

# FLUKE®

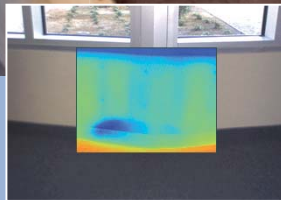
## Fluke TiR Series Buildings Thermal Imagers



TiR32 shown  
with optional  
wide angle lens

**The ultimate  
tools for energy  
audits, building  
maintenance,  
restoration and  
remediation.**

Rugged, reliable, easy  
to use... what you expect  
from the worldwide leader  
in test and measurement  
tools—Fluke.



# Where can thermal imaging save me time and money?



## Why thermal imaging?

### Productivity

Scan large areas quickly to detect problems or the extent of any damage. Whether you own your own business or maintain a commercial or residential facility, time is on your side when you use thermal imaging to get your work done.

### Profitability

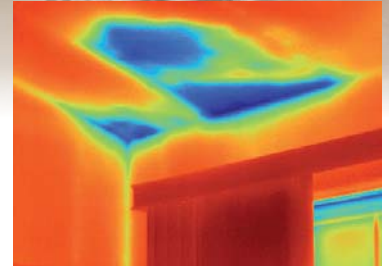
Turn to thermal imaging to drive improvements to your bottom line. Building inspections go much faster, saving you time and money—getting you to your next job faster. Use it to reduce energy usage or help keep mission critical equipment running.

### Safety

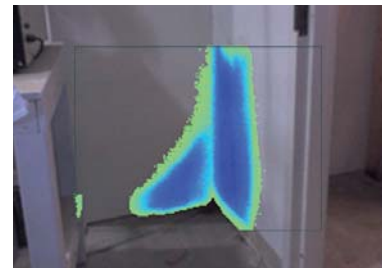
Thermal imaging is a non-contact technology and can identify potential problems from a safe distance. Scan elevated or hard to reach surfaces without risking you or your employees' safety.

- Reduce energy usage:
  - Locate air leakage resulting from improperly installed or worn seals on windows and doors
  - Verify missing, damaged or incorrectly installed insulation
- Detect moisture intrusion and the possible existence of mold or mildew
- Extend the life of roofs by locating and fixing leaks
- Locate damaged or unsealed components of HVAC/R systems (air conditioning, heating, air handlers, and refrigeration)

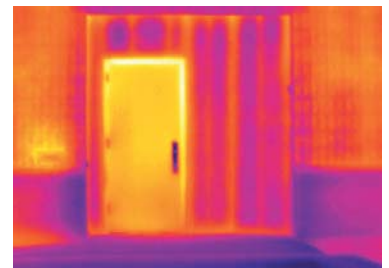
Visit [www.fluke.eu/ti](http://www.fluke.eu/ti) for a library of thermal imaging case studies and application notes.



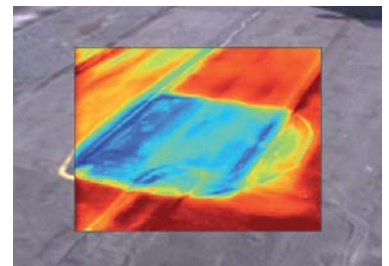
**Insulation failures:** Discover problems with insulation that result in elevated energy bills.



**Moisture detection:** Easily detect the extent of moisture damage behind interior walls, in ceilings and under carpets.



**Air leakage:** Identify sources of energy loss due to improperly installed or worn seals on windows and doors.



**Roofing:** Detect water-saturated insulation in flat-roof systems to locate damaged portions of roofing structure.

# Fluke TiR Series Building Diagnostic Thermal Imagers

FLUKE®

## Superior image quality

Just pick up a Fluke imager and you'll immediately see the difference. Fluke delivers the clear, crisp images needed to find and fix problems fast.

- Industry leading thermal sensitivity (NETD) enables you to identify the small temperature differences that could indicate big problems
- Even the smallest details become visible with the large, widescreen full VGA color LCD display
- Patented IR-Fusion®, only from Fluke, delivers the industry's best visible/infrared image alignment and focusing

## Easy to use

When you pick up a tool, you need it to operate and deliver results without having to read a heavy manual.

