



## Thermal Imaging

# Fluke Ti40FT and Ti45FT IR FlexCam® Thermal Imagers with IR-Fusion® Technology



## The versatile choice for maintenance and production engineers and technicians

The Fluke Ti4x models feature everything needed for virtually every thermography task. With a 160 x 120 detector and a temperature sensitivity down to 0.08°C (80mK) (NETD) they deliver high resolution images where even the smallest temperature differences can be seen. The units are extremely easy to use through the Windows® CE menu structure and offer an extended troubleshooting feature set to allow on the spot analysis in the field.



The FT models feature the innovative IR-Fusion® technology. IR-Fusion captures a visible light image in addition to the infrared image and takes the mystery out of IR image analysis. It helps to better identify and report suspect components and enable the repair to be done right the first time. To find out more select IR-Fusion on the side navigation of this page.

### Typical applications:

- Predictive maintenance – Identify electrical and mechanical problems before they cause failure
- Industrial maintenance – Check whether repairs have been performed successfully
- Quality control – Examine prototypes and refine thermal management designs
- Process monitoring – Real-time observation to ensure efficient and safe operation



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### See exactly what you are viewing

Fluke IR-Fusion® technology links a real world visual image with a thermal image. It merges the two images into one, with the possibility to blend between the two images or create picture-in-picture combinations. Alarm limits can be superimposed over the visible light image to exactly pinpoint the components exceeding a specified temperature limit. Both the visual images and thermal images are available for use in reports. This speeds up documentation by reducing the need to look for individual images taken with a separate digital camera. IR Fusion helps to better identify and report suspect components and enable the repair to be done right the first time.

### Large, sharp thermal images

Thanks to the largest display (five-inch) available on this type of thermal imager in combination with low-noise VOx sensors, the Fluke IR FlexCam units produce exceptionally high-quality images making even the smallest temperature differences visible. This is comparable with images normally only obtained on far more expensive instruments.

### A sharp image in every situation

The innovative 180 ° articulating lens makes it possible to view and capture images in areas with poor accessibility. The display remains clearly visible while viewing over high objects, under a machine or around immovable obstructions. The SmartFocus wheel simplifies getting a stable and sharp image. No need to take your hand off the instrument to turn a focus ring.

### Make anomalies visible

Thanks to built-in functions like AutoCapture, the IR FlexCam Thermal Imagers help to troubleshoot difficult problems. The instrument is easily set up to automatically capture only those images where a temperature limit is exceeded. This way, difficult to find intermittent problems can be captured and analyzed quicker by concentrating only on the images containing the anomalies.

### Analysis and reporting comes standard

The SmartView™ software (supplied with the unit) includes a complete range of infrared image viewing, analysis, annotation and reporting tools. It even allows for customized reports to accommodate specific company work processes or requirements like multiple image reporting and comparisons. To find out more select SmartView on the side navigation of this page.

### Radiometric measurement – the ‘data behind the picture’

Fully radiometric thermal imagers capture and store calibrated temperature data for the matrix of thousands of points that make up a thermal image. This makes it possible to perform detailed analysis and change key parameters like emissivity or temperature range either in the field on the camera or in the office using the PC software.

| •                                                                                       | Ti45FT                            | Ti40FT           |
|-----------------------------------------------------------------------------------------|-----------------------------------|------------------|
| High resolution, low noise VOx detector for high quality images                         | 160 x 120                         |                  |
| Temperature range to cover broad industrial applications                                | -20 to + 600 ° C (-4 to 1112 ° F) |                  |
| High temperature option                                                                 | 1200 °C (2192 °F)                 | •                |
| High thermal sensitivity for viewing even the smallest temperature differences          | ≤0.08 °C (80 mK)                  | ≤0.09 °C (90 MK) |
| 180° articulating flexible lens to view images in every situation                       | •                                 | •                |
| Choice of 3 interchangeable lenses to cover every application                           | •                                 | •                |
| Large 5" high contrast color LCD for a clear picture independent of lighting conditions | •                                 | •                |

|                                                                                                |   |   |
|------------------------------------------------------------------------------------------------|---|---|
| Fully radiometric for detailed temperature analysis and tracking                               | • | • |
| SmartFocus for best image quality and accurate temperature measurements                        | • | • |
| Windows® CE based menu structure for ease of use                                               | • | • |
| Personalized instrument set-up for multiple use                                                | • | • |
| CompactFlash memory cards to store over 1000 IR images plus fully radiometric temperature data | • | • |
| SmartView reporting and analysis software included                                             | • | • |
| AutoCapture for making intermittent problems visible                                           | • | • |
| On-board analysis functions                                                                    | • | • |
| User defined text annotations for simplified reporting                                         | • | • |
| Built-in visible light (digital) camera                                                        | • | • |
| IR/Visible Alarm function                                                                      | • |   |
| Laser pointer for easy targeting                                                               | • | • |
| Flash and torch light for high quality images in dark environments                             | • | • |



