

ADVANCED
Thermal
imaging
BUYER'S GUIDE

From our digital multimeters, to our award winning thermal imagers; for the past 65 years, Fluke's design team has been on the job and in the field for countless hours with our customers to deliver solutions around how they work and their applications. Understanding our customer pain points and developing unique solutions that address these pain points is what makes us stand out from the competition.



At Fluke, we focus on four areas that make thermal imaging a success.

Image quality

An in-focus image is needed to see details and also effects temperature measurement accuracy—both critical in identifying problems.

Managing data

Having the ability to capture multiple measurements at one time, having instant access to historical data and being able to easily analyze and manage your images helps you work faster, safer and easier.

Work environment

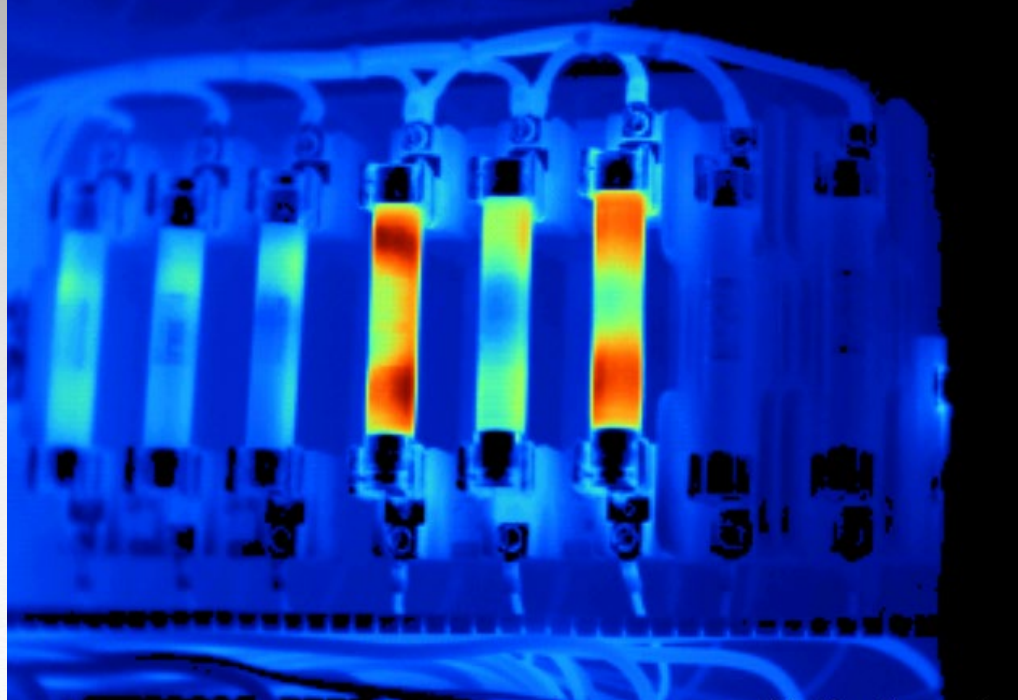
Fluke makes difficult inspections safer and easy with unique features like a full 240 degree rotating lens, tablet size screen and the only clear crystal IR Window that has passed the 63 kA arc blast test.

ROI and thermal imaging

Eliminating downtime, improving efficiency, productivity and customer satisfaction can only add to your overall bottom line.

Image quality

- Do you spend more than 5 seconds trying to get an image in-focus?
- Are there physical objects like a chain link fence blocking equipment?
- Are you required to inspect multiple complex targets or targets from varying distances making inspections difficult?



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Fluke uses only 100% diamond-turned germanium lenses covered with a specialty coating, providing premium quality images.

Companies conducting infrared inspections want high quality images that allow for better analysis, presentation, and professionalism. Poorly focus images make seeing details impossible and also impacts temperature measurement accuracy.

With a sharply focused image, there is a distinct contrast between areas of varying thermal energy on the surface being inspected. This allows the individual detector elements (also known as pixels) to clearly report the intensity of the energy being focused on them.