- Intuitive, three-button menu is easy to use... simply navigate with the push of a thumb
- Easy, manual focus allows for precise image viewing control
- File management is effortless with the Fluke proprietary .is2 file format, which automatically stores the visual image, infrared image, voice and text annotations in one simple file (other file formats are also supported both on imager and in SmartView software)

## Rugged

Tools are meant to be used, and Fluke thermal imagers are designed to reliably operate in the toughest environments.

- Engineered and tested to withstand a 2 meter drop—when was the last time you dropped a tool?
- Withstands dust and water, tested to an IP54 rating
- Use in ambient temperatures as low as -10 °C and high as +50 °C



Fluke thermal imagers are built tough to withstand long hours in the field so users can move from job-to-job quickly.



Field replaceable batteries and optional visor on the TiR32 gives you maximum flexibility no matter where your work takes you.



**Award winning performance —  
what you've come to expect  
from Fluke.**



Fluke TiR1

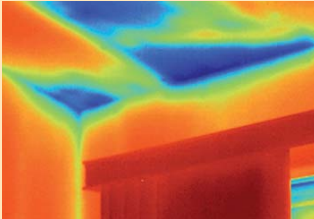
## Quick Product Selection Guide

|                             | TiR32     | TiR1      | TiR       | TiRx      |
|-----------------------------|-----------|-----------|-----------|-----------|
| Detector type               | 320 x 240 | 160 x 120 | 160 x 120 | 160 x 120 |
| Thermal sensitivity         | 50 mK     | 70 mK     | 100 mK    | 100 mK    |
| Temperature range           | 150°C     | 100°C     | 100°C     | 100°C     |
| IR-Fusion®                  | •         | •         | •         |           |
| Dew point temperature alarm | •         |           |           |           |
| Optional lenses             | •         |           |           |           |
| Voice annotation            | •         | •         |           |           |
| Replaceable batteries       | •         |           |           |           |
| Choice of palettes          | 15        | 6         | 6         | 4         |

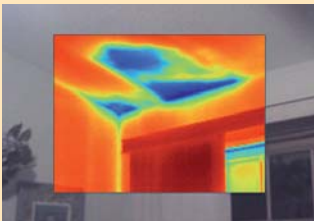
For detailed specifications see page 7.



## IR-Fusion® samples



**Full (traditional) infrared:** Displays a full screen infrared view for maximum infrared detail.



**Picture-in-picture:** Maintains a frame of reference by placing an IR "window" within a visual (visible light) image.



**Blending:** Blends the visible and infrared images together in any user-selected proportion to create a more compelling, understandable image.



**IR/color alarm:** Isolates problematic areas by displaying a visual image with infrared highlights for surface temperatures in between, above or below, or outside a user-selected range.



**Full Visual (visible light):** Displays a digital photographic image, as you would get from a digital camera.

## More than picture in picture

Infrared images alone can be difficult to understand, which is why Fluke pioneered IR-Fusion, a revolutionary marriage of visible and infrared images never before seen in commercial or industrial thermal imagers. Automatically capturing a visible image with every infrared image allows you to always know exactly what you're looking at.

## Not all fusion is created equal

Don't be fooled by imitators. Patented IR-Fusion is the only solution with physical parallax correction, enabling the perfect alignment and blending of both infrared and visible images. While many manufacturers have attempted to duplicate Fluke IR-Fusion, none have been able to match it. Turn to Fluke IR-Fusion to deliver the industry's best thermal images.

## Thermal imager features



# SmartView® Software

## Powerful

Everything you need for analysis and reporting.

- Extensive annotation, editing, and viewing options with full IR-Fusion® capabilities
- 3D-IR™ delivers unique three-dimensional analysis capabilities
- Multiple reporting options and templates

## Easy to use

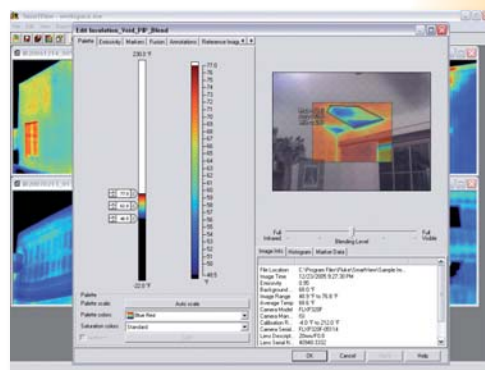
It's never been easier to enhance and analyze your thermal images.

