Operating Procedure - FLIR E75 camera
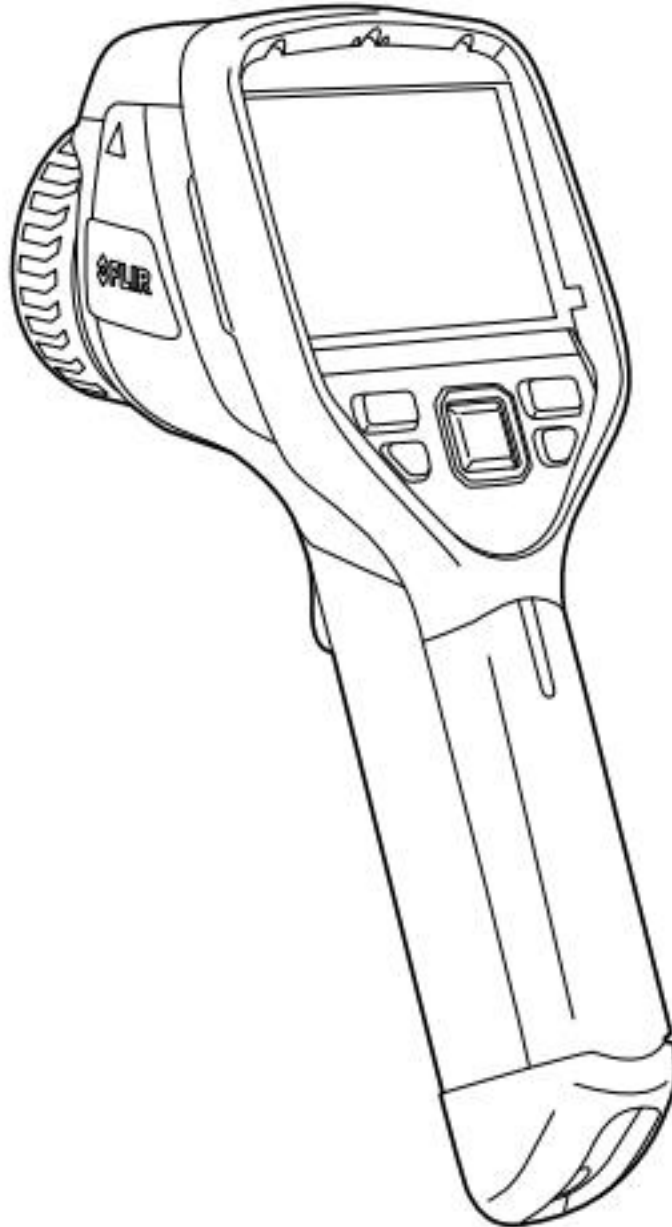
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A. Operating Procedure

1. Insert a battery into the battery compartment. If the battery is discharged, charge it for 4 hours or until the green battery condition LED (on the charger) glows continuously.

2. Insert a memory card into the card slot.

3. Push [⏻] for 10 secs to turn on the camera.

4. Aim the camera toward the object of interest and confirm that the full object is within camera's view. The camera angle (between the normal to camera lens and the object's surface) should be as close to 90° as possible.

Note: If required to image a large object from close distance, please attach the wide angle lens.

5. Set the emissivity depending on the object (0.85 for glass, 0.95 for white backsheet).

Note: The emissivity of glass changes with the camera angle. It is around 0.85 only for $60^\circ - 90^\circ$ angle, so it is important to hold the IR camera at the proper angle. Please refer to IEC TS 62446-3 for further details.
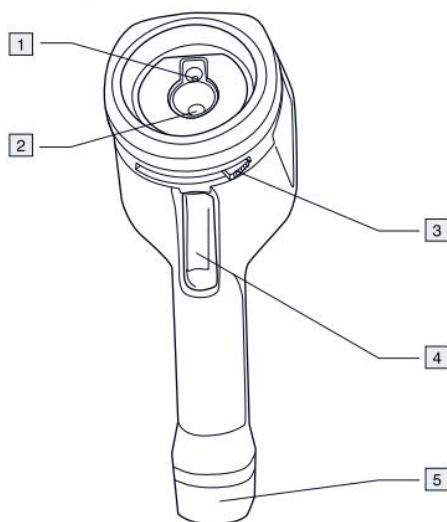
6. Adjust the focus by rotating the focus ring.

Note: It is very important to adjust the focus correctly. Incorrect focus adjustment affects how the image modes Thermal MSX, Thermal, and Picture-in-picture work. It also affects the temperature measurement.

