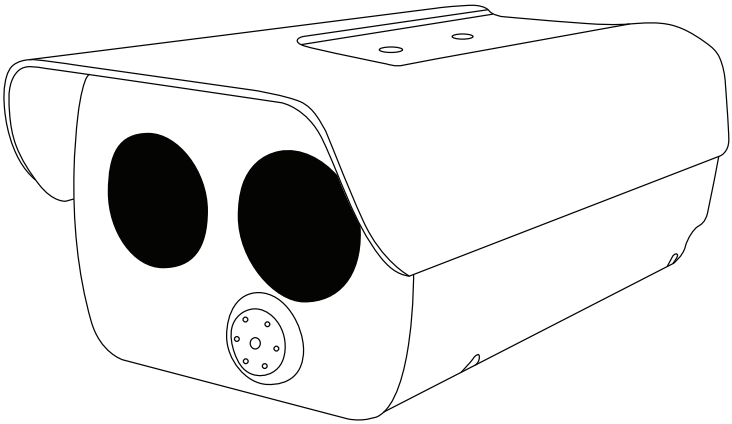
ICI | INFRARED CAMERAS INC

Medical

FM 384 P SERIES IR CAMERA

USER MANUAL

PLEASE READ THIS MANUAL BEFORE SWITCHING THE UNIT ON.
IMPORTANT SAFETY INFORMATION INSIDE.



THIS DEVICE IS INTENDED FOR ADJUNCTIVE USE WITH OTHER CLINICAL DIAGNOSTIC PROCEDURES TO MEASURE HUMAN BODY TEMPERATURE VIA NON-CONTACT SKIN MEASUREMENTS VISUALIZED FROM THE HUMAN FACE. NOT MEANT FOR STANDALONE CLINICAL DIAGNOSTIC PROCEDURES OR TO TREAT OR DIAGNOSE PATIENTS.

ICI cameras fall under US Federal Law and Export Control.

2105 W. Cardinal Dr. Beaumont, TX 77705

For more information, contact us: (409) 861-0788 | sales@infraredcameras.com | www.infraredcameras.com

Printed in the United States of America.

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Revision: 4.2021-001

Contents

1. General Description

FM 384 Series IR cameras are specially designed to take the body temperature of a person and to report the total number of persons scanned. It is used in for temperature screening.

2. Safety Information

- This device must be installed by qualified service personnel or system installation personnel.
- Do take precautions to prevent the lens from being worn, scratched or broken. Avoid touching the lens to prevent it from being damaged or getting dirty.
- Given that the uncooled thermal infrared image camera uses a very sensitive thermal sensor, under no circumstances (powered on or off) should the lens be pointed directly at a strong radiation source (such as sun, direct or reflected laser beam, etc.), otherwise permanent damage will be caused to the uncooled thermal imager.
- This product is a precise electronic device that must be handled with care during use, storage, and transportation to prevent dangerous actions such as the device being hit by external force, or falling from heights.
- During transportation and storage the original packaging box must be used.
- Prior to start of the device, make sure that the power supply is properly connected. If the power supply is connected incorrectly, the device may be damaged.
- Do not place any objects on the power cord, and do not place the device where the power cord can be easily touched.
- Do not submerge the device in water. Protect the device from heavy seas and projecting jets of water. Rated for environments of ≤ 95% humidity.
- Do not drop or throw the device.
- Do not put the product into a fire.
- It is recommended to calibrate the device(s) annually.
- If the device operates abnormally, please contact the supplier and do not dismantle the device on your own.

3. Intended Use

FM 384 Series IR Cameras are used as an adjunct to other clinical diagnostic procedures for elevated body temperature screening based on the skin surface temperature visualized from the human face.

Patient population: All age groups

Environment of use: hospitals, sub-acute healthcare settings, public areas, i.e., airports.