**FLUKE®**

# Fluke Ti5xFT and Ti4xFT FlexCam® Thermal Imagers

## Technical Data

The experts' choice for problem solving and preventive/predictive maintenance



### Features

|                                                                                                | Ti55FT                               | Ti50FT                              | Ti45FT                               | Ti40FT                              |
|------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------|--------------------------------------|-------------------------------------|
| High resolution, low noise VOx detector for high quality images                                | 320 x 240                            |                                     | 160 x 120                            |                                     |
| Temperature range to cover broad industrial applications                                       | -20 °C to +600 °C (-4 °F to 1112 °F) | -20 °C to +350 °C (-4 °F to 662 °F) | -20 °C to +600 °C (-4 °F to 1112 °F) | -20 °C to +350 °C (-4 °F to 662 °F) |
| High temperature option                                                                        | —                                    |                                     | 1200 °C (2192 °F)                    | —                                   |
| High thermal sensitivity for viewing even the smallest temperature differences                 | ≤0.05 °C at 30 °C (50 mK)            | ≤0.07 °C at 30 °C (70 mK)           | ≤0.08 °C at 30 °C (80 mK)            | ≤0.09 °C at 30 °C (90 mK)           |
| 180 ° articulating flexible lens to view images in every situation                             | •                                    | •                                   | •                                    | •                                   |
| Choice of 3 interchangeable lenses to cover every application*                                 | •                                    | •                                   | •                                    | •                                   |
| Large 5 inch high contrast color LCD for a clear picture independent of lighting conditions    | •                                    | •                                   | •                                    | •                                   |
| Fully radiometric for detailed temperature analysis and tracking                               | •                                    | •                                   | •                                    | •                                   |
| SmartFocus for best image quality and accurate temperature measurements                        | •                                    | •                                   | •                                    | •                                   |
| Windows CE based menu structure for ease of use                                                | •                                    | •                                   | •                                    | •                                   |
| Personalized instrument set-up for multiple person use                                         | •                                    | •                                   | •                                    | •                                   |
| CompactFlash memory cards to store over 1000 IR images plus fully radiometric temperature data | •                                    | •                                   | •                                    | •                                   |
| SmartView™ reporting and analysis software included                                            | •                                    | •                                   | •                                    | •                                   |
| AutoCapture for making intermittent problems visible                                           | •                                    | •                                   | •                                    | •                                   |
| On-board analysis functions                                                                    | •                                    | •                                   | •                                    | •                                   |
| User defined text annotations for simplified reporting                                         | •                                    | •                                   | •                                    | •                                   |
| Built-in visible (visual) light camera                                                         | •                                    | •                                   | •                                    | •                                   |
| IR-Fusion blending thermal and visible light images                                            | •                                    | •                                   | •                                    | •                                   |
| IR/Visible Alarm function                                                                      | •                                    | •                                   | •                                    | •                                   |
| Laser pointer for easy targeting                                                               | •                                    | •                                   | •                                    | •                                   |
| Flash and torch light for high quality images in dark environments                             | •                                    | •                                   | •                                    | •                                   |

The Fluke Ti5xFT and Ti4xFT models feature everything needed for virtually any thermography task.

All Fluke FlexCam Thermal Imagers come standard with the patent-pending Fluke IR-Fusion® Technology fusing visual (visible light) images with infrared images. SmartView™ IR analysis and reporting software is included with each purchase along with free software upgrades for the life of your product.

The Ti4xFT models feature 160 x 120 detectors and temperature sensitivity (NETD) down to 0.08 °C (80 mK) in the higher end model.

The Ti5xFT models feature 320 x 240 detectors and temperature sensitivity (NETD) down to 0.05 °C (50 mK) in the higher end model.

Choose Fluke FlexCam Thermal Imagers when you need industry leading thermal sensitivity for high resolution, ultra high-quality images.