When the focus is poor, the incoming energy isn't as concentrated on individual detectors, and their response is skewed. This can result in temperature measurements that are significantly off, resulting in expensive downtime and possible safety hazards. Fluke understands the criticality of image quality and the various environments that make getting quality images difficult. That is why Fluke engineered solutions that make troubleshooting faster, safer and easier.

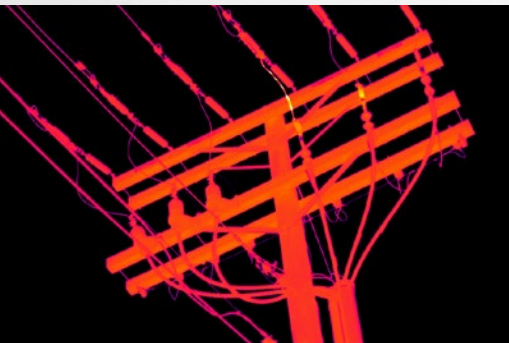
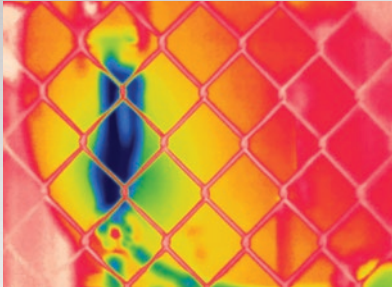


Image quality



Passive auto focus systems may only capture near-field subject



Difficult inspection sites



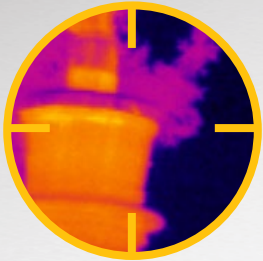
Fluke LaserSharp® Auto Focus captures what you need. Every. Single. Time.

FLUKE®

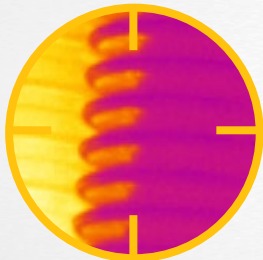
Choose your target

LaserSharp® Auto Focus, a proprietary feature only from Fluke, uses a built in laser distance meter that provides both speed and precision. The laser driven target detection pinpoints the target while the camera focuses to capture a precisely focused high quality image.

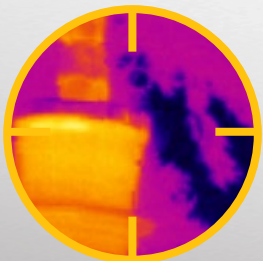
- Designed to give you instant focus under most conditions, an infrared technician of any level can work efficiently and confidently knowing they are capturing high quality images
- Equipment inspections behind chain link fences and other obstacles are no longer an issue because the laser pinpoints the desired target
- When looking at components at different distances in a panel or multiple motors at the same time, you want to be able to focus on what's important, not let some fixed or auto focus pick the focus point
- Repeatability is easy—the built in laser distance meter calculates and displays the distance to the target