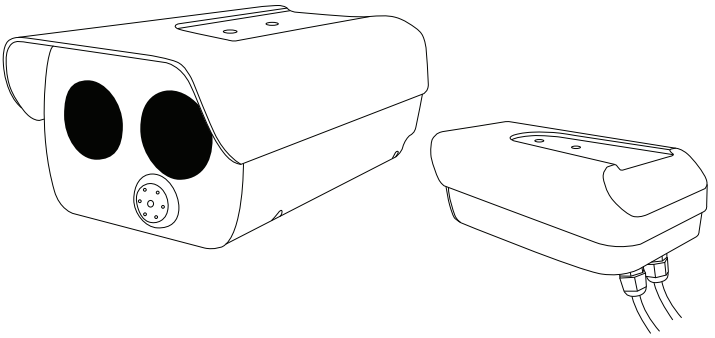
4. Technical Specifications

Detector Array	UFPA
Pixel Pitch	17 µm
FOV	25° x 16°
Measurement Distance	Lens dependent
Pixel Resolution	384 x 288
Spectral Band	7.5 µm to 14 µm
Thermal Sensitivity (NETD)	< (50 mK) 0.05 °C at 30 °C (86°F)
Frame Rate	50 Hz
Dynamic Range	H264 UVC
Temperature Range	30 °C to 45 °C (86°F to 113 °F)
Operation Range	-30 °C to 50 °C (-22°F to 122 °F)
Storage Range	40 °C to 70 °C (-40 °F to 158 °F)
Humidity	≤ 95%
Accuracy	± 0.2 °C (0.36 °F)
Pixel Operability	> 99 %
Shock/Vibration	25 G/2G
Dimensions (without lens)	236 mm x 130 mm x 80 mm (L x W x H ± 0.5 mm) (9.29” x 5.12” x 3.15” (L x W x H ± 0.02”))
Power	12V DC 1 A, < 30 W
Weight (without lens)	< 850 g (1.87 lbs)
Interface	USB 2.0
Video	H.264 IR and UVC (NV12) visible
Emissivity Correction	0.01 to 1.0
IP Rating	IP 54
Shutter	Built-in shutter
Visible Camera	1920 x 1080

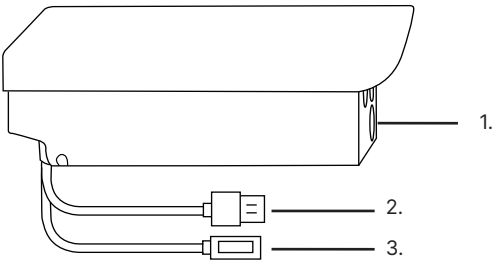
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