- SmartView tools and controls allow easy access to editing functions
- Report Wizard guides you through automatic, professional report generation

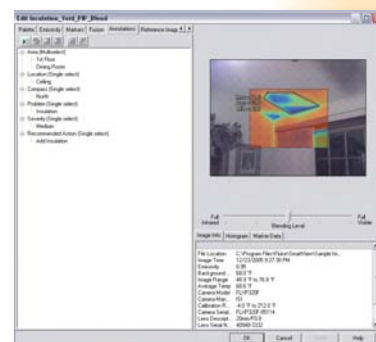
## Included with every imager

Fluke includes SmartView software with unlimited licenses and lifetime upgrades with every thermal imager.

- No need to pay extra for a professional software solution



Navigate, analyze and enhance IR images.



Organize data with extensive annotations.

## SmartView® system requirements

### Software requirements

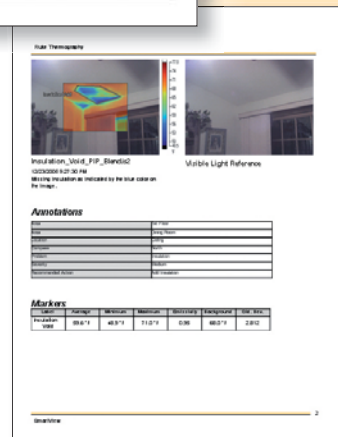
- Microsoft Windows XP/Vista
- Web browser for product registration and viewing FAQs: Microsoft® Internet Explorer 5.0 or newer
- Microsoft® Word 2007 for report template modification (optional)

### Hardware requirements

- Memory card reader to transfer images to computer (included)
- 512 MB RAM (1GB for Vista), not including the space requirements for web browser and Microsoft® Word
- 16-bit color, 1024x768 resolution video or better
- Color printer for printing images (optional)
- CD-ROM drive for installing SmartView software



Simplified professional report generation.



# Thermal imaging terminology explained



**Palette**—Color representation of the temperatures (temperature scale) in a displayed image. Certain color palettes meet personal preferences or optimize the image for different applications and/or problems. An example of the different palettes appear to the right.

**Sensor Size**—Similar to digital cameras the sensor size describes the amount of displayed points per image of a thermal imager. A sensor size of 320 x 240 captures and displays more than 76.800 measurement points with each measurement. If the imager is fully radiometric then it also truly measures and stores all captured points with the image.

**Field of view (FOV)**—Indicates what the thermal imager sees or measures at a given moment. The combination of the Field Of View specification and the distance to the measured object determines which surface or part of an object will be measured as a total. A FOV calculator on [www.fluke.eu/ti](http://www.fluke.eu/ti) helps you calculate the measurement surface at various distances to the object.

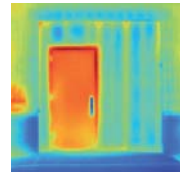
**Thermal sensitivity**—Indicates what the smallest temperature difference is which can be measured/displayed in an image. It basically is the maximum resolution of the image and is referred to as NETD (noise equivalent temperature difference).

**Emissivity adjustment**—All surfaces emit infrared energy or heat. The level of emission varies much per surface and is described with the term emissivity. Painted coatings and materials usually have a high emissivity while polished aluminum has a low emissivity. Visit [www.fluke.eu/ti](http://www.fluke.eu/ti) for a table with emissivities for different materials. To measure the temperature of a material accurately it will be necessary to adjust for the material's emissivity.

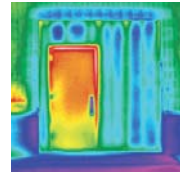
**Span**—The set of temperature values that can be measured within a preset range. Adjusting the span allows you to see more subtle temperature gradients (or contrast) in a captured image. When the span is optimized the imager shows 256 different shades of color in an image.