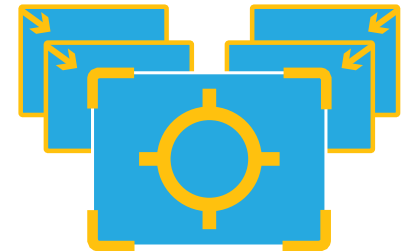
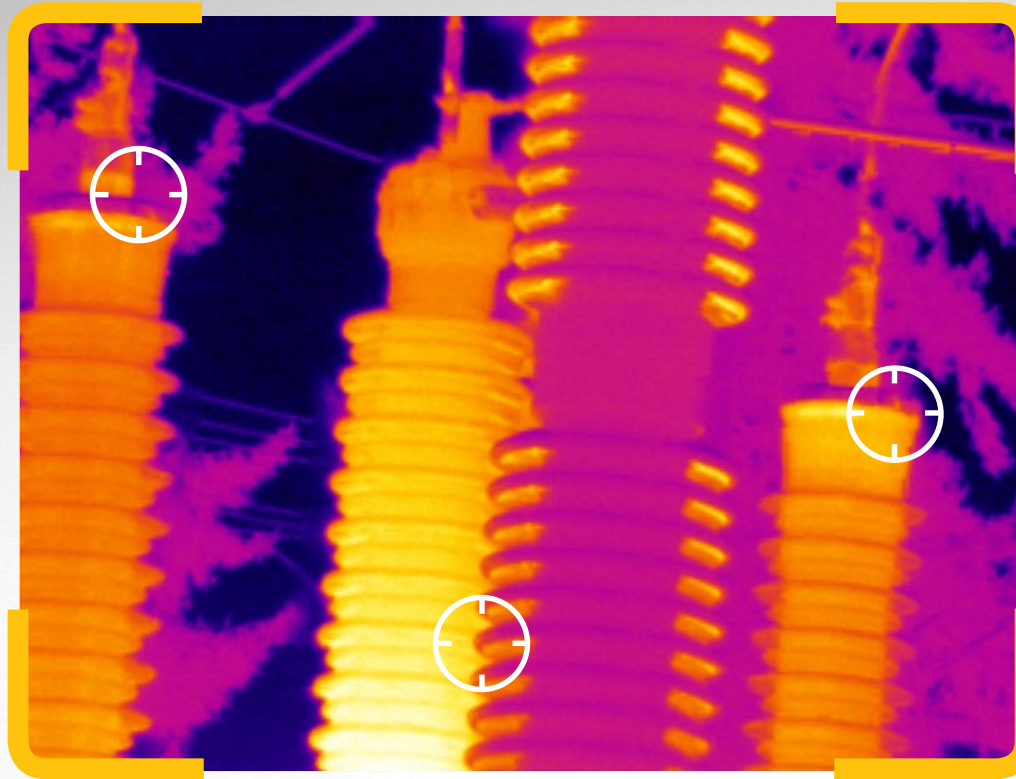
Middleground in focus



Foreground in focus



Background in focus



Choose multiple targets at different distances

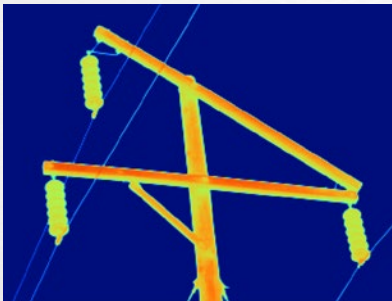
Introducing MultiSharp™ Focus which takes multiple images from different focal distances and combines them into one clear image. You can go from being completely out-of-focus to clear accurate and in focus throughout the field of view, simply point and shoot.

- Reduce the need to take individual images of target that are in the camera's field of view. Focus on one target and all objects that are in the camera's field of view will be in focus.
- Increase productivity—you have to take less images
- Don't worry about focus during daylight, capture quality in focus images under direct sunlight

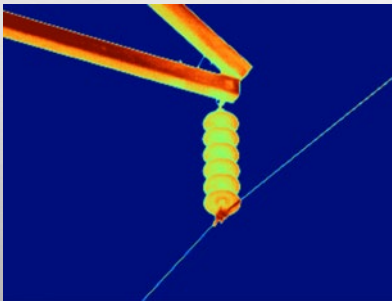
Image quality



High voltage power pole, captured with a TiX560 camera and standard lens.



The same power pole captured from the same distance, but with a Fluke 2x telephoto lens.



The same power pole captured from the same distance, but with a Fluke 4x telephoto lens.



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Shoot from a distance

Infrared inspections can take you into multiple types of environments with many types of equipment. Interchangeable lenses that require no calibration give you the versatility and the image quality needed to conduct inspections in almost any environment.

