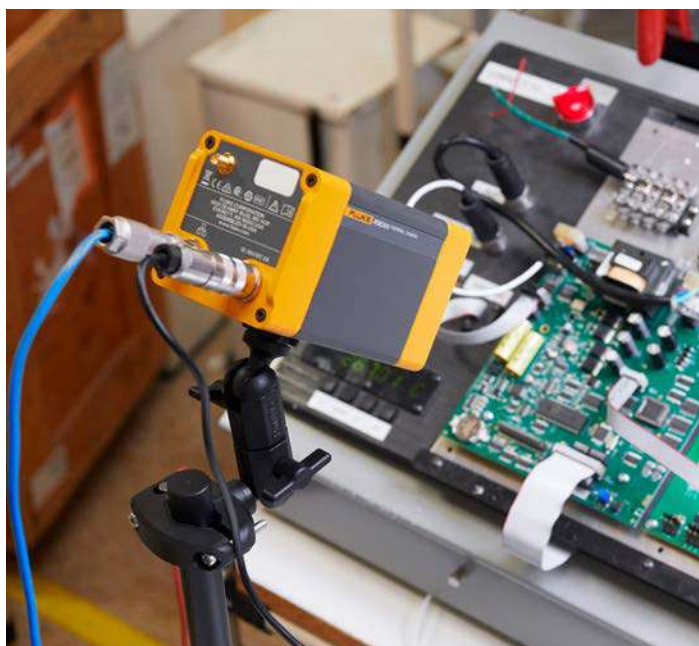
1. The metal material emissivity of some heat sinks leads to a low temperature reading. To avoid incorrect measurements, apply silicone grease or paint to the radiation fin.
2. Given the different sizes of various LED heat sinks, an add-on macro lens can help provide more detailed and accurate readings.
3. When using the camera for LED inspections look down upon the items being inspected and not from an angle.



See what you're missing

Whether you're designing the next mobile device, scaling down passenger vehicles, or developing a new stronger, lighter polymer, make sure you have the best thermal data you can get. For accurate and efficient R&D infrared testing, we recommend the Fluke RSE series—RSE300 and RSE600 Infrared Cameras. With down to 40mK thermal sensitivity, and up to 640 x 480 resolution, these mounted cameras stream data to your PC for R&D and quality assurance analysis.

To find out more about how these versatile, high resolution, high accuracy cameras can help you develop better products faster, consult your Fluke sales representative or visit **www.fluke.com/infrared** for more information.



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Fluke Corporation
PO Box 9090, Everett, WA 98206 U.S.A.

Fluke Europe B.V.
PO Box 1186, 5602 BD
Eindhoven, The Netherlands

For more information call:
In the U.S.A. (800) 443-5853 or
Fax (425) 446-5116
In Europe/M-East/Africa +31 (0)40 267 5100 or
Fax +31 (0)40 267 5222
In Canada (800)-36-FLUKE or
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From other countries +1 (425) 446-5500 or
Fax +1 (425) 446-5116
Web access: <http://www.fluke.com>

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HANDHELD



Technicians and contractors who need quality images and feature rich affordability for quick scans and/or intermittent inspections.

Where used

- Electrical inspections
 - HVAC/R inspections
 - Mechanical
- Residential home inspections
 - Light commercial maintenance
- Building diagnostics
 - Building envelope
 - Commercial/industrial facilities