5. Structure

5-1 Appearance

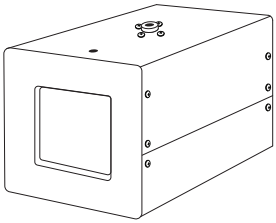


5-2 Definitions of Housing Interface

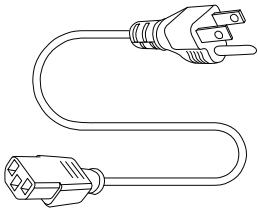


1. Speaker - reserved
2. USB interface
3. Barrel connector

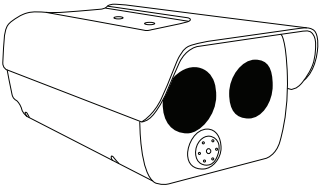
6. Package Contents



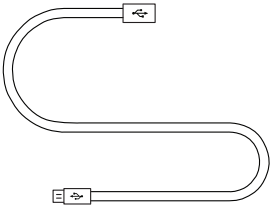
Temperature Reference



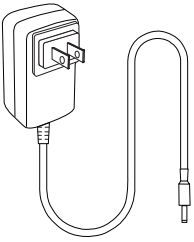
AC Power Cord



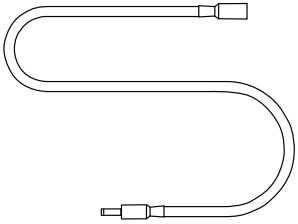
FM Series IR Camera



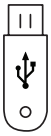
USB Cable



Power Adapter



Power Extension Cable



Software USB Drive

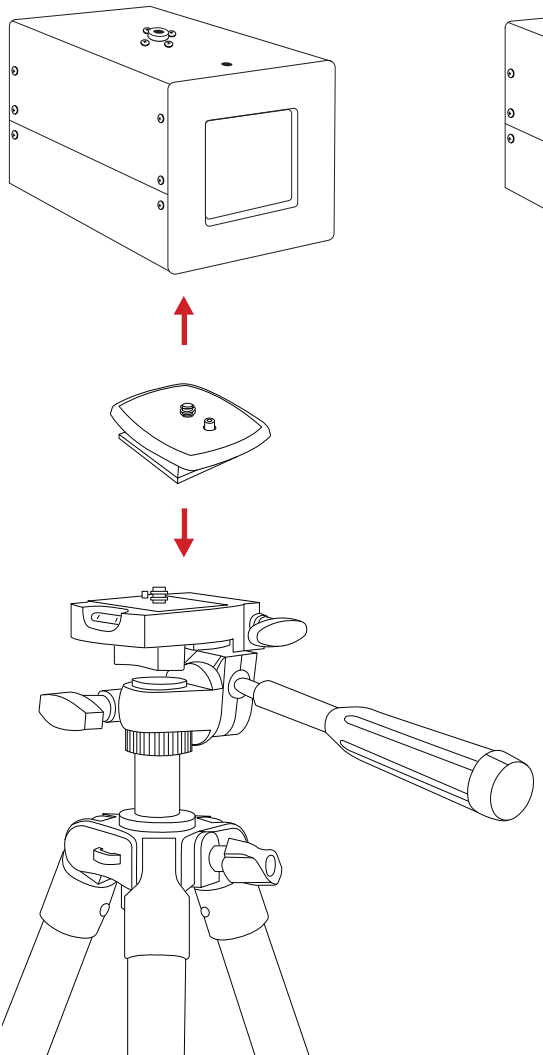
ENSURE ALL SYSTEM EQUIPMENT AND COMPONENT ITEMS ARE PRESENT BEFORE BEGINNING INSTALLATION

7. Installation Instructions

SELECT AN APPROPRIATE AREA FREE OF IMMEDIATE AIRFLOW FROM DOORWAYS AND AIR CONDITIONING/VENTILATION SYSTEMS. THE SELECTED AREA SHOULD HAVE A STABLE AMBIENT TEMPERATURE BETWEEN 20 °C AND 24 °C (68 °F TO 75.2 °F)AND RELATIVE HUMIDITY RANGE FROM 10% TO 50%.

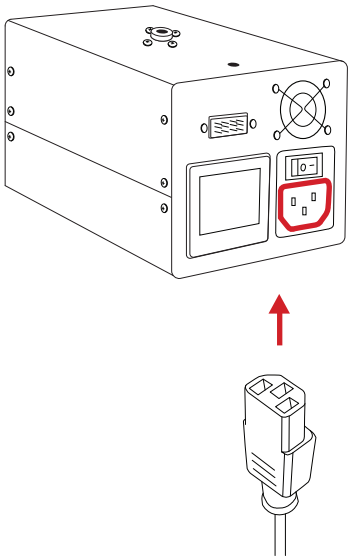
A.

Mount the Temperature Reference to a tripod using the ¼-20 mount.



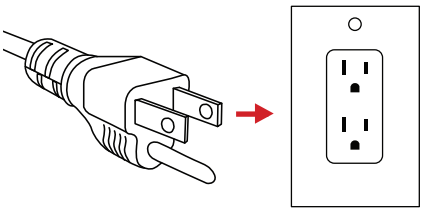
B.

Plug power cord into Temperature Reference.



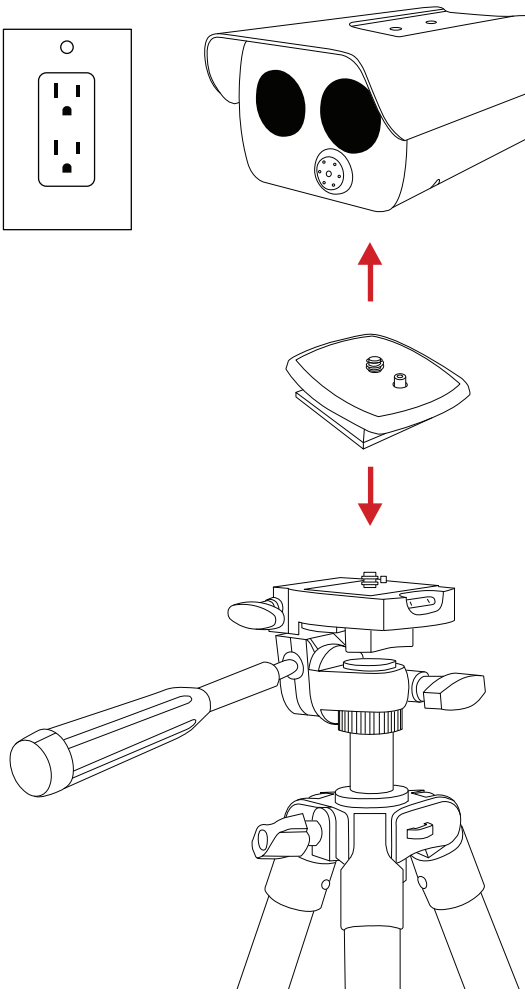
C.