7. Push the Save button (the trigger) to save an image.

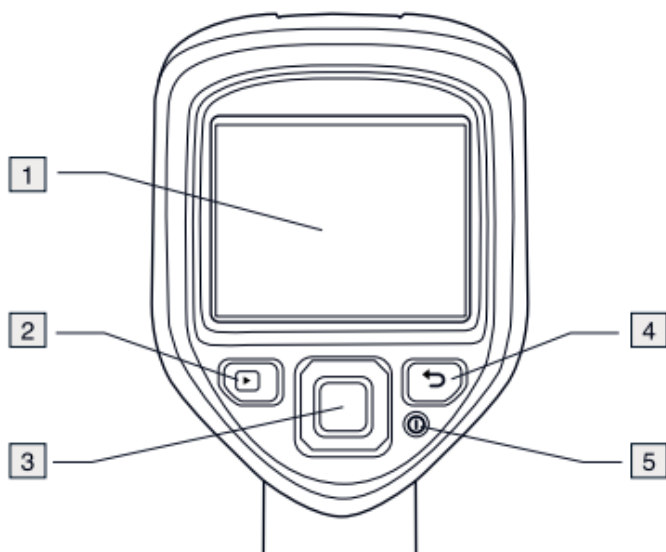8. Install FLIR Tools (software) on your computer.

9. Import the images into FLIR Tools (software).

B. Description of Camera Parts

1. Digital camera lens.

2. Infrared lens.

3. Lever to open and close the lens cap.

4. Trigger to save images.

5. Battery

C. Description of Keypad

1. Camera screen

2. Archive button

- Push to open the image archive.

3. Navigation pad

• Push left/right or up/down to navigate in menus, submenus, and dialog boxes.
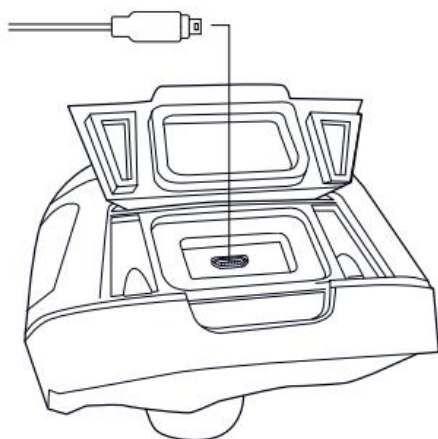
• Push the center to confirm.

4. Cancel button

• Push to cancel a choice.

• Push to go back into the menu system.

5. On/Off button

• Push and hold the button for less than 5 seconds to put the camera in standby mode. The camera then automatically turns off after 48 hours.

• Push and hold the button for more than 10 seconds to turn off the camera

D. Description of USB mini-B connector

The purpose of this USB mini-B connector is the following:

• Charging the battery using the FLIR power supply.

• Charging the battery using a USB cable connected to a computer. Note Charging the camera using a USB cable connected to a computer takes considerably longer than using the FLIR power supply or the FLIR stand-alone battery charger.

• Moving images from the camera to a computer for further analysis in FLIR Tools. Note Install FLIR Tools on your computer before you move the images.

E. Description of Screen elements

1. Main menu toolbar.

2. Submenu toolbar.

3. Spot meter.

4. Temperature of the spot.

5. Status icons for battery.

6. Temperature scale.

F. Changing the camera settings

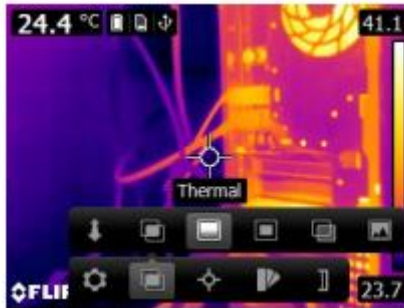## □ Measuring the hottest/coldest temperature within an area
- This displays a moving spot meter that indicates the hottest temperature.
- The spot meter can be activated by following these steps:

    1. Push the centre of the navigation pad. This displays a toolbar.

    2. On the toolbar, select Measurement.

    3. On the toolbar, select Hot spot for hottest temperature and select Cold spot for coldest temperature.
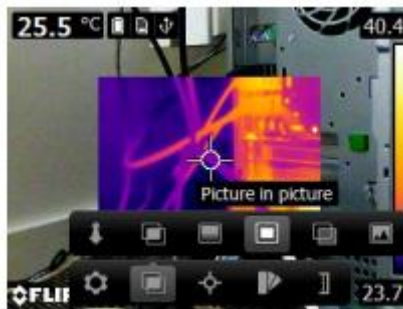
□ Changing image mode
- The camera can operate in five different image modes:
    1. Thermal MSX (Multi Spectral Dynamic Imaging): The camera displays an infrared image where the edges of the objects are enhanced.