- Reduce the need to enter the danger zone with a 2x telephoto lens
- Identify potential issues as small and distant as a failed splice on a high electrical line from the ground with a 4x telephoto lens
- Save time with roofing and industrial building inspections by viewing a large area at one time with a wide angle lens

Getting an in-focus image is critical in all scanning situations, poorly focused thermograms make seeing small details difficult and can prevent you from identifying critical anomalies. That is why Fluke engineered multiple solutions that make troubleshooting faster, safer and easier.

Designed for your work environment

- Are you required to inspect targets that are hard to reach or difficult to access?
- Do you inspect targets that force you to be in an uncomfortable position for long periods of time?
- Are you at risk for arc flash? Are you NFPA 70E compliant?



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Dirty, wet and dusty environment? Fluke has a rugged solution that works for you—making troubleshooting faster, safer and easier.

As a thermographer you work in many different conditions, some being more ideal than others. You might be on the factory floor inspecting conveyor belts, or inspecting outdoor substations or conducting an energy audit in a commercial building. Regardless of where you are, you need to quickly identify potential problems, prevent unplanned downtime and eliminate potential safety hazards.



Designed for
your work
environment

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A bigger screen results in a clearer picture—view your target and review images on the large 5.7 in tablet like screen with 640x480 resolution.



Fluke makes difficult inspections easy

Quickly capture in-focus images around hard to reach equipment or at tough angles with the only lens that rotates a full 240 degrees.

Cramped arms and stiff necks are a thing of the past. The ergonomic design of the full 240 degree rotating lens gives you the flexibility to keep the camera at a position that is comfortable for you, while the rotating lens views over, under and around hard to reach targets.



Designed for
your work
environment



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Hierarchy of controls

Occupational Health and Safety Organization (OSHA) and the National Fire Protection Association (NFPA) recommend the system of Hierarchy of Controls to minimize or eliminate exposure to occupational hazards.

Most effective

**Elimination/
substitution**

**Engineering
controls**

**Safe work practice
controls**

**Administrative
controls**

Personal protective equipment

Least effective

Are you concerned about arc flash?

Arc flash accidents occur every day in the United States and involve a fatality or serious injury to an employee. IR Windows provide a permanently installed 'access point' on an enclosure, creating a solid barrier between the thermographer and live conductors. IR Windows make it possible to not only reduce the trigger effects of an arc but also provide the thermographer with a safer working environment. Three good reasons to consider IR Windows:

- **Safety**—Infrared inspections can be performed without opening enclosures, virtually eliminating the risk of arc flash
- **Increased productivity**—Eliminate panel removal and infrared inspections can be performed more quickly
- **Save money**—Reduce the need to suite up in full PPE and more frequent inspections ensure uptime.

Managing your data

Would you like to:

- Capture multiple measurements (mechanical, electrical and thermal) organized by piece of equipment?
- Access historical data from your phone?
- Eliminate the use of pen and paper to take notes after you capture an image?
- Eliminate the need to take a visual light image with every IR image?



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Whether you are troubleshooting or conducting maintenance inspections, getting more information faster is a big benefit.

Regardless of where your infrared inspections take you, having the right troubleshooting tools help you work faster, safer and easier.

Fluke Connect® is not available in all countries.

Managing your data



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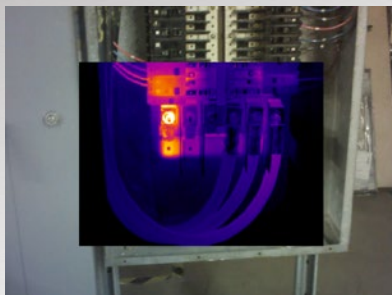


Looking for a solution to help prevent equipment failures?

The Fluke Connect® system is a preventive maintenance software platform that wirelessly links Fluke test tools to smartphones and to the cloud where measurements can be viewed, graphed, shared and stored for trending and further analysis.