Plug power cord into a 110/120V electrical outlet.



D.

Mount the FM Series IR Camera to a tripod using the ¼-20 mount.



MAKE SURE TRIPODS DO NOT BLOCK THE DIRECT PATH OF PERSON(S) TO BE IMAGED TO ENSURE THE EQUIPMENT WILL NOT BE MOVED OR KNOCKED DOWN. USING A DIVIDING BARRIER WILL HELP KEEP TRIPODS SEPARATE FROM THE PATH.

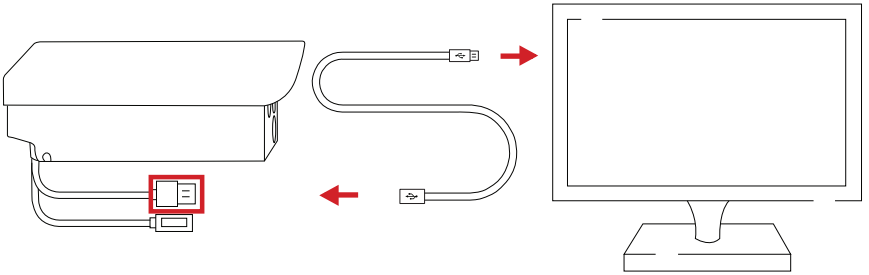
ENSURE THE CAMERA LENS AND TEMPERATURE REFERENCE SOURCE ARE FACING EACH OTHER ON PARALLEL PLANES. MAKE SURE CAMERA TARGET AREA IS FACING A NON-REFLECTIVE BACKGROUND.

E.

Plug the USB cable attached to the FM Series IR Cable into the barrel end of the USB cable.

F.

Plug the other end of the USB cable into a computer USB port.



G.

Plug the jack end of the power extension cable into the barrel cable attached to the FM Series IR Camera.

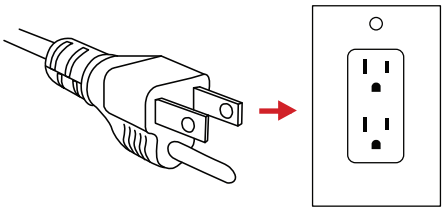
H.

Plug the power cord into the barrel end of the power extension cable.

IF EXTRA LENGTH IS NOT NEEDED LEAVE OUT THE POWER EXTENSION CABLE AND INSTEAD, PLUG THE JACK END OF THE POWER CORD INTO THE BARREL CABLE ATTACHED TO THE FM SERIES IR CAMERA.

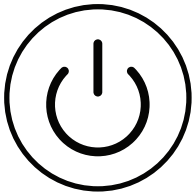
I.

Plug power cord into a 110/120V electrical outlet.



J.

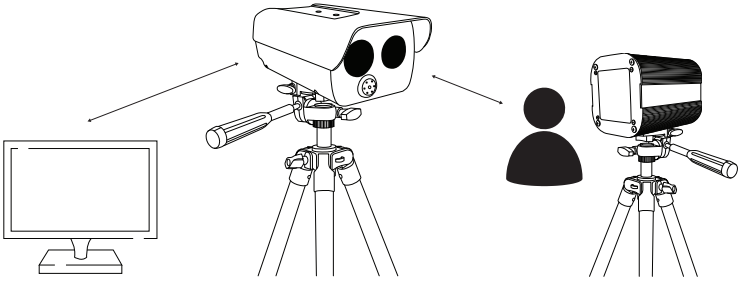
Power on Devices.



ALLOW AT LEAST 45 MINUTES FOR THE TEMPERATURE REFERENCE SOURCE TO WARM UP. THIS WILL PROVIDE THE MOST ACCURATE SKIN TEMPERATURE MEASUREMENTS.