### Typical applications:

- **Troubleshooting**—Pinpointing the location of specific problems in equipment and systems.
- **Preventive/predictive maintenance**—Identify electrical and mechanical problems before they cause failure.
- **Industrial maintenance**—Check whether repairs have been performed correctly.
- **Process monitoring**—Real-time observation to ensure efficient and safe operations.
- **Quality control**—Examine prototypes and refine thermal management designs.
- **Research and development**—Quantify heat patterns to improve product designs (Ti5xFT models).
- **Electronic design**—Circuit board analysis (Ti5xFT models).

\*10 mm and 54 mm lenses are optional and are only available at time of initial order.

## Detailed specifications

|                                               | Fluke Ti55FT                                                                                                                                                                                                                  | Fluke Ti50FT                                                                                                                                                      | Fluke Ti45FT                                                                                                                                                                                                                  | Fluke Ti40FT                                                                                                                                                      |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Imaging performance                           |                                                                                                                                                                                                                               |                                                                                                                                                                   |                                                                                                                                                                                                                               |                                                                                                                                                                   |
| Field of view (FOV)*                          | 23° horizontal x 17° vertical                                                                                                                                                                                                 |                                                                                                                                                                   |                                                                                                                                                                                                                               |                                                                                                                                                                   |
| Spatial resolution (IFOV)*                    | 1.30 mrad                                                                                                                                                                                                                     |                                                                                                                                                                   | 2.60 mrad                                                                                                                                                                                                                     |                                                                                                                                                                   |
| Min focus distance*                           | 0.15 m (5.9 in)                                                                                                                                                                                                               |                                                                                                                                                                   |                                                                                                                                                                                                                               |                                                                                                                                                                   |
| Thermal sensitivity (NETD)                    | ≤ 0.05 °C at 30 °C (50 mK)                                                                                                                                                                                                    | ≤ 0.07 °C at 30 °C (70 mK)                                                                                                                                        | ≤ 0.08 °C at 30 °C (80mK)                                                                                                                                                                                                     | ≤ 0.09 °C at 30 °C (90mK)                                                                                                                                         |
| Detector data acquisition/<br>image frequency | 60 Hz/60 Hz                                                                                                                                                                                                                   |                                                                                                                                                                   | 30 Hz/30 Hz                                                                                                                                                                                                                   |                                                                                                                                                                   |
| Focus                                         | SmartFocus; one finger continuous focus (manual)                                                                                                                                                                              |                                                                                                                                                                   |                                                                                                                                                                                                                               |                                                                                                                                                                   |
| IR digital zoom                               | 2x, 4x, 8x                                                                                                                                                                                                                    | 2x                                                                                                                                                                | 2x                                                                                                                                                                                                                            | —                                                                                                                                                                 |
| Detector type                                 | 320 x 240 Focal Plane Array, Vanadium Oxide (VOx)<br>Uncooled Microbolometer                                                                                                                                                  |                                                                                                                                                                   | 160 x 120 Focal Plane Array, Vanadium Oxide (VOx)<br>Uncooled Microbolometer                                                                                                                                                  |                                                                                                                                                                   |
| Spectral band                                 | 8 µm to 14 µm                                                                                                                                                                                                                 |                                                                                                                                                                   |                                                                                                                                                                                                                               |                                                                                                                                                                   |
| Digital image enhancement                     | Automatic full time enhanced                                                                                                                                                                                                  |                                                                                                                                                                   |                                                                                                                                                                                                                               |                                                                                                                                                                   |
| On camera operating<br>modes                  | Full thermal, full visual light or merged<br>thermal-visual images.<br>Picture-in-Picture                                                                                                                                     |                                                                                                                                                                   | Full thermal, full visual light or merged thermal-visual<br>images. Picture-in-Picture                                                                                                                                        |                                                                                                                                                                   |
| Visible light camera                          | 1280 x 1024 pixels, full color                                                                                                                                                                                                |                                                                                                                                                                   |                                                                                                                                                                                                                               |                                                                                                                                                                   |