- Pinpoint problems faster by pulling in other measurements types like electrical and vibration into your thermal image
- Get access to historical data and reports from the field. Measurement data is automatically uploaded to the cloud via the Fluke Connect® app
- Text or email measurements or images to get approvals or questions answered

Managing your data



PIP mode: Ironbow



PIP mode: AutoBlend



PIP mode: Color alarm



Looking for an alternative to taking a visible light image every time you take an IR image?

Fluke patented IR-Fusion® technology combines a visible light and an infrared image into one—giving you better clarity.

- Get exact location details in picture-in-picture mode, which provides the center part of the display in IR and the remainder of the image in visible light
- See more details when you adjust the level of infrared and visible light blending in AutoBlend mode
- Isolate problem areas with user-defined temperature ranges with IR color alarms

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Trouble identifying the IR image location?

With IR PhotoNotes™, voice or text annotation, you can easily document critical information about each piece of equipment and location. Each “note” attaches to the image, so you never have search or match up notes to images.

- Document critical information with your infrared image
- Capturing surrounding details like wind conditions and time of day
- Identify asset location

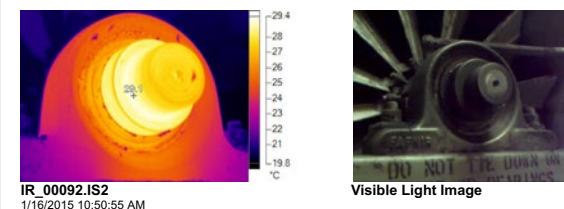
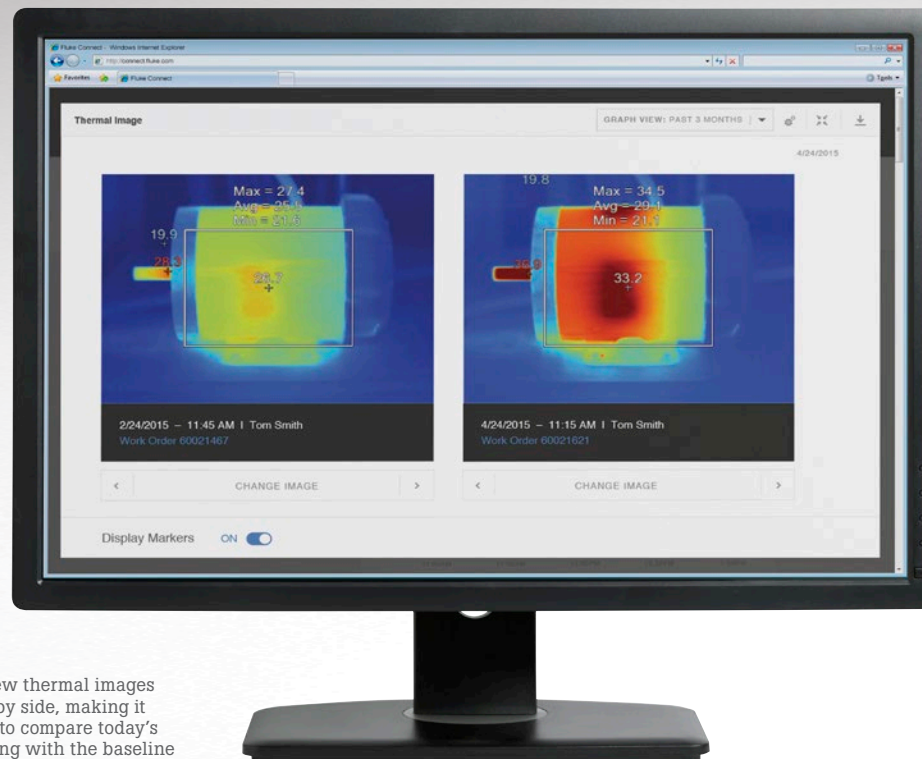
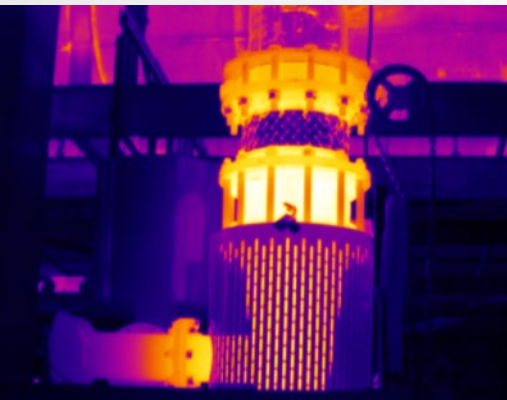