SOFTWARE ARRIVES INSTALLED ON COMPUTERS AND TABLETS PURCHASED FROM ICI AS COMPLETE SYSTEMS AND IT WILL LAUNCH AUTOMATICALLY ON STARTUP. AFTER THE SOFTWARE LAUNCHES THE USER SHOULD ENSURE THE TARGET ZONE IS IN VIEW OF THE CAMERA AND THE TEMPERATURE REFERENCE SOURCE IS POSITIONED OFF CENTER TO KEEP THE PERSON BEING IMAGED AS CENTERED AS POSSIBLE.

7-1 Full Assembly Diagram



GRAPHIC FOR ILLUSTRATION PURPOSES ONLY

CRITICAL INFORMATION

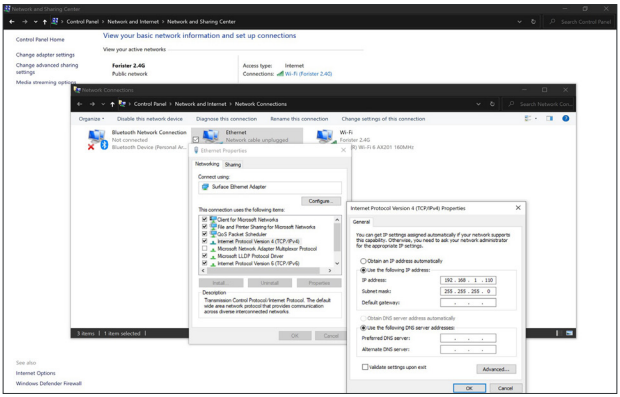
- The technology should be used to measure only one subject's temperature at a time.
- Measurements should not be solely, or primarily, relied upon to diagnose or exclude a diagnosis of any disease.
- Elevated body temperature should be confirmed with secondary evaluation methods (e.g., an NCIT or clinical grade contact thermometer).
- Signage should instruct for the removal of glasses, headwear, and masks.
- Read the current government guidance regarding the use of telethermographic systems for skin temperature measurements. Additional information can be found by reading IEC 80601-2-59:2017 Medical electrical equipment — Part 2-59: Particular requirements for the basic safety and essential performance of screening thermographs for human febrile temperature screening and ISO/TR 13154:2017 Medical electrical equipment - Deployment, implementation and operational guidelines for identifying febrile humans using a screening thermograph.

CRITICAL INFORMATION

8. Computer Setup

8-1 IP Address Configuration

The FM 384 comes configured with static IP address for both the visible and infrared cameras. The visible camera resides at 192.168.1.88, and the infrared camera lies at 192.168.1.88. Connecting your computer requires setting the IPv4 settings of the Ethernet port to a static IP address in the same “Class C.” We suggest applying 192.168.1.110 with a subnet mask of 255.255.255.0. There is no need to set a gateway as this is a direct connection from the computer to the cameras with no router.



Be sure the static IP address is set by doing the following:

1. Click on Windows icon.
2. Click on Settings.
3. Click on Network and Internet.
4. Click on Ethernet.
5. Click on Change Adapter Options.
6. Right click on Ethernet and choose properties.
7. Double click on Internet Protocol Version 4 (TCP/IPV4) Properties.
8. The IP address should read 192.168.1.110. If it does not, click in the box and fill in the correct number. Then click Tab to generate subnet.
9. The Subnet Mask should read 255.255.255.0. If it does not, click in the box and fill in the correct number.
10. Click Ok.

8-2 IR Flash Skin Temperature Monitor Software (IR Flash STM)

Software arrives installed on computers and tablets purchased from ICI as complete systems and it will launch automatically on startup. A copy of the software is provided on the Software USB Drive. Documentation can be found online on the IR Flash STM web page under the Downloads section or at this address:

https://infraredcameras.com/ir-flash-stm-manual/

- **Processor:** i5 or above (Quad Core or better)
- **RAM:** 4 GB or above
- **OS:** Windows 8/8.1/10
- **Hard Drive:** 256 GB or above
- **Resolution:** 1920 x 1080

8-3 Cybersecurity

The computer supplied with a complete system is provided with the Windows Operating System. IR Flash STM software preinstalled and the system has been checked for viruses and malware prior to shipping. To further decrease the possibility of introducing malware, Infrared Cameras Inc. recommends you take steps to reduce the likelihood that the system be compromised, which include:

- Prior to connecting the system's computer to the Internet or your secure internal network be sure to have your IT department install your organization's anti-virus software, anti-malware and, if applicable, system access software and apply security updates as necessary.
- If connecting the system's computer to the Internet be sure to locate the computer behind a firewall.
- Install security updates to the computer's operating system in accordance with your organization's policies
- Do not use the system's computer for other uses.
- Install software updates via instructions provided by Infrared Cameras Inc. only. Do not install software from unknown entities.
- Don't connect unknown hardware devices, e.g. USB devices, external hard drives, etc. to the system computer.
- If you suspect that the system computer has been infected with malware, contact your organization's IT department or Infrared Cameras Inc. for further assistance.