    2. Thermal: The camera displays a fully thermal image.

3. Picture-in-picture: The camera displays a digital camera image with a superimposed infrared image frame.

4. Thermal blending: The camera displays a blended image that uses a mix of infrared pixels and digital photo pixels. The mixing level can be adjusted.

- Procedure to change image mode

   1. Push the centre of the navigation pad.

   2. On the toolbar, select Image mode

   3. On the toolbar, select one of the following:

      • Thermal MSX .

      • Thermal.

      • Picture-in-picture.

      • Thermal blending

      • Digital camera

G. Changing the temperature scale mode

- The camera can operate in different temperature scale modes (depending on the camera model):
    - Auto mode: In this mode, the camera is continuously auto-adjusted for the best image brightness and contrast.
    - Manual mode: This mode allows manual adjustments of the temperature span and the temperature level.
- Procedure to change temperature scale mode

    1. Push the centre of the navigation pad.

    2. On the toolbar, select Temperature scale .

    3. On the toolbar, select one of the following:

    • Auto .

    • Manual .

    4. To change the temperature span and the temperature level in Manual mode, do the following:

    • Push the navigation pad left/right to select (highlight) the maximum and/or minimum temperature.

    • Push the navigation pad up/down to change the value of the highlighted temperature.

H. Setting the emissivity

- To measure temperatures accurately, the emissivity of the surface must be selected properly.
- The user can choose between the following surface properties: • Matt. • Semi-matt. • Semi-glossy
- Procedure:

    1. Push the centre of the navigation pad.

    2. On the toolbar, select Settings .

    3. In the dialog box, select Measurement parameters.

    4. In the dialog box, select Emissivity.

    5. In the dialog box, select one of the following: • Matt. • Semi-matt. • Semi-glossy

I. Changing the reflected apparent temperature

- This parameter is used to compensate for the radiation reflected by the object. If the emissivity is low and the object temperature significantly different from that of the reflected temperature, it will be important to set and compensate for the reflected apparent temperature correctly.

- Procedure:

    1. Push the centre of the navigation pad.

    2. On the toolbar, select Settings ⚙..

    3. In the dialog box, select Measurement parameters.

    4. In the dialog box, select Reflected apparent temperature and then set a value.

J. Changing the distance between the object and the camera
- To measure temperatures accurately, the camera requires the distance between the camera and the object.
- Procedure to set the distance:

    1. Push the centre of the navigation pad.

    2. On the toolbar, select Settings ⚙..

    3. In the dialog box, select Measurement parameters.

    4. In the dialog box, select Distance - where you can select a distance.

K. Saving an image
- Pressing the trigger button captures and saves the IR image into the memory card.
- Image capacity - Approximately 500 images can be saved to the internal camera memory.
- Naming convention - the naming convention for images is FLIRxxxx.jpg, where xxxx is a unique counter.

L. Cleaning the camera
- Use a soft cloth and one of these liquids: (a) warm water, or (b) a weak detergent solution
- Procedure to clean the camera:

    1. Soak the cloth in the liquid.

    2. Twist the cloth to remove excess liquid.

    3. Clean the part with the cloth. CAUTION: Do not apply solvents or similar liquids to the camera, the cables, or other items. This can cause damage.

M. Cleaning the IR lens
- Use cotton wool and one of these liquids: (a) commercial lens cleaning liquid with more than 30% isopropyl alcohol, or (b) 96% ethyl alcohol (C_2H_5OH).
  CAUTION: If you use a lens cleaning cloth it must be dry. Do not use a lens cleaning cloth with the water or detergents. These liquids can cause material on the lens cleaning cloth to become loose.

- Procedure to clean the lens:

1. Soak the cotton wool in the liquid.

2. Twist the cotton wool to remove excess liquid.

3. Clean the lens one time only and discard the cotton wool.

WARNING: Make sure that you read all applicable MSDS (Material Safety Data Sheets) and warning labels on containers before using a liquid: the liquids can be dangerous. Be careful when you clean the infrared lens. The lens has a delicate anti-reflective coating. Do not clean the infrared lens too vigorously. This can damage the anti-reflective coating.

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