Ironbow



Blue-red



High contrast



Amber



Hot metal



Grey

# Specifications

|                                                                     | TiR32                                                                                                                                                                                                                                                                                 | TiR1 | TiR                                                                         | TiRx                                   |
|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------|----------------------------------------|
| Temperature                                                         |                                                                                                                                                                                                                                                                                       |      |                                                                             |                                        |
| Temperature measurement range (not calibrated below -10 °C)         | -20 °C to +150°C                                                                                                                                                                                                                                                                      |      | -20 °C to +100 °C                                                           |                                        |
| Temperature measurement accuracy                                    | ± 2 °C or 2 % (at 25°C nominal, whichever is greater)                                                                                                                                                                                                                                 |      | ± 5 °C or 5 % (at 25°C nominal, whichever is greater)                       |                                        |
| On-screen emissivity correction                                     | Yes                                                                                                                                                                                                                                                                                   |      | —                                                                           |                                        |
| On-screen reflected background temperature compensation             | Yes                                                                                                                                                                                                                                                                                   |      | —                                                                           |                                        |
| On-screen transmission correction                                   | Yes                                                                                                                                                                                                                                                                                   |      | —                                                                           |                                        |
| Imaging performance                                                 |                                                                                                                                                                                                                                                                                       |      |                                                                             |                                        |
| Detector type                                                       | 320 X 240 Focal Plane Array, uncooled microbolometer                                                                                                                                                                                                                                  |      | 160 X 120 Focal Plane Array, uncooled microbolometer                        |                                        |
| Thermal sensitivity (NETD)                                          | ≤ 0.05 °C at 30 °C (50 mK)                                                                                                                                                                                                                                                            |      | ≤ 0.07 °C at 30 °C (70 mK)                                                  | ≤ 0.1 °C at 30 °C (100 mK)             |
| Infrared spectral band                                              | 7.5 μm to 14 μm (long wave)                                                                                                                                                                                                                                                           |      |                                                                             |                                        |
| Visual (visible light) camera                                       | Industrial Performance 2.0 Megapixel                                                                                                                                                                                                                                                  |      | Industrial Performance 1.3 MegaPixel                                        |                                        |
| Minimum focus distance                                              | 46 cm                                                                                                                                                                                                                                                                                 |      | —                                                                           |                                        |
| Standard infrared lens type                                         |                                                                                                                                                                                                                                                                                       |      |                                                                             |                                        |
| Field of view                                                       | 23 ° x 17 °                                                                                                                                                                                                                                                                           |      |                                                                             |                                        |
| Spatial resolution (IFOV)                                           | 1.25 mRad                                                                                                                                                                                                                                                                             |      | 2.5 mRad                                                                    |                                        |
| Minimum focus distance                                              | 15 cm                                                                                                                                                                                                                                                                                 |      |                                                                             |                                        |
| Optional telephoto infrared lens type                               |                                                                                                                                                                                                                                                                                       |      |                                                                             |                                        |
| Field of view                                                       | 11.5 ° x 8.7 °                                                                                                                                                                                                                                                                        |      | —                                                                           |                                        |
| Spatial resolution (IFOV)                                           | 0.63 mRad                                                                                                                                                                                                                                                                             |      | —                                                                           |                                        |
| Minimum focus distance                                              | 45 cm                                                                                                                                                                                                                                                                                 |      | —                                                                           |                                        |
| Optional wide-angle infrared lens type                              |                                                                                                                                                                                                                                                                                       |      |                                                                             |                                        |
| Field of view                                                       | 46 ° x 34 °                                                                                                                                                                                                                                                                           |      | —                                                                           |                                        |
| Spatial resolution (IFOV)                                           | 2.50 mRad                                                                                                                                                                                                                                                                             |      | —                                                                           |                                        |
| Minimum focus distance                                              | 7.5 cm                                                                                                                                                                                                                                                                                |      | —                                                                           |                                        |
| Focus mechanism                                                     | Manual, one-handed Smart Focus capability                                                                                                                                                                                                                                             |      |                                                                             |                                        |
| Image presentation                                                  |                                                                                                                                                                                                                                                                                       |      |                                                                             |                                        |
| Palettes                                                            |                                                                                                                                                                                                                                                                                       |      |                                                                             |                                        |
| Standard                                                            | Ironbow, Blue-Red, High Contrast, Amber, Amber Inverted, Hot Metal, Grayscale, Grayscale Inverted                                                                                                                                                                                     |      | Ironbow, Blue-Red, High Contrast, Amber, Hot Metal, Grey                    | Ironbow, Blue-Red, High Contrast, Grey |
| Ultra Contrast                                                      | Yes                                                                                                                                                                                                                                                                                   |      | —                                                                           |                                        |
| Level and span                                                      | Smooth auto-scaling and manual scaling of level and span                                                                                                                                                                                                                              |      |                                                                             |                                        |
| Fast auto toggle between manual and auto modes                      | Yes                                                                                                                                                                                                                                                                                   |      | —                                                                           |                                        |
| Fast auto-rescale in manual mode                                    | Yes                                                                                                                                                                                                                                                                                   |      | —                                                                           |                                        |
| Minimum span (in manual mode)                                       | 2 °C                                                                                                                                                                                                                                                                                  |      | 2,5 °C                                                                      |                                        |
| Minimum span (in auto mode)                                         | 3 °C                                                                                                                                                                                                                                                                                  |      | 5 °C                                                                        |                                        |