	TiS75+	TiS60+	TiS55+	TiS20+/TiS20+ MAX	PTi120
Infrared resolution	384 x 288 (110,592 pixels)	320 x 240 (76,800 pixels)	256 x 192 (49,152 pixels)	120 x 90 (10,800 pixels)	
IFOV (spatial resolution)	1.91 mRad	1.86 mRad	1.91 mRad	7.6 mRad	
Field of view	42 °H x 30 °V	34.1 °H x 25.6 °V	28 °H x 20 °V	50 °H x 38 °V	
Distance to spot				130:1	
Thermal sensitivity*	Target temp at or over 0 °C (40 mk)	≤ 0.045 °C at 30 °C target temp (45 mK)	Target temp at or over 0 °C (40 mk)	Target temp at or over 0 °C (60 mK)	
Temperature range	-20 °C to 550 °C (-4 °F to 1022 °F) (not calibrated below -10 °C)	-20 °C to 400 °C (-4 °F to 752 °F)	-20 °C to 550 °C (-4 °F to 1022 °F) (not calibrated below -10 °C)	TiS20+ -20 ° C to 150 ° C (-4 °F to +302 °F) TiS20+ MAX -20 ° C to 400 ° C (-4 °F to +752 °F)	-20 ° C to 150 ° C (-4 °F to +302 °F)
Focus system	Manual focus plus focus free operation for distances >0.5m via focus marker	Fixed Focus	Manual focus, plus focus free operation for distances >0.5m via focus marker	Fixed Focus	
level and span	Smooth auto and manual scaling				—
Optional lenses	Not compatible with optional lenses				
Wireless connectivity**		Fluke Connect™ app compatible. Wireless connectivity to PC, iPhone® and iPad® (iOS 4s and later), Android™ 4.3 and up, and WiFi to LAN			
IR-Fusion®	AutoBlend continuous 0 % to 100 %	Yes, 4 levels 0%, 25%, 50%, 75%, 100%	AutoBlend continuous 0 % to 100 %	Continuous Touchscreen IR-Fusion 0-100%	
Display	3.5" (8.9 cm landscape) touchscreen 640 x 480 LCD	3.5 inch (8.9 cm landscape) 320 x 240 LCD	3.5" (8.9 cm landscape) touchscreen 640 x 480 LCD	3.5 inch (8.9 cm landscape) 320 x 240 touchscreen LCD	
Design		Pistol-grip design for one-handed use			Pocket sized, one-handed use
Frame rate	9 Hz or 27 Hz models	< 9 Hz or 30 Hz	9 Hz or 27 Hz models	9Hz	
Software	Full analysis and reporting software with access to Fluke Connect Desktop				
Voice annotation	Yes, 60 second maximum audio recording via Bluetooth Audio Headset Profile (HSP) connection to external device. (sold separately)	60 seconds maximum recording time per image; review-able playback on camera; Bluetooth headset required (sold separately)	Yes, 60 second maximum audio recording via Bluetooth Audio Headset Profile (HSP) connection to external device. (sold separately)	—	
Text annotation	After IS2 capture, user can type in a note using on-screen keyboard.	-	After IS2 capture, user can type in a note using on-screen keyboard.	Yes. Including standard shortcuts as well as user programmable options	
Video recording	Standard and radiometric video. up to 5 minute recording length. avi and is3				—
Battery life	≥ 3.5 hours continuous without WiFi (Actual life depends on settings and usage)	4 hours continuous use per battery pack (without WiFi)	≥ 3.5 hours continuous without WiFi (Actual life depends on settings and usage)	≥ 5 hours continuous (without WiFi)	≥ 2 hours continuous (without WiFi)
Remote control operation	Yes	—			
Alarms	High temperature, low temperature, and dew point calculation	High temperature, low temperature, isotherms (within range)	High temperature, low temperature	—	
Warranty	2 year warranty				
Asset tagging	Automatically organize and file thermal images by scanning QR codes	-	Automatically organize and file thermal images by scanning QR codes		

*Best possible

**Fluke Connect™ not available in all countries.

HANDHELD

Professional in-house, service, and contract thermographers as well as maintenance personnel who need quality images and advanced features and specifications for use in multiple applications.

Where used

- Industrial maintenance
 - Heavy commercial facility maintenance
 - Oil and gas maintenance
 - Veterinary
 - Reliability inspections (PdM)
- Heavy building diagnostics
 - Building envelope
 - Construction defects
 - Electrical, water, gas utilities
 - Chemical processing
 - Machinery, instrumentation and appliances



	Ti480 PRO	Ti401 PRO	Ti300+
Infrared resolution	640 x 480 (307,200 pixels)	640 x 480 (307,200 pixels)	320 x 240 (76,800 pixels)
Super resolution	Yes, in software. Captures and combines 4x the data to create a 1280 x 960 image	No	
IFOV (spatial resolution)	0.93 mRad		1.85 mRad
Field of view	34° H x 24° V		
Distance to spot	1065:1		532:1
Thermal sensitivity*	≤ 0.05 °C at 30 °C target temp (50 mK)	≤ 0.075 °C at 30 °C target temp (75 mK)	
Temperature range	-20 °C to +1,000 °C (-4 °F to +1,832 °F)	-20 °C to +650 °C (-4 °F to +1,202 °F)	
MultiSharp™ Focus	Yes	No	
LaserSharp™ Auto Focus	LaserSharp™ Auto Focus for consistently in-focus images		
Manual focus	Yes		
Laser distance meter	Yes, calculates distance to the target for precisely focused images and displays distance on screen		
Optional lenses	Pre-calibrated smart optional lenses: wide angle, 2x and 4x telephoto, macro–25 micron		
Wireless connectivity**	Fluke Connect™ app compatible. Wireless connectivity to PC, iPhone® and iPad® (iOS 4s and later), Android™ 4.3 and up, and WiFi to LAN		
IR-Fusion*	Five modes of image blending (AutoBlend™ mode, Picture-in- Picture (PIP), IR/Visible alarm, Full IR, Full visible light) add the context of the visible details to your infrared image		
Display	3.5 inch touchscreen LCD, 640 x 480 pixel resolution		
Design	Pistol-grip design for one-handed use		
Frame rate	60 Hz or 9 Hz versions		
Software	Full analysis and reporting software with access to Fluke Connect Desktop		
Voice annotation	60 seconds maximum recording time per image, reviewable playback on camera; Bluetooth headset optional, but not required		
Text annotation	Yes. Including standard shortcuts as well as user programmable options		
Video recording	Standard and radiometric	—	
Streaming video (remote display)	Yes, see the live stream of the camera display on your PC, smartphone, or TV monitor. Via USB, WiFi hotspot, or WiFi network to Fluke Connect Desktop software on a PC; via WiFi hotspot to the Fluke Connect™ app on a smartphone; or via HDMI to a TV monitor		
Remote control operation	Yes, through Fluke Connect™ mobile app	—	
Alarms	High temperature, low temperature, and isotherms (within range)		
Warranty	Two-years (standard), extended warranties are available		