| Visible light digital zoom                    | 2x, 4x                                                                                                                                                                                                                        | 2x                                                                                                                                                                | 2x                                                                                                                                                                                                                            | —                                                                                                                                                                 |
| Temperature measurement                       |                                                                                                                                                                                                                               |                                                                                                                                                                   |                                                                                                                                                                                                                               |                                                                                                                                                                   |
| Calibrated temperature<br>range               | -20 °C to 600 °C (-4 °F to<br>1112 °F) in three ranges<br><br>Range one = -20 °C to<br>100 °C (-4 °F to 212 °F)<br>Range two = -20 °C to<br>350 °C (32 °F to 662 °F)<br>Range three = 250 °C to<br>600 °C (482 °F to 1112 °F) | -20 °C to 350 °C (-4 °F<br>to 662 °F) in two ranges<br><br>Range one = -20 °C to<br>100 °C (-4 °F to 212 °F)<br>Range two = -20 °C to<br>350 °C (32 °F to 662 °F) | -20 °C to 600 °C (-4 °F<br>to 1112 °F) in three ranges<br><br>Range one = -20 °C to<br>100 °C (-4 °F to 212 °F)<br>Range two = -20 °C to<br>350 °C (32 °F to 662 °F)<br>Range three = 250 °C to<br>600 °C (482 °F to 1112 °F) | -20 °C to 350 °C (-4 °F<br>to 662 °F) in two ranges<br><br>Range one = -20 °C to<br>100 °C (-4 °F to 212 °F)<br>Range two = -20 °C to<br>350 °C (32 °F to 662 °F) |
| Optional—High temperature                     | —                                                                                                                                                                                                                             | —                                                                                                                                                                 | Up to 1200 °C (2192 °F)<br><br>Range 4 = 500 °C to<br>1200 °C (932 °F to 2192<br>°F)                                                                                                                                          | —                                                                                                                                                                 |
| Accuracy                                      | ± 2 °C or 2 % (whichever is greater)                                                                                                                                                                                          |                                                                                                                                                                   |                                                                                                                                                                                                                               |                                                                                                                                                                   |
| Measurement modes                             | Centerpoint, center box<br>(area min/max, average),<br>moveable spots/boxes,<br>user defined field/text<br>annotations, automatic hot<br>and cold point detection,<br>visible color alarm above<br>and below                  | Centerpoint, center box<br>(area min/max, average)                                                                                                                | Centerpoint, center box<br>(area min/max, average),<br>moveable spots/boxes,<br>user defined field/text<br>annotations, automatic<br>hot and cold point<br>detection, visible color<br>alarm above and below                  | Centerpoint, center box<br>(area min/max, average)                                                                                                                |
| Emissivity correction                         | 0.1 to 1.0 (0.01 increments)                                                                                                                                                                                                  |                                                                                                                                                                   |                                                                                                                                                                                                                               |                                                                                                                                                                   |
| Image presentation                            |                                                                                                                                                                                                                               |                                                                                                                                                                   |                                                                                                                                                                                                                               |                                                                                                                                                                   |
| Digital display                               | 13 cm (5 in) diagonal large high-resolution digital display                                                                                                                                                                   |                                                                                                                                                                   |                                                                                                                                                                                                                               |                                                                                                                                                                   |
| LCD backlight                                 | Sunlight readable color LCD                                                                                                                                                                                                   |                                                                                                                                                                   |                                                                                                                                                                                                                               |                                                                                                                                                                   |
| Video output                                  | RS170 EIA/NTSC or CCIR/PAL composite video                                                                                                                                                                                    |                                                                                                                                                                   |                                                                                                                                                                                                                               |                                                                                                                                                                   |
| Palettes                                      | Grayscale, grayscale inverted, blue red, high contrast, hot metal, ironbow, amber, amber inverted                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                                                                               |                                                                                                                                                                   |
| Optical lenses                                |                                                                                                                                                                                                                               |                                                                                                                                                                   |                                                                                                                                                                                                                               |                                                                                                                                                                   |
| 54 mm telephoto lens                          | High precision Germanium lens<br>Field of view (FOV): 9° horizontal x 6° vertical                                                                                                                                             |                                                                                                                                                                   |                                                                                                                                                                                                                               |                                                                                                                                                                   |
|                                               | Spatial resolution (IFOV): 0.47 mrad                                                                                                                                                                                          |                                                                                                                                                                   | Spatial resolution (IFOV): 0.94 mrad                                                                                                                                                                                          |                                                                                                                                                                   |
|                                               | Min focus distance: 0.6 m (1.97 ft)                                                                                                                                                                                           |                                                                                                                                                                   |                                                                                                                                                                                                                               |                                                                                                                                                                   |