| IR Fusion® information                                              |                                                                                                                                                                                                                                                                                       |      |                                                                             |                                        |
| Automatically aligned (parallax correctable) visual and IR blending | Yes                                                                                                                                                                                                                                                                                   |      |                                                                             | —                                      |
| Picture-In-Picture (PIP)                                            | Three levels of on-screen IR blending displayed in center of LCD                                                                                                                                                                                                                      |      | 100 % IR displayed in center or LCD                                         | —                                      |
| Full screen infrared                                                | Three levels of on-screen IR blending displayed in center of LCD                                                                                                                                                                                                                      |      | 100 % IR displayed in center of LCD                                         | —                                      |
| Color alarms (temperature alarms)                                   | Dew point temperature alarm (User selectable)                                                                                                                                                                                                                                         |      | —                                                                           |                                        |
| Voice Annotation                                                    |                                                                                                                                                                                                                                                                                       |      |                                                                             |                                        |
| Voice annotation                                                    | 60 seconds maximum recording time per image; reviewable playback on imager                                                                                                                                                                                                            |      | —                                                                           |                                        |
| Image capture and data storage                                      |                                                                                                                                                                                                                                                                                       |      |                                                                             |                                        |
| Image capture, review, save mechanism                               | One-handed image capture, review, and save capability                                                                                                                                                                                                                                 |      |                                                                             |                                        |
| Storage medium                                                      | SD Memory Card (2 GB memory card will store at least 1200 fully radiometric (.is2) IR and linked visual images each with 60 seconds voice annotations, or 3000 basic bitmap (.bmp) images, or 3000 jpeg (.jpeg) images; transferrable to PC via included multi-format USB card reader |      |                                                                             |                                        |
| File formats                                                        | Non-radiometric (.bmp) or (.jpeg) or fully-radiometric (.is2)                                                                                                                                                                                                                         |      | Non-radiometric (.bmp) or fully-radiometric (.is2)                          |                                        |
|                                                                     | No analysis software required for non-radiometric (.bmp and .jpeg) files                                                                                                                                                                                                              |      | No analysis software required for non-radiometric (.bmp) files              |                                        |
| Export file formats w/ SmartView® software                          | JPEG, JPG, JPE, JFIF, BMP, GIF, DIB, PNG, TIF, and TIFF                                                                                                                                                                                                                               |      |                                                                             |                                        |
| Memory review                                                       | Thumbnail view navigation and review selection                                                                                                                                                                                                                                        |      | Sequential image navigation and review                                      |                                        |
| Software controls and adjustments                                   |                                                                                                                                                                                                                                                                                       |      |                                                                             |                                        |
| Language selection                                                  | English, German, French, Spanish, Portuguese, Italian, Swedish, Finnish, Russian, Czech, Polish, Turkish, Simplified Chinese, Traditional Chinese, Korean, Japanese                                                                                                                   |      |                                                                             |                                        |
| Image controls                                                      | Smooth auto scaling and manual scaling                                                                                                                                                                                                                                                |      |                                                                             |                                        |
| Power                                                               |                                                                                                                                                                                                                                                                                       |      |                                                                             |                                        |
| Battery type                                                        | Two replaceable rechargeable battery packs (Lithium ion)                                                                                                                                                                                                                              |      | Internal rechargeable battery NiMh (included)                               |                                        |
| Battery operating time                                              | 4+ hours per battery pack                                                                                                                                                                                                                                                             |      | 3 to 4 hours continuous operation                                           |                                        |
| Battery charging                                                    | Two-bay AC battery charger                                                                                                                                                                                                                                                            |      | 2 hours with ac charger or dc car charger (charges battery while operating) |                                        |
| AC operation                                                        | AC adapter/charger 110/230 V ac, 50/60Hz                                                                                                                                                                                                                                              |      |                                                                             |                                        |
| Power saving                                                        | Automatic shutdown and sleep modes (user specified)                                                                                                                                                                                                                                   |      |                                                                             |                                        |
| Environmental and mechanical design                                 |                                                                                                                                                                                                                                                                                       |      |                                                                             |                                        |
| Operating temperature                                               | -10 to +50 °C                                                                                                                                                                                                                                                                         |      |                                                                             |                                        |
| Storage temperature                                                 | -20 to +50 °C                                                                                                                                                                                                                                                                         |      |                                                                             |                                        |
| Relative humidity                                                   | 10% to 95%, non-condensing                                                                                                                                                                                                                                                            |      |                                                                             |                                        |
| Water and dust resistant                                            | IP54                                                                                                                                                                                                                                                                                  |      |                                                                             |                                        |
| Two meter drop test                                                 | Yes with standard lens                                                                                                                                                                                                                                                                |      | Yes                                                                         |                                        |
| Protective lens cover                                               | Yes                                                                                                                                                                                                                                                                                   |      |                                                                             |                                        |
| Weight (including battery)                                          | 1.05 kg                                                                                                                                                                                                                                                                               |      | 1.2 kg                                                                      |                                        |
| Imager size (HxWxD)                                                 | 277 x 122 x 170 mm                                                                                                                                                                                                                                                                    |      | 267 x 127 x 152 mm                                                          |                                        |
| Other                                                               |                                                                                                                                                                                                                                                                                       |      |                                                                             |                                        |
| Warranty                                                            | 2 years                                                                                                                                                                                                                                                                               |      |                                                                             |                                        |
| EN 61010-1 2nd edition and EN61326-1                                | Yes                                                                                                                                                                                                                                                                                   |      |                                                                             |                                        |