Image Info	
IR Sensor Size	320 x 240
Distance to Target	0.69m
Main Image Markers	
Name	Temperature
Centerpoint	29.1°C

ROI and thermal imaging

We often get asked “What is the return on investment I can expect from adding a thermal imager to my inspection tool bag”. While there are a couple ways to look at it, it’s all positive!



Review thermal images side by side, making it easy to compare today's reading with the baseline or other historical image.

On-site inspections

Reduce downtime.

Inspections can be done while equipment is running—no lost production time.

Protect lives while doing more.

The non-contact nature of infrared inspections allows technicians to scan large areas quickly, from a safer distance away. That means technicians can inspect more equipment faster.

Improve production efficiency.

Subtle problems are found and addressed before they have a major impact on production.

Document before and after.

Validate the work to the satisfaction of all, and capture the results for future review.

Reduce capital expenses.

Finding and repairing problems at an early stage can improve the life expectancy of equipment, as a result extending replacement intervals.

Increase productivity.

Quickly scan an area to find air leaks, insulation gaps, moisture, and overheated electrical components to complete more work in less time.

Identify work in easy to understand terms.

See exactly what the problem is on the camera, eliminating guesswork and making it easier for everyone to see what repairs need to be done.

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Down to the numbers—read what our customers say

“ The Fluke thermal imager has **saved us tremendous amounts of downtime and more than \$100,000** by finding problems with bearings, heat exchangers and too many other things to mention Thanks Fluke.”

— Jeffery Massey, Condition Based Maintenance (CBM) analyst

At Adams Columbia Electric Cooperative, Keith Weyh bought a Fluke thermal imager to protect their \$15,000 regulators and \$19,000 transformers from failing. He also wanted to bring down overtime costs caused by outages—which **had cost the company \$900,000** the year before.

Dave Feniak of Weyerhaeuser, an integrated forest products company, was very glad he had decided to purchase a Fluke thermal imager when he brought it into the plant, used the laser pointer feature, and saw that a motor was about to fail. He **saved his company \$30,000** in downtime on that one repair.

Contractors or consultants?

ROI for your customer means more revenue for you. See how quality thermography can impact how much more money you can earn. Use your thermal imager to show customers what needs to be done in a single image and leave “salesmanship” behind. When your presence means problem solved, word of mouth will keep the referrals flowing.

Need more proof? Listen to what others in your industry had to say.

Greg Ibbotson of Ibbotson Heating Company reports that the use of a Fluke thermal imager gives him a competitive advantage and has increased sales. On one occasion, a homeowner was having a problem with an in-floor heating system. With his thermal imager, Ibbotson identified the floor pipes that were leaking, and the **client did not have to spend thousands of dollars** replacing all the in-floor heating.

Jim Ackles uses his Fluke thermal imager to make images that help his non-technical clients understand why a building problem needs to be repaired, thus making them more willing to approve the repairs he recommends. He **no longer needs to advertise** and always has work.

Mike Bannon of Efficient Home, LLC, says his customers see him as an expert because of the high-tech equipment he uses and often recommend his company. With the help of his Fluke thermal imager, his business is **growing by 50 %**.

