ADVANCED
Thermal imaging
BUYERS’ GUIDE 2019
From our digital multimeters to our award winning thermal imagers; for the past 70 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.

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 accurately measure temperatures—both of which are critical in identifying problems.

**Work environment**

Fluke makes difficult inspections safer and easier with unique features like a full 240 degree rotating lens, tablet-like screen and clear crystal IR Windows that have passed the 63 kA arc blast test.

**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 and easier.

**ROI and thermal imaging**

Eliminating downtime, improving efficiency, productivity and customer satisfaction can only add to your overall bottom line.
• Do you spend more than 5 seconds trying to focus an image?

• Are there physical objects such as a chain link fence blocking equipment?

• Are you required to inspect multiple complex targets or targets from varying distances making inspections difficult?

When conducting infrared inspections, high quality images that allow for better analysis, presentation and professionalism are essential.
Fluke uses only 100% diamond-turned germanium lenses covered with a specialty coating, providing premium quality images.

Image quality

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 lead to 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 engineers solutions that make troubleshooting faster, safer and easier.
Easily choose and focus on your target

LaserSharp™ Auto Focus 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 precise, high-quality image. With LaserSharp Auto Focus, you can:

- Easily capture high-quality, focused images of your desired target with the push of a button
- Take infrared images through common obstacles like chain link fences
- Avoid skewed temperature measurements by precisely choosing your target
- Perform the same inspections multiple times as a part of your preventive maintenance program—the built-in laser distance meter calculates and displays how far you are from your target, making repeatability much easier.
Choose multiple targets at different distances

MultiSharp™ Focus takes multiple images from different focal distances and combines them into one clear image. With a simple point and shoot, you can go from being completely out of focus, to complete focus, throughout the field of view. With MultiSharp:

- Reduce the need to take individual images of targets 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
- Cut down time spent taking multiple images to increase productivity
- Capture quality, in-focus images, even under direct sunlight
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
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.

- 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?
**Work environment**

**Make tricky inspections easier and more ergonomic**

Quickly capture in-focus images around hard-to-reach equipment or at tough angles with a full 240 degree rotating lens.

Cramped arms and stiff necks are a thing of the past. Keep the camera at a position that is comfortable for you, while the rotating lens views over, under and around hard-to-reach targets.

A bigger screen results in a clearer picture—view your target and review images on the large 5.7 inch tablet-like screen with up to 640 x 480 resolution.
Reduce the risk of arc flash

Arc flash accidents occur every day in the United States and can involve a fatality or serious injury to an employee. Along with infrared cameras, Fluke also offers IR Windows. 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. Here are 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 from the process to perform infrared inspections quicker
- **Save money**—Reduce the need to suit up in full PPE, making it easier to inspect more frequently to ensure maximum uptime

**Hierarchy of controls**

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

Whether you are troubleshooting or conducting maintenance inspections, having easy access to more information faster is always a big benefit.
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. With Fluke Connect:

- Pinpoint problems faster by pulling other measurements types like electrical and vibration into your thermal image
- Easily access 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 while in the field

Fluke Connect is not available in all countries.
Document information on the equipment you’re inspecting

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

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

Capture digital and infrared images at once

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
We often get asked how much return on investment can be expected from adding a thermal imager to an inspection tool bag? While there are a couple ways to look at it, it’s all positive!

Please look under ‘tools and calculators’ on Fluke.com for an ROI estimation.
7 Benefits of on-site infrared inspections

1. **Reduce downtime.**
   Inspections can be done while equipment is running—no lost production time.

2. **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.

3. **Improve production efficiency.**
   Subtle problems are found and addressed before they have a major impact on production.

4. **Document before and after.**
   Validate post-maintenance work and capture the results for future review.

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

6. **Increase productivity.**
   Quickly scan a large area to find air leaks, insulation gaps, moisture and overheated electrical components to complete more work in less time.

7. **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.
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 Weyerhauser, an integrated forest products company, was very glad he had decided to purchase a Fluke thermal imager, especially 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. 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 traditional salesmanship behind.