ADD ON LENSES

FLUKE®



	Wide Angle Infrared Smart Lens	25 Micron Macro Infrared Smart Lens	4x Telephoto lens	2x telephoto lens
IFOV (spatial resolution)	640 x 480 camera 1.86 mRad 320 x 240 camera 3.71 mRad	N/A	640 x 480 camera: 0.17 mRad 320 x 240 camera: 0.34 mRad 0.33 mRad, D:S 3056:1	640 x 480 camera: 0.33 mRad 320 x 240 camera: 0.66 mRad 0.65 mRad
Field of view	46 ° H x 34 ° V	36.1° H x 27.1° V	6.0° H x 4.5° V	12 ° H x 9 ° V
Minimum focus distance	15 cm (approximately 6 in)	8 mm (0.3 in) to ~14 mm (0.6 in) with optimal at 10 mm (0.4 in)	1.5 m (approximately 5 ft)	45 cm (approximately 18 in)

*Best possible

**Fluke Connect™ not available in all countries.

ARTICULATING

Engineers, R&D professionals and advanced thermographers who require premium image quality and an unsurpassed level of detail in every infrared image.

Where used

- Industrial maintenance
- Oil and gas predictive maintenance
- Power generation/transmission
- Research and development
 - Electrical
 - Mechanical
 - Sciences

- Quality control
- Plus the industries included under the handheld series



	TiX580	TiX501
Detector resolution	640 x 480 (307,200 pixels) SuperResolution mode: 1280 x 960 (1,228,800 pixels)	640 x 480 (307,200 pixels)
IFOV (spatial resolution)	0.93 mRad	
Field of view	34 °H x 24 °V	
Distance to spot	1065:1	
Thermal sensitivity*	≤ 0.05 °C at 30 °C target temp (50 mK)	≤ 0.075 °C at 30 °C target temp (75 mK)
Temperature range	-20 °C to +1,000 °C (-4 °F to +1,832 °F)	-20 °C to +650 °C (-4 °F to +1,202 °F)
Focus systems	MultiSharp™ Focus, LaserSharp™ Auto Focus with built-in laser distance meter and advanced manual focus	LaserSharp™ Auto Focus with built-in laser distance meter and advanced manual focus
Laser distance meter	Yes, calculates distance to the target for precisely focused images and displays distance on screen	
Optional lenses	Pre-calibrated smart optional lenses: wide angle, 2x and 4x telephoto, macro~25 micron lens	
Wireless connectivity**	Fluke Connect™ app compatible. Wireless connectivity to PC, iPhone® and iPad® (iOS 4s and later), Android™ 4.3 and up, and WiFi to LAN	
IR-Fusion*	Five modes of image blending (AutoBlend™ mode, Picture-in- Picture (PIP), IR/Visible alarm, Full IR, Full visible light) add the context of the visible details to your infrared image	
Display	5.7 inch touchscreen LCD, 640 x 480 pixel resolution	
Design	240° rotating (articulating) lens	
Frame rate	60 Hz or 9 Hz versions	
Software	Full analysis and reporting software with access to Fluke Connect Desktop	
Voice annotation	60 seconds maximum recording time per image, reviewable playback on camera; Bluetooth headset optional, but not required	
Text annotation	Yes. Including standard shortcuts as well as user programmable options	
Video recording	Standard and radiometric	Standard
Streaming video (remote display)	Yes, see the live stream of the camera display on your PC, smartphone, or TV monitor. Via USB, WiFi hotspot, or WiFi network to Fluke Connect Desktop software on a PC; via WiFi hotspot to the Fluke Connect™ app on a smartphone; or via HDMI to a TV monitor	
Remote control operation	Remote display and control operation through Fluke Connect	Remote display through Fluke Connect
Alarms	High temperature, low temperature, and isotherms (within range)	
Warranty	Two-years (standard), extended warranties are available	