If your device does not require usage of the e-mail alert function using the device off a network is preferred.

Windows 10™ Operating System updates are evaluated by Infrared Cameras Inc. as they are released by Microsoft. Please contact Infrared Cameras Inc. Technical Support for compatibility information.

9. Cleaning and Maintenance

9-1 Cleaning the Germanium Lens

Do not use corrosive chemicals on the optical glass components. The germanium window surface is coated with anti-reflection coating. Dust, grease, and fingerprints will produce harmful substances and lead to a decline in performance, or cause scratches. If dirt is found, please use the following methods:

1. Use a blown balloon or a soft brush to clean the lens surface to avoid dust particles scratching the anti-reflection film on lens surface during the wiping process.
2. Use a soft cotton or microfiber cloth or lens wiping paper and dip in distilled water. Gently wipe the lens surface from the middle to the edge, paying attention to not crack the lens, or use too much liquid. If the lens is still not clean, replace the cloth and repeat the wiping process.

9-2 Disinfecting the Camera Surface

Do not use corrosive cleaning solutions on the optical glass components. It is recommended to disinfect the camera surface regularly with a non-corrosive sanitizing product. Follow the directions provided by the manufacturer of the cleaning solution. Adhere to the sanitation protocols and cleaning schedule set forth by the employer.

9-3 Device Calibration

It is recommended to have device(s) re-calibrated annually. Contact customer service to schedule maintenance.

9-4 Storage

When the equipment is not in use, the Temperature Reference Source should be placed in a dust-free and moisture-free environment with a stable temperature and humidity.

10. Site and System Setup Validation Checklist

Site: _____ **System:** _____
Contact Person: _____ **Date:** _____

**All those tasked with the initial setup of the temperature screening equipment must be present during this training.

***This portion of the validation requires a live video feed with the instructors.

10-1 The Screening Area

☐ Ensure that this area is free from:

- Any direct or indirect (reflected) sunlight
- Warm or cold conductive airflow
  - HVAC vents/intakes
- Any radiant energy from electrical sources
- Direct or indirect lighting on individual being screened

☐ Room temperature is 20 °C - 24 °C (68 °F - 75 °F)

☐ Relative humidity is within 10% – 50%

10-2 The Screening Background

☐ Placement is parallel and perpendicular to screening camera

- At a distance of ~12 feet

☐ Consists of a non-IR reflective homogeneous background

- Minimum size is 10’ x 8’
- White to gray flat finish

☐ The temperature reference source is in front of background (direct line of sight to the screening camera) and is framed within the screening image

10-3 The Traffic Flow

☐ Establish a guided pathway from the entrance to the screening area

Continues

- ☐ Design this pathway so there is an equilibration time
- ☐ No restrooms on ingress pathway
- ☐ Signage should instruct for removal of glasses, headwear, and masks

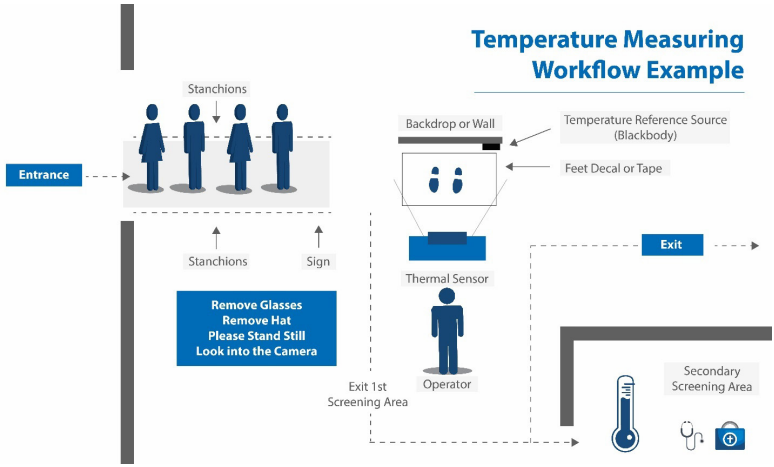
☐ Mark the point of measurement on the floor (“V/X” or a set of footprints)