Fluke Infrared Cameras

Products	Expert Series IR Cameras TiX1000, TiX660, TiX640, TiX560, TiX520, TiX500	Professional Series IR Cameras Ti450, Ti400, Ti300	Performance Series IR Cameras TiS75, TiS65/60, TiS55/50, TiS45/40, TiS20, TiS10
Description	Premium image quality with the highest resolution (up to 1024x768) and best thermal sensitivity	Quality images for advanced inspection and troubleshooting	Easy to use, standard performance with good image quality for everyday use
Applications	The most detailed and challenging inspections/targets • Industrial maintenance • Generation/transmission • Oil and gas predictive maintenance • Research and development (electrical, mechanical, biology/sciences, microelectronics)	• Industrial maintenance • Heavy commercial facility maintenance • Oil and gas maintenance • Veterinary • Reliability inspections • Heavy building diagnostics - Building envelope - Construction defects • Electrical, water, gas utilities	• Electrical inspections • HVAC/R inspections • Mechanical • Residential home inspections • Light commercial maintenance • Building diagnostics - Building envelope - Commercial/industrial facilities
Perfect for	Engineers, R&D professionals and advanced thermographers who require premium image quality and an unsurpassed level of detail in every infrared image.	Professional in-house, contract and service thermographers who need quality images and advanced features and specifications for use in multiple applications.	Technicians and contractors who need quality images and feature rich affordability for quick scans and/or intermittent inspections.
Fluke innovations	• 1024 x 768 Resolution • SuperResolution mode • A full 180° articulating lens • Largest 5.7 inch tablet like screen • MultiSharp™ Focus • LaserSharp® Auto Focus • Built-in laser distance meter • Create and email reports directly from the jobsite with the Fluke Connect® app* • IR-Fusion® AutoBlend, Picture-in-Picture • SmartView® Software	• SuperResolution mode • MultiSharp™ Focus • LaserSharp® Auto Focus • Built-in laser distance meter • Create and email reports directly from the jobsite with the Fluke Connect® app • IR-Fusion® AutoBlend, Picture-in-Picture • SmartView® Software	• Wireless connectivity with the Fluke Connect® app • IR-Fusion® AutoBlend, Picture-in-Picture • SmartView® Software
Key features	• Premium image quality • High temperature measurement (up to 1200 °C) • Subwindowing • Fastest, highest performance • Save and share measurements from the field with your team anytime, from anywhere. • Instantly capture an in-focus image with the touch of a button • Infinite storage capability due to interchangeable SD cards—each holds thousands of images • Built-in voice recording and annotation • Streaming video • Optional 2x and 4x telephoto, wide angle and macro lenses • Remote control and operation • Field replaceable, easy release battery with charge indicator to prevent unexpected power loss • Ergonomic design • Fully radiometric • Windows based navigation menu	• Excellent image quality • High temperature measurement (up to 1200 °C) • Save and share measurements from the field with your team anytime, from anywhere. • Instantly capture an in-focus image with the touch of a button • Infinite storage capability due to interchangeable SD cards—each holds thousands of images • Large 3.5 inch touchscreen LCD • Built-in voice recording and annotation • Streaming video • Optional 2x and 4x telephoto and wide angle lenses • Remote control and operation • Field replaceable, easy release battery with charge indicator to prevent unexpected power loss • Rugged, ergonomic design • Fully radiometric • Windows based navigation menu	• Good image quality • Save and share measurements from the field with your team anytime, from anywhere. • Easy to use, point and shoot or manual focus options • Infinite storage capability due to interchangeable SD cards—each holds thousands of images • Large 3.5 inch LCD • Built-in voice recording and annotation • Streaming video • Field replaceable, easy release battery with charge indicator to prevent unexpected power loss • Rugged, ergonomic design • Fully radiometric • Windows based navigation menu



The tools of choice

Experience. Performance. Confidence.

To find out which Fluke infrared camera is right for you, or to locate a distributor in your area, call us between the hours of 8 a.m. and 5 p.m. CT. at:

1.800.760.4523 (U.S.) or 1.800.363.5853 (Canada)

Primo Instrument --> 1-888-774-6665 - info@primoinc.com

Fluke. *Keeping your world up and running.®*