*Best possible

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ADD ON LENSES



	Wide Angle Infrared Smart Lens	25 Micron Macro Infrared Smart Lens	4x Telephoto lens	2x telephoto lens
IFOV (spatial resolution)	640 x 480 camera 1.86 mRad 320 x 240 camera 3.71 mRad	N/A	640 x 480 camera: 0.17 mRad 320 x 240 camera: 0.34 mRad 0.33 mRad, D:S 3056:1	640 x 480 camera: 0.33 mRad 320 x 240 camera: 0.66 mRad 0.65 mRad
Field of view	46 ° H x 34 ° V	36.1° H x 27.1° V	6.0° H x 4.5° V	12 ° H x 9 ° V
Minimum focus distance	15 cm (approximately 6 in)	8 mm (0.3 in) to ~14 mm (0.6 in) with optimal at 10 mm (0.4 in)	1.5 m (approximately 5 ft)	45 cm (approximately 18 in)

MOUNTED

R&D professionals, scientists and engineers who require a mounted infrared camera to continuously stream, measure and analyze data

Where used

- Research and development
 - Electrical
 - Mechanical
 - Biology/sciences
- Quality control
 - Pre- and post- production testing



	RSE600	RSE300
Infrared resolution	640 x 480 (307,200 pixels)	320 x 240 (76,800 pixels)
IFOV (spatial resolution)	0.93 mRad	1.85 mRad
Field of view	34° H x 24° V	
Thermal sensitivity*	≤ 0.040 °C at 30 °C target temp (40 mK)*	≤ 0.030 °C at 30 °C target temp (30 mK)*
Temperature range	-10 °C to +1200 °C (14 °F to +2192 °F)	
Focus systems	Focus is adjusted in Fluke Connect Desktop software (manual or MultiSharp™)	
Laser distance meter	—	
Optional lenses	Pre-calibrated smart lenses: wide angle, 2x telephoto, 4x telephoto, macro	
Wireless connectivity**	—	
IR-Fusion®	Yes, in Fluke Connect Desktop software. Five modes of image blending (AutoBlend™ mode, Picture-in-Picture (PIP), IR/Visible alarm, Full IR, Full visible light) add the context of the visible details to your infrared image	
Display	—	
Design	Can be mounted to a stand or wall bracket for continuous data streaming	
Frame rate	60 Hz or 9 Hz versions	
Software	Fluke Connect Desktop software—full analysis and reporting software Compatible with MATLAB® and LabVIEW® software	
Voice annotation	Yes, in Fluke Connect Desktop software	
Text annotation	Yes, in Fluke Connect Desktop software	
Video recording	Radiometric, in Fluke Connect Desktop software, with exports to standard non-radiometric formats	
Streaming video (remote display)	Yes, see the live stream of the camera on your PC, smartphone, or TV monitor. Via USB, WiFi hotspot, or WiFi network to Fluke Connect Desktop software on a PC; via WiFi hotspot to the Fluke Connect™ app	
Remote control operation	Yes, through ethernet or Fluke Connect Desktop software	
Alarms	Yes, in Fluke Connect Desktop software—high temperature low temperature, and isotherms (within range)	
Warranty	Two years (standard), extended warranties are available	

ADD ON LENSES



	Wide Angle Infrared Smart Lens	25 Micron Macro Infra-red Smart Lens	4x Telephoto lens	2x telephoto lens
IFOV (spatial resolution)	640 x 480 camera: 0.93 mRad 320 x 240 camera: 1.85 mRad	N/A	640 x 480 camera: 0.24 mRad 320 x 240 camera: 0.48 mRad	640 x 480 camera: 0.47 mRad 320 x 240 camera: 0.94 mRad
Field of view	45° H x 32° V	36.1° H x 27.1°	8.5° H x 6.0° V	17 ° H x 12 ° V
Minimum focus distance	15 cm (approximately 6 in)	8 mm (0.3 in) to ~14 mm (0.6 in) with optimal at 10 mm (0.4 in)	1.5 m (approximately 5 ft)	45 cm (approximately 18 in)

*Best possible

**Fluke Connect™ not available in all countries.