- ☐ The distance is unique to each screening system

☐ Ensure the line of sight from the temperature reference source to the camera is never blocked by an individual entering or leaving the point of measurement

☐ The secondary screening area should be setup near the screening area

10-4 Typical traffic flow illustration:



10-5 IR Camera Placement

☐ Level on tripod or other suitable support

☐ Perpendicular to floor and individual being screened

Continues

- ☐ Height of camera
  - ☐ Average male 70 ± 4 inches; Average female 65 ± 4 inches
  - ☐ 5'4" – 5'8" will image 4'8" to 6'4" individual
    - ☐ Larger will require a height adjustment to camera
- ☐ Distance of camera to individual being screened is 8 - 10 feet
  - ☐ The individual's face and temperature reference source should be in the frame
- ☐ Distance to temperature reference source: 10 - 12 feet
  - ☐ Behind the individual being screened yet visible within the frame of the image
- ☐ Protect the camera from exposure to direct sunlight to avoid damage to the camera sensor

10-6 Temperature reference source

- ☐ On tripod or other stable stand, in front of background, and positioned for visibility within the frame of the image
- ☐ Temperature is set at 35 °C (95 °F) or 37 °C (98.6 °F)
- ☐ Warm-up time is 15 minutes

10-7 Software

- ☐ Set up the software according to the instructions provided
- ☐ Documentation can be found online on the IR Flash STM web page under the Downloads section or at this address:

https://infraredcameras.com/ir-flash-stm-manual/

10-8 Final Step

Final validation is dependent upon a signed copy of this checklist from each person responsible for each site.

Upon completion please sign below:

ICI representative: **Company representative:**

Signature: _____ Signature: _____

Print Name: _____ Print Name: _____

Date: _____

11. Troubleshooting

11-1 Camera(s) not showing, camera(s) lagging, or software crashing

- Close and reopen software
- Reconnect power & USB cables
- Ensure that camera has been powered on for a few minutes
- Verify that static IP address is correct:
  - Default IPv4 of 192.168.1.110
  - Default subnet mask of 255.255.255.0
- Restart computer
- Verify that correct software is installed
- Uninstall & reinstall software, running as administrator
- Verify that firewall is not blocking software
- Try newer or different version of IR Flash STM software

11-2 Camera out of focus

- Adjust distance between camera and subject.

11-3 Temperature readings are incorrect or facial recognition is suboptimal

- Close and reopen software
- Check that software settings are correct:
  - Fixed temperature of 35 °C (95 °F) or 37 °C (98.6 °F), depending on temperature reference source
  - Temperature reference source has crosshair over it
- Remove masks & glasses
- Camera is proper distance from person
- Camera is at proper height
- Temperature reference source in view, perpendicular to camera, but not blocked
- Person is looking directly at camera lens, not at an angle
- Temperature reference source power switch is on
- Camera and temperature reference source powered on for 15 minutes
- Ensure temperatures on back of temperature reference source match
- Camera is away from direct sunlight or reflective light

- Plain background
- Try newer version of IR Flash STM software

12. About ICI

Infrared Cameras, Inc.
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Beaumont, TX 77705

Phone: (409) 861-0788 | Toll Free: (866) 861-0788 | International: (409) 861-0788

General Inquiry: support@infraredcameras.com
Website: www.infraredcameras.com

You may reach a representative by phone or email Monday – Friday 8:00AM - 5:00PM CST.

ICI manufactures complete systems and software. We can provide complete engineering, software, and OEM solutions. Our Fortune 500 clients rely on us for infrared equipment and thermography training (which we offer through the Infrared Training Institute).

In addition to providing custom germanium, silica, and sapphire optics, we also build windows for enclosures, as well as custom pan and tilt units. We can even provide customizable explosion-proof systems.

Our knowledge and experience stems from years of using infrared imaging and temperature measurement instruments to provide solutions to: managers, engineers, scientists, inspectors and operators in space, power companies, medical, pulp and paper, food industry, research and development, and various process industries. You can see our products and services used in industrial, commercial, and government applications worldwide. Originally named Texas Infrared (still DBA), Infrared Cameras, Inc. has been in business since March, 1995.

Thank you for your dedicated and continued support.