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

<table>
<thead>
<tr>
<th>Description</th>
<th>TiX1000, TiX620, TiX580 and TiX501</th>
<th>TiX580, TiX501, Ti401 PRO, Ti480 PRO</th>
<th>PTi120</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Premium image quality with the highest resolution and best thermal sensitivity</td>
<td>Quality images for advanced inspection and troubleshooting</td>
<td>Easy to use, standard performance with good image quality for everyday use</td>
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</tbody>
</table>

## Applications

<table>
<thead>
<tr>
<th>Applications</th>
<th>The most detailed and challenging inspections/targets</th>
<th>Industrial maintenance</th>
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<tbody>
<tr>
<td></td>
<td>• Industrial maintenance</td>
<td>• Oil and gas maintenance</td>
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<tr>
<td></td>
<td>• Generation/transmission</td>
<td>• Heavy building diagnostics</td>
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<tr>
<td></td>
<td>• Oil and gas predictive maintenance</td>
<td>- Building envelope</td>
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<td></td>
<td>• Research and development (electrical, mechanical,</td>
<td>- Construction defects</td>
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<tr>
<td></td>
<td>biology/sciences, microelectronics)</td>
<td>• Electrical, water, gas utilities</td>
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<td></td>
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<td>• Electrical inspections</td>
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<td>• HVAC/R inspections</td>
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<td>• Mechanical</td>
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<td></td>
<td></td>
<td>• Residential home inspections</td>
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<td>• Light commercial maintenance</td>
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<td>- Building envelope</td>
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<tr>
<td></td>
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<td>- Commercial/industrial facilities</td>
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## Common users

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<tr>
<th>Common users</th>
<th>Engineers, R&amp;D professionals and advanced thermographers who require premium image quality and an unsurpassed level of detail in every infrared image.</th>
<th>Professional in-house, contract and service thermographers who need quality images and standard features and specifications for use in multiple applications.</th>
<th>Technicians and contractors who need quality images and feature-rich affordability for quick scans and/or intermittent inspections.</th>
</tr>
</thead>
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<tr>
<td>TiX1000 only</td>
<td>• Up to 1024 x 768 resolution</td>
<td>• Standard 640 x 480 resolution</td>
<td>• IR-Fusion technology with continuous touch-screen blending</td>
</tr>
<tr>
<td>TiX80 only</td>
<td>A full 240° articulating lens</td>
<td>• SuperResolution mode (Ti480 PRO and TiX580 only)</td>
<td>• Fluke Connect Desktop reporting and analysis software allows you to create and email reports directly from the jobsite</td>
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<td>Up to 5.7 inch screen display</td>
<td>• MultiSharp Focus (Ti480 PRO and TiX580 only)</td>
<td>• IR-Fusion technology with five modes of image blending</td>
</tr>
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<td>MultiSharp Focus (TiX580 only)</td>
<td>• LaserSharp Auto Focus</td>
<td>• Fluke Connect Desktop reporting and analysis software allows you to create and email reports directly from the jobsite</td>
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<td>LaserSharp Auto Focus</td>
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## Key features

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<th>Premium image quality</th>
<th>Excellent image quality</th>
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<td>TiX1000 only</td>
<td>Fastest, highest performance</td>
<td>High temperature measurement (1,000 °C max)</td>
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<td>Save and share measurements from the field with your team anytime, from anywhere with Fluke Connect</td>
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<td>Instantly capture an in-focus image with the touch of a button</td>
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<td>Infinite storage capability due to interchangeable SD cards—each holds thousands of images</td>
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<td>Built-in voice recording and annotation</td>
<td>Large 3.5 inch touchscreen LCD on the Ti401 PRO and Ti480 PRO and a 5.7 inch touchscreen LCD on the TiX501 and TiX580</td>
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<td>Streaming video</td>
<td>Built-in voice recording and annotation</td>
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<td>Optional 2x and 4x telephoto, wide angle and macro lenses</td>
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<td>Remote control and operation</td>
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<td></td>
<td>Field replaceable, easy release battery with charge indicator to prevent unexpected power loss</td>
<td>Rugged, ergonomic design</td>
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<tr>
<td></td>
<td>Ergonomic design</td>
<td>Fully radiometric images</td>
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*Specifications vary by model

*Fluke Connect not available with TiX1000

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866.472.8948
Fluke Thermography.
The tools of choice.


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:

1.866.472.8948