# Thermal imaging accessories



## Everything you need to get started is included:

- In-box training DVD
  - SmartView® analysis and reporting software
  - 2 GB SD Memory Card
  - Multi-function Memory Card Reader for downloading images into your computer
  - Rugged, hard carry case and portable, soft carry case
  - Hand strap, adjustable for left of right handed user
  - Rechargeable battery (TiR32 includes two external smart rechargeable batteries)
  - AC charger/power supply
- Note: Included accessories vary by model.

## Ordering information

Fluke TiR32 Thermal Imager  
 Fluke TiR1 Thermal Imager  
 Fluke TiR Thermal Imager  
 Fluke TiRx Inspector Thermal Imager

## Expand your thermal imaging capabilities with the following Fluke accessories:



FLK-LENS/TELE1  
Telephoto Infrared Lens  
(TiR32 only)



FLK-LENS/WIDE1 Wide-angle Infrared Lens  
(TiR32 only)



TI-CAR-CHARGER  
Thermal Imager Vehicle  
Charger



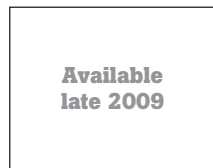
TI-VISOR Thermal Imager  
Visor



FLK-TI-SBP3  
Extra battery (TiR32 only)



FLK-TI-SBC3 Charging  
Base (TiR32 only)



TI-TRIPOD Tripod  
Mounting Base Accessory

**Available  
late 2009**

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

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