## General specifications

|                                     | Fluke Ti55FT                                                                                                                                | Fluke Ti50FT | Fluke Ti45FT                         | Fluke Ti40FT |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------------------------|--------------|
| Optical lenses (continued)          |                                                                                                                                             |              |                                      |              |
| 10.5 mm wide angle lens             | High precision Germanium lens<br>Field of view (FOV): 42° horizontal x 32° vertical                                                         |              |                                      |              |
|                                     | Spatial resolution (IFOV): 2.45 mrad                                                                                                        |              | Spatial resolution (IFOV): 4.9 mrad  |              |
|                                     | Min focus distance: 0.3 m (0.98 ft)                                                                                                         |              |                                      |              |
| Image and data storage              |                                                                                                                                             |              |                                      |              |
| Storage medium                      | Compact flash card stores over 1000 IR images (512 MB card standard)                                                                        |              |                                      |              |
| File formats supported              | 14 bit measurement data included. Exportable Images: bmp, gif, jpg, png, tiff;<br>Data formats: comma separated (csv), tab separated (txt). |              |                                      |              |
| Interface and software              |                                                                                                                                             |              |                                      |              |
| Interface                           | Compact flash card reader included                                                                                                          |              |                                      |              |
| Software                            | SmartView; Full analysis and reporting software included                                                                                    |              |                                      |              |
| Laser                               |                                                                                                                                             |              |                                      |              |
| Classification                      | Class II                                                                                                                                    |              |                                      |              |
| Laser targeting                     | Laser dot visible on screen when blending thermal and visible image                                                                         |              |                                      |              |
| Controls and adjustments            |                                                                                                                                             |              |                                      |              |
| Set-up controls                     | Date/time, temperature units C/F, language, scale, LCD intensity (high/normal/low)                                                          |              |                                      |              |
| Image controls                      | Level, span, auto adjust (continuous/manual)                                                                                                |              |                                      |              |
| On-screen indicators                | Battery status, target emissivity, background temperature and realtime clock                                                                |              |                                      |              |
| Power                               |                                                                                                                                             |              |                                      |              |
| Battery type                        | Li-Ion smart battery, rechargeable, field-replaceable (two included)                                                                        |              |                                      |              |
| Battery operating time              | Two hours continuous operation (per battery)                                                                                                |              |                                      |              |
| Battery charging                    | Two bay intelligent charger powered via ac outlet                                                                                           |              |                                      |              |
| Continuous ac operation             | AC adapter 110/220 V ac,<br>50/60 Hz                                                                                                        | —            | AC adapter 110/220 V ac,<br>50/60 Hz | —            |
| Power saving                        | Automatic shutdown and sleep modes (user specified)                                                                                         |              |                                      |              |
| Environmental and mechanical design |                                                                                                                                             |              |                                      |              |
| Operating temperature               | -10 °C to +50 °C (14 °F to 122 °F)                                                                                                          |              |                                      |              |
| Storage temperature                 | -40 °C to +70 °C (-40 °F to 158 °F)                                                                                                         |              |                                      |              |
| Relative humidity                   | Operating and storage 10 % to 95 %, non-condensing                                                                                          |              |                                      |              |
| Water and dust resistant            | IP54                                                                                                                                        |              |                                      |              |
| Weight (including batteries)        | 1.95 kg (4.3 lb)                                                                                                                            |              |                                      |              |
| Camera size (H x W x D)             | 162 mm x 262 mm x 101 mm (6.5 in x 10.5 in x 4.0 in)                                                                                        |              |                                      |              |
| Other                               |                                                                                                                                             |              |                                      |              |
| Warranty                            | Two-years                                                                                                                                   |              |                                      |              |

\*Standard 20 mm Germanium lens

## Ordering information

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up and running.®

|                      |                                          |
|----------------------|------------------------------------------|
| <b>FLK-Ti40FT-20</b> | IR FlexCam Thermal Imager with IR-Fusion |
| <b>FLK-Ti45FT-20</b> | IR FlexCam Thermal Imager with IR-Fusion |
| <b>FLK-Ti50FT-20</b> | IR FlexCam Thermal Imager with IR-Fusion |
| <b>FLK-Ti55FT-20</b> | IR FlexCam Thermal Imager with IR-Fusion |

### Included with product

Heavy duty carrying case, 2 rechargeable battery packs, battery charger, ac adapter (for Ti45FT and Ti55FT only), video cable, 512 MB compact flash card, compact flash card reader and USB cable, PCMCIA compact flash card reader, neck strap, printed getting started guide, SmartView reporting and analysis, software on CD, complete user manual on CD

